California Water Service Company

2010 Urban Water Management Plan

Antelope Valley 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 13
1.5 PLAN ORGANIZATION 14
1.6 IMPLEMENTATION OF PREVIOUS UWMP 15
2 SYSTEM DESCRIPTION **17**
2.1 SERVICE AREA DESCRIPTION 17
2.2 SERVICE AREA POPULATION 20
2.3 SERVICE AREA CLIMATE 24
3 SYSTEM DEMANDS **27**
3.1 DISTRIBUTION OF SERVICES 27
3.2 HISTORICAL AND CURRENT WATER DEMAND 28
3.3 WATER DEMAND PROJECTIONS 31
3.3.1 Senate Bill No. 7 Baselines and Targets *35*
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 43
4.3 SURFACE WATER 44
4.4 GROUNDWATER 44
4.4.1 Basin Boundaries and Hydrology *50*
4.4.2 Antelope Valley Basin Adjudication *51*
4.4.3 Groundwater Management Plan *52*
4.5 RECYCLED WATER 52
4.5.1 Wastewater Collection *52*
4.5.2 Estimated Wastewater Generated *53*
4.5.3 Potential Water Recycling *54*
4.6 DESALINATED WATER 54
4.7 TRANSFER OR EXCHANGE OPPORTUNITIES 54
5 WATER SUPPLY RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING **55**
5.1 WATER SUPPLY RELIABILITY 55
5.2 DROUGHT PLANNING 56
5.2.1 Normal-Year Comparison *57*
5.2.2 Single Dry-Year Comparison *57*
5.2.3 Multiple Dry-Year Comparison *59*
5.3 FACTORS THAT AFFECT SUPPLY RELIABILITY 60
5.4 WATER QUALITY 60

5.5 WATER SHORTAGE CONTINGENCY PLAN 61
5.5.1 Water Shortage Contingency Plan Scope *61*
5.5.2 Water Conservation/Water Supply Team *62*
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 *72*
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 93

8 COMPLETED UWMP CHECKLIST 95

8.1 REVIEW CHECKLIST 95

APPENDIX A-1: RESOLUTION TO ADOPT UWMP 103

APPENDIX A-2: CORRESPONDENCES 105

APPENDIX A-3: PUBLIC MEETING NOTICE 106

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 ORDINANCE 113

APPENDIX F: WATER EFFICIENT LANDSCAPE GUIDELINES 115

APPENDIX G: CONSERVATION MASTER PLAN 117

APPENDIX H: ANTELOPE VALLEY INTEGRATED REGIONAL WATER MANAGEMENT PLAN 119

APPENDIX I: AVEK WATER SERVICE AGREEMENT 121

List of Figures

Figure 2.1-1: General Location of Antelope Valley 17
Figure 2.1-2: General Service Area 18
Figure 2.1-3: Major Fault Lines near Kern River Valley District 19
Figure 2.2-1: Approximated SAM with US Census 2000 Tract Map 20
Figure 2.2-2: Historical & Projected Services 22
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 30
Figure 3.2-4: Percent of Total Demand by Type of Use (2010) 31
Figure 3.3-1: Historical & Projected Demand 32
Figure 3.4-1: Historical & Projected Sources 41
Figure 4.4-1: Geologic Cross Section of the Lancaster Subbasin 45
Figure 4.4-2: Surface Geology of Antelope Valley 46
Figure 4.4-3: Groundwater Level Trend and Location of Monitoring Well 31S37E33H001M .. 48
Figure 4.4-4: Groundwater Level Trend and Location of Monitoring Well 07N12W19R001S .. 49
Figure 4.5-1: Estimated District Annual Wastewater Generated 53
Figure 5.1-1: Comparison of Annual Rainfall to Historical Average 55
Figure 7.4-1: The Climate Regions of California 89
Figure 7.4-2: Maximum Temperature Departure for Mojave Desert Region 91
Figure 7.4-3: Mean Temperature Departure for Mojave Desert Region 91
Figure 7.4-4: Minimum Temperature Departure for Mojave Desert Region 92
Figure 7.4-5: Annual Precipitation in Mojave Desert Region 93

List of Tables

Table 1.2-1: Coordination with Appropriate Agencies (Table 1) 12
Table 1.5-1: Plan Organization 14
Table 2.2-1: Summary of Census 2000 Data 21
Table 2.2-2: Population - Current and Projected (Table 2) 22
Table 2.3-1: Average Annual Climate (Table 3) 24
Table 3.3-1: Actual 2005 Water Deliveries – AF (Table 3) 33
Table 3.3-2: Actual 2010 Water Deliveries – AF (Table 4) 33
Table 3.3-3: Projected 2015 Water Deliveries – AF (Table 5) 33
Table 3.3-4: Projected 2020 Water Deliveries - AF (Table 6) 34
Table 3.3-5: Projected 2025 and 2030 Water Deliveries - AF (Table 7) 34
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 36
Table 3.3-8: Base Period Ranges (Table 13) 37
Table 3.3-9: Daily Base Per Capita Water Use-10-Year Range (Table 14) 38
Table 3.3-10: Daily Base Per Capita Water Use-5-Year Range (Table 15) 38
Table 3.3-11. Antelope Valley District SBx7-7 Targets 39
Table 3.3-12: Low-income Projected Water Demands (Table 8) 40
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) 41
Table 4.1-1: Planned Water Supplies (Table 16) 43
Table 4.2-1: Agency Demand Projections Provided to Wholesale Suppliers (Table 17) 44
Table 4.4-1: Amount of Groundwater Pumped – AFY (Table 18) 50
Table 4.4-2: Amount of Groundwater projected to be pumped – AFY (Table 19) 50
Table 4.5-1: Recycled Water-- Wastewater Collected and Treated-AFY (Table 21) 53
Table 4.5-2: Disposal of wastewater (non-recycled) AF Year (Table 22) 54
Table 5.2-1: Basis of Water Year Data (Table 27) 56
Table 5.2-2: Supply Reliability – gal/service/yr (Table 28) 56
Table 5.2-3: Supply Reliability – Current Water Sources - AFY (Table 31) 57
Table 5.2-4: Supply and Demand Comparison - Normal Year - AF (Table 32) 57
Table 5.2-5: Supply and Demand Comparison – Single Dry Year - AF (Table 33) 58
Table 5.2-6: Supply And Demand Comparison - Multiple Dry Year Events – AFY (Table 34) 59
Table 5.3-1: Factors Resulting In Inconsistency of Supply (Table 10) 60
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)..... 95

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:

General Office:	**California Water Service Company** **1720 North First Street** **San Jose, CA 95112**
E-mail address:	**tsalzano@calwater.com**
Phone:	**(408) 367-8340**
Fax:	**(408) 367-8427**
District Office:	**Antelope Valley District** **5015 West Avenue L-14, Unit 2** **Quartz Hill, CA 93536**
Local Manager:	**Chris Whitley**
Superintendent:	**Jose Ojeda**
District Phone:	**(661) 943-9001**

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 Antelope Valley communities since 2000.

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 Urban Water Management Plan.

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.

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
Los Angeles County				✓	✓	✓	
Kern County				✓	✓	✓	
Antelope Valley East Kern Water Agency (AVEK)				✓	✓	✓	

Cal Water conducted a formal public meeting to present information on its Antelope Valley District UWMP on Thursday June 2, at 5:00 p.m. at the following location:

Leona Valley Community Center Building
8367 Elizabeth Lake Road
Leona Valley, CA 93551

Proof of the public hearing is presented in Appendix A

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 hearing.
- Correspondence between Cal Water and participating agencies.

A copy of the final version of this plan 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 connection information.
- 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 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) §10621(a -b) §10635(b) §10642 §10643 §10644 (a) §10645
Section 2	System Description This section describes the District service area and includes area information, population estimate, and climate description.	§10631 (a)
Section 3	System Demands 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 §10608.20(e)
Section 4	System Supplies This section includes a detailed discussion of the water supply sources.	§10631 §10633 §10634
Section 5	Water Supply Reliability and Water Shortage Contingency Planning 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 §10631 (d) §10632 §10634 §10635 (a)
Section 6	Demand Management Measures This section describes Cal Water's conservation programs.	§10631
Section 7	Climate Change This section contains a discussion of climate change.	
Section 8	DWR Checklist This section includes the completed DWR UWMP Checklist.	
Appendix A	Resolution To Adopt The Urban Water Management Plan This section includes the following: 1) Resolution 2) Letters to and comments from various agencies 3) Minutes from the public hearing 4) Correspondence between Cal Water and participating agencies	§10621 (b) §10642 §10644 (a)
Appendix B	Service Area Map 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 This section includes the spreadsheets used to estimate the water demand for the District.	-

Section	Table 1.5-1: Plan Organization	Act Provision
Appendix D	DWR Groundwater Bulletin 118 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 Water Conservation Ordinances This section contains the tariff rule and ordinance for reference.	-
Appendix F	Water Efficient Landscape Guidelines This section contains the Guideline for Water Efficient Landscape that Cal Water uses at its properties, including renovations.	-
Appendix G	Conservation Master Plan This section contains the District's Conservation Master Plan.	§10631 (j)
Appendix H	Antelope Valley Integrated Regional Water Management Plan	§10631

1.6 Implementation of Previous UWMP

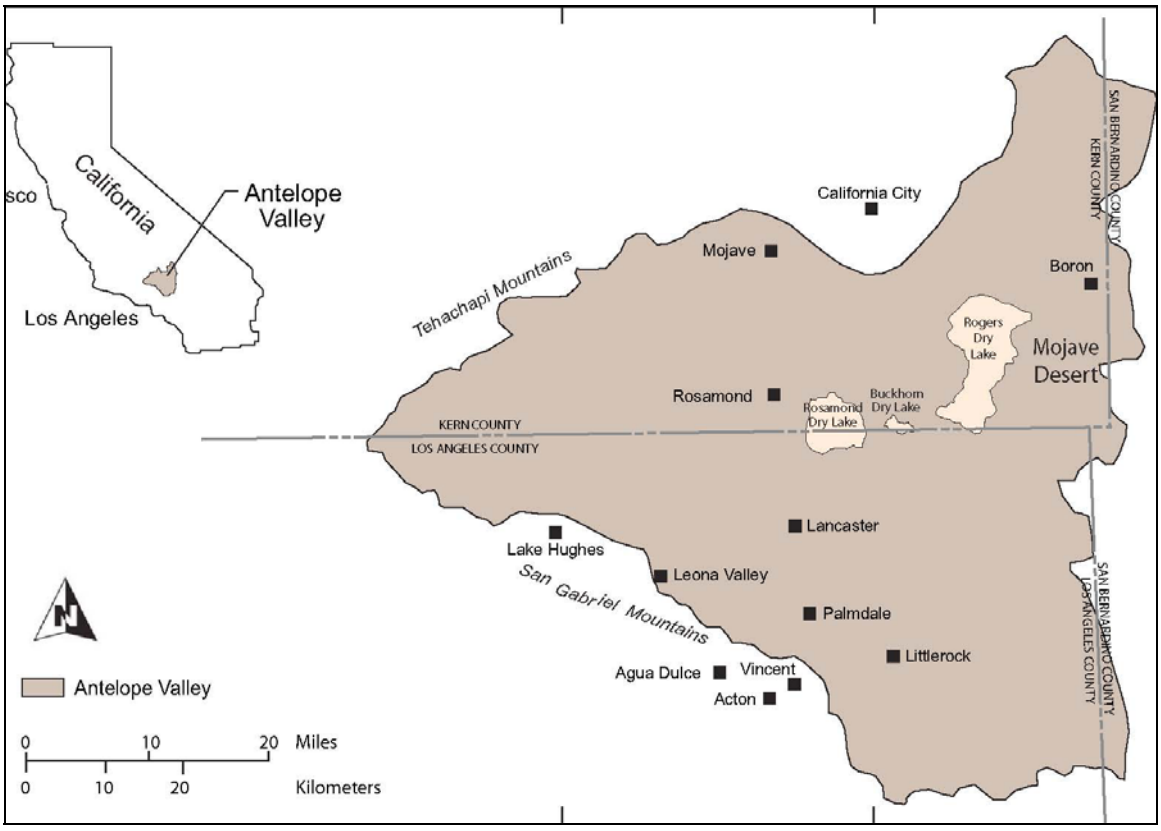
Cal Water will follow the California Water Code and file an UWMP at least once every five years on or before December 31, in years ending in five and zero. Since Cal Water operates 24 separate service districts the UWMP for each district has historically been submitted every third year to coincide with 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. 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 Antelope Valley District is located near the border of northeastern Los Angeles and southeastern Kern Counties in the Western Mojave Desert. The District consists of four hydraulically separated water systems in unincorporated areas of these counties. The Lancaster, Lake Hughes, and Leona Valley systems are found at the base of the San Gabriel Mountains west of the City of Lancaster. The Fremont Valley system is located at the base of the Tehachapi Mountains approximately 25 miles north of the city of Lancaster. The Antelope Valley District provides water service primarily to rural single family residential communities. The major transportation routes in the area are State Highways 14, 58, and 138. Figure 2.1-1 shows a general location map of the district in relation to other cities in the area[1].

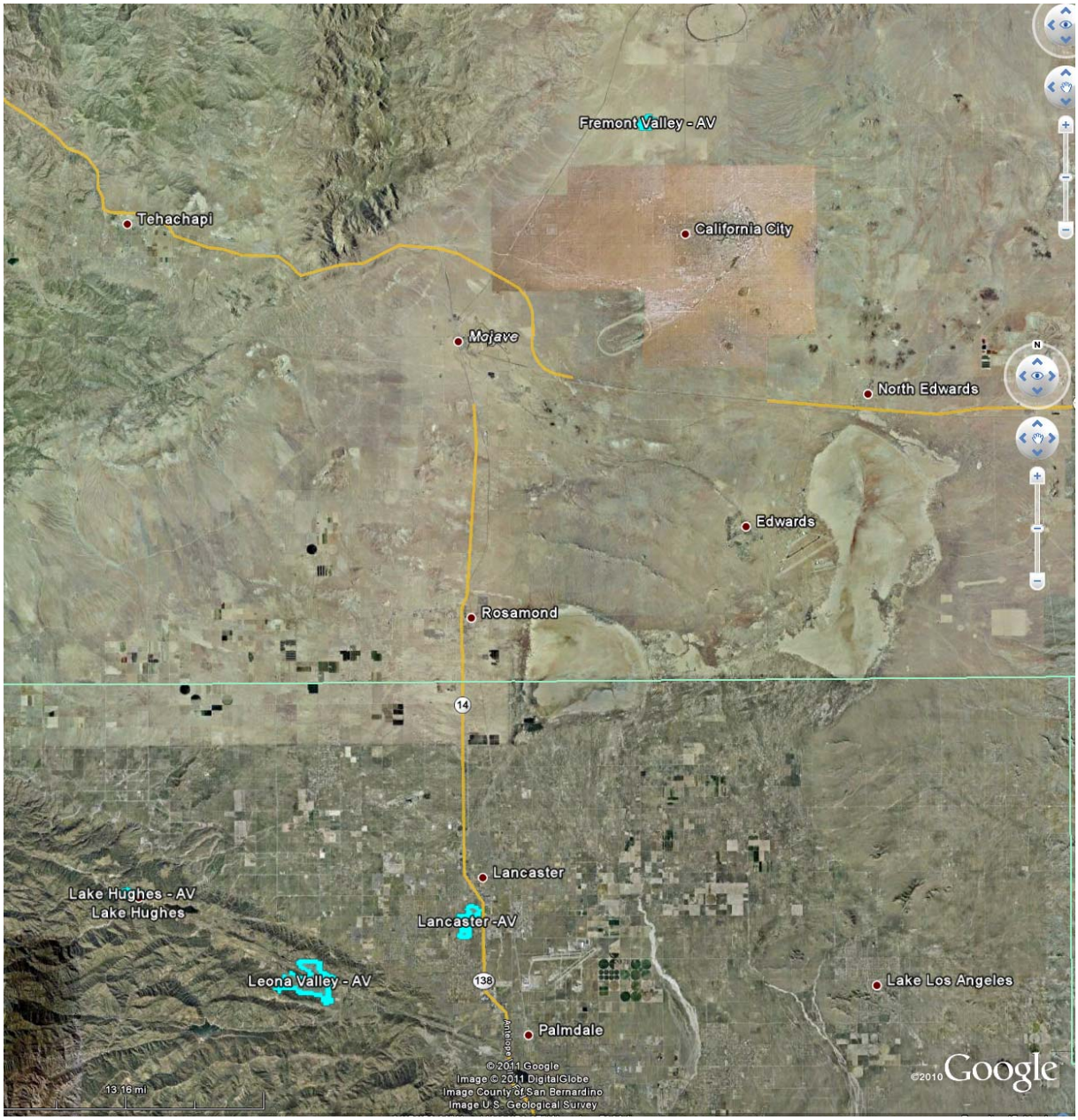
Figure 2.1-1: General Location of Antelope Valley



[1] Los Angeles County Sanitation District, Final 2025 PRWP Facilities Plan and EIR
http://www.lacsd.org/civica/filebank/blobdload.asp?BlobID=2843

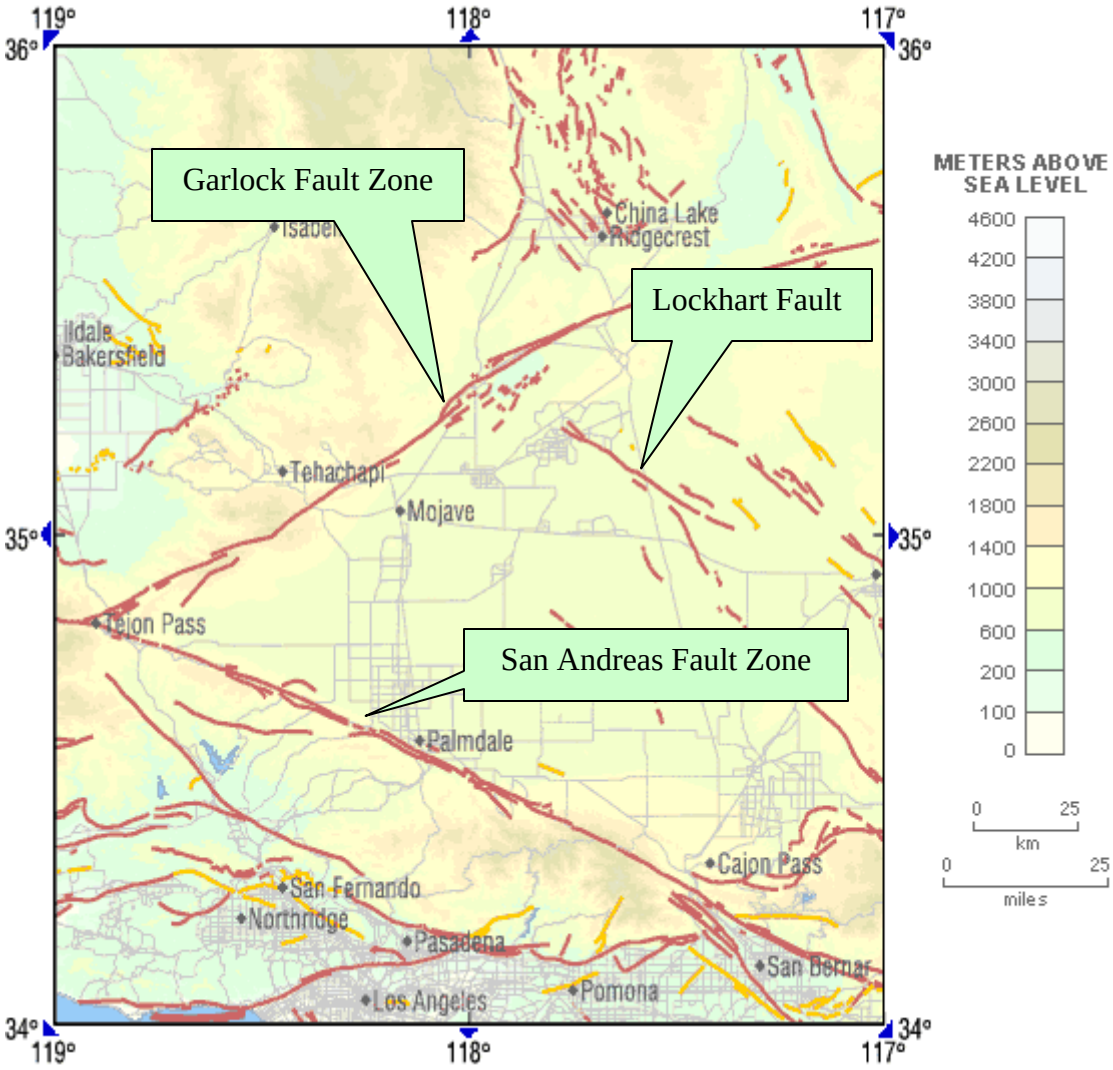
Figure 2.1-2 shows the approximated service areas of each system within the District.

Figure 2.1-2: General Service Area



The most significant geological features in the area are the Garlock Fault Zone in the northern portion of the Antelope Valley District and the San Andreas Fault Zone, which runs through the southwestern portion of the District, as shown in Figure 2.1-3. The smaller Lockhart Fault is located in eastern Antelope Valley[2].

Figure 2.1-3: Major Fault Lines near Kern River Valley District



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

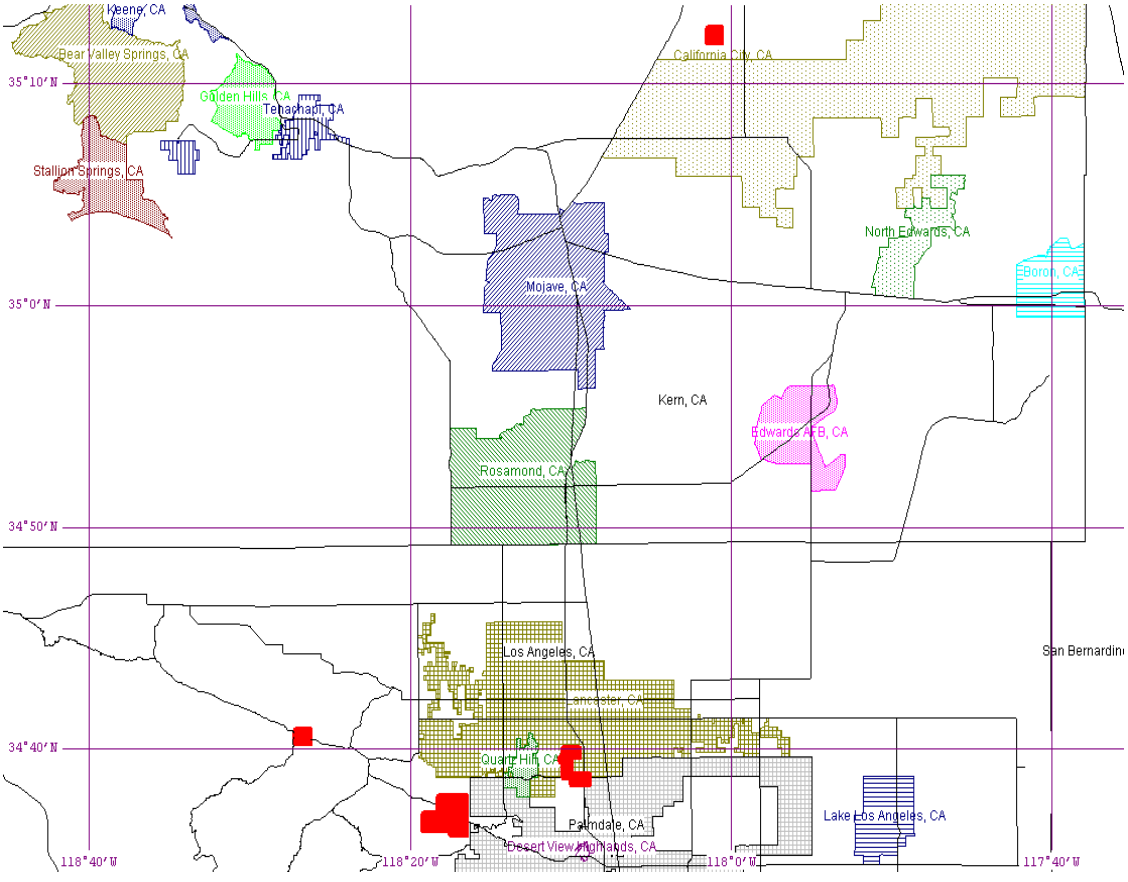
2.2 Service Area Population

The growth rate in Cal Water's Antelope Valley District has shown minor fluctuations over the short term but has remained relatively consistent over time. Because it is a smaller District, sudden increases or decreases in service counts have a larger impact on observed growth rates. Over the past five years growth in total services has averaged 0.42 percent per year. The ten year average growth rate is 0.80 percent per year.

Cal Water estimates that the District's population was approximately 3,397 in 2009, based on the 2000 U.S. Census data and considering current average annual service connections (assuming that the density has remained unchanged). A density of 2.52 persons per residential service (single family services plus multifamily units) was used for this estimate.

The process for estimating population in the Antelope Valley 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.[3]

.

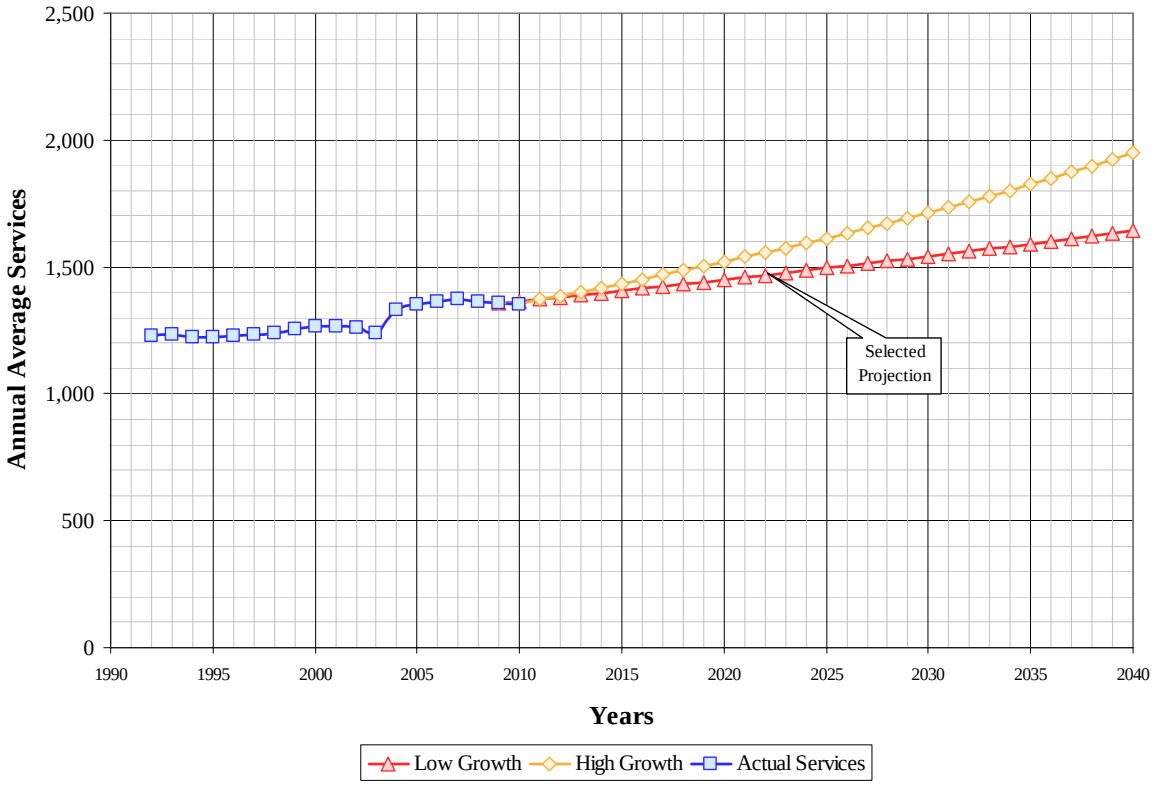
Table 2.2-1: Summary of Census 2000 Data			
System	**Census Blocks**	**Population**	**Housing Units**
Leona Valley	9	1,103	423
Lancaster	35	1,715	743
Lake Hughes	18	159	113
Fremont Valley	15	129	72
Total	77	3,106	1,351

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 year.

To establish a range of future service counts the low and high projected growth rates for each service type were continued to estimate future service counts through 2040. These growth rates were developed in Cal Water's Water Supply and Facilities Master Plan for the Antelope Valley District. The low growth rate was the most consistent with the historic average and was used to develop the service count projections. A comparison of service connection growth rates is shown in Figure 2.2-2.

[3] 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



Cal Water estimates the service area's population could reach 4,106 by 2040. Table 2.2-2 lists the population growth in five year increments.

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

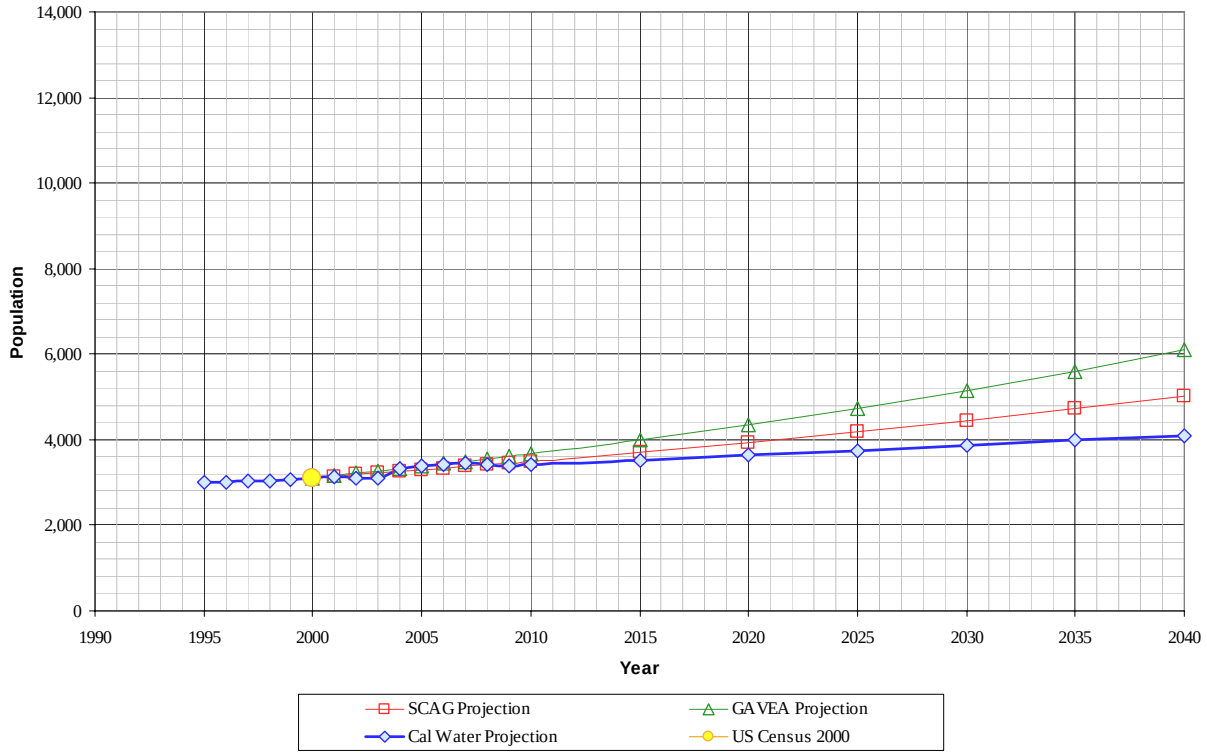
	2010	2015	2020	2025	2030	2035	2040
Service Area Population	3,423	3,528	3,637	3,748	3,864	3,983	4,106

The population estimates for the District are compared to projections made by the Southern California Association of Governments (SCAG) and by the Greater Antelope Valley Economic Alliance (GAVEA) as shown in Figure 2.2-3. The US Census 2000 population estimate was used as the starting point for both of these projections. The US Census 2000 estimate is higher than the Cal Water estimate because the census blocks are often larger than service area that Cal Water serves, which leads to inflated numbers of total households in that block.

The Cal Water population projection is based on projected services over the planning horizon. The estimated population was calculated by multiplying the total projected dwelling units by the number of people per dwelling unit for each year.

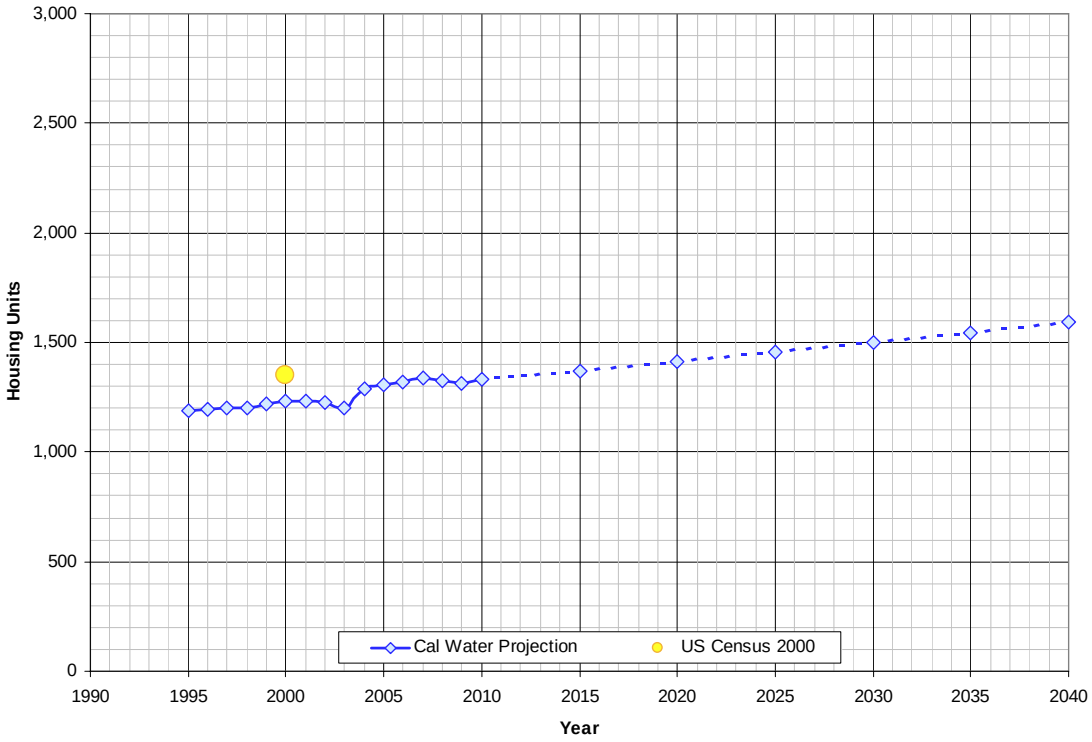
The SCAG projection is set at 1.2 percent average annual growth, and is based on actual historical data for all of Southern California. The annual growth rate for the GAVEA projection was set at 1.7 percent, which was the estimated growth rate in Antelope Valley between 2000 and 2006. This projection includes urbanized areas of Antelope Valley, which are more likely to grow at a faster rate than the unincorporated areas served by Cal Water.

Figure 2.2-3: Estimated Population Comparison



Similarly, the housing count was estimated by comparing the US Census 2000 data and the service counts for the Antelope Valley District, Figure 2.2-4. The service count for the year 2000 is lower than US Census 2000 housing units estimate. This is a result of District service connections including one meter that serves several housing units, such as duplexes or apartments, whereas the US Census totals all of the housing units (single and multifamily residences). The US Census 2000 housing units was established by summarizing the individual census blocks enclosed within the service area of the District.

Figure 2.2-4: Estimated Housing Comparison



2.3 Service Area Climate

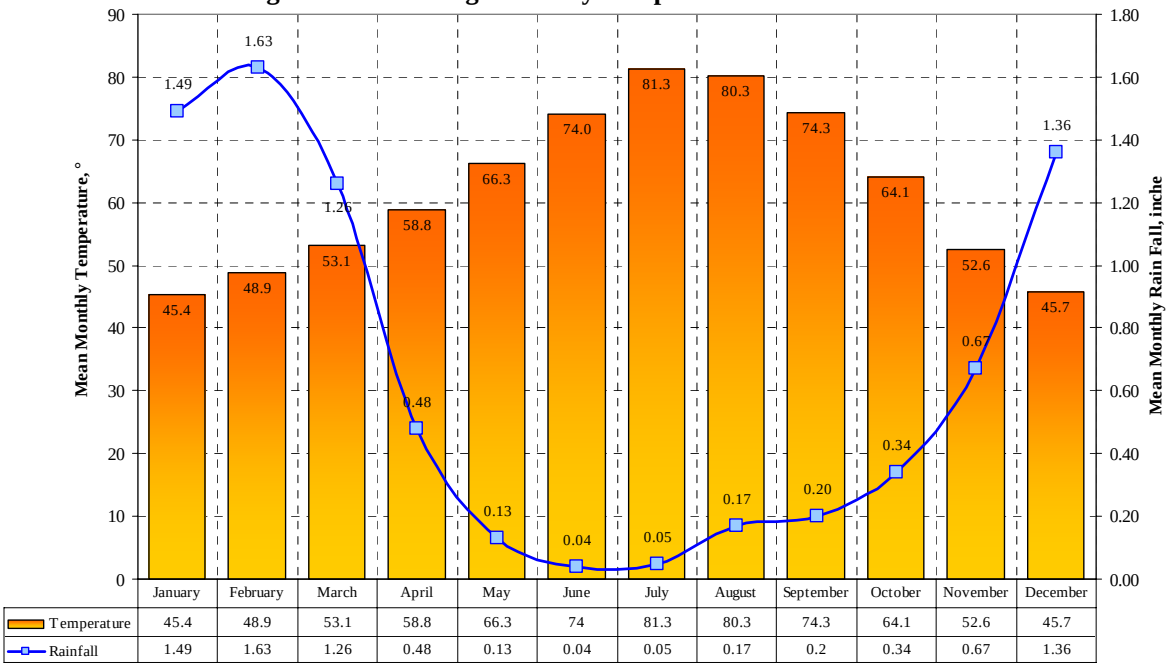
The climate for the Antelope Valley District is extreme with hot dry summers and cool winters. The majority of precipitation falls during late autumn, winter, and early spring. Table 2.3-1 lists the average annual conditions for the weather station in Palmdale. Additional climate data is provided in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

Table 2.3-1: Average Annual Climate (Table 3)

Average Temperature	Average Rainfall	Annual Total Evapotranspiration
77.1	7.8	66.2

Figure 2.3-1 displays the average monthly temperature and rainfall[4].

Figure 2.3-1: Average Monthly Temperature and Rainfall

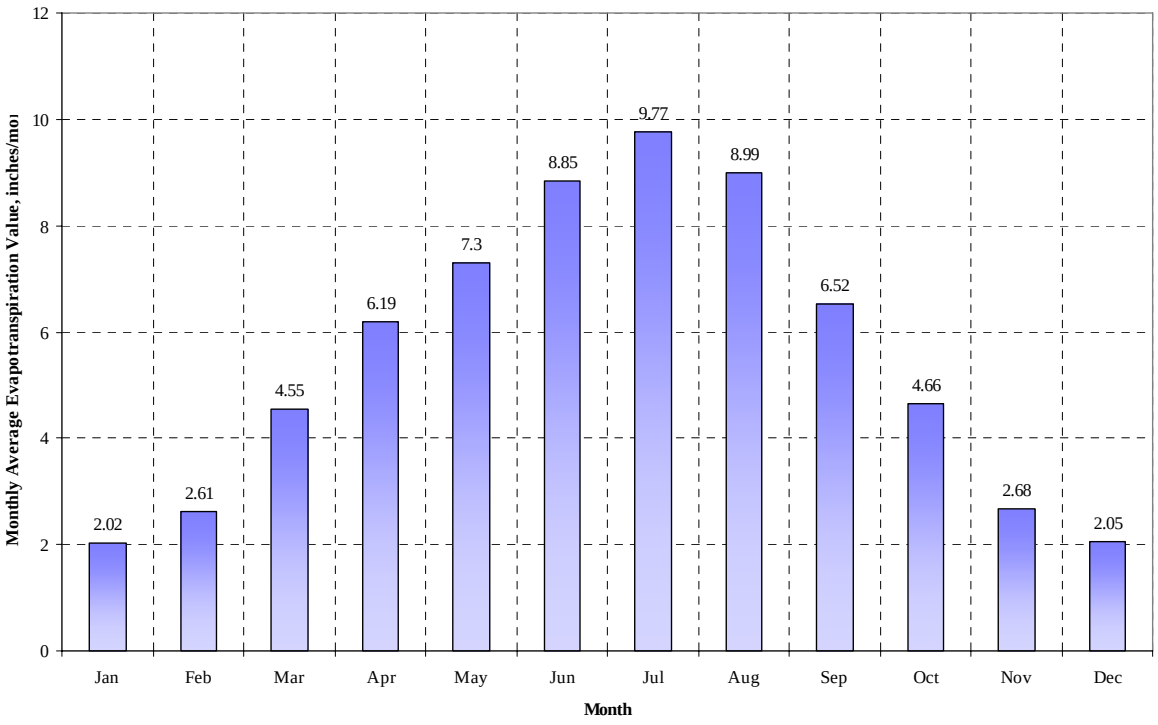


	January	February	March	April	May	June	July	August	September	October	November	December
Temperature	45.4	48.9	53.1	58.8	66.3	74	81.3	80.3	74.3	64.1	52.6	45.7
Rainfall	1.49	1.63	1.26	0.48	0.13	0.04	0.05	0.17	0.2	0.34	0.67	1.36

[4] Western Regional Climate Center, King City WSO Airport Weather Station, http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?caking+sca

Figure 2.3-2 displays the monthly average evapotranspiration values for the area of the District[5]. 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 Antelope Valley is 66.2 inches. The average annual rainfall of 7.8 inches is only 12 percent of the annual total evapotranspiration value. This indicates that the Antelope Valley District is located in a water-deficient environment.

Figure 2.3-2: Monthly Average ETo Values



[5] 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

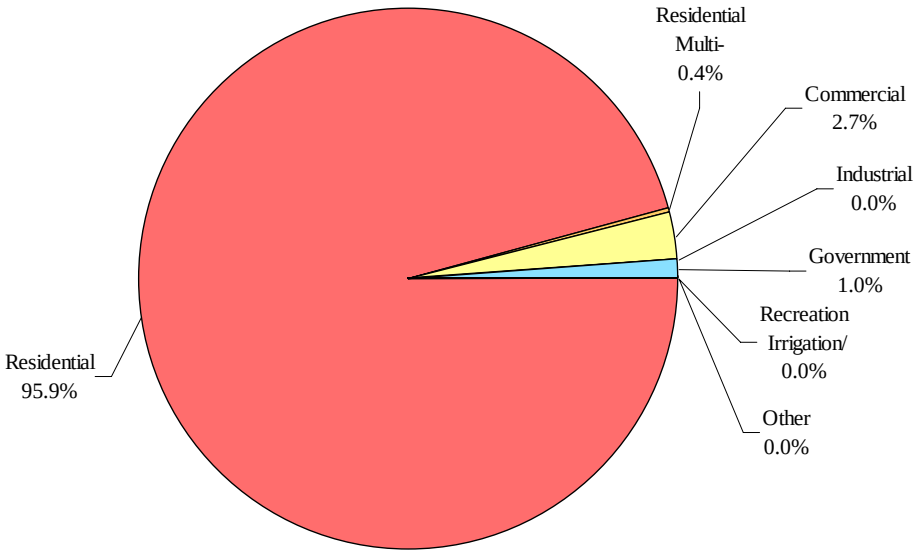
Cal Water designates the different customer classification categories as follows:

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

The residential sector includes permanent single and multifamily residents. Service for seasonal customers was not considered.

The average annual service count for the calendar year 2010 was 1,353 total services. Single Family Residential services represent 95.9 percent of all services with 1,297 connections and Multi Family Residential connections represent 0.4 percent of total services with 5 connections. The 37 Commercial service connections represent 2.7 percent, and the 14 Governmental services account for 1.0 percent. The distribution of services for 2010 is shown graphically in Figure 3.1-1.

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

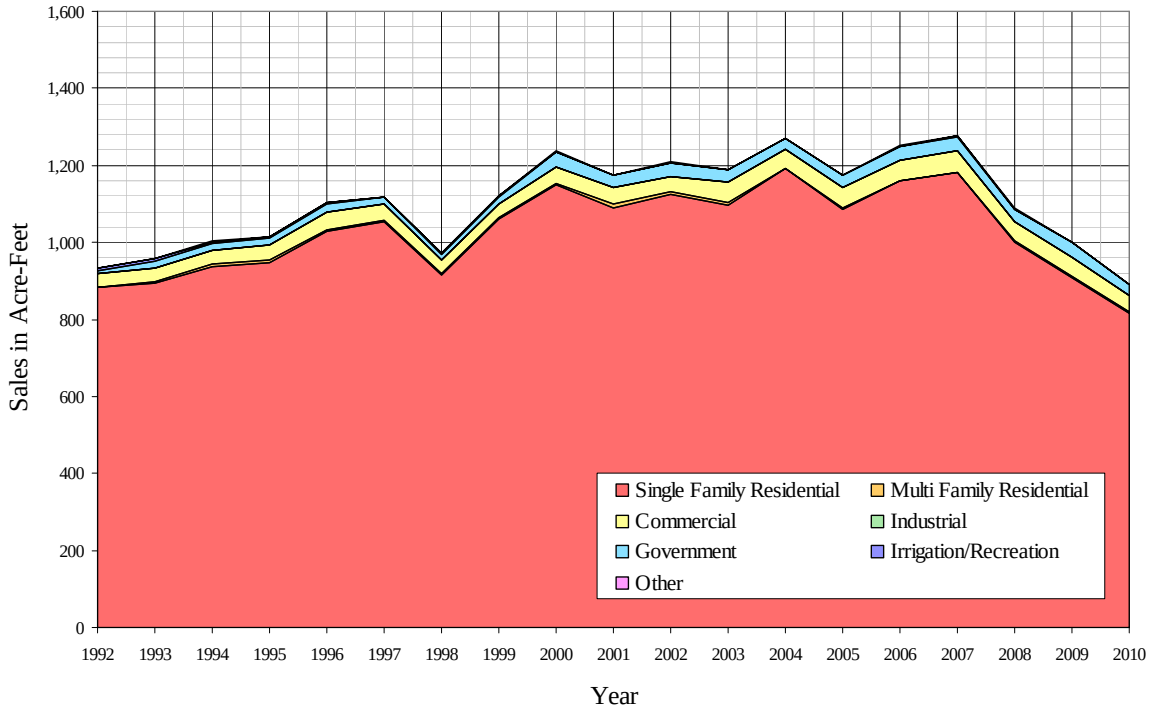
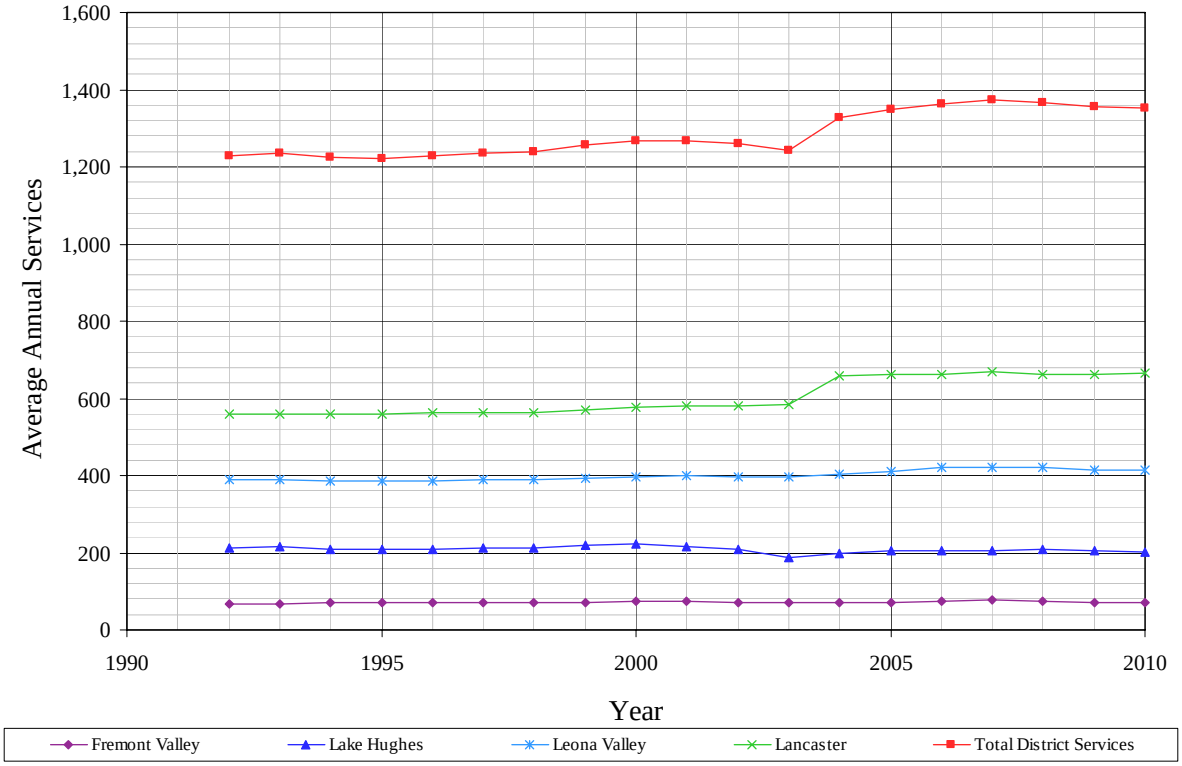
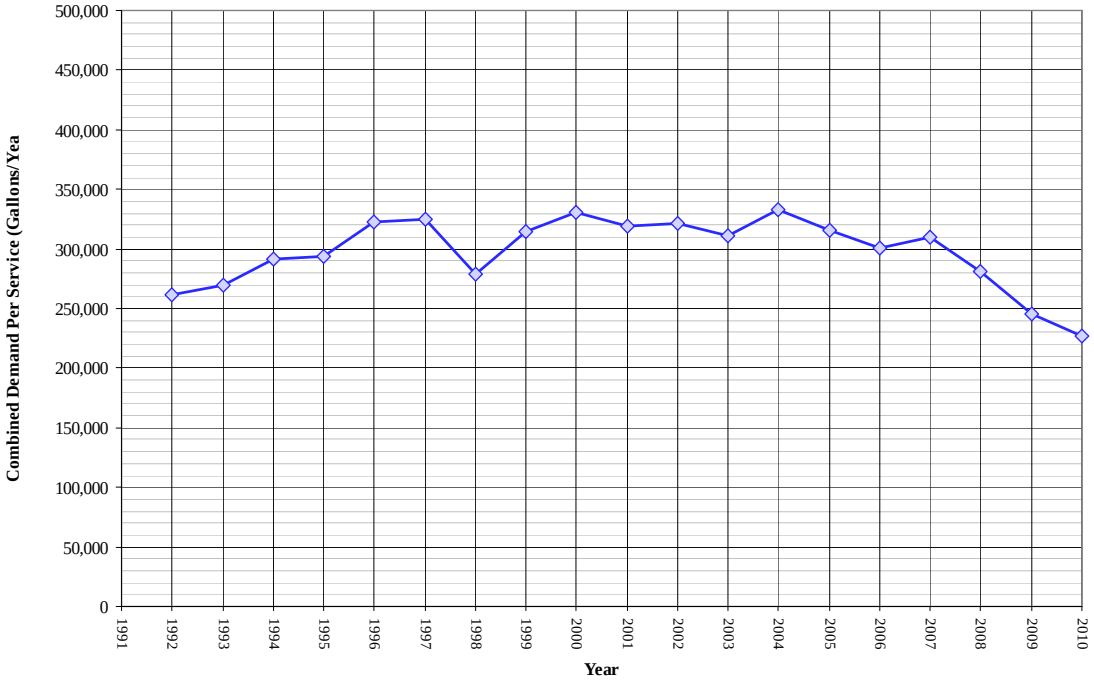


Figure 3.2-2: Historical Service Counts



The combined demand for all services fluctuates between 225,000 to 340,000 gallons per service per year, Figure 3.2-3.

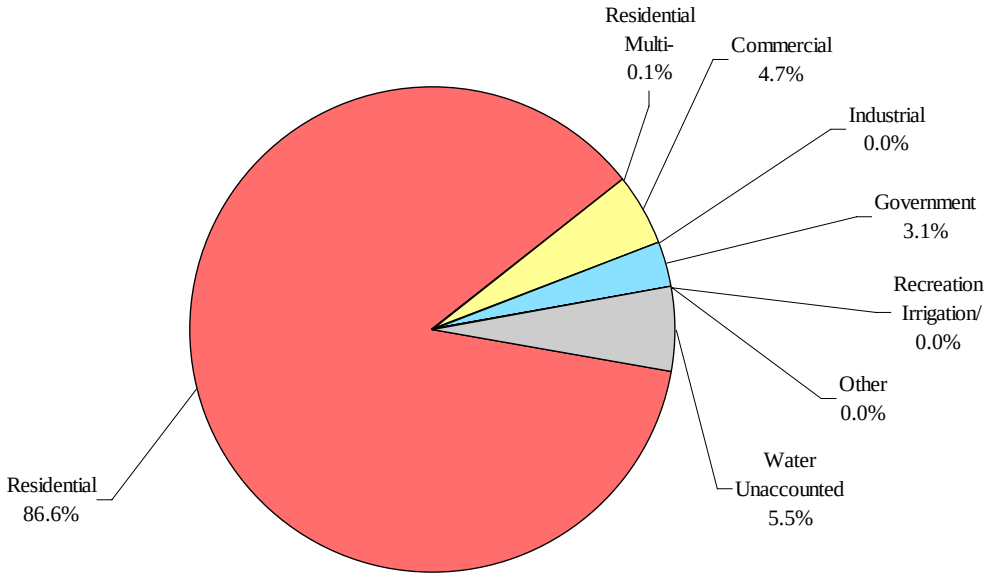
Figure 3.2-3: Historical Demand per Service



The demand per service value has often shown a relationship with weather conditions in the Antelope Valley District. During dry years the demand per service has increased. This happens as more water is needed for landscaping and other activities that are normally supplied by rainfall. During wet years such as 1998, demand per service has dropped.

Single Family Residential water use represents one of the lowest demand per service values in the District with a five-year average of 266,000 gallons per service per year, yet this category uses 86.6 percent of the total demand. The multi family residential use was 0.1 percent of the total demand with a demand per service that has a five-year average of 95,200 gallons per service per year. Figure 3.2-4 displays the percent of total demand by type of use.

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



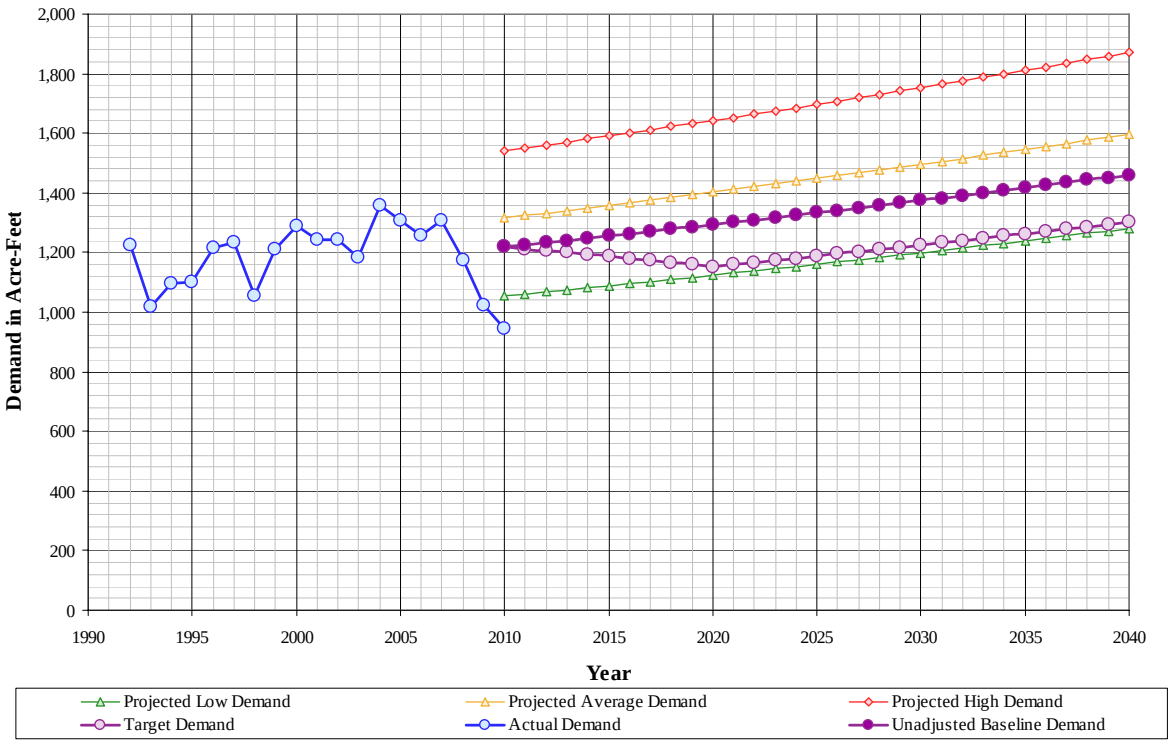
3.3 Water Demand Projections

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 318 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



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	1,291	1,086	-	-	1,086
Multi-family	6	2	-	-	2
Commercial	38	53	-	-	53
Industrial	-	-	-	-	0
Institutional/government	12	32	-	-	32
Landscape	-	-	-	-	-
Recycled	-	-	-	-	-
Other	3	2	-	-	2
Total	1,350	1,175	0	0	1,175

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	1,297	817	-	-	817
Multi-family	5	1	-	-	1
Commercial	37	44	-	-	44
Industrial	-	-	-	-	-
Institutional/government	14	29	-	-	29
Landscape	-	-	-	-	-
Recycled	-	-	-	-	-
Other	0	0	-	-	0
Total	1,353	892	0	0	892

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	1,346	989	-	-	989
Multi-family	6	2	-	-	2
Commercial	40	51	-	-	51
Industrial	-	-	-	-	-
Institutional/government	15	37	-	-	37
Landscape	-	-	-	-	-
Recycled	-	-	-	-	-
Other	-	-	-	-	-
Total	1,406	1,078	-	-	1,078

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	1,388	958	-	-	958
Multi-family	6	2	-	-	2
Commercial	41	51	-	-	51
Industrial	-	-	-	-	-
Institutional/government	15	37	-	-	37
Landscape	-	-	-	-	-
Recycled	-	-	-	-	-
Other	-	-	-	-	-
Total	1,450	1,048	-	-	1,048

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	1,431	985	1,475	1,013
Multi-family	6	2	6	2
Commercial	43	54	44	58
Industrial	-	-	-	-
Institutional/government	16	39	17	41
Landscape	-	-	-	-
Recycled	-	-	-	-
Other	-	-	-	-
Total	1,495	1,080	1,542	1,113

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	1,521	1,041	1,568	1,070
Multi-family	6	2	6	2
Commercial	46	61	48	66
Industrial	-	-	-	-
Institutional/government	18	44	19	46
Landscape	-	-	-	-
Recycled	-	-	-	-
Other	-	-	-	-
Total	1,591	1,148	1,641	1,184

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 Antelope Valley 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. Because Antelope Valley District is the only Cal Water district in the South Lahontan hydrologic region, regional compliance is not an option.

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

The following analysis presents the individual SBx7-7 compliance targets for the Antelope Valley 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 Antelope Valley District, the 10-year base period 1996-2005 yielded the maximum target under this method. The 2015 target is 317 gpcd and a 2020 target is 281 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 3.3-8: Base Period Ranges (Table 13)

Base	Parameter	Value	Units
10-15-year base period	2008 total water deliveries	1,087	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	1996	
	Year ending base period range	2005	
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 3.3-9: 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	1996	1,192	1.1	360
Year 2	1997	1,201	1.1	363
Year 3	1998	1,201	0.9	311
Year 4	1999	1,217	1.1	352
Year 5	2000	1,232	1.1	370
Year 6	2001	1,233	1.1	356
Year 7	2002	1,225	1.1	356
Year 8	2003	1,203	1.1	341
Year 9	2004	1,286	1.2	364
Year 10	2005	1,308	1.2	345
			Base Daily Per Capita Water Use	352

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 Antelope Valley District is located in the South Lahontan hydrologic region the Antelope Valley District's 2015 target is 194 gpcd and the 2020 target is 162 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 Antelope Valley District is 326 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 3.3-10: 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	3,100	1.1	341
Year 2	2004	3,335	1.2	364
Year 3	2005	3,385	1.2	345
Year 4	2006	3,416	1.1	329
Year 5	2007	3,449	1.2	338
			Base Daily Per Capita Water Use	343

Based on the results of this analysis as shown in Table 3.3-12, the Method 1 targets were chosen for the Antelope Valley District.

Table 3.3-11. Antelope Valley District SBx7-7 Targets	
Maximum Allowable Target	
Base Period:	2003-2007
Per Capita Water Use:	343
Maximum Allowable 2020 Target:	326
Method 1: 80% of Baseline Per Capita Daily Water Use	
Base Period:	1996-2005
Per Capita Water Use:	352
2015 Target:	317
2020 Target:	281
Method 3: 95% of Hydrologic Region Target	
Hydrologic Region:	S. Lahontan
2015 Target:	194
2020 Target:	162
Selected District Target	
2015 Target:	317
2020 Target:	281

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 demand from low income households, Cal Water used the Housing Element from the City of Lancaster to represent the entire Antelope Valley District. According to the housing Element, 12.5 percent of the total households were classified as extremely low income, which is define as having less than

30 percent of the county-wide median income. The projected water demands in Table 3.3-12 represent 12.5 percent of the total residential projected demands in the District.

Table 3.3-12: Low-income Projected Water Demands (Table 8)						
Low Income Water Demands	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**
Single-family residential	123.6	119.8	123.2	126.6	130.2	133.8
Multi-family residential	0.2	0.2	0.2	0.2	0.2	0.2
Total	123.8	120.0	123.4	126.8	130.3	134.0

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.

3.4 Total Water Use

Cal Water does not 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.

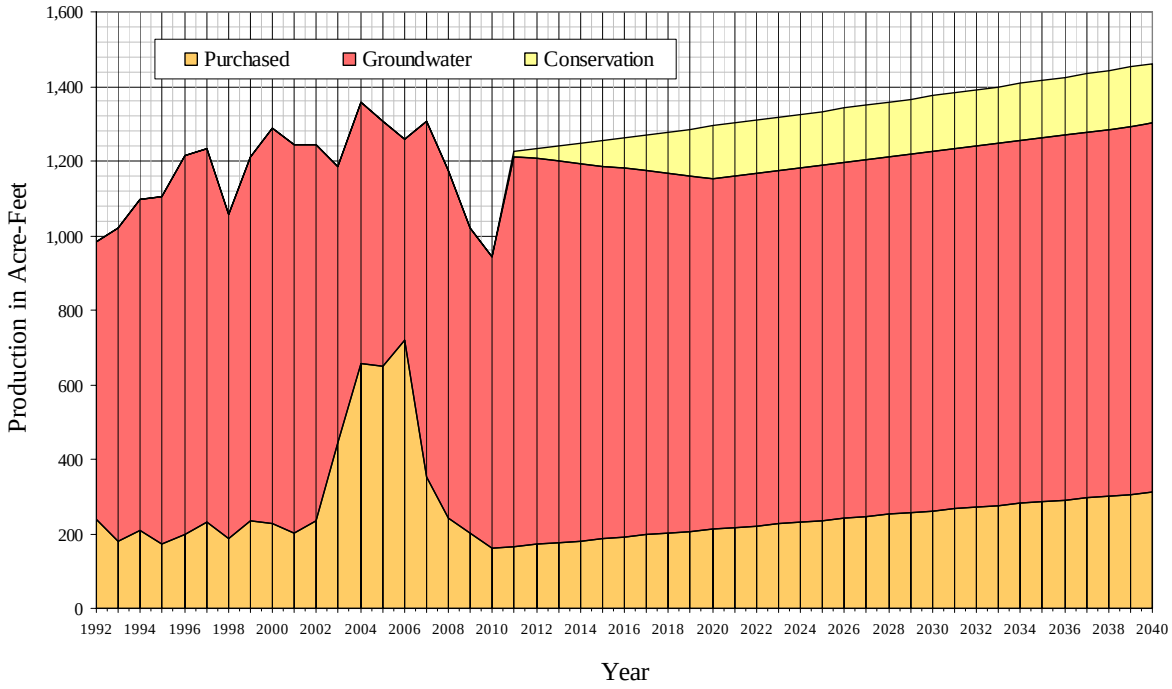
Table 3.4-1: Additional Water Uses and Losses - AFY (Table 9 and 10)							
Water Use	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**
Sales to Other Agencies	-	-	-	-	-	-	-
Saline barriers	-	-	-	-	-	-	-
Groundwater recharge	-	-	-	-	-	-	-
Conjunctive use	-	-	-	-	-	-	-
Raw water	-	-	-	-	-	-	-
Recycled	-	-	-	-	-	-	-
Unaccounted-for system losses	52	108	105	108	111	115	118
Total	52	108	105	108	111	115	118

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	1,308	944	1,187	1,153	1,188	1,225	1,263	1,301

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 Antelope Valley District comes from a mix of groundwater and purchased water. The projected water supply source and amounts 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
Supplier Produced Groundwater	782	1,000	941	952	963	976	990
Purchased Water	161	186	211	236	261	286	311
Transfers in or out	-	-	-	-	-	-	-
Exchanges In or out	-	-	-	-	-	-	-
Recycled Water (projected use)	-	-	-	-	-	-	-
Desalination	-	-	-	-	-	-	-
Total	**944**	**1,187**	**1,153**	**1,188**	**1,225**	**1,263**	**1,301**

4.2 Purchased Water

The Lancaster system began purchasing imported water from Los Angeles County in 2003 to compensate for insufficient well production. Purchased water has accounted for between 50 and 60 percent of the total supply for the Lancaster system over the last several years. The remaining supply comes from groundwater. A new well has since been installed and Lancaster has not needed to purchase water from Los Angeles County to meet demand. The Lancaster system also constructed a connection with the Antelope Valley East Kern Water Agency (AVEK) in 2010 for reliability purposes.

Water supply in Leona Valley comes from a combination of locally produced groundwater and purchased water from AVEK. AVEK is a California State Water Project (SWP) contractor and receives water from the Department of Water Resources (DWR). The availability of purchased water is determined by the DWR and is dependent on annual rainfall. Purchased water has historically made up about 35 percent of the total supply, but this amount has declined over the last two years. In 2006, 100 percent of supply came from AVEK purchased water. Table 4.2-1 shows Cal Water's projected supplies to be received from AVEK.

Table 4.2-1: Agency Demand Projections Provided to Wholesale Suppliers (Table 17) (AFY)

Wholesaler	2010	2015	2020	2025	2030	2035	2040
Antelope Valley-East Kern Water Agency	161	186	211	236	261	286	311

4.3 Surface Water

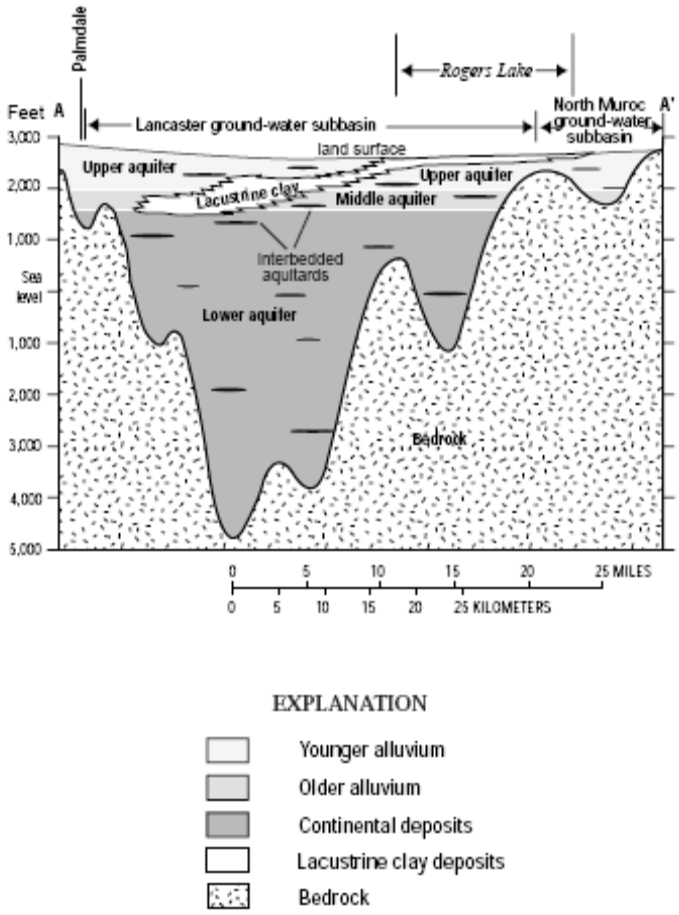
The Antelope Valley District does not directly divert or impound surface water as a source of supply for its customers. Surface water sources are not likely to be developed in the future.

4.4 Groundwater

Groundwater is the sole source of supply for the Lake Hughes and Fremont Valley systems in the Antelope Valley District. Groundwater also supplies between 40 and 50 percent of the total supply in the Lancaster system and approximately 35 percent in Leona Valley. For the Lake Hughes and Fremont Valley systems groundwater will continue to provide 100 percent of the supply into the foreseeable future. Cal Water owns eight wells in Antelope Valley, six of which are active and in service. The wells pull water either from shallow alluvial deposits or hard rock aquifers and produce water at a low rate.

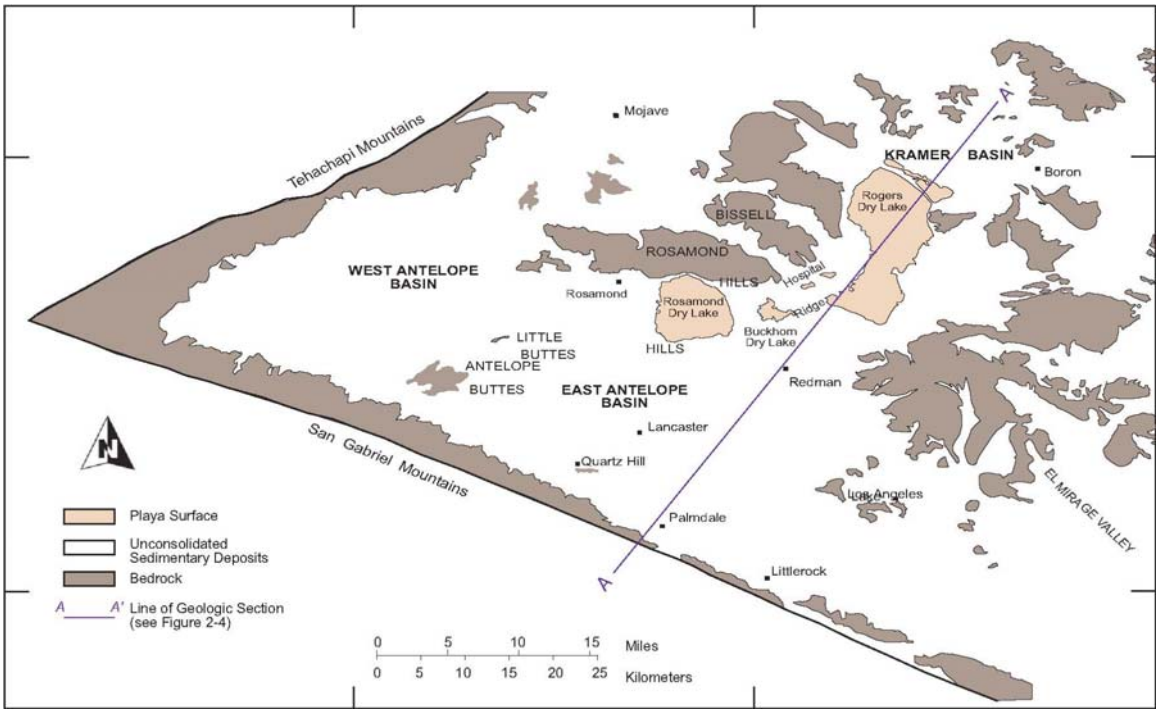
The four water systems that make up the Antelope Valley District are located in areas that vary geologically but are generally characterized by bedrock in the uplands and alluvial deposits in the valleys. In the Lancaster system, groundwater supplies are pumped from the Lancaster Subbasin of the Antelope Valley Groundwater Basin, which is located in an alluvial valley at the base of the San Gabriel Mountains. Surface geology is characterized by unconsolidated deposits of gravel, sands, silts, and clays with the larger materials found closer to the mountains and the finer materials in the valley floors and dry lakes, as shown in Figure 4.4-1.

Figure 4.4-1: Geologic Cross Section of the Lancaster Subbasin



The unconsolidated upper aquifer is the source of groundwater, and natural recharge occurs through percolation of surface runoff mostly near the foot of the mountains (Figure 4.4-2).[6]

Figure 4.4-2: Surface Geology of Antelope Valley



Leona Valley is located along the southwest border of the Antelope Valley Groundwater Basin directly at the base of the San Gabriel Mountains. Surface deposits shift from unconsolidated alluvial materials in the east part of the valley to the bedrock of the San Gabriel Mountains in the west.

The Fremont Valley Groundwater Basin is located just north of Antelope Valley. Surface deposits consist of alluvium, which is thickest at the base of the mountains and thins towards the valley floor. Lacustrine deposits are also found in the middle of the valley, as most of the surface drainage collects in the dry Koehn Lake, while the southwestern portion of the valley drains south towards the Antelope Valley. The wells pull from the upper unconfined aquifer, which has a depth of up to 1,190 feet. Recharge occurs as ephemeral streams percolate as they flow towards the center of the basin.

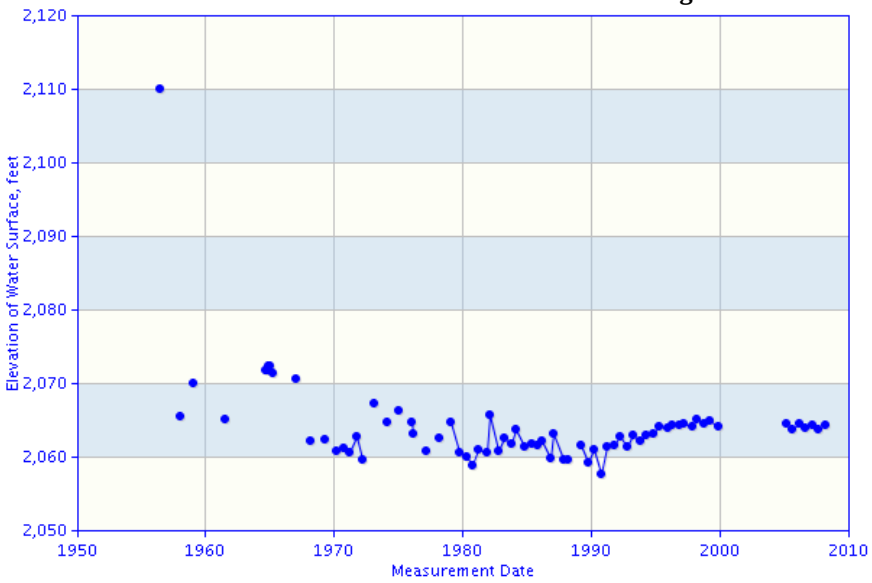
The groundwater supply for Lake Hughes is pumped from alluvial and stream terrace deposits of the Acton Valley Groundwater Basin, which is drained by the Santa Clara

[6] Final PWRP 2025 Facilities Plan and EIR, Los Angeles County Sanitation District, 1993

River. Recharge occurs through surface percolation, Santa Clara River runoff, and inflow from neighboring groundwater basins.

Groundwater level data is limited for all basins that make up the Antelope Valley District. Water levels records are not being maintained by the District and DWR records are spotty. No current data or apparent trends are available for the Fremont Valley, Lake Hughes, and Leona Valley Systems. Historic data for well 31S37E33H001M Fremont Valley indicates that water levels are stable, with seasonal variations, as shown in Figure 4.4-3. Several wells located in the Lancaster area adjacent to Cal Water's service area that have a long record of water level data show a decline of approximately 80 feet since the 1960s, as shown in Figure 4.4-4. This is consistent with other DWR data for the area, especially along the Highway 14 corridor near the populated areas of Lancaster and Palmdale.

Figure 4.4-3: Groundwater Level Trend and Location of Monitoring Well 31S37E33H001M



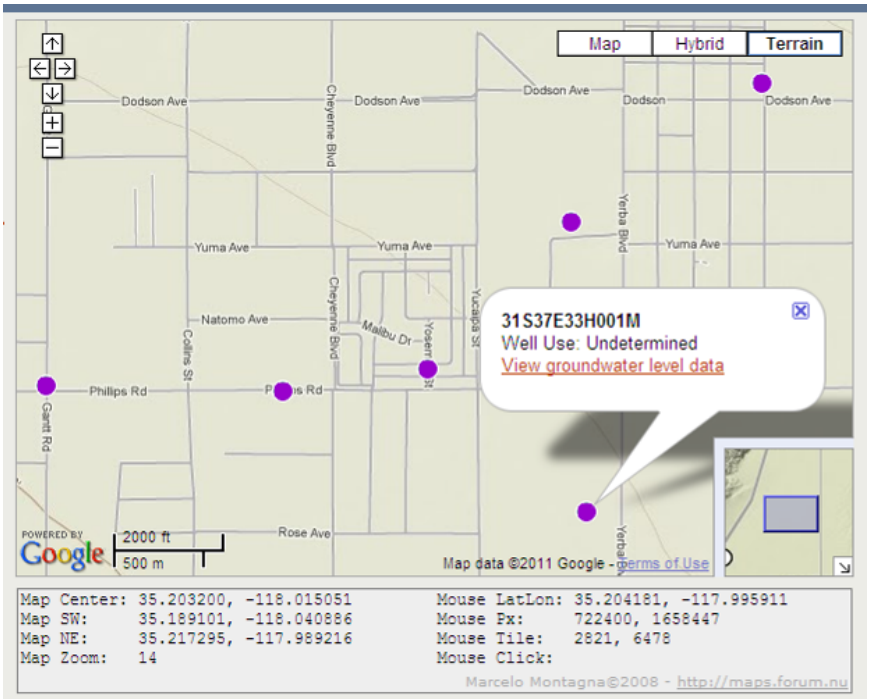
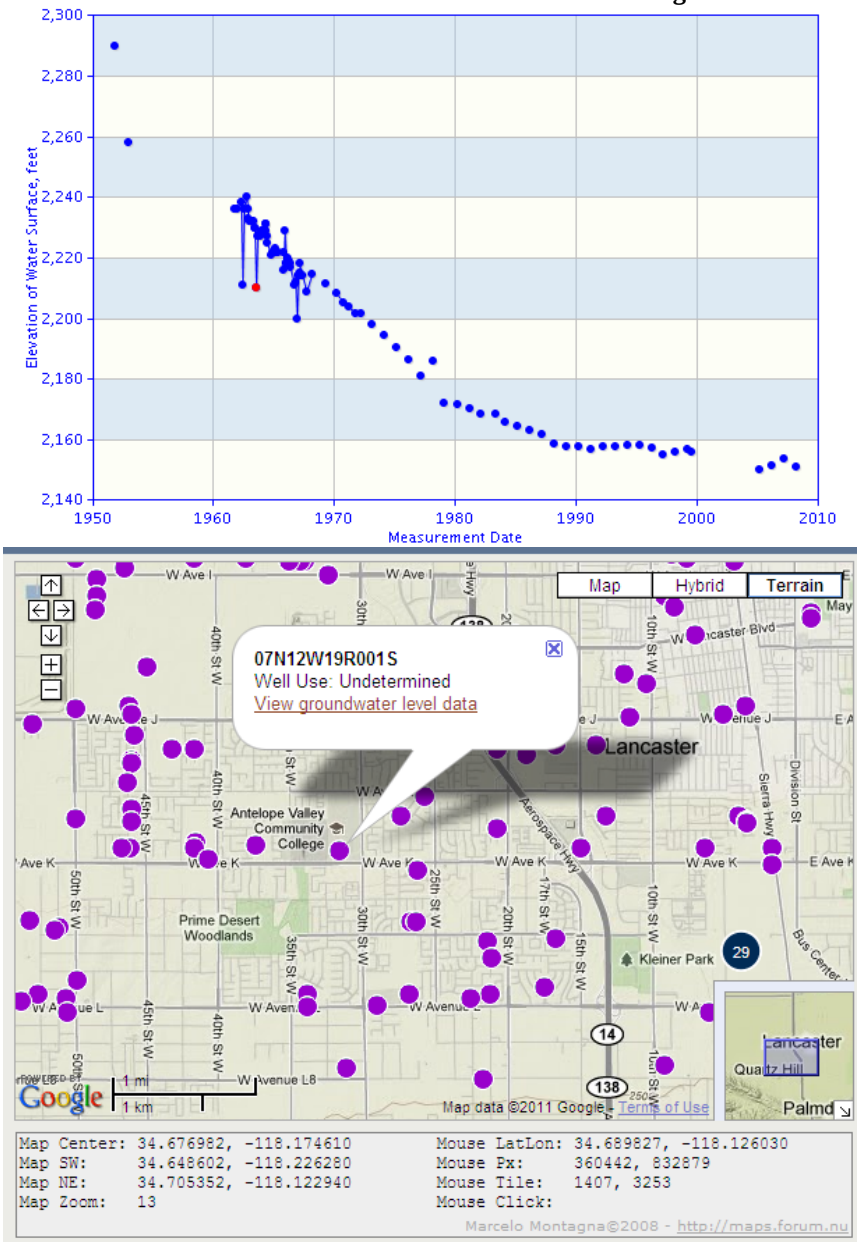


Figure 4.4-4: Groundwater Level Trend and Location of Monitoring Well 07N12W19R001S



The amount of groundwater pumped by the Antelope Valley District over the last five years is shown in Table 4.4-1. The projected groundwater pumping is shown in Table 4.4-2

Table 4.4-1: Amount of Groundwater Pumped – AFY (Table 18)					
Basin Name	**2006**	**2007**	**2008**	**2009**	**2010**
Antelope, Acton, Fremont Valleys	541	956	934	821	782
% of Total Water Supply	43%	73%	79%	80%	83%

Table 4.4-2: Amount of Groundwater projected to be pumped – AFY (Table 19)						
Basin Name	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**
Antelope, Acton, Fremont Valleys	1,000	941	952	963	976	990
% of Total Water Supply	84%	82%	80%	79%	77%	76%

4.4.1 Basin Boundaries and Hydrology

Antelope Valley Groundwater Basin, 6-44:

The Lancaster and Leona Valley Systems are located in the Antelope Valley Groundwater Basin. However, Leona Valley uses primarily purchased water from AVEK to meet customer demands while Lancaster uses groundwater as its primary supply source.

The Antelope Valley Groundwater Basin underlies an extensive alluvial valley in the western Mojave Desert. The elevation of the valley floor ranges from 2,300 to 3,500 feet above sea level. The basin is bounded on the northwest by the Garlock fault zone at the base of the Tehachapi Mountains and on the Southwest by the San Andreas fault zone at the Base of the San Gabriel Mountains. The basin is bounded on the east by ridges, buttes, and low hills that form a surface and groundwater drainage divide and on the north by Fremont Valley Groundwater Basin at a groundwater divide approximated by a southeastward-trending line from the mouth of Oak Creek through Middle Butte to exposed bedrock near Gem Hill, and by the Rand Mountains farther east. Runoff in Big Rock and Little Rock Creeks from the San Gabriel Mountains and in Cottonwood Creek from the Tehachapi Mountains flows toward a closed basin at Rosamond Lake. Rogers Lake is a closed basin that collects ephemeral runoff from surrounding hills.

Acton Valley Groundwater Basin, 4-5:

The Lake Hughes System is located within the Acton Valley Groundwater Basin. The Acton Valley Groundwater Basin is bounded by the Sierra Pelona on the north and the San Gabriel Mountains on the south, east, and west. The valley is drained by the Santa Clara River.

Fremont Valley Groundwater Basin, 6-46:
The Fremont Valley System is located within the Fremont Valley Groundwater Basin. The Fremont Valley Groundwater Basin underlies Fremont Valley in eastern Kern County and northwest San Bernardino County. The basin is bounded on the northwest by the Garlock fault zone against impermeable crystalline rocks of the El Paso Mountains and the Sierra Nevada. This basin is bounded on the east by crystalline rocks of the Summit Range, Red Mountain, Lava Mountains, Rand Mountains, Castle Butte, Bissle Hills, and Rosamond Hills. The basin is bounded on the southwest by the Antelope Valley Groundwater Basin along a groundwater divide approximated by a line connecting the mouth of Oak Creek through Middle Butte to exposed basement rock near Gem Hill. The above descriptions and additional details of the basin are given in the DWR's Groundwater Bulletin 118, see Appendix D[7].

4.4.2 Antelope Valley Basin Adjudication

In 1999 two farming interests filed a quiet title action against public water suppliers, including the Antelope Valley Water Company, a subsidiary of the Dominguez Water Corporation, which owned and operated a small system located in Lancaster in the Antelope Valley. In 2000, California Water Service Company in connection with the merger with the Dominguez Water Corporation, acquired the Antelope Valley Water Company.

In 2004 Cal Water and four other public water suppliers filed a cross complaint to adjudicate all groundwater rights within the Antelope Valley basin. The Court has completed two phases of the trial and is currently engaged in the third phase. The first phase outlined the boundary of the effected groundwater basin and identified the parties whose rights would be impacted. The second phase of the trial determined that the groundwater basin is a single basin.

The third phase of the trial is underway to determine the safe yield of the basin and whether or not the basin is in overdraft. Subsequent phases of the trial will determine Cal Water's prescriptive right if any.

Cal Water has budgeted and is in the process of connecting to the Antelope Valley East Kern Water District (AVEK) a State Water Project contractor for an imported supply. At this time Cal Water cannot say what percentage of its future demand in the Lancaster portion of the Antelope Valley District will be meet by groundwater or imported water from AVEK. It is Cal Water's long term desire to continue to use groundwater pumping to meet this demand.

[7] California's Ground Water Bulletin 118, 2003; Central Coast Hydrologic Region; Salinas Valley Groundwater Basin; Upper Valley Aquifer Subbasin; Groundwater Basin Number: 3-4.05

4.4.3 Groundwater Management Plan

The Antelope Valley Regional Water Management Group (RWMG) was formed as a collaborative effort to address water management issues in the growing Antelope Valley region. It is made up of a collection of local municipalities, regulatory agencies, and other interested stakeholders. The RWMG developed the Integrated Regional Water Management Plan (IRWMP), which provided a framework for developing a strategy to address these issues, and it prioritized the projects necessary to meet the goals outlined in the IRWMP. The IRWMP includes a plan for developing groundwater resources in Antelope Valley, and acts as a groundwater management plan for the region. A copy of the IRWMP is included in Appendix H.

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 from the domestic or industrial wastewater streams 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

In the Antelope Valley District the Lake Hughes and Lancaster system customers have sewer service. Leona Valley and Fremont Valley customers use septic tanks to treat wastewater.

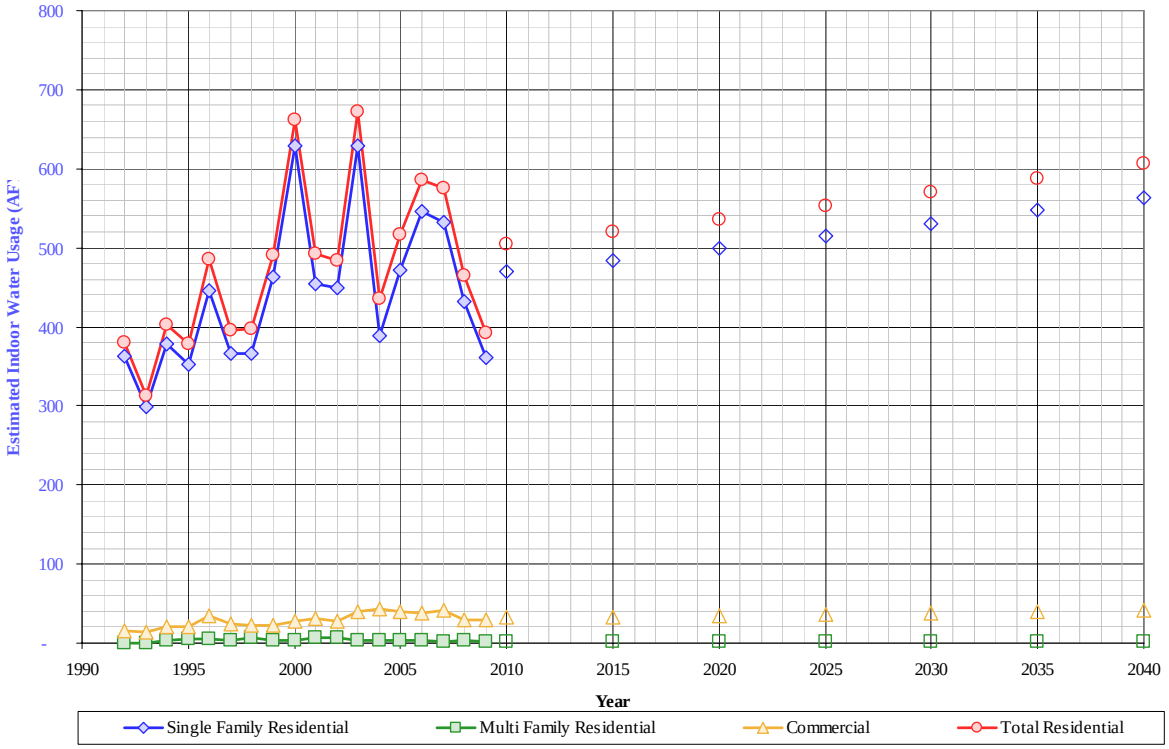
The Lancaster Wastewater Reclamation Plant, operated by Los Angeles County Sanitation District, processes about 16 mgd with secondary treatment. Approximately 3 mgd of treated wastewater is used for irrigation of alfalfa nearby the Reclamation Plant. Another 3 mgd is diverted to Piute Ponds wildlife refuge to maintain 200 acres of wetlands. A small portion (0.5 mgd) of the wastewater is tertiary treated and used for landscape irrigation at Apollo Lakes Regional Park.

Los Angeles County Department of Public Works operates the Lake Hughes Community Wastewater Facility. It treats an average of 93,000 gpd with secondary treatment and onsite disposal.

4.5.2 Estimated Wastewater Generated

Estimate for the District wastewater quantity since 1980 are shown in Figure 4.5-1 and were calculated by annualizing 90 percent of January water use in Cal Water's service area. The future quantity of waste generation is based on a linear equation of the historical estimates.

Figure 4.5-1: Estimated District Annual Wastewater Generated



The estimated volume of wastewater generated for the District in five-year increments is presented in Table 4.5-1. The amount of treated wastewater meeting the recycled water standard is assumed to be three percent of the total produced in Cal Water's service areas, and is based on the ratio of tertiary treated wastewater to the total amount processed in the Lancaster Wastewater Reclamation Plant.

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	Secondary	504	520	536	553	570	588	607
Volume Meeting Recycled Water Standard	Tertiary	15	16	16	17	17	18	18

According to LACSD, approximately 40 percent of the treated wastewater is reused either for agricultural irrigation, landscape irrigation, or environmental enhancement. The remaining amount of wastewater disposed of in evaporation basins is listed in Table 4.5-2.

Table 4.5-2: Disposal of wastewater (non-recycled) AF Year (Table 22)

Method of Disposal	Treatment Level	2010	2015	2020	2025	2030	2035	2040
Evaporation beds/septic tanks	Secondary	303	312	322	332	342	353	364

4.5.3 Potential Water Recycling

Recycled water customers are not anticipated to be acquired for any of the Antelope Valley water systems in the near future. There is little demand for recycled water use because the majority of services are residential. Using recycled water is not considered economically viable given the anticipated extra costs for treatment and distribution, and the lack of viable customers within the service area. Therefore, the projected recycled water supply for Cal Water's Antelope Valley 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 Cal Water does not own or operate the wastewater system.

4.6 Desalinated Water

There are no opportunities for the development of desalinated water in the District. Antelope Valley is located in the Mojave Desert a great distance from sources of saline water.

4.7 Transfer or Exchange Opportunities

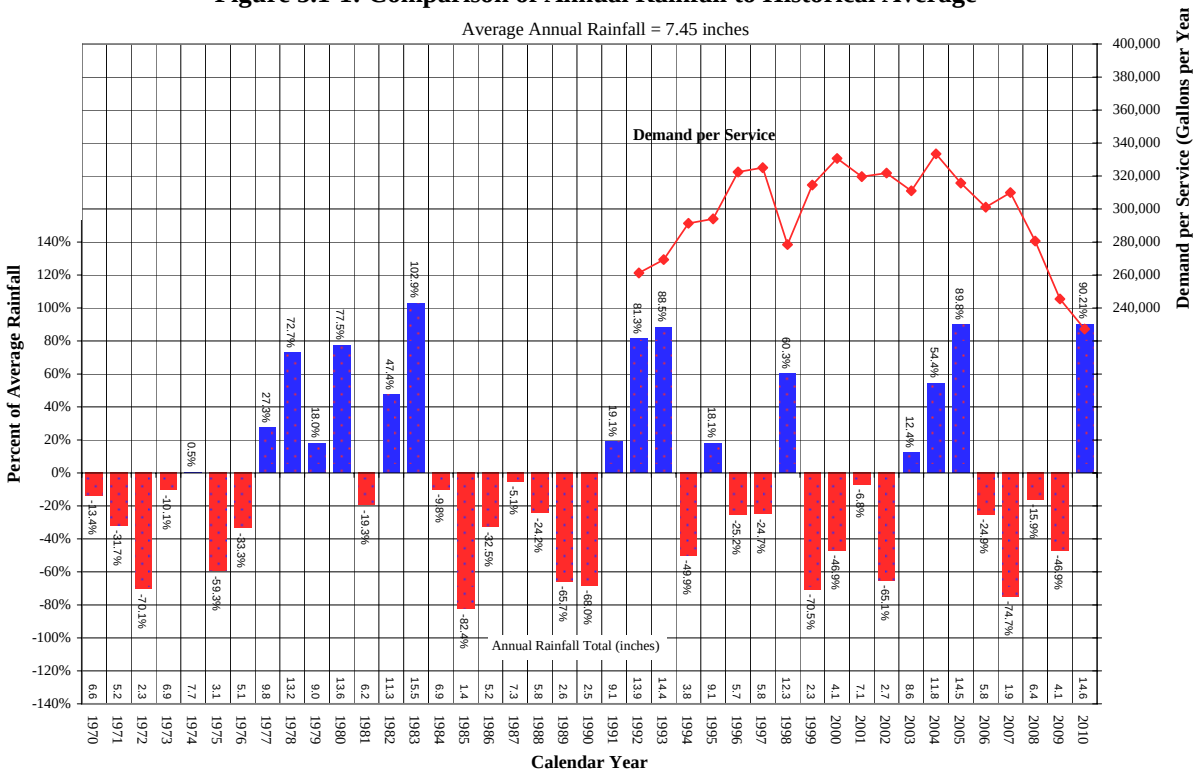
The Antelope Valley District has not historically entered into transfer or exchange agreements with any local municipalities or regional water agencies. However, it would be possible to begin a groundwater banking or in lieu replenishment program with AVEK in Leona Valley or with Los Angeles County in Lancaster. Under these scenarios, Cal Water would purchase excess imported water supply in wet years at a cost equivalent to pumping groundwater. This would reduce the reliance on groundwater supplies and would allow for natural recharge of the aquifer. During dry years when imported supplies are not as available, Cal Water would increase groundwater pumping to meet demand.

5 Water Supply Reliability and Water Shortage Contingency Planning

5.1 Water Supply Reliability

The water supply for the Antelope Valley District is reliant on annual precipitation in the watershed of the Feather River that supplies the State Water Project, and on local groundwater conditions. Local precipitation has little impact on imported supplies, but does have a significant impact on groundwater replenishment. In dry years demand tends to increase as natural precipitation is replaced by potable supply for uses such as outdoor landscape irrigation. As dry conditions persist, demands tend to decrease over time as customers respond to drought conditions and conservation messaging. A comparison of annual rainfall and customer demand since 1992 is shown in Figure 5.1-1. These trends are expected to repeat during future drought events.

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



5.2 Drought Planning

For the purposes of this analysis 2003 was chosen as the most recent normal hydrologic year when rainfall was 13 percent (8.6 in) above average. 1999 was chosen as the single dry year because preceded and followed by wet years, and had a rainfall of 75 percent (1.8 in) below average. The multiple dry year range used in this analysis was from 2006-2009, 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	2003
Single-Dry Water Year	2007
Multiple-Dry Water Years	2006-2009

Cal Water is not a regional water wholesaler and does not store water seasonally in reservoirs or other storage facilities. Therefore total runoff figures can not be used to determine supply reliability. 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**			
		Year 1	**Year 2**	**Year 3**	**Year 4**
311,016	309,936	301,088	309,936	280,554	245,452
% of Normal	100%	97%	100%	90%	79%

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 supplies that would be available in a multiple dry year event from 2011-2013. The supply amounts were calculated by applying the percentages from years 1-3 in Table 5.2-2 to the 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
Purchased	161	166	171	176
Groundwater	1,057	1,007	1,030	906
Total	1,218	1,173	1,202	1,082
% of Normal Year	100%	96%	99%	89%

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.

Although each of the individual water systems within the Antelope Valley District has a different supply portfolio, for the purposes of this analysis, all of the systems have been combined. The normal supply is considered equal to the target water demand projection. In normal years there is sufficient purchased water and groundwater available to meet demands. Table 5.2-4 indicates that supplies 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
Purchases	186	211	236	261	286	311
Groundwater	1,000	941	952	963	976	990
Total supplies	1,187	1,153	1,188	1,225	1,263	1,301
Total Demand	1,187	1,153	1,188	1,225	1,263	1,301
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. 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. Any deficiency is purchased water deliveries will be made up for with groundwater withdrawals. 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
Purchases	186	211	236	261	286	311
Groundwater	996	937	948	959	972	986
Supply totals	1,183	1,149	1,184	1,221	1,258	1,297
Demand totals	1,183	1,149	1,184	1,221	1,258	1,297
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 decrease as time goes on. 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 as purchased water deliveries will be supplemented with groundwater pumping..

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	Purchases	186	211	236	261	286
	Groundwater	963	905	914	924	936
	Supply Totals	1,149	1,116	1,150	1,186	1,222
	Demand Totals	1,149	1,116	1,150	1,186	1,222
	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	Purchases	191	216	241	266	291
	Groundwater	985	939	950	962	974
	Supply Totals	1,176	1,156	1,191	1,228	1,266
	Demand Totals	1,176	1,156	1,191	1,228	1,266
	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	Purchases	196	221	246	271	296
	Groundwater	862	831	839	847	856
	Supply Totals	1,059	1,053	1,085	1,118	1,153
	Demand Totals	1,059	1,053	1,085	1,118	1,153
	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 That Affect Supply Reliability

Factors which may threaten the reliability of the supply sources 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	✓		✓	✓
Purchased Water	✓	✓	✓	✓

Although the historical climatic record shows that the demand can be met by the supply, future climatic changes may present an obstacle. During drought events the availability of purchased water will decrease in proportion to the severity and duration of the drought. To offset reduced purchased water supplies, the Leona Valley system will need to rely more heavily on groundwater production to meet demand.

Groundwater overdraft is already occurring in the Antelope Valley region, leading to a decrease in aquifer storage. The continued overdraft of the basin could lead to reduced availability of groundwater supplies over time, especially during droughts. The groundwater basins within the Antelope Valley District have been unadjudicated. Due to the continued overdraft problem a legal adjudication began several years ago and at the time of preparing this UWMP was in the trial phase.

Purchased water supplies may be influenced by legal and environmental factors such as the Wanger Decision concerning the Delta Smelt populations in the Sacramento-San Joaquin Delta. AVEK is supplied with purchased water by the SWP, which will face supply shortfalls if the current levels of pumping from the Delta are continued. This will ultimately reduce the availability of purchased water for the District. The Antelope Valley District also faces some minor water quality issues that affect the availability of supply including iron and manganese contamination, elevated chlorides, and lingering trihalomethanes.

5.4 Water Quality

The drinking water delivered to customers in the King City 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 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.

In Lake Hughes an Iron and Manganese treatment system is being installed at one well station. In Leona Valley purchased water is blended with groundwater, which has elevated chloride levels. And at certain times of the year the purchased water from AVEK is high in trihalomethanes, which are disinfection by products. Chloramination facilities are being constructed to alleviate trihalomethane contamination in purchased water. Nitrates and coliform bacteria are also a concern in one Leona Valley well.

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 6 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 insure 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 5 to 10 percent Shortage Up to 10 percent Reduction Goal Voluntary Reductions	**Cal Water will:** Request voluntary customer conservation as described in CPUC Rule 14.1. Maintain an ongoing public information campaign. Maintain conservation kit distribution programs. Maintain school education programs. Maintain incentive programs for high efficiency devices. Coordinate drought response with wholesale suppliers and cities. Lobby cities for passage of drought ordinances. Discontinue system flushing except for water quality purposes. 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 10 to 20 Percent Shortage Up to 20 Percent Reduction Goal Voluntary or Mandatory Reductions	**Cal Water will:** Increase or continue all actions from Stage 1. Implement communication plan with customers, cities, and wholesale suppliers. Request voluntary or mandatory customer reductions. File Schedule 14.1 with CPUC approval if necessary. Request memorandum account to track penalty rate proceeds and other drought related expenses. Lobby for implementation of drought ordinances. 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	**Cal Water will:**
20 to 35 Percent Shortage	Increase or continue all actions from previous stages.
	Implement mandatory conservation with CPUC approval.
Up to 35 Percent Reduction Goal	Install flow restrictors on repeat offenders.
	Require customers to have high efficiency devices before granting increased allocations.
Mandatory Reductions	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 35 to 50+ Percent Shortage Up to and above a 50 percent Reduction Goal Mandatory Reductions	**Cal Water will:** Increase or continue all actions from previous stages. Discontinue service for repeat offenders. Monitor water use weekly for compliance with reduction targets. Prohibit potable water use for landscape irrigation.

5.5.6 Water Supply Conditions and Trigger Levels

As described in Section 3, the water supply for the Antelope Valley District is a mix of groundwater and imported water. None of the groundwater basins that Cal Water pumps from are adjudicated. Therefore the groundwater supply is limited only by the pumping capacity of the wells and by natural conditions. Since little is known about the availability of groundwater, it is difficult to know if a water shortage condition exists in the systems supplied solely by groundwater. The limited water level data available indicates that there are areas that have seasonal fluctuations but are mostly in balance, and other areas, notably Lancaster, where the long term trend shows declining groundwater levels, which indicates overdraft conditions.

Cal Water's imported supply for the Antelope Valley District comes through the Antelope Valley-East Kern Water Agency (AVEK), which is State Department of Water Resources contractor. Cal Water's Water Shortage Allocation Plan will ultimately be triggered by actions within these agencies. Although Cal Water could decide to increase groundwater pumping to make up the difference in demand, except in unusual

circumstances it will follow the lead of these agencies when deciding whether to implement the Water Shortage Allocation Plan. The percent shortage identified by AVEK will determine which drought stage Cal Water enters into. These 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

In the spring of each year, after the winter storm season, AVEK will assess its available water supply and decide if it will request voluntary of mandatory reductions by its retail customers. These reduction targets will be passed along from AVEK to Cal Water and from Cal Water to our customers. If necessary, the allocation period will begin on July 1st of the given year and will continue at least one year or until the availability of supplies warrants the lifting of water use restrictions.

Cal Water's timeline for implementing its Water Shortage Contingency Plan will generally follow AVEK's schedule. However, Cal Water will monitor water supply conditions throughout the year and will independently assess the threat of water shortage conditions. This will allow Cal Water to make the necessary preparations prior to the high water use season when restrictions would likely go into effect. Preparations may include filing the appropriate advice letters with the CPUC, hiring additional staff, training existing staff, making billing system improvements, developing public communications material, making operational changes, and performing maintenance to the water system facilities. This advanced planning will minimize the potential lag time between when a water shortage is declared and when restrictions can take effect. The reduction in lag time is essential in order to maximize the water savings during the high use summer months.

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.

In the Antelope Valley District the city of Lancaster passed a water conservation ordinance. It is 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 Antelope Valley 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 Antelope Valley District has a gross savings requirement of 4 AF from 2011-2015, as shown in Table 6.3-1.

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	1,290 AF	1,290 AF
2015 Target Demand	1,286 AF	1,280 AF
Gross Savings Requirement	**4 AF**	**10 AF**

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. 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.

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 Antelope Valley 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, meter conversions, 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	1,259	1,267	1,275	1,282	1,290
Less Savings from					
Codes	1.2	2.3	3.4	4.4	5.8
Schedule Rate Increases	13.5	27.6	42.0	42.9	44.0
Existing Programs & Meter Conversion	1.3	1.2	1.2	1.1	1.1
Adjusted Baseline Demand	**1,243**	**1,236**	**1,228**	**1,234**	**1,239**
Per Capita (GPCD)	313	310	306	305	305

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 317 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, expected savings from codes, rates, and existing programs exceed the 2015 gross savings requirement by about 47 AF, and new program savings are unlikely to be needed to comply with SBx7-7 in 2015. Approximately 9 AF of additional water savings are required by 2015 in order for the district to meet its MOU Flex Track target.

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	**4.1**	**9.9**
Less		
Savings from codes	-5.8	NA
Savings from rates	-44.0	NA
Savings from existing programs	-1.1	-1.1
Subtotal Expected Savings	*-50.9*	*-1.1*
Savings Required from New Programs[1]	**-46.8**	**8.8**
[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 Antelope Valley 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 Antelope Valley 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 Antelope Valley 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, water savings from existing water efficiency codes and ordinances, scheduled adjustments to water rates, and past investment in conservation programs are expected to be sufficient to meet Antelope Valley District's 2015 SBx7-7 per capita water use target. It also showed that an additional 9 AF of water savings from new programs would be required to satisfy MOU compliance requirements in 2015. For the Antelope Valley 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	40	50	50	60	60
Clothes Washers	20	10	10	10	10
Urinals	20	10	10	10	10
Customer Surveys/Audits	50	30	30	30	30
Conservation Kit Distribution	30	30	30	30	30
Pop-Up Nozzle Distribution	200	200	200	400	400
NON-CORE PROGRAMS					
Direct Install Toilets/Urinals	0	0	0	0	0
Smart Irr. Controller Vendor Incentives	30	20	20	10	10
Large Landscape Water Use Reports	0	0	0	0	0
Large Landscape Surveys/Incentives	10	10	10	10	10
Commercial Kitchen Rebates/Vouchers	0	0	0	10	10
Cooling Tower/Process Water Retrofit Incentives	0	0	0	0	10

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	1.1	2.2	3.3	4.7	6.1
Clothes Washers	0.3	0.5	0.6	0.8	0.9
Urinals	0.4	0.4	0.4	0.4	0.4
Customer Surveys/Audits	1.8	2.5	3.2	3.8	4.3
Conservation Kit Distribution	0.4	0.7	1.0	1.3	1.5
Pop-Up Nozzle Distribution	0.8	1.6	2.4	4.0	5.6
Subtotal Core Programs	***4.7***	***7.9***	***10.9***	***15.0***	***18.9***
NON-CORE PROGRAMS					
Direct Install Toilets/Urinals	0.0	0.0	0.0	0.0	0.0
Smart Irr. Controller Vendor Incentives	0.5	0.8	1.1	1.2	1.2
Large Landscape Water Use Reports	0.0	0.0	0.0	0.0	0.0
Large Landscape Surveys/Incentives	0.1	0.1	0.2	0.2	0.2
Commercial Kitchen Rebates/Vouchers	0.0	0.0	0.0	0.5	1.0
Cooling Tower/Process Water Retrofit Incentives	0.0	0.0	0.0	0.0	1.0
Subtotal Non-Core Programs	***0.6***	***0.9***	***1.3***	***1.8***	***3.4***
Total Core and Non-Core Program Savings	**5.3**	**8.8**	**12.2**	**16.8**	**22.3**

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 Antelope Valley 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.

Mitigation

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.

Adaptation

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

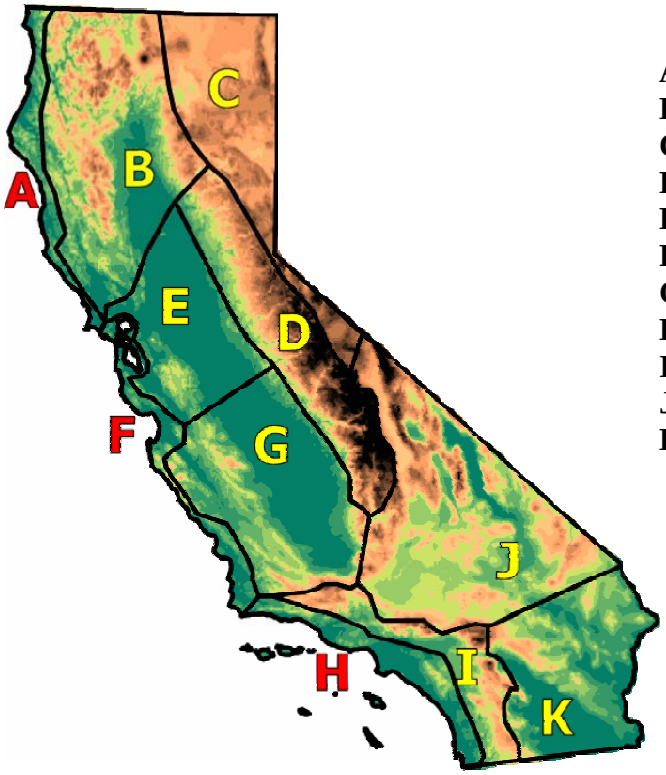
Even in the near term of the next 20 years, DWR has outlined potential climate change effects to water supplies, water demand, sea level, and the occurrence and severity of natural disasters. Some of these potential changes are presented below. Cal Water will investigate the following climate change 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[8]



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 Antelope Valley District is located in the Mojave Desert 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**
Sonoran Desert Region	None

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

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 1.57°F, 2.01°F, and 1.79°F, respectively. More recently, since 1975, the maximum, minimum, and mean temperature departures have increased 6.19°F, 5.48°F, and 5.84°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 Mojave Desert Region

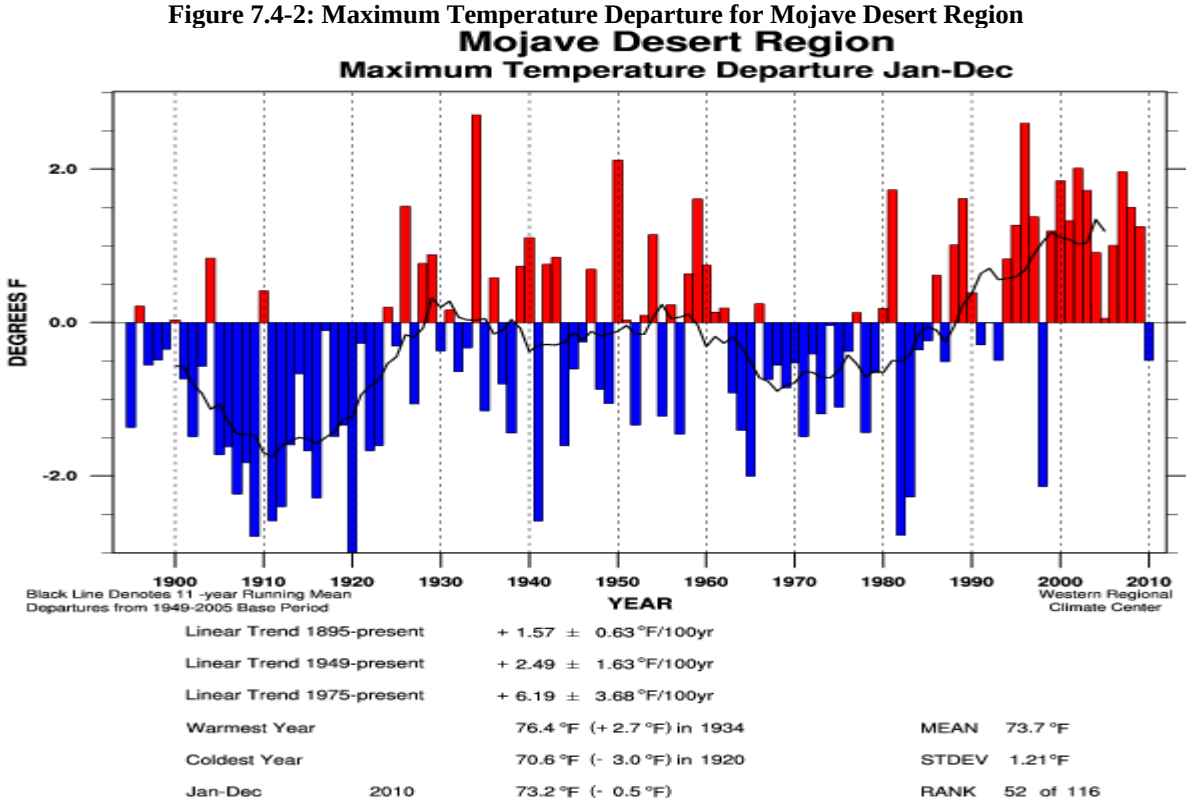


Figure 7.4-3: Mean Temperature Departure for Mojave Desert Region

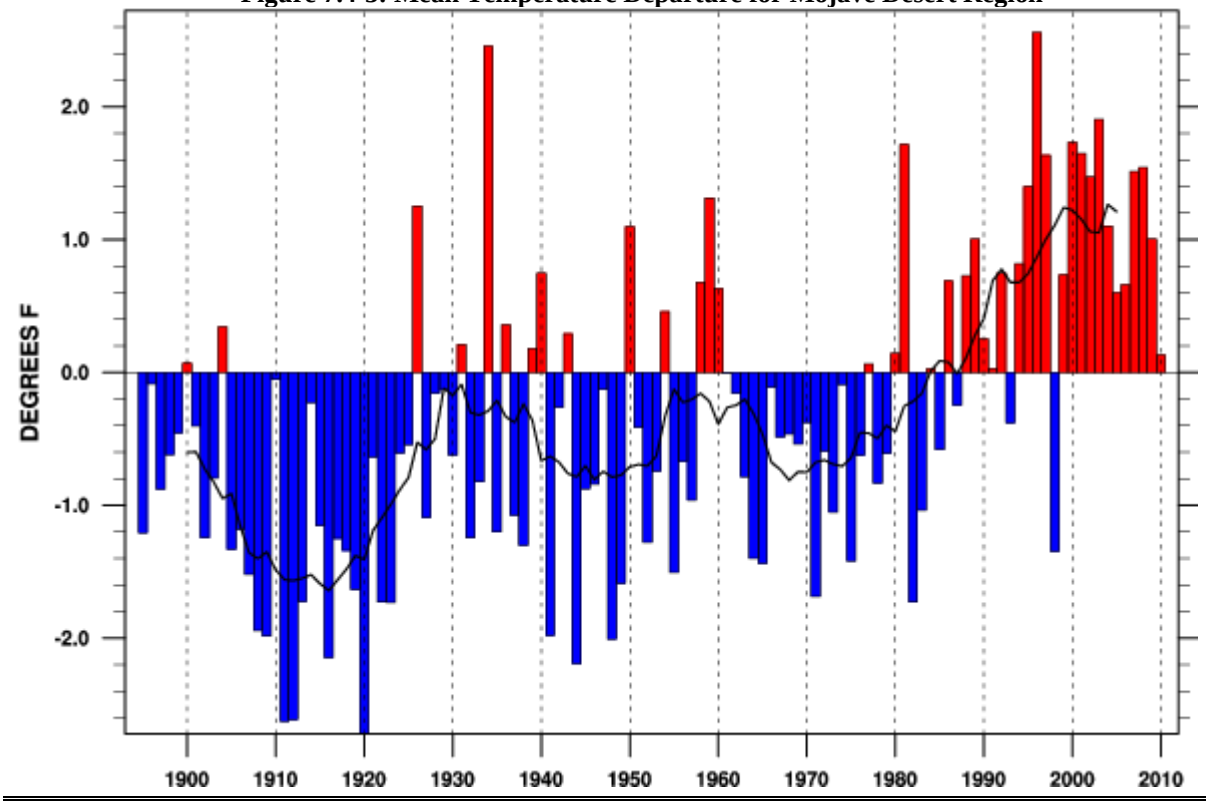
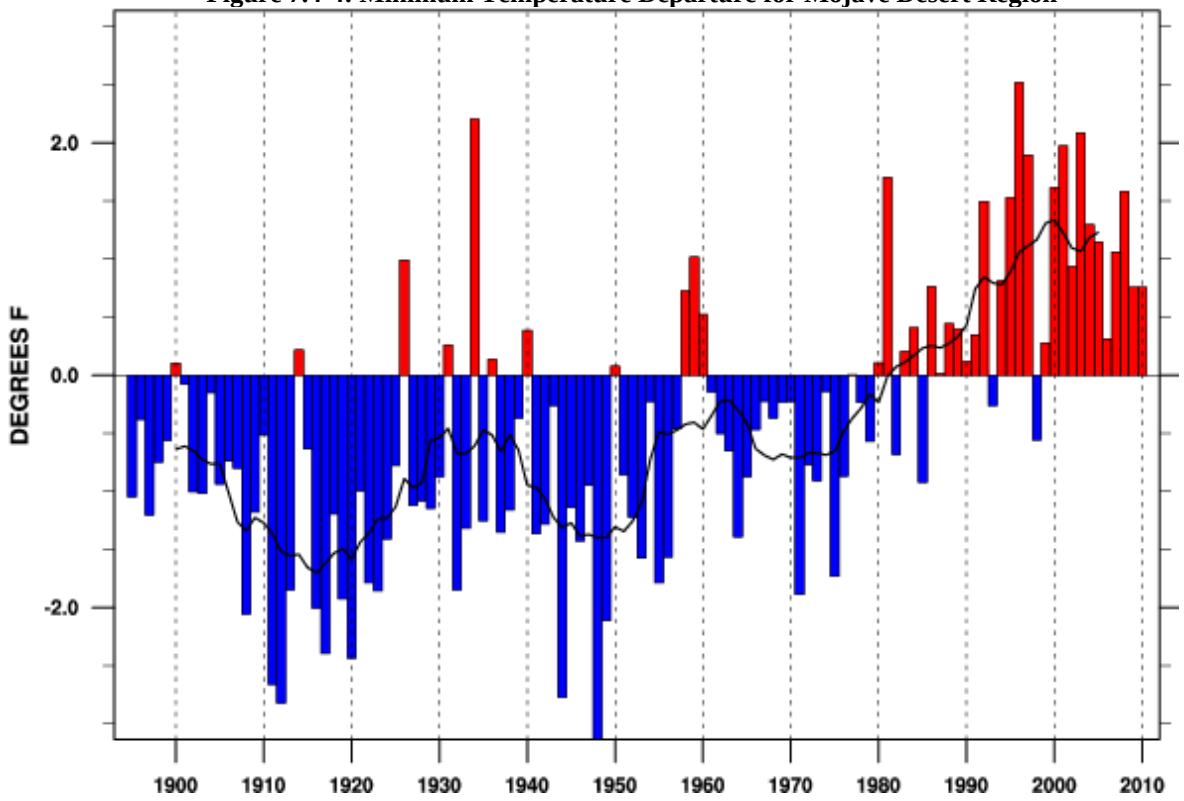
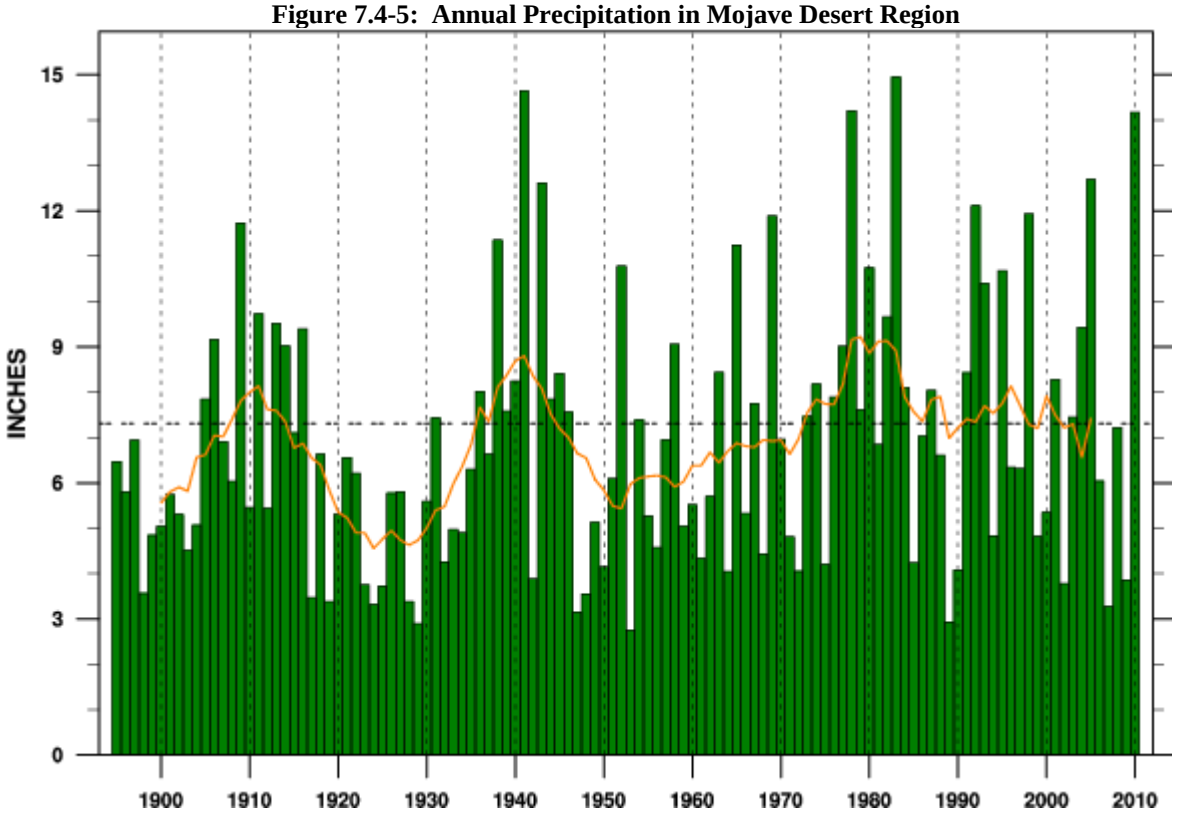


Figure 7.4-4: Minimum Temperature Departure for Mojave Desert Region



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 Mojave Desert 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

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

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

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

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

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

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

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: PUBLIC MEETING NOTICE

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 ORDINANCE

APPENDIX F: WATER EFFICIENT LANDSCAPE GUIDELINES

APPENDIX G: CONSERVATION MASTER PLAN

APPENDIX H: ANTELOPE VALLEY INTEGRATED REGIONAL WATER MANAGEMENT PLAN

APPENDIX I: AVEK WATER SERVICE AGREEMENT

Antelope Valley District Conservation Master Plan: 2011 - 2015

California Water Service Company

Prepared by

M.Cubed
Gary Fiske and Associates, Inc.
A&N Technical Services, Inc.

April 2011

Table of Contents

List of Acronyms/Abbreviations vi
Executive Summary vii
ES-1 Introduction vii
ES-2 Baseline Per-Capita Demand viii
ES-3 Demand-Reduction Targets viii
ES-3.1 SBx7-7 Requirements ix
ES-3.2 MOU Requirements x
ES-3.3 Gross and Net Savings Requirements x
ES-4 Conservation Program Analysis xi
ES-5 Portfolio Development xvi
ES- 6 Required Staffing and Expenditure Levels xviii
ES-6.1 Administration and Research xviii
ES-6.2 Public Information and School Education xix
ES-6.3 Cost Summary xix
ES-6.4 Expected Savings xix
ES-7 Plan Monitoring and Updates xx
1 Introduction 1
1.1 Master Plan Scope and Objectives 1
1.2 Plan Development 2
1.3 Report Organization 3
2 District Profile 5
2.1 Introduction 5
2.2 Service Area Description 5
2.3 Population and Service Connections 5
2.4 Historical Water Demand 7
2.5 Unadjusted Baseline Water Demand Projection 9
2.6 Local Water Supply Issues 10
2.7 Future Water Cost 11
2.7.1 Short-Run Avoided Costs 11
2.7.2 Long-Run Avoided Costs 12
2.8 Future Water Rates 12

3 Statewide Urban Water Demand Reduction Policies 14
3.1 Introduction 14
3.2 CPUC GPCD Policy 14
3.3 State Per Capita Water Use Policies and Targets 14
3.3.1 SBx7-7 GPCD Reduction Targets 14
3.3.2 Regional Compliance 15
3.3.3 Cal Water SBx7-7 Compliance Strategy 16
3.4 Urban Water Conservation MOU 17
3.4.1 MOU Compliance Options 17
3.4.2 Cal Water MOU Compliance Strategy 18
4 SBx7-7 and MOU Savings Targets 20
4.1 Introduction 20
4.2 SBx7-7 Target Calculation 20
4.3 MOU Flex Track Target Calculation 22
4.4 Difference from Unadjusted Baseline Water Use 24
5 Water Savings Required from New Programs 25
5.1 Introduction 25
5.2 Expected Savings from Efficiency Codes 25
5.3 Expected Savings from Rates 27
5.4 Expected Savings from Current Programs 27
5.5 Adjusted Baseline Demand 28
5.6 Water Savings Needed from New Programs 28
6 Conservation Program Analysis 31
6.1 Introduction 31
6.2 Conservation Program Concepts 31
6.2.1 Concept Screening 35
6.2.2 Preliminary Quantitative Analysis 37
6.2.3 Identification of Core and Non-Core Programs 38
6.3 Benefit-Cost Analysis of Core and Non Core Programs 41
7 Portfolio Development 43
7.1 Introduction 43
7.2 SBx7-7 and MOU Savings Targets 43
7.3 2011-13 General Rate Case Decision 43
7.4 Minimum and Maximum Program Levels 44

7.5 Recommended Annual Program Activity and Staff Levels 44
7.5.1 Residential and Non-Residential Conservation Programs 44
7.5.2 Administration & Research 45
7.5.3 Public Information & School Education 46
7.6 Projected Annual Program Expenditures 47
7.7 Projected Portfolio Water Savings 48
7.8 Projected Water Demands 49
7.9 Program Cut Sheets 50
8 Plan Monitoring and Updates 51
8.1 Introduction 51
8.2 Program Tracking 51
8.3 2014-16 General Rate Case 51
8.4 2015 UWMP 51
8.5 MOU Flex Track Target 51
8.6 Water Savings Verification 52
8.7 Local Codes and Ordinances 52
8.8 2015 Plan Update 52
Appendix 1 Conservation Program Cut Sheets
Appendix 2 Conservation Program Modeling Assumptions and Results

Report Tables

Table ES-1. Cal Water Districts Sorted by Hydrologic Region ix
Table ES-2. Antelope Valley District Gross Savings Required for SBx7-7 and MOU Compliance xi
Table ES-3. Antelope Valley District New Program Savings Required for SBx7-7 and MOU Compliance xi
Table ES-4. Antelope Valley District Program Concepts Passing Qualitative Screen xii
Table ES-5. Cal Water Conservation Programs xv
Table ES-6. Antelope Valley District Core and Non-Core Program Benefit-Cost Ratios xvi
Table ES-7. Antelope Valley District GRC Conservation Program Expenditure Constraints xvii
Table ES-8. Antelope Valley District Recommended Residential and Non-Residential Program Levels xviii
Table ES-9. Antelope Valley District Projected Annual Conservation Expenditures xix
Table ES-10. Antelope Valley District Projected Water Savings by Customer Class xx
Table ES-11. Antelope Valley District Recommended Portfolio Projected 2015 Demand xx
Table 2-1. Antelope Valley District Historical and Projected Population 6
Table 2-2. Antelope Valley District Antelope Valley District Service Connections 7
Table 2-3. Antelope Valley District Unadjusted Baseline Demand Projection 10
Table 2-4. Antelope Valley District Avoided Cost Forecast 12
Table 2-5. Antelope Valley District Nominal Change in Service Rates 13
Table 3-1. Cal Water Districts Sorted by Hydrologic Region 16
Table 3-2. MOU Best Management Practices 19
Table 4-1. Antelope Valley District SBx7-7 GPCD Targets 21
Table 4-2. Programmatic BMPs Used to Calculate Flex Track Target 23
Table 4-3. Antelope Valley District 2015 MOU Flex Track Target 24
Table 4-4. Antelope Valley District Gross Savings Required for SBx7-7 and MOU Compliances 24
Table 5-1. Antelope Valley District 2011-2015 Code-Driven Water Savings 26
Table 5-2. Antelope Valley District 2011-2015 Water Savings from Proposed Rate Adjustment 27
Table 5-3. Antelope Valley District Water Savings from 2009-10 Conservation Programs 28
Table 5-4. Antelope Valley District Adjusted Baseline Demand Projection 28
Table 5-5. Antelope Valley District New Program Savings Required for SBx7-7 and MOU Compliance 29
Table 5-6. 2015 GPCD Required for SBx7-7 and MOU Compliance 29
Table 6-1. Antelope Valley District Indoor Conservation Program Concepts 33
Table 6-2. Antelope Valley District Outdoor Conservation Program Concepts 34
Table 6-3. Antelope Valley District General Conservation Program Concepts 35
Table 6-4. Antelope Valley District Program Concepts Passing Qualitative Screen 36

Table 6-5. Cal Water Conservation Programs 40
Table 6-6. Antelope Valley District Core and Non-Core Program Benefit-Cost Ratios 42
Table 7-1. Antelope Valley District GRC Conservation Program Expenditure Constraints 43
Table 7-2. Antelope Valley District Recommended Residential and Non-Residential Program Levels 45
Table 7-3. Antelope Valley District Projected Annual Conservation Expenditures 47
Table 7-4. Antelope Valley District Projected Water Savings by Program 49
Table 7-5. Antelope Valley District Projected Water Savings by Customer Class 49
Table 7-6. Antelope Valley District Recommended Portfolio Projected 2015 Demand 50

Report Figures

Figure ES-1. Antelope Valley District Historical Per Capita Demand viii
Figure 2-1. Antelope Valley District Distribution of Services by Customer Type 6
Figure 2-2. Antelope Valley District District Historical Demand 7
Figure 2-3. Antelope Valley District Percent of Total Demand by Type of Use 8
Figure 2-4. Antelope Valley District Historical Per Capita Demand 9
Figure 2-5. Antelope Valley District Unadjusted Baseline Demand Projection 10
Figure 4-1. Antelope Valley District SBx7-7 Per Capita Target Demand 22
Figure 7-1. Cal Water Conservation Program Management Regions 46
Figure 7-2. Antelope Valley District 2011-15 Conservation Expenditure Shares 48

List of Acronyms/Abbreviations

AF	Acre-Feet
AFY	Acre-feet Per Year
BCR	Benefit-Cost Ratio
BMP	Best Management Practice, as in MOU Conservation BMPs
Cal Water	California Water Service Company
CII	Commercial, Industrial, Institutional
Comm	Commercial
Cont	Contractor
CPUC	California Public Utilities Commission
Cust	Customer
CUWCC	California Urban Water Conservation Council
CW	Clothes Washer
Dist	Distributor
DWR	California Department of Water Resources
ETo	Reference Evapotranspiration
GPCD	Gallons Per Capita Per Day
GPM	Gallons Per Minute
GRC	General Rate Case
HE	High-Efficiency, as in HE Toilets
HECW	High-Efficiency Clothes Washer
HET	High-Efficiency Toilet
HR	Hydrologic Region
Inc	Incentive
Irrig or Irr	Irrigation
Lg	Large, as in Large Landscape Survey
Lndscp	Landscape
MCL	Maximum Contaminant Level
MOU	Memorandum of Understanding Regarding Urban Water Conservation in California
NAICS	North American Industrial Classification System
Reb	Rebate
SBx7-7	Senate Bill 7 (Steinberg), The Water Conservation Act of 2009
SWP	State Water Project
ULFT	Ultra Low Flush Toilet
UWMP	Urban Water Management Plan
UWMPA	Urban Water Management Planning Act
WBIC	Weather-Based Irrigation Controller (also called “Smart Controllers”)
WSS	WaterSense Specification

Executive Summary

ES-1 Introduction

California Water Service Company (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% 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.

Aside from these mandates, conservation will also help to address local water supply constraints in some districts.

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. Each district plan was developed with the following questions in mind:

- How much water conservation will each district need to implement in order to comply with state urban per capita water use targets?
- How much of this conservation requirement can be met by existing water efficiency codes and ordinances, scheduled increases in water rates, and past investment in conservation programs?
- How much of this conservation requirement will need to be met through new investments in conservation?
- Which water conservation programs at what levels of activity result in the most benefit to Cal Water ratepayers?
- Should existing programs be expanded, new programs developed, or both?
- How can conservation be used to help address local water supply constraints?
- How many conservation programs can Cal Water reasonably expect to operate given the geographic dispersion of its districts, and staffing and

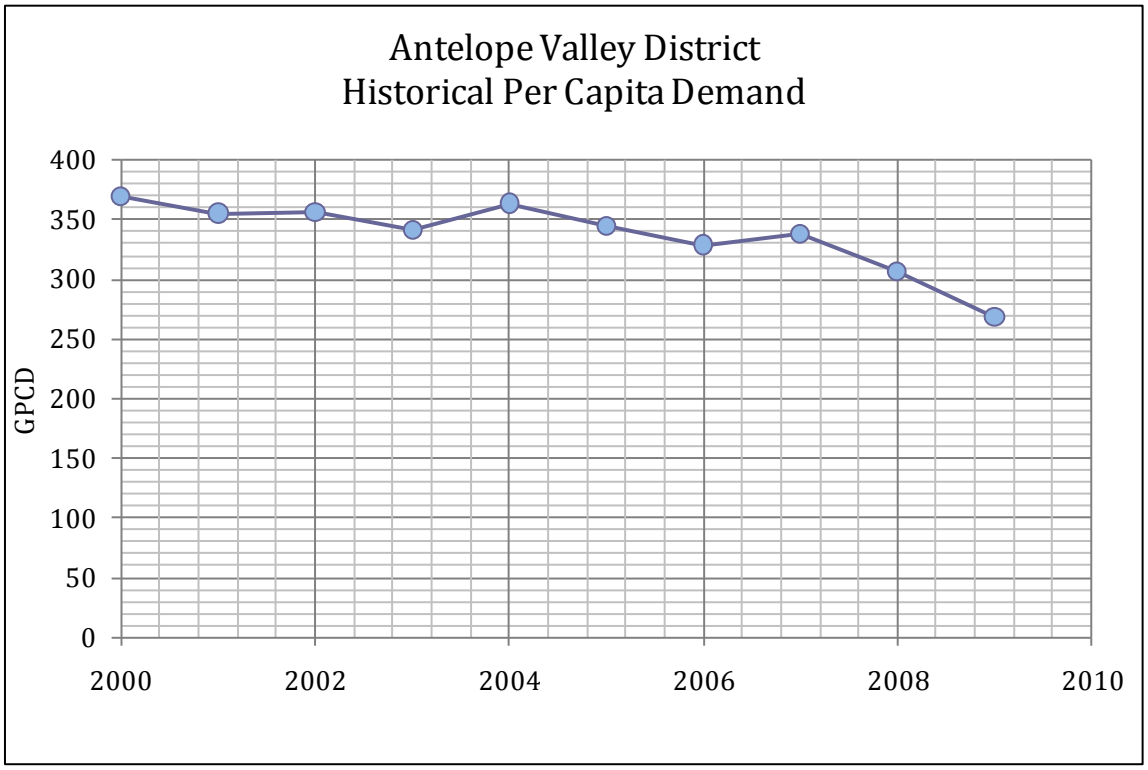
budgetary constraints?

- How can regional partnerships be leveraged to more efficiently achieve a district's water conservation targets?

ES-2 Baseline Per-Capita Demand

The determination of the required future demand reductions must begin with a clear understanding of past and current per-capita demands. As Figure ES-1 shows, Antelope Valley's per-capita demands have declined significantly over the past decade. Assuming that future per-capita demand stays constant, total future demand will grow at the rate of population growth, which is forecast to be about 0.6% annually over the next decade.

Figure ES-1. Antelope Valley District Historical Per Capita Demand



ES-3 Demand-Reduction Targets

The two statewide policies that result in quantified future demand reduction targets are those of SBx7-7 and the MOU. Following are brief discussions of each of these requirements.

ES-3.1 SBx7-7 Requirements

Senate Bill 7 (SBx7-7), which was signed into law in November 2009, amended the State Water Code to require a 20% reduction in urban per capita water use by 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).

SBx7-7 requires the state to achieve a 20% 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% 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. Cal Water districts sorted by hydrologic region are shown in Table ES-1.

Table ES-1. 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	Domiguez, 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

Because Antelope Valley District is the only Cal Water district in the South Lahontan hydrologic region, regional compliance is not an option.

Cal Water's SBx7-7 compliance strategy involves:

1. Identifying for each district the largest allowable interim and 2020 GPCD targets under the relevant compliance methods allowed by the statute;[1]

2. Grouping districts by hydrologic region and calculating population-weighted regional targets where applicable; and

3. Developing conservation programs aimed at achieving the regional and/or district-specific targets.

ES-3.2 MOU Requirements

Administered by the California Urban Water Conservation Council (CUWCC), the *Memorandum of Understanding Regarding Urban Water Conservation in California* (MOU) has guided urban water conservation programs in California since it was first adopted in 1991. 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. Because the Flex Track compliance option affords the most flexibility in selecting conservation programs suited to each Cal Water district and allows for more streamlined reporting, Cal Water plans to use Flex Track to comply with the MOU. 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.

ES-3.3 Gross and Net Savings Requirements

Table ES-2 shows the gross savings required under SBx7-7 and MOU Flex Track compliance. These, however, do not reflect the savings that are required to be achieved from new conservation programming, which are net of the expected savings from water efficiency codes, expected future rate adjustments, and already-existing conservation programs. The impacts of these savings components are shown in Table ES-3. In the case of SBx7-7, expected savings from codes, rates, and existing programs exceed the 2015 gross savings requirement by about 47 AF; thus, new program savings are unlikely to be needed to comply with SBx7-7 in 2015.[2] Approximately 9 AF of additional water savings are required by 2015 in order for the district to meet its MOU Flex Track target.

[1] District-specific targets are based either on Method 1 or Method 3, as defined in SBx7-7, whichever yielded the highest per capita target for the district.

[2] However, this does not mean that conservation programming between now and 2015 is not needed in order to comply with SBx7-7 in 2020, since per capita water use must fall an additional 36 gallons per day between 2015 and 2020 in order for the district to comply with SBx7-7.

Table ES-2. Antelope Valley District Gross Savings Required for SBx7-7 and MOU Compliance

Gross Water Savings Required by 2015	SBx7-7	MOU Flex Track
2015 Unadjusted Baseline Demand	1,290 AF	1,290 AF
2015 Target Demand	1,286 AF	1,280 AF
Gross Savings Requirement	**4 AF**	**10 AF**

Table ES-3. Antelope Valley District New Program Savings Required for SBx7-7 and MOU Compliance

2015 Net Savings Requirement (AF)	SBx7-7	MOU Flex Track
Gross Savings Requirement (Tbl ES-2)	**4.1**	**9.9**
Less		
Savings from codes	-5.8	NA
Savings from rates	-44.0	NA
Savings from existing programs	-1.1	-1.1
Subtotal Expected Savings	*-50.9*	*-1.1*
Savings Required from New Programs[1]	**-46.8**	**8.8**

[1]*Negative net savings indicates that no new program savings required for compliance in 2015.*

ES-4 Conservation Program Analysis

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 universe of more than 75 conservation program concepts was 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.

For the purposes of this plan, a conservation program concept is comprised of two components:

- Targeted technologies or changes in customer behavior; and
- A delivery mechanism by which customers will be encouraged (or required) to adopt the technology(ies) or change their behavior.

Each program may apply to multiple customer classes (Single Family, Multi-Family, Commercial/ Industrial/Institutional, and Large Landscape).

Once the universe 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. For this purpose, six screening criteria were developed. For each program concept, Cal Water staff answered "yes" or "no" for each of these criteria. A "yes" answer on all of these criteria was considered to be essential for program success. Thus, a negative response to any one of the criteria for a particular program concept eliminated that concept from further consideration.

The programs passing the qualitative screen for Antelope Valley District are shown in Table ES-4.

Table ES-4. Antelope Valley District Program Concepts Passing Qualitative Screen

		CUSTOMER CLASS			
Technology/Intervention	**Delivery Mechanism**	**Single Family**	**Multi-Family**	**CII**	**Lg Lndscp**
INDOOR					
HE Toilets	Customer rebates or vouchers	x	x	x	
	Vendor, distributor & contractor incentives	x	x	x	
	Distribution (by utility, community group, vendor)	x	x	x	
	Direct install	x	x	x	
Urinals	Customer rebates or vouchers			x	
	Vendor, distributor & contractor incentives			x	
	Distribution (by utility or vendor)			x	
	Valve replacement			x	
Clotheswashers: in-unit, common area, & coin-op	Customer rebates & vouchers	x	x	x	
	Vendor, distributor & contractor incentives	x	x	x	
Showerhead (2.0, 1.5 gpm)/ flapper/aerators	Kit distribution or install	x	x		
Shower timers, Reminder cards	Distribution	x	x		
Cooling Towers	Customer rebates, customized incentives			x	
OUTDOOR					
Large Landscape Surveys					x
Weather-Based Irrigation Controllers	Direct Install	x	x	x	x
	Customer rebate	x	x	x	x

		CUSTOMER CLASS			
Technology/Intervention	**Delivery Mechanism**	**Single Family**	**Multi-Family**	**CII**	**Lg Lndscp**
	Vendor, distributor & contractor incentives	x	x	x	x
	Distribution	x	x	x	x
Irrigation System (including, but not limited to, high efficiency nozzles for pop-up heads, drip, soil moisture sensors, rain shut off, pressure control)	Customer rebate	x	x	x	x
	Vendor, distributor & contractor incentives	x	x	x	x
Landscape design	Customer rebate	x	x	x	x
	Vendor, distributor & contractor incentives	x	x	x	x
Turf buy back (Cash for Grass)	Customer rebate	x	x	x	x
Large Landscape Water Use Reports					x
Pool, hot tub covers & other upgrades	Customer rebate or voucher	x	x	x	
GENERAL					
Audits & Surveys (incl high bill contacts)*		x	x	x	x
Water use meter alerting device		x	x	x	x
Water recycling, grey water use, rainwater harvesting	Customized incentives	x	x	x	x
Education/outreach		x	x	x	x

The savings and cost parameters associated with each of these program concepts were then identified and each program concept was subjected to a preliminary quantitative analysis to help Cal Water distinguish between core and non-core programs. A key challenge facing Cal Water is finding a way to efficiently scale up conservation programming across its 24 districts with the limited staffing it has to implement and manage these programs. The current General Rate Case (GRC) decision authorizes 4 full-time conservation program staff for 2011-13. These staff will be responsible for implementing and managing programs in 24 geographically dispersed districts serving a combined population of over 1.7 million.[3]

Even with the added staffing beginning in 2014 that Cal Water intends to propose to the CPUC, the most efficient way for Cal Water to manage programs across its geographically dispersed districts is to standardize programs and centralize their implementation and oversight. Using the results of the qualitative screening and the preliminary quantitative analysis, Cal Water identified five core programs that it would run in every district over the next five years.

[3] By way of comparison, the East Bay Municipal Utility District has a conservation program staff of 21 full-time positions serving a population of 1.3 million within a geographically contiguous and compact service area.

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 or MOU compliance, or to help address local supply constraints.

The set of core and non-core programs that Cal Water will offer over the next five years is shown in Table ES-5.

Table ES-5. 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

A detailed benefit-cost analysis was then performed for all of the core and non-core programs, the results of which are shown in Table ES-6.

Table ES-6. Antelope Valley District Core and Non-Core Program Benefit-Cost Ratios

Program ID	Program Name	Customer Class	BCR
1	HE Toilets: Cust Rebates or Vouchers	Single Family	1.10
2	HE Toilets: Cust Rebates or Vouchers	Multi Family	2.14
3	HE Toilets: Cust Rebates or Vouchers	Commercial	0.74
4	Clotheswasher: Cust Reb or Voucher	Single Family	0.43
5	CW common: Cust Reb or Voucher	Multi Family	0.53
6	CW in-unit: Cust Reb or Voucher	Multi Family	0.32
7	CW coin-op: Cust Reb or Voucher	Commercial	0.66
8	Urinals (0.25 gpf): Cust Rebates or Vouchers	Commercial	0.49
9	HE Toilets: Direct Install	Single Family	0.48
10	HE Toilets: Direct Install	Multi Family	1.24
11	HE Toilets: Direct Install	Commercial	0.44
12	Urinals: Direct Install	Commercial	0.74
13	Audits & Surveys (incl high bill contacts)	Single Family	0.37
14	Audits & Surveys (incl high bill contacts)	Multi Family	0.15
15	High Efficiency Pop-Up Nozzle Web Voucher	Single Family	3.14
16	High Efficiency Pop-Up Nozzle Web Voucher	Multi Family	3.14
17	High Efficiency Pop-Up Nozzle Web Voucher	Commercial	3.14
18	Showerhead/Aerator, Tablet Kit Dist	Single Family	0.91
19	Showerhead/Aerator, Tablet Kit Dist	Multi Family	0.94
20	WBIC Vendor, Dist, & Cont Inc	Single Family	0.18
21	WBIC Vendor, Dist, & Cont Inc	Multi Family	0.32
22	WBIC Vendor, Dist, & Cont Inc	Commercial	0.21
23	Large Landscape Water Use Reports	Irrigation	20.67
24	Lg Lndscp Surveys & Irrig Sys: Rebates	Irrigation	0.91
25	Comm Irrigation System: Rebates	Commercial	0.34
26	Dishwashers: Vendor, Dist & Cont Inc	Commercial	11.35
27	Cooling Tower Cond Cont: Cust Reb, Inc	Industrial	2.38
28	Cooling Tower pH Cont: Cust Reb, Inc	Industrial	2.34

ES-5 Portfolio Development

The program analysis results described above provided the starting point for portfolio development. The next step was to determine the annual levels of program activity needed to, at minimum, meet Antelope Valley District's water savings targets. 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 shown in Table ES-6.

Table ES-3 showed that water savings from existing water efficiency codes and ordinances, scheduled adjustments to water rates, and past investment in conservation programs are expected to be sufficient to meet Antelope Valley District's 2015 SBx7-7 per capita water use target. It also showed that an additional 9 AF of water savings from new programs would be required to satisfy MOU compliance requirements in 2015. This established the minimum level of water savings the program portfolio would need to produce by 2015.

Cal Water's current GRC decision established conservation budgets for each district for the years 2011-2013. These budgets specify the total annual expenditure on conservation programs, as well as the maximum amount that can be allocated to (1) program administration and research, (2) public information and school education programs, (3) residential conservation programs, and (4) non-residential conservation programs. Table ES-7 shows these budgetary restrictions for Antelope Valley District.

Table ES-7. Antelope Valley District GRC Conservation Program Expenditure Constraints

Budget Constraint ($000)	**2011**	**2012**	**2013**
Overall Budget	$50.0	$33.0	$33.0
Admin & Research	$6.2	$4.1	$4.1
Public Info & School Educ.	$5.0	$3.9	$3.9
Programmatic Activity	$38.8	$25.0	$25.0
Expenditure Caps			
Residential Programs	$34.3	$24.9	$24.9
Non Residential Programs	$39.8	$23.8	$23.8

For each district, Cal Water then specified minimum and maximum program activity levels to guide portfolio development. The minimum levels were those below which it would not be administratively feasible or cost-effective to offer the program in the district, while the maximum levels were those that could reasonably be achieved given district customer characteristics, current market demand, and past experience marketing similar programs/technologies to district customers. The constraints placed on annual program activity levels are presented in Appendix 2.

Based on the foregoing, Table ES-8 shows the recommended annual program levels for residential and non-residential programs.. The program levels were derived from the following decision rules:

- For 2011-13, set annual program activity to maximize water savings subject to the GRC conservation program budget constraints and the min/max annual activity constraints. This ensured that the portfolio would reflect the least-cost mix of core and non-core conservation programs consistent with

the GRC budget constraints.

- For 2014-15, set annual activity of programs with BCRs greater than one to their maximum level. This ensured that the portfolio would benefit ratepayers by helping to lower average water supply costs.

- For 2014-15, if needed to satisfy the 2015 district-specific SBx7-7 and MOU Flex Track water savings targets, increase program activity of programs with BCRs less than one in order of cost-effectiveness. This ensured the least-cost set of activity levels needed to achieve the water savings targets.

Table ES-8. Antelope Valley District Recommended Residential and Non-Residential Program Levels

Program	Recommended Annual Activity Levels[1]				
	2011	2012	2013	2014	2015
CORE PROGRAMS					
Rebates/Vouchers					
Toilets	80	60	60	60	60
Clothes Washers	30	20	20	10	10
Urinals	20	10	10	10	10
Customer Surveys/Audits	50	50	50	30	30
Conservation Kit Distribution	80	80	80	30	30
Pop-Up Nozzle Distribution	400	400	400	400	400
NON-CORE PROGRAMS					
Direct Install Toilets/Urinals	0	0	0	0	0
Smart Irr. Controller Vendor Incentives	10	10	10	10	10
Large Landscape Water Use Reports	0	0	0	0	0
Large Landscape Surveys/Incentives	10	10	10	10	10
Commercial Kitchen Rebates/Vouchers	10	10	10	10	10
Cooling Tower/Process Water Retrofit Incentives	0	0	0	0	10

[1]Annual activity levels are aggregated across customer classes and rounded up to the nearest 10 units of activity. Appendix 2 contains the detail modeling results broken down by customer class and program measure.

ES- 6 Required Staffing and Expenditure Levels

ES-6.1 Administration and Research

District staff levels and expenditure for administration and research for 2011-13 are set by the current GRC. At present, Cal Water divides its 24 districts into two program management regions which are administered by its two conservation program coordinators. Program reporting and analysis will be conducted by its conservation program analyst. Proposed expenditures for 2014 and 2015 assume two additional conservation program coordinator positions and one additional

conservation analyst position for a total of seven full-time positions. Given the scale and diversity of programs proposed in this plan and the geographic dispersion of Cal Water's districts, this is the minimum staffing level recommended for program implementation, and assumes Cal Water will divide its 24 districts into four program management regions. Program administration costs for 2014-15 are prorated to the districts based on their share of company-wide conservation program expenditures.

ES-6.2 Public Information and School Education

District expenditure for public information and school education programs in 2011-13 is set by the current GRC. Recommended expenditures in 2014 and 2015 were set to allow some expansion in these programs to support proposed increases in residential and non-residential program levels.

ES-6.3 Cost Summary

Annual program expenditures for conservation programming, administration and research, and public information and education, based on the recommended program levels and GRC budget allocations are shown in Table ES-9. The plan allocates approximately 76% of projected expenditure to programmatic activity, 13% to public information and education functions, and 11% to administration and research functions. Within the programmatic expenditure category, approximately 82% of planned expenditure is for residential conservation programs and 18% is for non-residential programs.

Proposed annual expenditures in 2014 and 2015 are about 77% of the annual expenditure allowed under the current GRC. The decrease results from the decision rule to minimize implementation of programs with BCRs less than one.

Table ES-9. Antelope Valley District Projected Annual Conservation Expenditures

Expenditure Category	Projected Annual Expenditures ($000)				
	2011	2012	2013	2014	2015
Program Costs:					
Residential	$27.3	$22.3	$22.3	$15.8	$15.8
Non-Residential	$11.5	$2.7	$2.7	$3.0	$4.0
Program Subtotal	***$38.8***	***$25.0***	***$25.0***	***$18.8***	***$19.8***
Admin/Research	$6.2	$4.1	$4.1	$2.0	$2.1
Public Info/Education	$5.0	$3.9	$3.9	$4.3	$4.3
TOTAL ANNUAL	**$50.0**	**$33.0**	**$33.0**	**$25.2**	**$26.2**

ES-6.4 Expected Savings

Table ES-10 summarizes projected annual water savings by customer class. By 2015 projected water savings are approximately 29 AF. Programs affecting residential water demands account for approximately 80% of these savings, while programs

affecting non-residential demands account for 20%. Projected savings are expected to exceed both SBx7-7 and MOU Flex Track targets.

Table ES-10. Antelope Valley District Projected Water Savings by Customer Class

	Annual Water Savings (AF)				
Customer Class	**2011**	**2012**	**2013**	**2014**	**2015**
Single Family	6.1	11.3	16.3	19.2	22.1
Multi Family	0.2	0.5	0.7	0.9	1.1
Commercial/Industrial	1.5	2.1	2.7	3.6	5.5
Large Landscape	0.0	0.1	0.1	0.2	0.2
Total Water Savings	**7.8**	**14.0**	**19.7**	**23.8**	**28.9**

Table 7-6 compares per capita water use under the recommended portfolio to that under the adjusted baseline and the MOU and SBx7-7 targets. Per capita use under the recommended portfolio is 298 gpcd, which is 5 gpcd less than the MOU Flex Track target and 19 gpcd less than the 2015 SBx7-7 target.

Table ES-11. Antelope Valley District Recommended Portfolio Projected 2015 Demand

Demand Projection	**Demand (GPCD)**	**Difference from Adjusted Baseline (GPCD)**
Adjusted Baseline	305	
SBx7-7 Target	317	12
MOU Flex Track Target	303	-2
Recommended Portfolio	298	-7

ES-7 Plan Monitoring and Updates

Cal Water will need to regularly review the plan and make adjustments to it as appropriate. Key monitoring and updating activities Cal Water anticipates undertaking following plan implementation include:

- Cal Water will assess and adopt conservation program tracking software to be used to track and manage its core and non-core programs.
- Cal Water will submit its initial filing for the 2014-16 GRC in July 2012. Prior to that filing, Cal Water may elect to update this plan to reflect new information and changed circumstances affecting the baseline water demands, calculated water savings targets, recommended conservation programs, projected water savings, and proposed conservation program budgets.
- Cal Water may, in conjunction with preparation of its 2015 Urban Water Management Plans, elect to update its baseline demand estimates and gpcd

targets, if new information warrants doing so. Depending on the final methodology adopted by DWR for the as-yet unspecified fourth target calculation option, Cal Water may decide to update the SBx7-7 targets included in the plan using this alternative methodology.

- Cal Water may elect to update this plan to reflect a revised Flex Track target based on a CUWCC-sanctioned Flex Track target calculator, expected to be available in the first half of 2011.
- Results from studies, such as the one Cal Water and San Jose State University Research Foundation are jointly undertaking to better estimate realized water savings from converting customers from flat rate to metered billing, will be used by Cal Water to update water savings projections.
- Cal Water will work with local planning and enforcement departments to ensure that its conservation programs are consistent with and complementary to local water use codes and ordinances, and may elect to modify the design or level of implementation of programs included in the plan in order to do so.
- Cal Water plans to update these plans no less frequently than every five years, in conjunction with the update and reporting cycle for the district-specific UWMPs. Plan updates may entail adjustment of existing programs and addition of new programs based on performance history, community input, and changes to state and local conservation requirements.

1 Introduction

1.1 Master Plan Scope and Objectives

California Water Service Company (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. Recently adopted state policies requiring future reductions in per capita urban water use are providing much of the impetus for this effort. Primarily the passage of Senate Bill No. 7 (SBx7-7) in November 2009, which mandated a statewide 20% reduction in per capita urban water use by 2020, but also 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 addition, conservation will help to address local water supply constraints in some districts.

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. Each district plan was developed with the following questions in mind:

- How much water conservation will each district need to implement in order to comply with state urban per capita water use targets?
- How much of this conservation requirement can be met by existing water efficiency codes and ordinances, scheduled increases in water rates, and past investment in conservation programs?
- How much of this conservation requirement will need to be met through new investments in conservation?
- Which water conservation programs at what levels of activity result in the most benefit to Cal Water ratepayers?
- Should existing programs be expanded, new programs developed, or both?
- How can conservation be used to help address local water supply constraints?
- How many conservation programs can Cal Water reasonably expect to operate given the geographic dispersion of its districts, available staffing and budgetary resources?

- How can regional partnerships be leveraged to more efficiently achieve a district's water conservation targets?

The primary objective of this planning process was the development of a set of comprehensive, service-area-specific conservation plans to guide Cal Water conservation program development and investment over the next five years. This report describes the five-year plan developed for the Antelope Valley District.

1.2 Plan Development

Plan development proceeded in phases. The first phase focused on compiling data needed for projecting future district water demand, developing per capita water use targets, and analyzing conservation programs. The data collected during this phase is used extensively throughout this report and provides the foundation for the quantitative analyses used to develop the plan's per capita water use targets and conservation program recommendations.

The next phase of plan development centered on estimating the volume of water savings the district would need to achieve over the next five years in order to satisfy SBx7-7 and MOU interim compliance requirements. Once these volumes were determined, expected water savings from existing codes and ordinances, scheduled increases in water rates, and past conservation program activity were deducted in order to determine the amount of water savings that would need to come from new conservation programs.

Using the results of the second phase as a starting point, the third phase of plan development entailed a comprehensive assessment of conservation program concepts to identify the best mix of programs to achieve the required water savings. This included soliciting input on program concepts from community stakeholders, and passing a broad universe of conservation program concepts through qualitative and quantitative screens designed to eliminate program concepts that were not good matches for Cal Water districts. Program concepts making it through the screening process were further refined and used to develop a set of core and non-core conservation programs, where core programs are those that Cal Water will offer in every district over the next five years and non-core programs are those that Cal Water will offer in some districts as needed.

To complete the plan, the recommended annual levels of activity for core and non-core programs were developed for each district. Proposed district program activity levels were informed by several considerations, as follows:

- First, minimum and maximum levels of activity for each district were established, where the minimum level sets the point below which it would not be administratively feasible or cost-effective to offer the program in the district, and the maximum level sets the point above which additional program participation would be highly uncertain given current market

penetration and district experience.

- Second, the current CPUC General Rate Case (GRC) decision for Cal Water establishes each district's conservation budget for 2011-13 as well as the maximum amount of budget each district can allocate to residential and non-residential conservation programs. Thus, the proposed program activity levels are designed so as not to violate these budgetary constraints.

- Third, the proposed program activity levels seek to achieve each district's water use targets at lowest possible cost, subject to the activity level and budgetary constraints described above.

- Lastly, any program with a benefit-cost ratio greater than one was set to its maximum activity level in 2014 and 2015, since doing so would benefit ratepayers by lowering the average cost of water service.[4]

1.3 Report Organization

The organization of this plan closely follows the analytical process described above, and, in addition to this introduction, includes the following sections:

- *Section 2, District Profile*, provides a general overview of the Antelope Valley District, including service area description, historical and projected population and service connections, historical water demand, projected water demand (without additional conservation), future water supply constraints and costs, projected water rates affecting future water use in the district.

- *Section 3, Statewide Urban Water Demand Reduction Policies*, describes the inter-related state-level policies and agreements aimed at reducing urban water use. These include: (1) recent decisions by the 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% by 2020; and (3) the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU).

- *Section 4, Per Capita and MOU Savings Targets,* derives the reduction in demand required by 2015 in order for Antelope Valley District to achieve interim compliance with SBx7-7 and the MOU.

- *Section 5, Water Savings Required from New Programs*, calculates the volume of water savings expected from existing water efficiency codes and

[4] This could not be done for 2011-13 because of the annual budget constraints resulting from the current General Rate Case (GRC).

ordinances, scheduled increases in water rates, and past investment in conservation programs in order to derive the amount of water savings that will be needed from new conservation program investment.

- *Section 6, Conservation Program Analysis*, describes the conservation program screening and quantitative analysis used to identify, evaluate and select conservation programs for Antelope Valley District.

- *Section 7, Portfolio Development*, describes the process used to develop the recommended conservation program portfolio for Antelope Valley District.

- *Section 8, Plan Monitoring and Updates*, describes how plan implementation will be monitored, discusses key uncertainties related to plan implementation, realization of projected water savings, and achieving the stated water savings targets, and how the plan will be updated as conditions change and new information on the effectiveness and cost of programs becomes available.

2 District Profile

2.1 Introduction

This part of the plan provides a general overview of the Antelope Valley District, including service area description, historical and projected population and service connections, historical water demand, projected water demand (without additional conservation), future water supply constraints and costs, projected water rates affecting future water use in the district.

2.2 Service Area Description

The Antelope Valley District is located near the border of northeastern Los Angeles and southeastern Kern Counties in the Western Mojave Desert. The District consists of four hydraulically separated water systems in unincorporated areas of these counties. The Lancaster, Lake Hughes, and Leona Valley systems are found at the base of the San Gabriel Mountains west of the City of Lancaster. The Fremont Valley system is located at the base of the Tehachapi Mountains approximately 25 miles north of the city of Lancaster. The Antelope Valley District provides water service primarily to rural single family residential communities.

2.3 Population and Service Connections[5]

Antelope Valley District's current population is approximately 3,400. Over the previous ten years, the district's population has been growing at an annual rate of about 1%. Annual growth in population is expected to slow to about 0.6% over the next ten years. By 2020, the district's population is projected to reach just over 3,700. Historical and projected population for the district is shown in Table 2-1.

[5] The population and service connection projections in this section are based on the draft final projections for the district's 2011 UWMP. Because the final UWMP projections were not available during the development of this plan, the data in this section may differ slightly from the final projections contained in the 2011 UWMP update.

Table 2-1. Antelope Valley District Historical and Projected Population

Historical		Projected	
Year	Population	Year	Population
1999	3,072	2010	3,519
2000	3,106	2011	3,540
2001	3,125	2012	3,562
2002	3,116	2013	3,583
2003	3,100	2014	3,605
2004	3,335	2015	3,627
2005	3,385	2016	3,649
2006	3,416	2017	3,671
2007	3,449	2018	3,693
2008	3,416	2019	3,716
2009	3,397	2020	3,738
Av. Ann. Growth Rate	1.0%	Av. Ann. Growth Rate	0.6%

The distribution of services by customer type for 2009 is shown in Figure 2-1. Projected services through 2020 are shown Table 2-2.

Figure 2-1. Antelope Valley District Distribution of Services by Customer Type

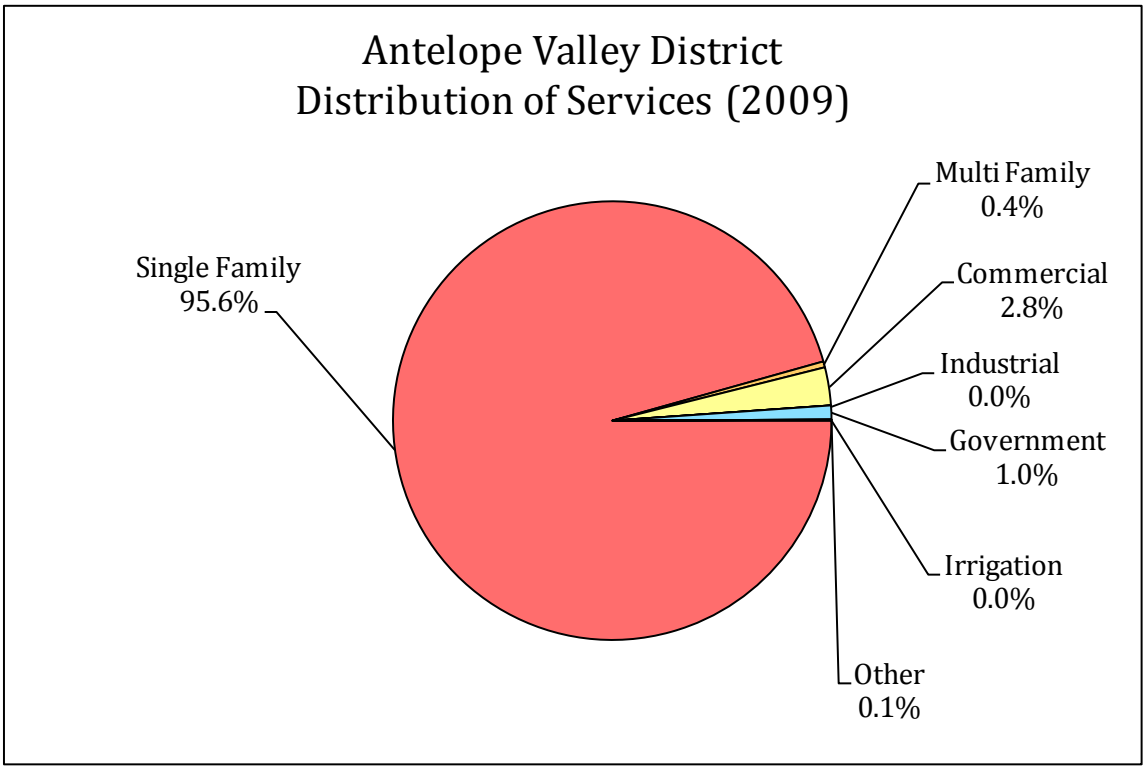


Table 2-2. Antelope Valley District Antelope Valley District Service Connections

Customer Type	Estimated Services 2010	Projected Services 2015	Projected Services 2020
Single Family Residential	1,339	1,380	1,423
Multi Family Residential	6	6	6
Commercial	40	41	43
Industrial	0	0	0
Government	12	13	13
Irrigation/Recreation	0	0	0
Other	2	2	2
Total	1,399	1,443	1,488

2.4 Historical Water Demand

Since 2005, annual demand in the district has averaged about 1,250 AF. Historical demands by category are shown in Figure 2-2. Single-family residential services currently account for about 85% of system demand. Demands from all other customer categories account for about 7.5%, and unaccounted water losses account for the remaining 7.5%. The percent of total demand in 2009 by type of use is shown in Figure 2-3.

Figure 2-2. Antelope Valley District District Historical Demand

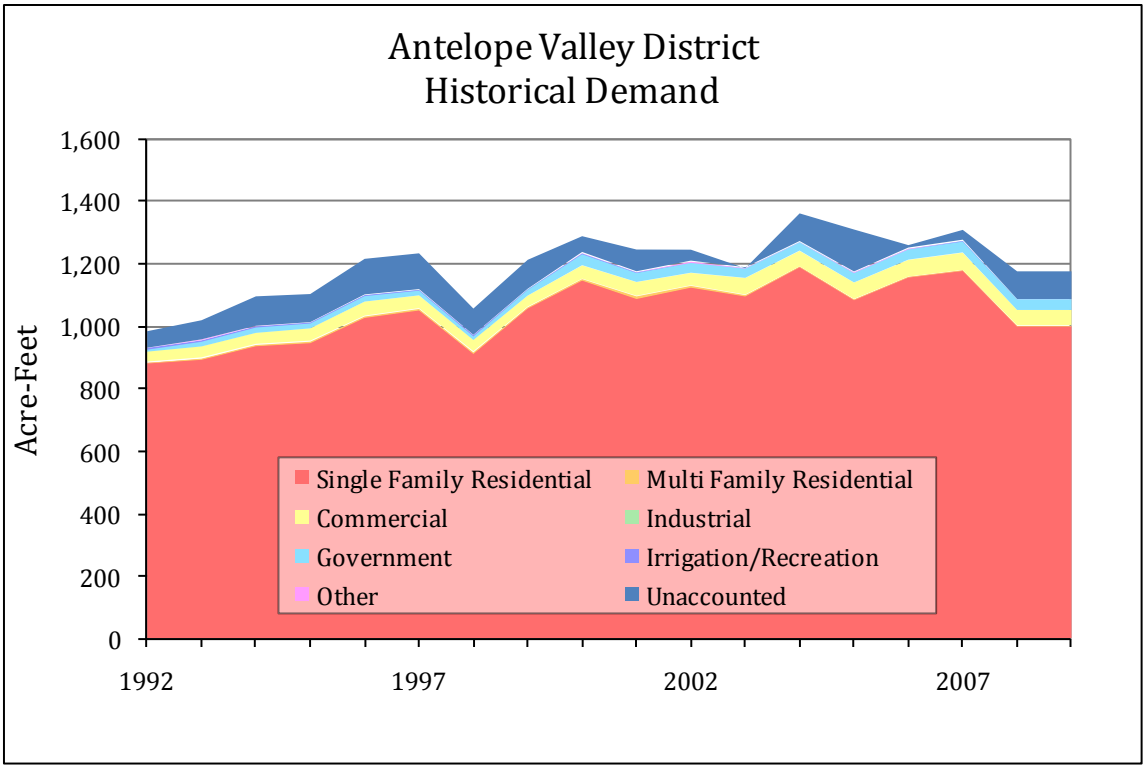
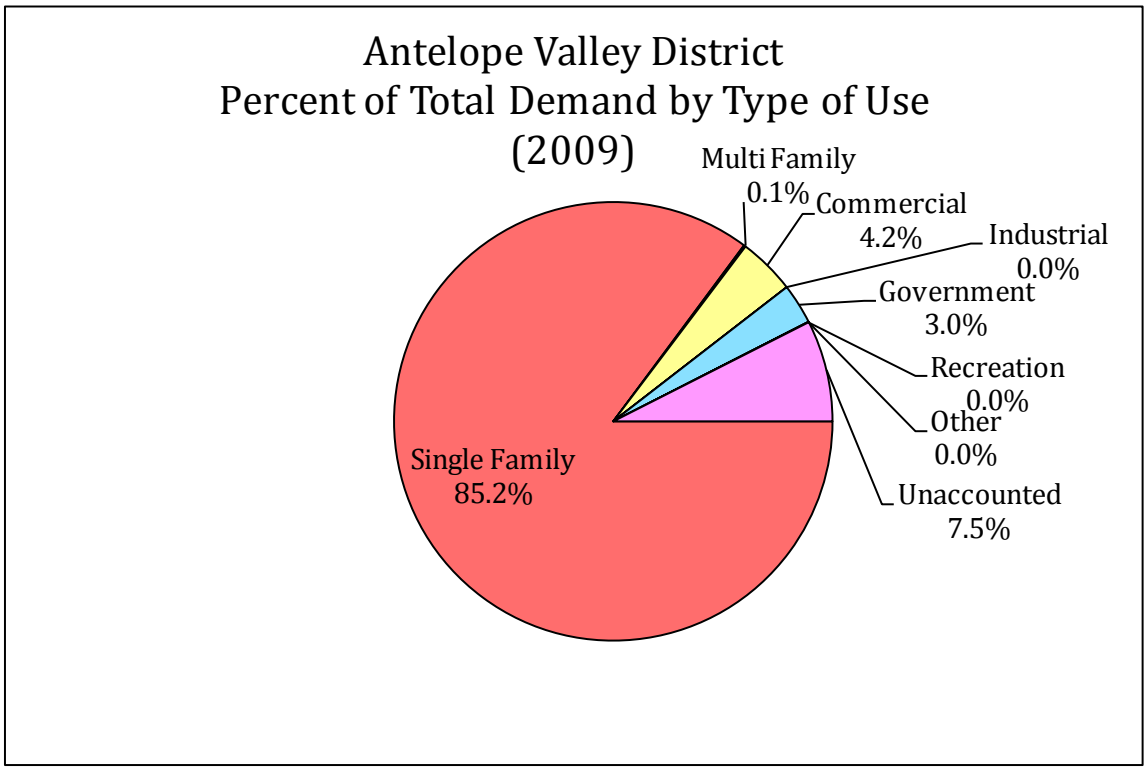


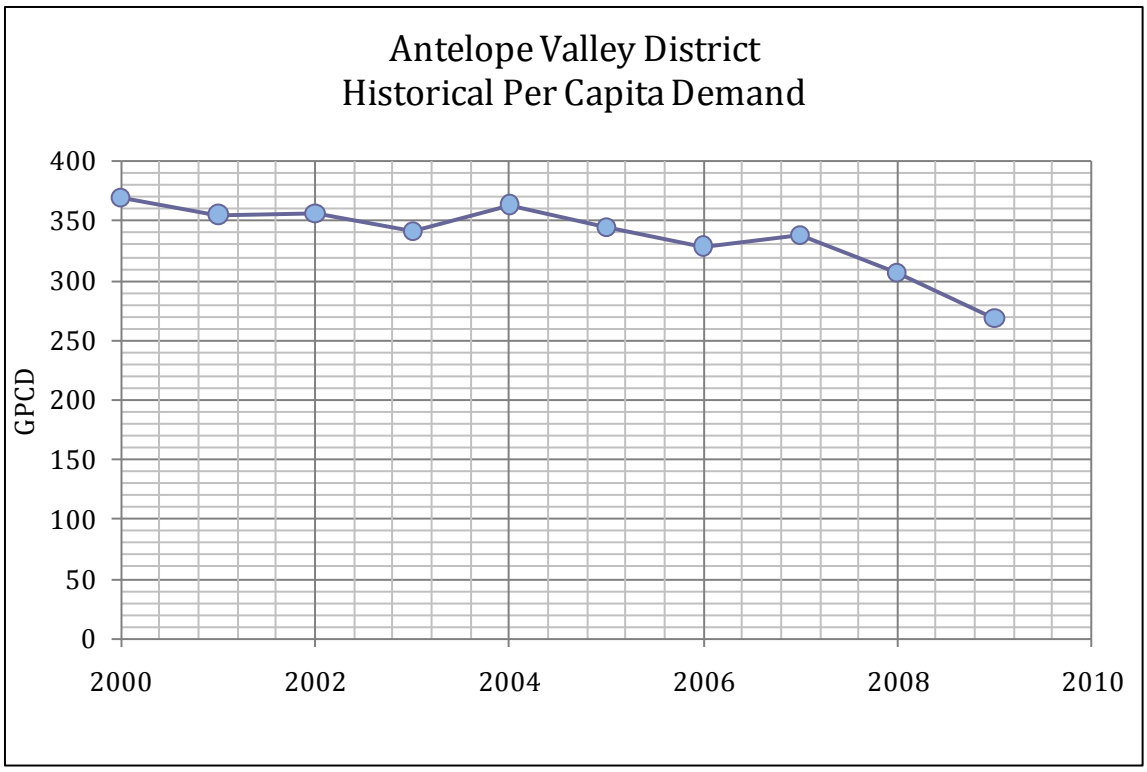
Figure 2-3. Antelope Valley District Percent of Total Demand by Type of Use



Historical per capita demand is shown in Figure 2-4.[6] In the last five years, per capita demand has averaged 318 gallons per day. The marked decline in 2008 and 2009 per capita demand is likely a consequence of shortage management programs implemented in response to drought conditions in the region.

[6] Per capita demand is the quotient of total demand across all customer classes and the district population.

Figure 2-4. Antelope Valley District Historical Per Capita Demand



2.5 Unadjusted Baseline Water Demand Projection

The unadjusted baseline water demand projection is equal to forecasted district population multiplied by 2005-09 average GPCD. This shows expected future demand given current patterns of consumption and water use efficiency and expected population growth. The difference between the unadjusted baseline demand projection and projected demands based on SBx7-7 GPCD targets is used to establish the Plan's minimum water conservation requirements. These requirements and their derivation are presented in Section 4. The unadjusted baseline projection does not account for future changes in water demand due to the effects of plumbing fixture efficiency codes, changes in water rates, and existing conservation programs. These effects are taken into account in Section 5, resulting in an adjusted baseline from which the amount of water savings that will be required from new conservation programs in order to comply with SBx7-7 and MOU requirements can be determined.

The district's unadjusted baseline water demand projection is shown in Figure 2-5. Projected increases in demand under the unadjusted baseline are shown in Table 2-3.

Figure 2-5. Antelope Valley District Unadjusted Baseline Demand Projection

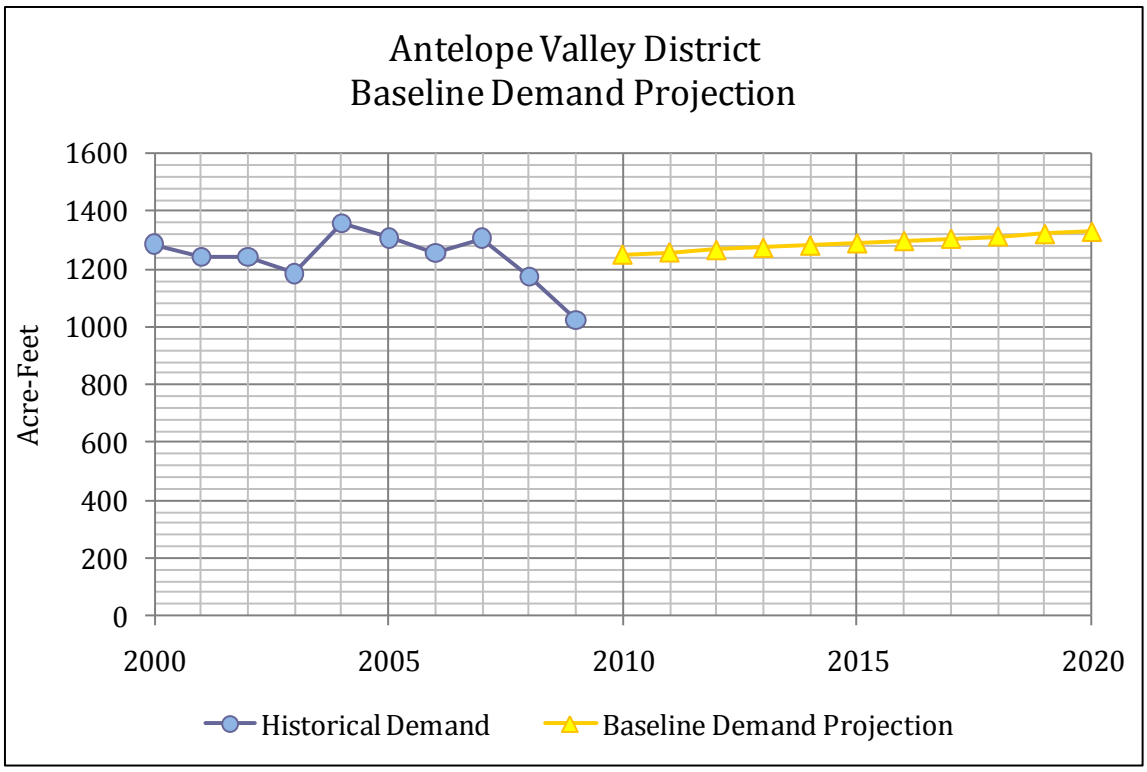


Table 2-3. Antelope Valley District Unadjusted Baseline Demand Projection

Year	2010	2015	2020
Unadjusted Baseline Demand (AF)	1,252	1,290	1,330
Increase from 2010 (AF)	NA	38	78
Increase from 2010 (%)	NA	3.1%	6.2%

2.6 Local Water Supply Issues[7]

The water supply for the customers of the Antelope Valley District comes from a mix of groundwater and purchased water. The Lancaster system began purchasing imported water from Los Angeles County in 2003 to compensate for insufficient well production. Purchased water has accounted for between 50 and 60 percent of the total supply for the Lancaster system over the last several years. The remaining supply comes from groundwater. A new well has since been installed and Lancaster has not needed to purchase water from Los Angeles County to meet demand. The Lancaster system also constructed a connection with the Antelope Valley East Kern Water Agency (AVEK) in 2010 for reliability purposes. Water supply in Leona Valley comes from a combination of locally produced groundwater and purchased water

[7] The district's 2010 Urban Water Management Plan provides a detailed discussion of district water supply sources and water supply management issues.

from AVEK. AVEK is a California State Water Project (SWP) contractor and receives water from the Department of Water Resources (DWR). The availability of purchased water is determined by the DWR and is dependent on annual rainfall. Groundwater has historically made up about 35 percent of the total supply, but this amount has declined over the last two years. In 2006, 100 percent of supply came from AVEK purchased water. Groundwater is the sole source of supply for the Lake Hughes and Fremont Valley systems in the Antelope Valley District. Groundwater also supplies between 40 and 50 percent of the total supply in the Lancaster system and approximately 35 percent in Leona Valley. For the Lake Hughes and Fremont Valley systems groundwater will continue to provide 100 percent of the supply into the foreseeable future. Cal Water owns eight wells in Antelope Valley, six of which are active and in service. The wells pull water either from shallow alluvial deposits or hard rock aquifers and produce water at a low rate. Groundwater overdraft is already occurring in the Antelope Valley region, leading to a decrease in aquifer storage. The continued overdraft of the basin could lead to reduced availability of groundwater supplies over time, especially during droughts. The groundwater basins within the Antelope Valley District are not adjudicated. If the overdraft problem is not solved by other means, a legal adjudication is a possibility, however unlikely.

2.7 Future Water Cost

As will be discussed below in Section 6, a key component of the analysis of potential water conservation programs for each district is a forecast of the district's future avoided costs of water supplies and infrastructure. Each unit of water conservation provides an economic benefit to the water utility by allowing the agency to avoid certain supply and/or infrastructure costs.

The avoided cost for each Cal Water district was estimated using the CUWCC/Water Research Foundation Avoided Cost Model. The model estimates the costs that the water utility will avoid as a result of each acre foot of water conserved. The model estimates both short run and long run avoided costs, and differentiates between water saved in the peak and off-peak seasons.[8] Following is a description of how the avoided costs were estimated for Antelope Valley District.

2.7.1 Short-Run Avoided Costs

As water conservation programs reduce demand, less water must be purchased, produced, pumped, and/or treated. These reduced variable operating costs constitute the short-run avoided costs. To estimate the short-run avoided costs per acre-foot of reduced demand, the supplies and/or facilities that will be cut back in response to conservation-induced demand reductions (the so-called "marginal" supplies and facilities) must be identified. In the case of Antelope Valley District, it was determined that the district could be divided into two sub-regions, for which the marginal supplies differ. For the bulk of the district, the marginal supply is

[8] The peak season is separately specified for each district depending on district supply and demand characteristics. For Antelope Valley, the peak season includes the months of May-September.

purchased water. For a small portion of the district, it is well water. Given the district's demand patterns, it was further estimated that the likelihood of the purchased water being on the margin is 88.4%; the well water was estimated to be on the margin the remaining 11.6% of the time.[9]

The avoidable cost components for each acre-foot of supply provided by each of these sources, and the rate at which those costs are expected to escalate in the future, were then estimated. Avoided cost components for the purchased supply include the purchase price and power costs for pumping. For the well water, power and chemical costs are avoidable.

2.7.2 Long-Run Avoided Costs

In addition to the immediate reduction in variable operating costs, peak-season demand reductions may, in the long run, also enable a water supplier to defer or downsize planned future capital investments in supply and/or infrastructure capacity. For Antelope Valley District, one such project was identified. This project was deemed to be deferrable in response to conservation-induced demand reductions. Thus, beginning in 2012, and based on this project's estimated annualized capital and fixed operating costs, Antelope Valley District's avoided costs will also include a long-run component.

Table 2-4 summarizes the Antelope Valley District avoided cost forecast.

Table 2-4. Antelope Valley District Avoided Cost Forecast

Avoided Cost ($/AF)	2010	2020	2030	2040
Short-Run	$390	$422	$458	$497
Long-Run[1]	--	$312	$260	$18
TOTAL	$390	$734	$718	$515

[1] Long-Run costs are avoided only as a result of reductions in peak-season demand.

2.8 Future Water Rates

Water service rates in the district are regulated by the California Public Utilities Commission (CPUC). The district files a General Rate Case with the CPUC every three years. The CPUC uses the information provided in the rate case to set rates so that the district can recover the cost of service and earn a reasonable return on its investments in the water system. The last rate case was concluded in 2010 and established rates for 2011, 2012, and 2013. The percentage increase in service rates

[9] This means that 88.4% of the time purchased water is expected to be the marginal source of supply for the district, and 11.6% of the time groundwater is expected to be the marginal source of supply.

over the prior year is shown in Table 2-5.[10] These rate changes are incorporated into the analysis of future demand and net water saving requirements, as described in Section 5 of the plan.[11]

Table 2-5. Antelope Valley District Nominal Change in Service Rates

Year	2011	2012	2013
Change from Prior Year	37.0%	4.4%	4.1%

[10]More precisely, the increases for 2012 and 2013 show the percentage change in district revenue requirement, which may be slightly different than the percentage change in the average rate, but provide a close proxy for the expected change in volumetric rates.

[11] The percentage increases shown in the table do not include possible increases in purchased water costs that would be passed through to customer bills. Thus, the change in customer rates could turn out to be greater than suggested by the table in districts, such as Antelope Valley, purchasing water from regional wholesalers.

3 Statewide Urban Water Demand Reduction Policies

3.1 Introduction

Inter-related state-level policies and agreements aimed at reducing urban water use have provided much of the impetus for this plan. These 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% by 2020; and (3) the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU). This section of the plan discusses these requirements, their relationship to one another, and their relationship to Cal Water's overall conservation strategy.

3.2 CPUC GPCD Policy

The CPUC's Decision 07-05-062 directed Class A and B water utilities to submit a plan to achieve a 5% 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% 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% by 2020.

3.3 State Per Capita Water Use Policies and Targets

Senate Bill 7 (SBx7-7), which was signed into law in November 2009, amended the State Water Code to require a 20% reduction in urban per capita water use by 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).[12]

3.3.1 SBx7-7 GPCD Reduction Targets

SBx7-7 requires the state to achieve a 20% 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% 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 described

[12] Cal Water prepares separate urban water management plans for each of its service districts and updates these plans every five years. Starting in 2011, districts submitting urban water management plans to the state are required, under SBx7-7, to document their interim and 2020 gpcd targets and compliance daily water use. While the smallest Cal Water districts, including Antelope Valley, are below the size threshold at which an urban water supplier is subject to SBx7-7 requirements, because Cal Water prepares urban water management plans for these districts, it is electing to include SBx7-7 compliance information in them.

below. Urban retail water suppliers will not be eligible for state water grants or loans unless they comply with SBx7-7's requirements.

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% of average GPCD for any continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.[13]

2. Set the 2020 target as the sum of the following:

    a. 55 GPCD for indoor residential water use

    b. 90% 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.[14]

3. Set the 2020 target to 95% of the applicable state hydrologic region[15] target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009).

4. A method as yet unspecified, to be determined by DWR no later than December 31, 2010.

Additionally, if baseline GPCD is greater than 100 gallons, the 2020 GPCD target can be no greater than 95% of average GPCD calculated over a continuous 5-year period ending no earlier than December 31, 2007 and no later than December 31, 2010, irrespective of the target method adopted.

3.3.2 Regional Compliance

SBx7-7 allows water suppliers to form regional alliances and set regional targets for purposes of compliance. Under the regional compliance approach, water suppliers within the same hydrologic region can comply with SBx7-7 by either meeting their

[13] If the supplier meets at least 10% of its retail demand with recycled water, it may extend the period for calculating average baseline GPCD by up to an additional five years.
[14] This method requires the use of satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas served by residential and dedicated irrigation meters.
[15] California is divided into 10 hydrologic regions. A map of these regions can be viewed at: www.water.ca.gov/floodmgmt/hafoo/csc/.

individual target or being part of a regional alliance that meets its regional target.[16] The regional target is calculated as the population-weighted average target for the water suppliers comprising the regional alliance.

Importantly, being part of a regional alliance does not preclude a water supplier from complying with SBx7-7 by meeting its individual target. A water supplier that is part of a regional alliance will not comply with SBx7-7 only if the regional alliance fails to meet the regional target and the water supplier fails to meet its individual target. This provision of SBx7-7 effectively gives a water supplier that is part of a regional alliance two ways to comply. Cal Water districts sorted by hydrologic region are shown in Table 3-1. Because Antelope Valley District is the only Cal Water district in the South Lahontan hydrologic region, regional compliance is not an option for it.

Table 3-1. 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	Domiguez, 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

3.3.3 Cal Water SBx7-7 Compliance Strategy

Cal Water's SBx7-7 compliance strategy involves:

1. Identifying for each district the largest allowable interim and 2020 GPCD targets under methods 1 and 3;[17]

2. Grouping districts by hydrologic region and calculating population-weighted regional targets where applicable; and

[16] Water suppliers may also form regional alliances if they are served by the same wholesale water supplier, they are members of a regional agency authorized to plan and implement water conservation, or they are part of an integrated regional water management funding area.
[17] Targets based on method 2 were not considered because the data necessary to accurately estimate landscape areas served by residential and dedicated irrigation meters was not available. Method 4 had not been defined at the time this plan was developed.

3. Developing conservation programs aimed at achieving the regional and/or district-specific targets.

The resulting SBx7-7 targets and required water demand reductions for Antelope Valley District are presented in Section 4 of the plan. It is important to emphasize that SBx7-7 is just one of several factors used to determine the Plan's recommended level of water savings. Other factors included MOU compliance, cost-effectiveness, and district water supply and quality considerations.

3.4 Urban Water Conservation MOU

The MOU has guided urban water conservation programs in California since it was first adopted in 1991. More than 230 California urban water suppliers have signed the MOU and pledged good faith efforts to comply with its terms. Most urban water conservation programs operated by California water utilities have been shaped to some extent by MOU requirements. While compliance with the MOU is voluntary, access to some types of state funding for water resources management is conditioned on MOU compliance.[18] These eligibility requirements will end July 1, 2016. After that date, access to state funding for water resources management will be conditioned on compliance with SBx7-7 requirements.

3.4.1 MOU Compliance Options

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.

BMP Implementation Compliance

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.

[18] Section 10631.5 of the California Water Code.

Table 3-2 shows the BMPs by category. The requirements and coverage levels of each BMP are set forth in Exhibit 1 of the MOU.

Flex Track Compliance

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.[19] 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.

GPCD Compliance

Under the GPCD option, a water supplier can comply with the MOU by reducing its baseline GPCD by 18% 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.

3.4.2 Cal Water MOU Compliance Strategy

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, as described in Section 4. Cal Water will update these estimates as necessary following the release of the CUWCC Flex Track target calculator.

[19] The supplier is required to implement the foundational BMPs regardless of which compliance option it selects.

Table 3-2. 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
BMP definitions, coverage requirements, and schedule of implementation are contained in the MOU (www.cuwcc.org).

4 SBx7-7 and MOU Savings Targets

4.1 Introduction

This section of the plan presents the SBx7-7 and MOU compliance targets for Antelope Valley District. For district-specific SBx7-7 compliance, targets were set to either 80% of baseline GPCD or 95% of the district's hydrologic region target, whichever was greater. For MOU compliance, the Flex Track target was calculated as the volume of expected water savings from cost-effective programmatic BMPs over the 10-year period 2009 - 2018.

4.2 SBx7-7 Target Calculation

Table 4-1 shows the SBx7-7 target calculation for Antelope Valley District. This table shows: (1) the maximum allowable target under SBx7-7, (2) the target based on Method 1 – 80% of baseline water use, (3) the target based on Method 3 – 95% of the hydrologic region target, and (4) the selected target for the district.

Maximum Allowable Target

As described in Section 3, the SBx7-7 target for 2020 cannot exceed 95% 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. In the case of Antelope Valley District, neither target calculation method results in a target exceeding the maximum allowable target, so no adjustment is necessary.

Method 1 Target

Under Method 1, the 2015 and 2020 targets are set to 90% and 80% 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 Antelope Valley District, the 10-year base period 1996-2005 yielded the maximum target under this method. The 2015 target is 317 gpcd and a 2020 target is 281 gpcd.

Method 3 Target

Under Method 3, the 2015 and 2020 targets are set to 95% of the 2015 and 2020 targets for the hydrologic region in which the district is located. Antelope Valley District is located in the South Lahontan hydrologic region. The 2015 target is 194 gpcd and the 2020 target is 162 gpcd.

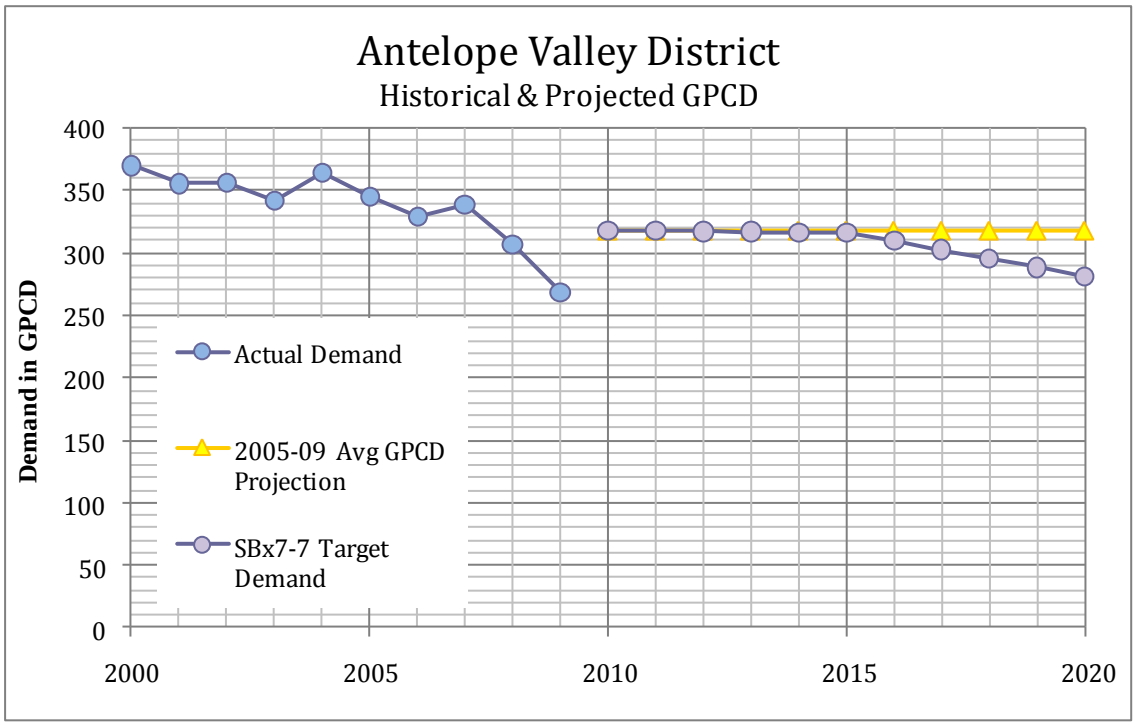
Selected District Target

For Antelope Valley District, SBx7-7 non-compliance risk is minimized by selecting the Method 1 targets. Figure 4-1 shows projected per capita demand based on the last five-years of district sales data and how it would need to change in order to meet the SBx7-7 targets.

Table 4-1. Antelope Valley District SBx7-7 GPCD Targets

Maximum Allowable Target (GPCD)	
Base Period:	2003-2007
Per Capita Water Use:	343
Maximum Allowable 2020 Target:	326
Method 1: 80% of Baseline Per Capita Daily Water Use (GPCD)	
Base Period:	1996-2005
Per Capita Water Use:	352
2015 Target:	317
2020 Target:	281
Method 3: 95% of Hydrologic Region Target (GPCD)	
Hydrologic Region:	S. Lahontan
2015 Target:	194
2020 Target:	162
Selected District Target (GPCD)	
2015 Target:	317
2020 Target:	281

Figure 4-1. Antelope Valley District SBx7-7 Per Capita Target Demand



4.3 MOU Flex Track Target Calculation

As discussed in Section 3, 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 listed in Table 4-2 were used to calculate the Flex Track targets. Expected water savings and cost-effectiveness were based on the conservation program specifications presented in Section 6 and avoided water supply costs presented in Section 2. The resulting 2015 Flex Track target for Antelope Valley District is shown in Table 4-3.

Table 4-2. Programmatic BMPs Used to Calculate Flex Track Target

BMP No.	Coverage Requirement Used to Calculate Water Savings
3.1 *Residential Assistance*	Provide leak detection assistance to an average of 1.5 percent per year of current single-family accounts and 1.5 percent per year of current multi-family units during the first ten years after signing the MOU. After completing the ten-year 15 percent target, agencies will maintain a program at the level of high-bill complaints or not less than 0.75 percent per year of current single-family accounts and 0.75 percent per year of current multi-family units. Showerhead distribution will be considered complete when 75 percent market saturation is achieved.
3.2 *Landscape Water Surveys*	Provide landscape water surveys to an average of 1.5 percent per year of current single-family accounts during the first ten years after signing the MOU. After completing the ten-year 15 percent target, agencies will maintain a program at the level of high-bill complaints or no less than 0.75 percent per year of current single-family accounts.
3.3 *High Efficiency Clothes Washer Incentives*	Provide financial incentives for the purchase of HECWs that meet an average water factor value of 5.0. If the WaterSense Specification is less than 5.0, then the water factor value will decrease to that amount. Incentives shall be provided to 0.9 percent of current single-family accounts during the first reporting period following BMP implementation, rising to 1.0 percent per year of current single-family accounts for the remainder of ten year period following signing of the MOU. An alternative method is to demonstrate 1.4 percent per year of the market penetration during the first ten years after signing the MOU.
3.4 *WSS Toilet Incentives*	A financial incentive shall continue to be offered for toilets meeting the current WSS and updated standard whenever a more efficient toilet is identified by WSS. Compliance will entail demonstrating a number of toilet replacements of 3.5 gpf or greater, toilets at or above the level achieved through a retrofit on resale ordinance until 2014, or a market saturation of 75% is demonstrated, whichever is sooner.
4.0 *CII Water Use Reduction*	Implement measures to achieve the water savings goal for CII accounts of 10% of the baseline water use over a 10-year period. Baseline water use is defined as the water consumed by CII accounts in the agency's service area in 2008. Credit for prior activities, as reported through the BMP database, will be given for up to 50% of the goal; in this case, coverage will consist of reducing annual water use by CII accounts by an amount equal to the adjusted percentage goal within 10 years.
5.1 *Dedicated Irrigation Account Budgets*	ETo-based water use budgets developed for 90% of CII accounts with dedicated irrigation meters at an average rate of 9% per year over 10 years.
5.2 *Non Residential Landscape Surveys*	Complete irrigation water use surveys for not less than 15% of CII accounts with mixed-use meters and un-metered accounts within 10 years of the date implementation is to commence. (Note: CII surveys that include both indoor and outdoor components can be credited against coverage requirements for both the Landscape and CII BMPs.)

Table 4-3. Antelope Valley District 2015 MOU Flex Track Target

BMP	2015 Savings at Full Coverage	Cost-Effective[1]	2015 Target Contribution
BMP 3.1 Residential Assistance Savings - Single Family	1.3 AF	FALSE	0.0 AF
BMP 3.1Residential Assistance Savings - Multi Family	0.0 AF	FALSE	0.0 AF
BMP 3.2 Landscape Surveys - Single Family	1.5 AF	FALSE	0.0 AF
BMP 3.3 High Efficiency Clothes Washers	2.0 AF	FALSE	0.0 AF
BMP 3.4 WSS Toilets - Single Family	7.2 AF	TRUE	7.2 AF
BMP 3.4 WSS Toilets - Multi Family	0.0 AF	TRUE	0.0 AF
BMP 4.0 CII Reduction	5.9 AF	2.7 AF	2.7 AF
BMP 5.1 Dedicated Irrigation Account Budgets[2]	0.0 AF	NA	NA
BMP 5.2 Non Residential Landscape Surveys	0.5 AF	FALSE	0.0 AF
2015 Flex Track Target			9.9 AF

[1]True or false, except BMP 4.0 CII Reduction, which shows the calculated volume of cost-effective CII water savings based on the conservation program analysis presented in Section 6. Cost-effectiveness based on avoided water supply costs presented in Section 2 and the conservation program savings and cost assumptions presented in Section 6.
[2]District does not have dedicated irrigation accounts.

4.4 Difference from Unadjusted Baseline Water Use

The differences between the unadjusted baseline demand projection and target demand under SBx7-7 and MOU Flex Track compliance are shown in Table 4-4. As will be discussed in the next section, some of this water savings 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, as will be addressed in Sections 6 and 7 of the plan.

Table 4-4. Antelope Valley District Gross Savings Required for SBx7-7 and MOU Compliances

Gross Water Savings Required by 2015	SBx7-7	MOU Flex Track
2015 Unadjusted Baseline Demand	1,290 AF	1,290 AF
2015 Target Demand	1,286 AF	1,280 AF
Gross Savings Requirement	**4 AF**	**10 AF**

5 Water Savings Required from New Programs

5.1 Introduction

In Section 4 the gross water savings Antelope Valley District needs to realize by 2015 in order to satisfy SBx7-7 and MOU compliance requirements were presented. In this section, the volume of water savings that can reasonably be expected from existing efficiency codes, water rate adjustments, and past conservation program implementation is considered. 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.

5.2 Expected Savings from Efficiency Codes

Two recent California laws are expected to accelerate the replacement of low efficiency plumbing fixtures – primarily toilets and showerheads – with higher efficiency alternatives. [20]

- 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.[21] It also requires that urinals sold or installed use no more than 0.5 gallons per flush.[22]

- 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.[23] 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.

[20] Cities and counties also are required, under AB 1881, to adopt water efficient landscape design ordinances at least as effective as the state's model landscape ordinance. The extent and variability of landscape water use in the service area, as well as uncertain enforcement of ordinance requirements by the relevant city or county, make projections of potential water savings highly uncertain and therefore they are not incorporated into the forecast of potential water savings from efficiency codes.

[21] State law currently prohibits the sale and installation of toilets using more than 1.6 gallons per flush.

[22] State law currently prohibits the sale and installation of urinals using more than 1.0 gallon per flush.

[23] Non compliant plumbing fixtures include any toilet manufactured to use more than 1.6 gallons per flush, any showerhead manufactured to have a flow capacity more than 2.5 gallons per minute, and any interior faucet that emits more than 2.2 gallons per minute. Compliant water conserving plumbing fixtures means any fixture that is in compliance with current building standards applicable to a newly constructed real property of the same type.

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.[24]

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.

Expected code-driven water savings for the period 2011-2015 are shown in Table 5-1. These estimates incorporate existing plumbing code requirements, as well as the full phase-in of AB 715 requirements starting in 2014.

Table 5-1. Antelope Valley District 2011-2015 Code-Driven Water Savings

Code-Driven Water Savings (AF)	2011	2012	2013	2014	2015
Toilets					
Single Family	0.8	1.5	2.2	2.9	3.9
Multi Family	0.0	0.0	0.0	0.0	0.0
Non Residential	0.2	0.4	0.5	0.7	1.0
Subtotal Toilets	*1.0*	*1.9*	*2.8*	*3.7*	*4.9*
Showerheads					
Single Family	0.2	0.4	0.6	0.7	0.9
Multi Family	0.0	0.0	0.0	0.0	0.0
Subtotal Showerheads	*0.2*	*0.4*	*0.6*	*0.7*	*0.9*
Total Savings	**1.2**	**2.3**	**3.4**	**4.4**	**5.8**

[24] In the case of multi-family and commercial property, the permit approval requirements apply only if (a) the improvements would increase building floor area by more than 10%, or (b) the value of the improvements exceed $150,000, or (c) the improvements are in a room containing non-compliance plumbing fixtures.

5.3 Expected Savings from Rates

Water savings from expected rate adjustments in Antelope Valley 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.[25] Expected water savings from the proposed rate increase are shown in Table 5-2.[26]

Table 5-2. Antelope Valley District 2011-2015 Water Savings from Proposed Rate Adjustment

Rate-Driven Water Savings (AF)	2011	2012	2013	2014	2015
% Change in Inflation-Adjusted Water Rate[1]	34%	1%	1%	NA	NA
Expected Savings	**13.5**	**27.6**	**42.0**	**42.9**	**44.0**

[1]Percent change does not include adjustments to the future costs of purchased water, assessments charged for pumping groundwater, electricity, and other costs generally beyond Cal Water's control. Additionally, some water system improvements approved by the CPUC will not be included in rates until they are completed and are in service.

5.4 Expected Savings from Current Programs

In addition to savings from codes and rates, expected on-going water savings from district conservation program activity occurring in 2009 and 2010 was also taken into account. These savings are shown in Table 5-3.[27] Because Antelope Valley District is fully metered, no savings are expected from converting flat rate customers to metered billing.

[25] California Urban Water Conservation Council, "Designing, Evaluating, and Implementing Conservation Rate Structures," July 1997, p. 8-18. Price elasticity measures the expected percentage change in demand given a one percent change in price. For example, an elasticity of -0.25 indicates that a one percent increase in price would be expected to result in a 0.25 percent decrease in demand.
[26] The savings estimates in the table were derived using the methodology and assumptions contained in *Rebuttal to DRA's Report on the Conservation Expenditures of California Water Service Company (California Water Service Company Application 09-07-001), prepared by David Mitchell and Gary Fiske, March 29, 2010.*
[27] Estimated savings from 2009 and 2010 program activity are taken from the report *Achieving Conservation Targets: Conservation Program Recommendations and Budgets for California Water Service Company Districts: Test Years 2011 through 2013, prepared by M.Cubed, Gary Fiske and Associates, and A&N Technical Services, June 2009.*

Table 5-3. Antelope Valley District Water Savings from 2009-10 Conservation Programs

Existing Programs (AF)	2011	2012	2013	2014	2015
Existing Programs: 2009-10	1.3	1.2	1.2	1.1	1.1
Total Existing Programs	**1.3**	**1.2**	**1.2**	**1.1**	**1.1**

5.5 Adjusted Baseline Demand

The adjusted baseline demand is calculated by deducting expected savings from codes, rates, and past programs from the unadjusted demand projection presented in Section 2. The adjusted baseline demand is shown in Table 5-4.

Table 5-4. Antelope Valley District Adjusted Baseline Demand Projection

Adjusted Baseline (AF)	2011	2012	2013	2014	2015
Unadjusted Baseline	1,259	1,267	1,275	1,282	1,290
Less Savings from					
Codes	1.2	2.3	3.4	4.4	5.8
Schedule Rate Increases	13.5	27.6	42.0	42.9	44.0
Existing Programs	1.3	1.2	1.2	1.1	1.1
Adjusted Baseline Demand (AF)	**1,243**	**1,236**	**1,228**	**1,234**	**1,239**
Per Capita (GPCD)	313	310	306	305	305

5.6 Water Savings Needed from New Programs

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 in Table 4-1, 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 5-5. In the case of SBx7-7,

expected savings from codes, rates, and existing programs exceed the 2015 gross savings requirement by about 47 AF, and new program savings are unlikely to be needed to comply with SBx7-7 in 2015.[28] Approximately 9 AF of additional water savings are required by 2015 in order for the district to meet its MOU Flex Track target.

Table 5-5. Antelope Valley District New Program Savings Required for SBx7-7 and MOU Compliance

2015 Net Savings Requirement (AF)	SBx7-7	MOU Flex Track
Gross Savings Requirement (Tbl 4-4)	**4.1**	**9.9**
Less		
Savings from codes (Tbl 5-1)	-5.8	NA
Savings from rates (Tbl 5-2)	-44.0	NA
Savings from existing programs (Tbl 5-3)	-1.1	-1.1
Subtotal Expected Savings	*-50.9*	*-1.1*
Savings Required from New Programs[1]	**-46.8**	**8.8**

[1]*Negative net savings indicates that no new program savings required for compliance in 2015.*

The calculated levels of demand (in gpcd) in 2015 required for SBx7-7 and MOU Flex Track compliance are shown in Table 5-6. MOU Flex Track compliance requires that Antelope Valley District 2015 demand fall to 303 gpcd, about 2 gpcd less than the adjusted baseline demand of 305 gpcd.

Table 5-6. 2015 GPCD Required for SBx7-7 and MOU Compliance

Demand Projection	Demand (GPCD)	Difference from Adjusted Baseline (GPCD)
Adjusted Baseline	305	
SBx7-7 Target	317	12
MOU Flex Track Target	303	-2

[28] However, this does not mean that conservation programming between now and 2015 is not needed in order to comply with SBx7-7 in 2020, since per capita water use must fall an additional 36 gallons per day between 2015 and 2020 in order for the district to comply with SBx7-7.

The next two sections of the plan describe the analyses undertaken to identify the best mix of new conservation programs to achieve the required savings as well as to help address other district demand management objectives.

6 Conservation Program Analysis

6.1 Introduction

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 universe 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 Antelope Valley District, and the programs that emerged as potential components of a portfolio of programs for the district. Section 7 will then describe the process of creating this portfolio.

6.2 Conservation Program Concepts

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 universe of more than 75 conservation program concepts was 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.

For the purposes of this plan, a conservation program concept is comprised of two components:

- Targeted technologies or changes in customer behavior; and
- A delivery mechanism by which customers will be encouraged (or required) to adopt the technology(ies) or change their behavior. Key delivery mechanisms that apply to one or more measures/technologies include:

    - **Customer rebates or vouchers**. Customers who choose to participate in the program receive either cash rebates upon suitable evidence of purchase and/or installation or vouchers that can be used to purchase the water efficient device or fixture.
    - **Vendor, distributor and contractor incentives**. Instead of providing incentives to customers, they are provided to 'upstream' entities such as vendors, distributors, or contractors to encourage them to promote water-efficiency devices or fixtures.
    - **Retrofit/conversion on resale ordinance**. Prior to sale of a property, the seller must retrofit or convert to the designated water-efficient technology.

- **Direct distribution**. Devices or fixtures are directly provided to eligible customers at designated sites, either by the utility or by vendors or distributors.
- **Direct install**. Devices or fixtures are delivered and installed at the customer premises.
- **New construction ordinance**. All specified categories of new construction are required to include the designated technology(ies).
- **Audits/Surveys**. These are customer-specific assessments, focused on a particular technology, to determine whether and how that technology is applicable to the customer and the volume of water that might be saved. These audits are to be distinguished from the more general audits and surveys, which are designed to identify a variety of water savings opportunities.
- **Customized incentives**. Unlike the rebate and voucher incentives described above, these incentives are tailored to each customer based on the results of an audit.
- **Mandatory operating standards**. Designated types of equipment are required to be operated in particular ways to reduce water usage.
- **Demonstration**. For new technologies, demonstration projects can be implemented to gather information about their more general applicability.
- **Utility system maintenance**. Water savings from these measures come from enhancements to the utility's own delivery system. Unlike the other mechanisms, this one is not associated with individual customers and occurs on the utility's side of the meter.

Each program may apply to multiple customer classes (Single Family, Multi-Family, Commercial/ Industrial/Institutional, and Large Landscape).

The universe of program concepts, shown in Table 6-1, Table 6-2, and Table 6-3, includes programs targeting indoor, outdoor, and general end-uses. It includes programs that have been successfully implemented by many other utilities as well as programs that do not have such a history. It includes some programs for which there is a considerable amount of available savings and cost data, and others for which little or no such data exists.

Table 6-1. Antelope Valley District Indoor Conservation Program Concepts

Technology/Intervention	Delivery Mechanism	Single Family	Multi-Family	CII
HE Toilets	Customer rebates or vouchers	x	x	x
	Vendor, distributor & contractor incentives	x	x	x
	Retrofit on resale ordinance	x	x	x
	Direct distribution (by utility, community group, vendor)	x	x	x
	Direct install	x	x	x
Urinals	Customer rebates or vouchers			x
	Vendor, distributor & contractor incentives			x
	Retrofit on resale ordinance			x
	Direct distribution (by utility or vendor)			x
	Valve replacement			x
Clotheswashers: in-unit, common area, & coin-op	Customer rebates & vouchers	x	x	x
	Vendor, distributor & contractor incentives	x	x	x
	New construction ordinance		x	x
Industrial laundries	Audits			x
	Customized incentives			x
Showerhead (2.0, 1.5 gpm)/ flapper/aerators	Kit distribution or install	x	x	x
Showerhead (1.5 gpm)	Customer rebates or vouchers	x	x	x
Shower timers, Reminder cards	Direct distribution	x	x	x
Faucets (reduced flow, auto shut-off)	Customer rebates or vouchers	x	x	x
Hot Water recirculation, point-of-use, or demand Systems	Customer rebates or vouchers	x	x	x
	Retrofit on resale ordinance	x	x	x
	New construction ordinance	x	x	x
Hot water pipe insulation	Retrofit on resale ordinance	x	x	x
	New construction ordinance	x	x	x
Cooling Towers	Customer rebates, customized incentives			x
Food Steamers	Customer rebates			x
Ice Machines	Customer rebates			x
Steam Sterilizers	Customer rebates			x
Vacuum Pumps	Customer rebates			x
Car Washes	Mandatory operating standards			x
	Customer rebates			x
	Audits			x
Dishwashers	Customer rebates or vouchers	x	x	x
	New construction ordinance		x	x
	Vendor, distributor & contractor incentives	x	x	x
Spray valves	Direct install			x
	Customer rebates			x

Technology/Intervention	Delivery Mechanism	Single Family	Multi-Family	CII
	Audits			x
Sensor-operated faucets	Customer rebates or vouchers			x
Plan requirement (indoor & outdoor)	New construction ordinance	x	x	x
Self-generating water softener replacement	Customer rebates	x	x	x
	Operating restrictions	x	x	x
X Ray film & photo processors	Customer rebates			x
Industrial process	Audits & incentives			x
Wet cleaning systems	Customer rebates			x
Evaporative Coolers	Customer rebates	x	x	X
An "x" indicates the program could be offered to the indicated customer class.				

Table 6-2. Antelope Valley District Outdoor Conservation Program Concepts

		CUSTOMER CLASS			
Technology/Intervention	Delivery Mechanism	Single Family	Multi-Family	CII	Lg Lndscp
Large Landscape Surveys					x
WBIC	Direct Install	x	x	x	x
	Customer rebate	x	x	x	x
	Vendor, distributor & contractor incentives	x	x	x	x
	Direct distribution	x	x	x	x
Irrigation System (including, but not limited to, high efficiency nozzles for pop-up heads, drip, soil moisture sensors, rain shut off, pressure control)	New construction ordinance	x	x	x	x
	Customer rebate	x	x	x	x
	Vendor, distributor & contractor incentives	x	x	x	x
	Retrofit on resale ordinance	x	x	x	x
Landscape design	Customer rebate	x	x	x	x
	Vendor, distributor & contractor incentives	x	x	x	x
	Conversion on resale ordinance	x	x	x	x
	New construction ordinance	x	x	x	x
Turf buy back (Cash for Grass)	Customer rebate	x	x	x	x
Artificial Turf	Customer rebate	x	x	x	x
Water Budgets	(Potentially rate-linked)	x	x	x	x
Large Landscape Water Use Reports					x
Pool, hot tub covers & other upgrades	Customer rebate or voucher	x	x	x	
Water Brooms	Customer rebate or voucher			x	
	Direct distribution			x	
Dedicated Irrigation Meters	Customer rebate	x	x	x	
	New construction ordinance	x	x	x	
An "x" indicates the program could be offered to the indicated customer class.					

Table 6-3. Antelope Valley District General Conservation Program Concepts

		CUSTOMER CLASS			
Technology/Intervention	**Delivery Mechanism**	**Single Family**	**Multi-Family**	**CII**	**Lg Lndscp**
Audits & Surveys (incl high bill contacts)*		x	x	x	x
Meter installation	Direct Install	x	x	x	x
Water use meter alerting device		x	x	x	x
"Smart Meters"	Demonstration	x	x	x	x
Increased billing frequency		x	x	x	x
Water waste ordinance		x	x	x	x
Water recycling, grey water use, rainwater harvesting	Customized incentives	x	x	x	x
New construction guidelines		x	x	x	x
New const conservation offsets		x	x	x	x
System loss prevention, leak detection & repair	Utility system maintenance				
An "x" indicates the program could be offered to the indicated customer class.					

6.2.1 Concept Screening

Once the universe 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. For this purpose, six screening criteria were developed:

1. **Implementation feasibility**. Are the administrative, staffing, billing, institutional, legal, and/or political difficulties associated with implementing the program acceptable?
2. **Customer/stakeholder acceptability**. Will the program likely be deemed acceptable by customers and/or other key program stakeholders?
3. **District match**. Is the technology well matched to the customers, appliance stocks, climate, building stock, and/or other characteristics of the service area? Are there enough target sites in the district to warrant developing and operating the program?
4. **Relationship to other programs**. Does the program reinforce rather than duplicate or conflict with other existing or proposed conservation programs?
5. **Program costs**. Are the expected costs of the program acceptable?
6. **Certainty of savings**. Are we able to forecast future program savings with a sufficient degree of certainty? Is our savings forecast sufficiently reliable?

For each program concept, Cal Water staff answered "yes" or "no" for each of these criteria. A "yes" answer on each of these criteria was considered to be essential for program success. Thus, a negative response to any one of the criteria for a particular program concept eliminated that concept from further consideration.

The programs passing the qualitative screen for Antelope Valley District are shown in Table 6-4.

Table 6-4. Antelope Valley District Program Concepts Passing Qualitative Screen

		CUSTOMER CLASS			
Technology/Intervention	**Delivery Mechanism**	**Single Family**	**Multi-Family**	**CII**	**Lg Lndscp**
INDOOR					
HE Toilets	Customer rebates or vouchers	x	x	x	
	Vendor, distributor & contractor incentives	x	x	x	
	Distribution (by utility, community group, vendor)	x	x	x	
	Direct install	x	x	x	
Urinals	Customer rebates or vouchers			x	
	Vendor, distributor & contractor incentives			x	
	Distribution (by utility or vendor)			x	
	Valve replacement			x	
Clotheswashers: in-unit, common area, & coin-op	Customer rebates & vouchers	x	x	x	
	Vendor, distributor & contractor incentives	x	x	x	
Showerhead (2.0, 1.5 gpm)/ flapper/aerators	Kit distribution or install	x	x		
Shower timers, Reminder cards	Distribution	x	x		
Cooling Towers	Customer rebates, customized incentives			x	
OUTDOOR					
Large Landscape Surveys					x
Weather-Based Irrigation Controllers	Direct Install	x	x	x	x
	Customer rebate	x	x	x	x
	Vendor, distributor & contractor incentives	x	x	x	x
	Distribution	x	x	x	x
Irrigation System (including, but not limited to, high efficiency nozzles for pop-up heads, drip, soil moisture sensors, rain shut off, pressure control)	Customer rebate	x	x	x	x
	Vendor, distributor & contractor incentives	x	x	x	x
Landscape design	Customer rebate	x	x	x	x
	Vendor, distributor & contractor incentives	x	x	x	x
Turf buy back (Cash for Grass)	Customer rebate	x	x	x	x

		CUSTOMER CLASS			
Technology/Intervention	**Delivery Mechanism**	**Single Family**	**Multi-Family**	**CII**	**Lg Lndscp**
Large Landscape Water Use Reports					x
Pool, hot tub covers & other upgrades	Customer rebate or voucher	x	x	x	
GENERAL					
Audits & Surveys (incl high bill contacts)*		x	x	x	x
Water use meter alerting device		x	x	x	x
Water recycling, grey water use, rainwater harvesting	Customized incentives	x	x	x	x
Education/outreach		x	x	x	x

6.2.2 Preliminary Quantitative Analysis

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 in Table 6-4. 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,[29] program cost assumptions are uniform across districts, although in some cases, cost sharing with other water utilities reduce Cal Water's share.

The specific savings and cost variables that were estimated for each program are as follows.

Savings Parameters

Unit savings. The savings in gallons per year that can be expected per device or intervention.

Savings decay. The annual rate at which the unit savings will decay due to behavioral attrition or physical device limitations.

Seasonal distribution. The percentage of the annual savings that will occur during the peak season. Generally, this parameter will differ between indoor and outdoor programs.

[29] Seven CWS districts include a meter installation program as part of their conservation program portfolios. Antelope Valley is not among those districts.

Useful life. The expected life of the device or intervention over which the savings will persist.

Free riders. The percentage of program participants who would be expected to have acted in the absence of the program and for whom, therefore, there is assumed to be no incremental savings.

Natural replacement. The annual rate at which customers would be expected to replace their inefficient fixtures in the absence of utility intervention, due either to code requirements or market forces.

Cost Parameters

Initial variable cost. The cost the utility must pay per device or intervention at the time that the device is installed or the intervention occurs. This cost could include such things as the cost of a fixture, a survey, a customer rebate, a voucher, plus the cost for program administration and marketing.

Follow-up variable cost. Subsequent annual per-device or intervention costs the utility must pay to maintain the program savings.

Follow-up years. The number of years the follow up costs will persist.

6.2.3 Identification of Core and Non-Core Programs

A key challenge facing Cal Water is finding a way to efficiently scale up conservation programming across its 24 districts with the limited staffing it has to implement and manage these programs. The current GRC decision authorizes 4 full-time conservation program staff for 2011-13. These staff will be responsible for implementing and managing programs in 24 geographically dispersed districts serving a combined population of over 1.7 million.[30] As will be discussed in Section 7, Cal Water intends to propose to the CPUC adding three more conservation positions beginning in 2014 so that it can divide its districts into four program management regions. Even with the added staffing, the most efficient way for Cal Water to manage programs across its geographically dispersed districts is to standardize programs and centralize their implementation and oversight. 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. The following criteria were used for selecting core programs:

- Scalable – programs were more likely to be selected if they could simultaneously be run at low volumes in smaller districts and at much higher volumes in larger districts.

[30] By way of comparison, the East Bay Municipal Utility District has a conservation program staff of 21 full-time positions serving a population of 1.3 million within a geographically contiguous and compact service area.

- Vendor Operation – programs were more likely to be selected if they could be operated by third-parties specializing in water conservation program implementation.
- Scale Economies – programs were more likely to be selected if aggregation of material purchases could lower unit costs of implementation.
- Synergy with Regional Programs – programs were more likely to be selected if they complemented or could leverage regional conservation programs that may be available to the district.
- Program Diversity –programs were selected to ensure a mix of programs for residential, commercial, industrial, and landscape customer segments.
- Proven Track Record – programs were more likely to be selected if they had demonstrated water savings and a proven track record of implementation by other water providers.
- Low Unit Cost – programs were more likely to be selected if they had low unit costs of implementation relative to other program options.[31]

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.

The set of core and non-core programs that Cal Water will offer over the next five years is shown in Table 6-5.

[31] A program's unit cost was only one factor taken into account, which had to be balanced against other competing criteria, such as scalability, program diversity, and synergy with regional programs.

Table 6-5. 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

6.3 Benefit-Cost Analysis of Core and Non Core Programs

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 final assumptions for the Antelope Valley District programs are provided in Appendix 2.

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.

Program Benefits

For each acre-foot of water saved by a conservation program in a particular year – and in a particular season – the benefit to the utility is given by that year's/season's avoided cost, as described in Section 2.7. The model calculates the programmatic savings (that is, the savings that can be attributed to the utility program) for each year/season based on the program water savings parameters shown in Appendix 2. Each year's/season's programmatic savings is then multiplied by that year's real-dollar avoided costs to compute the annual program benefits. The model then computes the present value of these benefits.[32]

Program Costs

For each device/intervention, the model uses the program cost parameters shown in Appendix 2 to compute the annual costs the utility will incur. It then computes the present value of these costs.

Benefit-Cost Ratios

For each program, the benefit-cost ratio (BCR) is the quotient of the present value of the program benefits and the present value of the program costs. A BCR greater than 1 indicates that, over time, the program provides a positive net benefit to the utility and its ratepayers. Table 6-6 shows the BCRs for the Antelope Valley District programs. As described in Section 7, these BCRs were a key input to the development of the recommended district conservation portfolio.

[32] Present values are computed using a 3.4% real discount rate, which is based on a 6% nominal discount rate and a 2.5% annual inflation rate.

Table 6-6. Antelope Valley District Core and Non-Core Program Benefit-Cost Ratios

Program ID	Program Name	Customer Class	BCR
1	HE Toilets: Cust Rebates or Vouchers	Single Family	1.10
2	HE Toilets: Cust Rebates or Vouchers	Multi Family	2.14
3	HE Toilets: Cust Rebates or Vouchers	Commercial	0.74
4	Clotheswasher: Cust Reb or Voucher	Single Family	0.43
5	CW common: Cust Reb or Voucher	Multi Family	0.53
6	CW in-unit: Cust Reb or Voucher	Multi Family	0.32
7	CW coin-op: Cust Reb or Voucher	Commercial	0.66
8	Urinals (0.25 gpf): Cust Rebates or Vouchers	Commercial	0.49
9	HE Toilets: Direct Install	Single Family	0.48
10	HE Toilets: Direct Install	Multi Family	1.24
11	HE Toilets: Direct Install	Commercial	0.44
12	Urinals: Direct Install	Commercial	0.74
13	Audits & Surveys (incl high bill contacts)	Single Family	0.37
14	Audits & Surveys (incl high bill contacts)	Multi Family	0.15
15	High Efficiency Pop-Up Nozzle Web Voucher	Single Family	3.14
16	High Efficiency Pop-Up Nozzle Web Voucher	Multi Family	3.14
17	High Efficiency Pop-Up Nozzle Web Voucher	Commercial	3.14
18	Showerhead/Aerator, Tablet Kit Dist	Single Family	0.91
19	Showerhead/Aerator, Tablet Kit Dist	Multi Family	0.94
20	WBIC Vendor, Dist, & Cont Inc	Single Family	0.18
21	WBIC Vendor, Dist, & Cont Inc	Multi Family	0.32
22	WBIC Vendor, Dist, & Cont Inc	Commercial	0.21
23	Large Landscape Water Use Reports	Irrigation	20.67
24	Lg Lndscp Surveys & Irrig Sys: Rebates	Irrigation	0.91
25	Comm Irrigation System: Rebates	Commercial	0.34
26	Dishwashers: Vendor, Dist & Cont Inc	Commercial	11.35
27	Cooling Tower Cond Cont: Cust Reb, Inc	Industrial	2.38
28	Cooling Tower pH Cont: Cust Reb, Inc	Industrial	2.34

7 Portfolio Development

7.1 Introduction

This section of the plan presents the recommended conservation program portfolio for Antelope Valley District. The program analysis results described in Section 6 provided the starting point for portfolio development. The next step was to determine the annual levels of program activity needed to, at minimum, meet Antelope Valley District's water savings targets. 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 presented in Section 6.

7.2 SBx7-7 and MOU Savings Targets

Section 5 showed that water savings from existing water efficiency codes and ordinances, scheduled adjustments to water rates, and past investment in conservation programs are expected to be sufficient to meet Antelope Valley District's 2015 SBx7-7 per capita water use target. It also showed that an additional 9 AF of water savings from new programs would be required to satisfy MOU compliance requirements in 2015. This established the minimum level of water savings the program portfolio would need to produce by 2015.

7.3 2011-13 General Rate Case Decision

Cal Water's current GRC decision established conservation budgets for each district for the years 2011-2013. These budgets specify the total annual expenditure on conservation programs allowed under the GRC decision, as well as the maximum amount that can be allocated to (1) program administration and research, (2) public information and school education programs, (3) residential conservation programs, and (4) non-residential conservation programs. Table 7-1 shows these budgetary restrictions for Antelope Valley District.

Table 7-1. Antelope Valley District GRC Conservation Program Expenditure Constraints

Budget Constraint ($000)	2011	2012	2013
Overall Budget	$50.0	$33.0	$33.0
Admin & Research	$6.2	$4.1	$4.1
Public Info & School Educ.	$5.0	$3.9	$3.9
Programmatic Activity	$38.8	$25.0	$25.0
Expenditure Caps			
Residential Programs	$34.3	$24.9	$24.9
Non Residential Programs	$39.8	$23.8	$23.8

7.4 Minimum and Maximum Program Levels

For each district, Cal Water specified minimum and maximum program activity levels to guide portfolio development. The minimum levels were those below which it would not be administratively feasible or cost-effective to offer the program in the district, while the maximum levels were those that could reasonably be achieved given district customer characteristics, current market demand, and past experience marketing similar programs/technologies to district customers. As part of development of this plan, Cal Water matched its non-residential customer accounts to North American Industrial Classification (NAICS) 4-digit codes, which enabled it to estimate the number of businesses in each of its districts that would potentially participate in the non-residential programs. It also identified, using a review and analysis of prior consumption, the number of large landscape customers in each district so that it could accurately assess potential participation levels and savings potential for large landscape conservation programs. The constraints placed on annual program activity levels are presented in Appendix 2.

7.5 Recommended Annual Program Activity and Staff Levels

7.5.1 Residential and Non-Residential Conservation Programs

Recommended annual program levels for residential and non-residential programs are shown in Table 7-2. The program levels were derived from the following decision rules:[33]

- For 2011-13, set annual program activity to maximize water savings subject to the GRC conservation program budget constraints and the min/max annual activity constraints. This ensured that the portfolio would reflect the least-cost mix of core and non-core conservation programs consistent with the GRC budget constraints.

- For 2014-15, set annual activity of programs with BCRs greater than one to their maximum level. This ensured that the portfolio would benefit ratepayers by helping to lower average water supply costs.

- For 2014-15, if needed to satisfy the 2015 SBx7-7 and MOU Flex Track water savings targets, increase program activity of programs with BCRs less than one in order of cost-effectiveness. This ensured the least-cost set of activity levels needed to achieve the water savings targets.

[33] Linear programming models were used to implement the decision rules.

Table 7-2. Antelope Valley District Recommended Residential and Non-Residential Program Levels

Program	Recommended Annual Activity Levels[1]				
	2011	2012	2013	2014	2015
CORE PROGRAMS					
Rebates/Vouchers					
Toilets	80	60	60	60	60
Clothes Washers	30	20	20	10	10
Urinals	20	10	10	10	10
Customer Surveys/Audits	50	50	50	30	30
Conservation Kit Distribution	80	80	80	30	30
Pop-Up Nozzle Distribution	400	400	400	400	400
NON-CORE PROGRAMS					
Direct Install Toilets/Urinals	0	0	0	0	0
Smart Irr. Controller Vendor Incentives	10	10	10	10	10
Large Landscape Water Use Reports	0	0	0	0	0
Large Landscape Surveys/Incentives	10	10	10	10	10
Commercial Kitchen Rebates/Vouchers	10	10	10	10	10
Cooling Tower/Process Water Retrofit Incentives	0	0	0	0	10

[1]Annual activity levels are aggregated across customer classes and rounded up to the nearest 10 units of activity. Appendix 2 contains the detail modeling results broken down by customer class and program measure.

7.5.2 Administration & Research

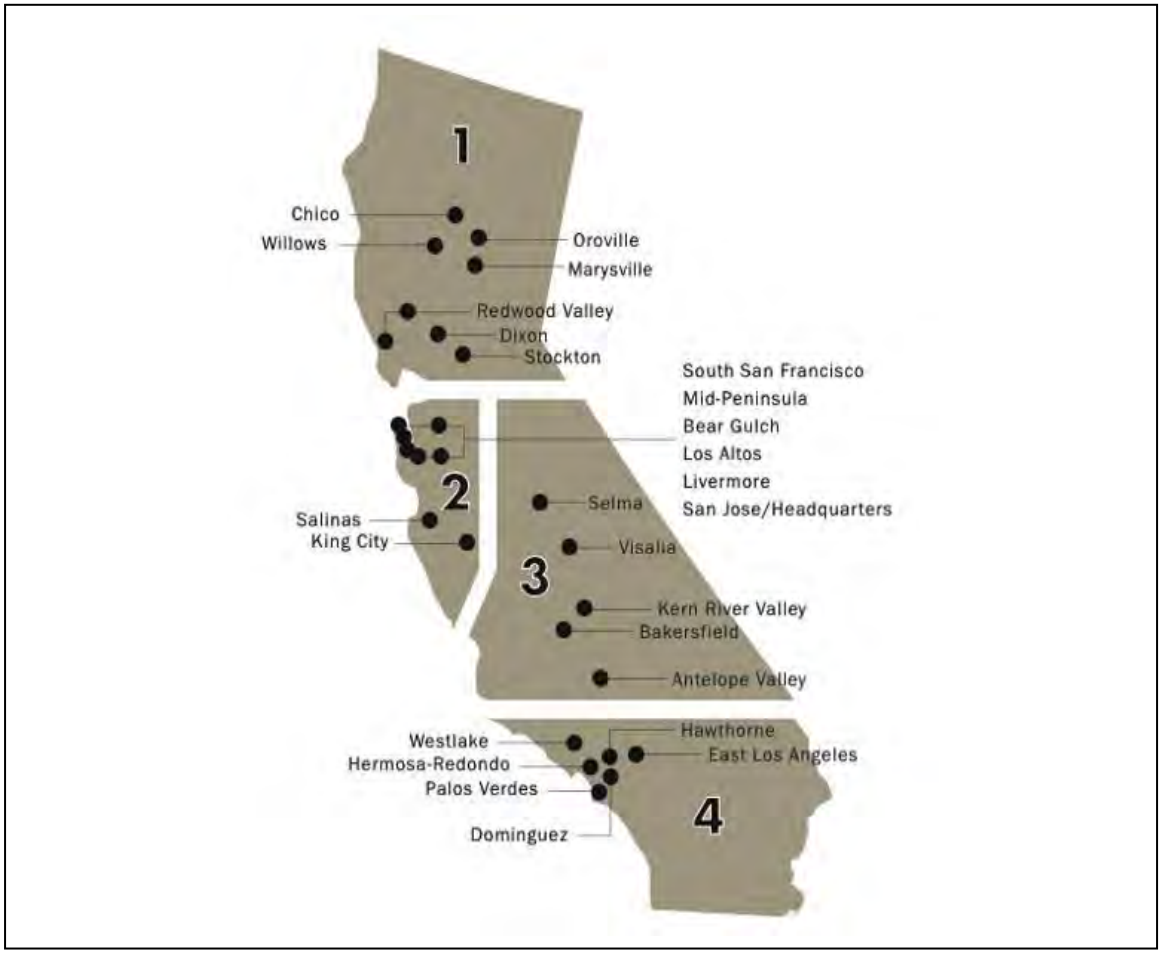
District staff levels and expenditure for administration and research for 2011-13 are set by the current GRC. At present, Cal Water divides its 24 districts into two program management regions which are administered by its two conservation program coordinators. Program reporting and analysis will be conducted by its conservation program analyst. Proposed expenditures for 2014 and 2015 assume two additional conservation program coordinator positions and one additional conservation analyst position for a total of seven full-time positions. Given the scale and diversity of programs proposed in this plan and the geographic dispersion of Cal Water's districts, this is the minimum staffing level recommended for program implementation, and assumes Cal Water will divide its 24 districts into four program management regions, as shown in Figure 7-1, with one program coordinator assigned to each region. Antelope Valley District would be within program management region 3. Program administration costs for 2014-15 are prorated to the districts based on their share of company-wide conservation

program expenditures.[34] Proposed annual expenditures for administration and research for Antelope Valley District are shown in Table 7-3.

7.5.3 Public Information & School Education

District expenditure for public information and school education programs in 2011-13 is set by the current GRC. Recommended expenditures in 2014 and 2015 were set to allow some expansion in these programs to support proposed increases in residential and non-residential program levels.[35] Recommended annual expenditures for public information and school education programs are shown in Table 7-3.

Figure 7-1. Cal Water Conservation Program Management Regions



[34] Projected expenditure in 2014 and 2015 and the allocation of these expenditures to each Cal Water district are shown in Appendix 2.

[35] Specifically, the recommended level of expenditure in 2014 and 2015 was set to either 110% of the 2013 public information/school education budget or 10% of recommended expenditures for residential and non-residential programs, whichever was greater. This decision rule ensured continuity with 2011-13 public information/school education program levels while allowing for an expansion of this programming in districts with significant increases in residential and non-residential program activity.

7.6 Projected Annual Program Expenditures

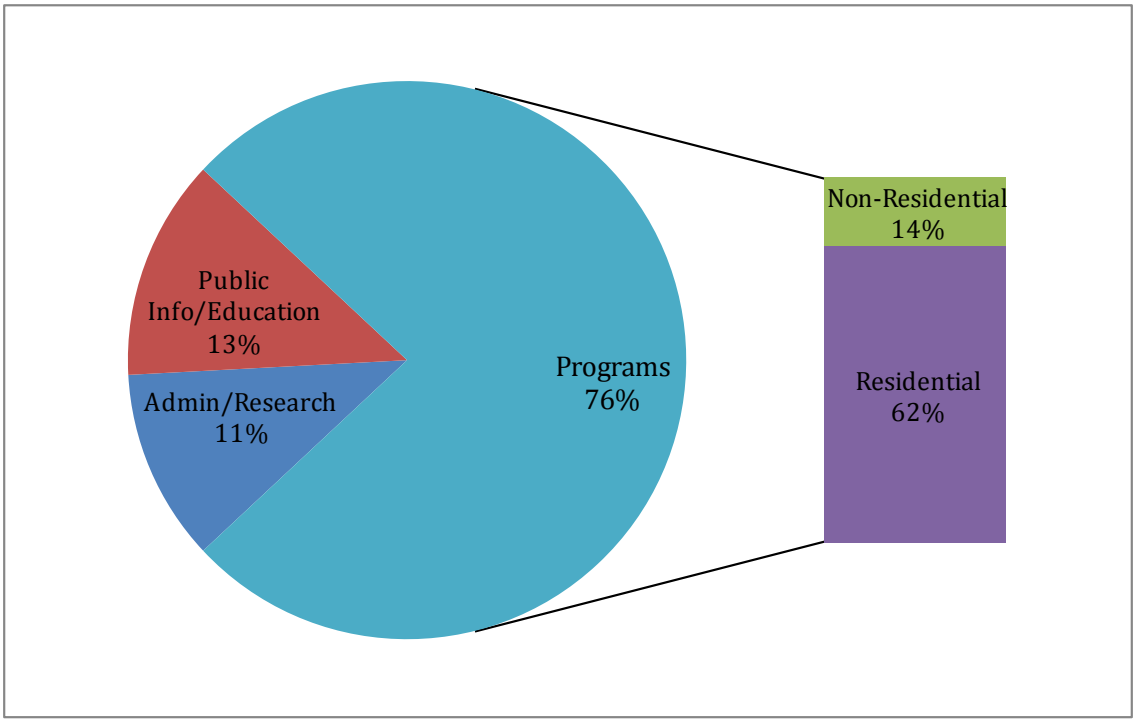
Annual program expenditures based on the recommended program levels and GRC budget allocations are shown in Table 7-3. Appendix 2 provides a detailed breakdown of these expenditures by year and individual program activity. Figure 7-2 shows the recommended expenditure shares by expenditure category over the entirety of the five-year planning period. The plan allocates approximately 76% of projected expenditure to programmatic activity, 13% to public information and education functions, and 11% to administration and research functions. Within the programmatic expenditure category, approximately 82% of planned expenditure is for residential conservation programs and 18% is for non-residential programs.

Proposed annual expenditures in 2014 and 2015 are about 77% of the annual expenditure allowed under the current GRC. The decrease results from the decision rule to minimize implementation of programs with BCRs less than one.

Table 7-3. Antelope Valley District Projected Annual Conservation Expenditures

Expenditure Category	Projected Annual Expenditures ($000)				
	2011	2012	2013	2014	2015
Program Costs:					
Residential	$27.3	$22.3	$22.3	$15.8	$15.8
Non-Residential	$11.5	$2.7	$2.7	$3.0	$4.0
Program Subtotal	***$38.8***	***$25.0***	***$25.0***	***$18.8***	***$19.8***
Admin/Research	$6.2	$4.1	$4.1	$2.0	$2.1
Public Info/Education	$5.0	$3.9	$3.9	$4.3	$4.3
TOTAL ANNUAL	**$50.0**	**$33.0**	**$33.0**	**$25.2**	**$26.2**

Figure 7-2. Antelope Valley District 2011-15 Conservation Expenditure Shares



7.7 Projected Portfolio Water Savings

Table 7-4 and Table 7-5 show projected annual water savings broken down by program category and customer class, respectively. By 2015 projected water savings are approximately 29 AF. Programs impacting residential water demands account for approximately 80% of these savings, while programs impacting commercial, industrial, and irrigation demands account for 20%. Projected savings exceed SBx7-7 and MOU Flex Track targets.

Table 7-4. Antelope Valley District Projected Water Savings by Program

Program	Annual Water Savings (AF)				
	2011	2012	2013	2014	2015
CORE PROGRAMS					
Rebates/Vouchers					
Toilets	2.1	3.6	5.0	6.4	7.7
Clothes Washers	0.5	0.6	0.8	0.9	1.1
Urinals	0.4	0.4	0.4	0.4	0.4
Customer Surveys/Audits	1.8	3.4	4.9	5.3	5.7
Conservation Kit Distribution	1.2	2.2	3.1	3.1	3.1
Pop-Up Nozzle Distribution	1.6	3.2	4.8	6.4	8.0
Subtotal Core Programs	***7.5***	***13.4***	***19.0***	***22.6***	***26.0***
NON-CORE PROGRAMS					
Direct Install Toilets/Urinals	0.0	0.0	0.0	0.0	0.0
Smart Irr. Controller Vendor Incentives	0.1	0.1	0.1	0.1	0.1
Large Landscape Water Use Reports	0.0	0.0	0.0	0.0	0.0
Large Landscape Surveys/Incentives	0.1	0.1	0.2	0.2	0.2
Commercial Kitchen Rebates/Vouchers	0.1	0.3	0.4	0.9	1.4
Cooling Tower/Process Water Retrofit Incentives	0.0	0.0	0.0	0.0	1.0
Subtotal Non-Core Programs	***0.3***	***0.5***	***0.7***	***1.3***	***2.8***
Total Core and Non-Core Program Savings	**7.8**	**14.0**	**19.7**	**23.8**	**28.9**

Table 7-5. Antelope Valley District Projected Water Savings by Customer Class

	Annual Water Savings (AF)				
Customer Class	**2011**	**2012**	**2013**	**2014**	**2015**
Single Family	6.1	11.3	16.3	19.2	22.1
Multi Family	0.2	0.5	0.7	0.9	1.1
Commercial/Industrial	1.5	2.1	2.7	3.6	5.5
Irrigation	0.0	0.1	0.1	0.2	0.2
Total Water Savings	**7.8**	**14.0**	**19.7**	**23.8**	**28.9**

7.8 Projected Water Demands

Table 7-6 compares per capita water use under the recommended portfolio to that under the adjusted baseline and the MOU and SBx7-7 targets. Per capita use under the recommended portfolio is 298 gpcd, which is 5 gpcd less than the MOU Flex Track target and 19 gpcd less than the 2015 SBx7-7 target.

Table 7-6. Antelope Valley District Recommended Portfolio Projected 2015 Demand

Demand Projection	Demand (GPCD)	Difference from Adjusted Baseline (GPCD)
Adjusted Baseline	305	
SBx7-7 Target	317	12
MOU Flex Track Target	303	-2
Recommended Portfolio	298	-7

7.9 Program Cut Sheets

As part of plan development, one page program summaries, or "cut sheets," were developed for each recommended program. These cut 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. Appendix 1 includes a copy of each program cut sheet for Antelope Valley District.

8 Plan Monitoring and Updates

8.1 Introduction

This conservation master plan is a working document and, as such, will need to be modified and updated as new information becomes available. Cal Water will need to regularly review the plan and make adjustments to it as appropriate. This section of the plan describes key monitoring and updating activities Cal Water anticipates undertaking following plan implementation

8.2 Program Tracking

Cal Water intends to adopt conservation program tracking software that it can use to track and manage its core and non-core programs. Such software will help Cal Water track customer participation in its programs, manage program materials, track program costs, and estimate program water savings. Cal Water will conduct a review of tracking software options in early 2011 with the goal of selecting the deploying the software in spring 2011.

8.3 2014-16 General Rate Case

Implementation of the recommended programs in 2014 and 2015 is contingent upon the outcome of Cal Water's 2014-16 GRC. Cal Water will not know until late 2013 whether the CPUC will approve the 2014-15 conservation program budgets proposed in this plan. Cal Water will submit its initial filing for the 2014-16 GRC in July 2012. Prior to that filing, Cal Water may elect to update this plan to reflect new information and changed circumstances affecting the baseline water demands, calculated water savings targets, recommended conservation programs, projected water savings, and proposed conservation program budgets.

8.4 2015 UWMP

Under SBx7-7 water suppliers may update their baseline demands and per capita water use targets in their 2015 UWMP. As part of its 2015 UWMP preparation, Cal Water may elect to update its baseline demand estimates and gpcd targets, if new information warrants doing so. Depending on the final methodology adopted by DWR for the fourth target calculation method, Cal Water may decide to update the SBx7-7 targets included in the plan using this alternative methodology.

8.5 MOU Flex Track Target

The CUWCC-sanctioned tools for calculating the Flex Track target for MOU compliance were not available during this plans development. Therefore, Cal Water used its own Flex Track calculator to calculate the required volume of water savings. CUWCC tools for calculating the Flex Track target are expected to be available sometime in early 2011. Cal Water may elect to update this plan to reflect a revised Flex Track target based on a CUWCC-sanctioned Flex Track target calculator.

8.6 Water Savings Verification

Cal Water intends to undertake various research projects to verify water savings projections included in these plans. For example, Cal Water and San Jose State University Research Foundation are jointly undertaking a study of realized water savings from converting customers from flat rate to metered billing. This study is expected to commence in early 2011. Results from studies such as this one will be used by Cal Water to update water savings projections.

8.7 Local Codes and Ordinances

Water waste prohibitions and codes and ordinances affecting new construction and landscape design and irrigation enacted by cities and counties in the communities served by Cal Water may alter demands in ways not anticipated by this plan.[36] Cal Water will work with local planning and enforcement departments to ensure that its conservation programs are consistent with and complementary to local water use codes and ordinances, and may elect to modify the design or level of implementation of programs included in the plan in order to do so.

8.8 2015 Plan Update

Cal Water plans to update these plans no less frequently than every five years. These plan updates will correspond to the update and reporting cycle for the UWMPs Cal Water prepares for each district every five years. Plan updates may entail adjustment of existing programs and addition of new programs based on performance history, community input, and changes to state and local conservation requirements.

[36] For example, AB 1881, passed in 2006, gave cities and counties until January 2010 to update an existing or adopt a new landscape water use ordinance to comply with the state's updated model landscape ordinance.

Appendix 1
Conservation Program Cut Sheets

The program cut sheets in this appendix 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.

High Efficiency Toilet Rebate Program

Antelope Valley District

Program Description

High-efficiency toilets use approximately 70% less water than non-efficient toilets and 20% less water than ultra-low flush toilets. This program will provide customer incentives for residential and non-residential high-efficiency toilets. Cal Water will centrally administer the program as part of a company-wide toilet rebate program.

EPA WaterSense

Program Marketing

This program will be available to all residential and non-residential customers. Cal Water will market the program through direct mail, print media, bill stuffers, and its website. Expected program participation levels (rounded up to nearest 10 units) are shown in the table to the right.

Year	Rebate Goal
2011	80
2012	60
2013	60
2014	60
2015	60

*Combined goal for single family, multi family, and commercial toilet rebates.

IMPLEMENTATION COST

Costs Per Rebate and Per AF of Water Savings: Program costs vary by fixture type and customer class. Expected program costs per fixture (including marketing and administration) and per AF of water savings are shown below.

Customer Class	Program Cost ($/Rebate)	Water Savings ($/AF)
Single Family	$150	$470
Multi Family	$130	$240
Non-Residential	$250	$700

*Costs rounded to nearest $10.

Year	Annual Program Cost
2011	$13,500
2012	$9,500
2013	$9,500
2014	$9,500
2015	$9,500
Five-Year Cost	$51,500

*Annual cost rounded to nearest $100.

WATER SAVINGS

Fixture and Program Savings: Projected water savings per fixture vary by customer class. Projected savings per fixture, and annual and lifetime program water savings are shown below.

Customer Class	Unit Savings (gal/yr)	Lifetime Savings (AF/Rebate)
Single Family	8,600	0.5
Multi Family	14,800	0.9
Non-Residential	9,900	0.6

*Unit savings rounded to nearest 100 gal.

Year	Water Savings (AF)
2011	2.1
2012	3.6
2013	5.0
2014	6.4
2015	7.7
5-Year Total Savings	24.8

High Efficiency Clothes Washer Rebate Program

Antelope Valley District

Program Description

Washing clothes is the second biggest use of water inside most homes, accounting for approximately 20% of indoor water use for a typical family. High-efficiency clothes washers can cut this water use by up to 60%, and save a significant amount of energy too. Unfortunately, many households and businesses are still purchasing low-efficiency washers because of their lower up-front purchase cost. Rebates are an effective way to level the playing field.

This program will provide customer incentives for residential and non-residential high-efficiency clothes washers. The program will target single-family households, multi-family units, multi-family common laundry areas, and commercial coin-op laundries.

Cal Water will centrally administer the program as part of a company-wide toilet rebate program.

Program Marketing

This program will be available to all residential and non-residential customers. Cal Water will market the program through direct mail, print media, bill stuffers, and its website. Expected program participation levels (rounded up to nearest 10 units) are shown in the table below.

Year	Rebate Goal
2011	30
2012	20
2013	20
2014	10
2015	10

*Combined rebates for single family, multi family, and commercial customers.

IMPLEMENTATION COST

Costs per Rebate and per AF of Water Savings: Program costs vary by fixture type and customer class. Expected program costs per rebate (including marketing and administration) and per AF of water savings are shown below.

Washer Location	Program Cost ($/Rebate)	Water Savings ($/AF)
Single Family	$170	$1,200
Multi Family - In Unit	$170	$1,640
Multi Family - Common	$460	$960
Commercial Coin-op	NA	NA

Year	Annual Program Cost
2011	$4,600
2012	$1,800
2013	$1,800
2014	$1,700
2015	$1,700
Five-Year Cost	**$11,600**

*Annual cost rounded to nearest $100.

WATER SAVINGS

Fixture and Program Savings: Projected water savings per fixture vary by customer class. Projected savings per fixture, and annual and lifetime program water savings are shown below.

Customer Class	Unit Savings (gal/yr)	Lifetime Savings (AF/Rebate)
Single Family	7,100	0.3
Multi Family - In Unit	5,200	0.2
Multi Family - Common	25,300	1.1
Commercial Coin-op	31,400	1.3

Year	Water Savings (AF)
2011	0.5
2012	0.6
2013	0.8
2014	0.9
2015	1.1
Total Five-Year Savings	**3.9**

High Efficiency Urinal Rebate Program

Antelope Valley District

Program Description

New high-efficiency urinals utilize only 0.1 to 0.5 gallons of water to flush. These systems combine the vitreous china fixture with either a manual or sensor-operated flush valve. High-efficiency urinals provide effective, low-maintenance flushing in public restrooms while reducing water consumption by as much as 90%.

This program will provide customer incentives for replacement of non-efficient urinals flushing 1 gallon or more with high-efficiency urinals flushing 0.5 gallons or less. The program will target offices and public buildings receiving significant foot traffic.

Cal Water will centrally administer the program and will offer it in districts not participating in its high-efficiency urinal direct installation program.

Program Marketing

While this program will be available to all non-residential customers, marketing will focus on prime targets, such as restaurants and high-density office buildings. Cal Water will market the program through direct mail, print media, bill stuffers, and its website. Expected program participation levels (rounded up to nearest 10 units) are shown in the table to the right.

EPA WaterSense

Year	Rebate Goal
2011	20
2012	10
2013	10
2014	10
2015	10

IMPLEMENTATION COST

Costs per Rebate and per AF of Water Savings: Expected program costs per rebate (including marketing and administration) and per AF of water savings are shown below.

Urinal Location	Program Cost ($/Rebate)	Water Savings ($/AF)
Offices/Public Buildings	$360	$1,030

*rounded to nearest $10.

Year	Annual Program Cost
2011	$4,900
2012	$400
2013	$400
2014	$400
2015	$400
Five-Year Cost	**$6,500**

*Annual cost rounded to nearest $100.

WATER SAVINGS

Fixture and Program Savings: Projected annual and lifetime water savings per fixture and from program implementation are shown below.

Urinal Location	Unit Savings (gal/yr)	Lifetime Savings (AF/Urinal)
Offices/Public Buildings	9,300	0.6

*Unit savings rounded to nearest 100 gallons.

Year	Water Savings (AF)
2011	0.4
2012	0.4
2013	0.4
2014	0.4
2015	0.4
Five-Year Total Savings	**2.0**

Residential & Commercial Survey Program

Antelope Valley District

Program Description

This program will provide residential and non-residential water use surveys to Cal Water customers. Residential surveys will evaluate a customer's indoor and outdoor water use and provide information on how to reduce household water use. Customers will receive a report with specific water saving recommendations as well as information on available Cal Water conservation rebate programs that may benefit them. Multi family and commercial surveys will be used to assist high-bill customers, as well as to screen potential properties for the bathroom fixture direct installation program (if available in the district).

Surveys will be conducted by trained professionals. Cal Water will centrally administer the program as part of a company-wide program.

Program Marketing

This program will be available to all residential and non-residential customers. Cal Water will market the program through direct mail, print media, bill stuffers, and its website. Expected program participation levels (rounded up to nearest 10 units) are shown in the table to the right.

Year	Survey Goal
2011	50
2012	50
2013	50
2014	30
2015	30

*Combined surveys for single family, multi family, and commercial customers.

IMPLEMENTATION COST

Costs Per Rebate and Per AF of Water Savings: Program costs vary by fixture type and customer class. Expected program costs per fixture (including marketing and administration) and per AF of water savings are shown below.

Customer Class	Program Cost ($/Survey)	Water Savings ($/AF)
Single Family	$210	$1,470
Multi Family	NA	NA
Non-Residential	NA	NA

*Cost rounded to nearest dollar. Water savings cost rounded to nearest $10. Multi family program cost is per property complex.

Year	Annual Program Cost
2011	$10,600
2012	$10,500
2013	$10,500
2014	$5,300
2015	$5,300
Five-Year Cost	**$42,200**

*Annual cost rounded to nearest $100.

WATER SAVINGS

Fixture and Program Savings: Projected water savings per fixture vary by customer class. Projected savings per fixture, and annual and lifetime program water savings are shown below.

Customer Class	Unit Savings (gal/yr)	Lifetime Savings (AF/Survey)
Single Family	12,300	0.2
Multi Family	NA	NA
Non-Residential	NA	NA

*Unit savings rounded to nearest 100 gal/yr.

Year	Water Savings (AF)
2011	1.8
2012	3.4
2013	4.9
2014	5.3
2015	5.7
Five-Year Savings	**21.1**

Residential Conservation Kit Distribution Program

Antelope Valley District

Program Description

This program will offer Cal Water residential customers conservation kits featuring a range of water-saving plumbing retrofit fixtures. Kits will be available at no charge to customers, who can request them via Cal Water's website, via mail, or by contacting or visiting their district.

Each kit can include up to two of each of the following items: high-efficiency showerhead, kitchen faucet aerator, bathroom faucet aerator, full-stop hose nozzle, and toilet leak detection tablets. Customers may customize items and quantities included in their kit.

Cal Water will centrally administer this program as part of a company-wide program operated in each of its 24 service districts.

Year	Kits Distributed
2011	80
2012	80
2013	80
2014	30
2015	30

Program Marketing

This program will be available to all residential customers. Cal Water will market the program through direct mail, print media, bill stuffers, and through its website. Expected program participation levels (rounded up to nearest 10 units) are shown in the table to the right.

IMPLEMENTATION COST

Costs Per Nozzle and Per AF of Water Savings: Bulk purchasing will help keep program costs low. Kit distribution costs about $29/kit, including the costs for the kit, marketing, and administration.

Fixture	Program Cost ($/Kit)	Water Savings ($/AF)
Residential Conservation Kit	$29	$550

*Water savings cost rounded to nearest $10.

Year	Annual Program Cost
2011	$2,300
2012	$2,300
2013	$2,300
2014	$800
2015	$800
Five-Year Cost	**$8,500**

*Annual cost rounded to nearest $100.

WATER SAVINGS

Kit and Program Savings: Projected savings per kit are based on prior program experience and assume a 50% to 60% installation rate for each device included in the kit. Annual and lifetime savings per kit and for the five-year program are shown below.

Fixture	Unit Savings (gal/yr)	Lifetime Savings (gal/Kit)
Residential Conservation Kit	5,100	25,500

*Unit savings rounded to nearest 100 gal/yr. Savings assumed to last five years.

Year	Water Savings (AF)
2011	1.2
2012	2.2
2013	3.1
2014	3.1
2015	3.1
Five-Year Total Savings	**12.7**

Sprinkler Nozzle Distribution Program

Antelope Valley District

Program Description

Water efficient sprinkler nozzles use up to 20% less water than a standard sprinkler head by distributing water more slowly and uniformly to the landscape. In addition to reducing water use, water directed from these nozzles reduces run-off onto streets and sidewalks with a more directed flow.

Customers will be able to obtain the nozzles either directly through Cal Water or via a web-voucher program. Restrictions on the number of nozzles individual customers may receive will vary by customer class and/or landscape size.

Cal Water will centrally administer this program as part of a company-wide program operated in each of its 24 service districts.

Program Marketing

This program will be available to all residential and non-residential customers. Cal Water will market the program through direct mail, print media, bill stuffers, and its website. Expected program participation levels (rounded up to nearest 10 units) are shown in the table to the right.

Year	Nozzles Distributed
2011	400
2012	400
2013	400
2014	400
2015	400

IMPLEMENTATION COST

Costs Per Nozzle and Per AF of Water Savings: Bulk purchasing will help keep program costs low. Nozzles are expected to cost about $3/nozzle. Program marketing and administration is estimated at under $1/nozzle.

Fixture	Program Cost ($/Nozzle)	Water Savings ($/AF)
Sprinkler Nozzle	$4	$190

*Fixture cost rounded to nearest dollar. Water savings cost rounded to nearest $10.

Year	Annual Program Cost
2011	$1,500
2012	$1,500
2013	$1,500
2014	$1,500
2015	$1,500
Five-Year Cost	**$7,500**

*Annual cost rounded to nearest $100.

WATER SAVINGS

Nozzle and Program Savings: Projected savings per nozzle, and annual and lifetime program water savings are shown below. These estimates are based on Metropolitan Water District's Save Water-Save A Buck program estimates.

Fixture	Unit Savings (gal/yr)	Lifetime Savings (gal)
Sprinkler Nozzle	1,300	6,500

*Unit savings rounded to nearest 100 gal/yr. Nozzles assumed to have a five-year useful life.

Year	Water Savings (AF)
2011	1.6
2012	3.2
2013	4.8
2014	6.4
2015	8.0
Five-Year Total Savings	**24.0**

Smart Irrigation Controller Distribution Program

Antelope Valley District

Program Description

Weather-based "smart" irrigation controllers allow for more accurate, customized irrigation by automatically adjusting the schedule and amount of water in response to changing weather conditions. Empirical studies have shown savings of 15% to 25% of irrigation water use.

This program will target residential and non-residential customers with high landscape water use. The program will offer incentives to either the customer or contractor for proper installation of the Smart Controller at customer sites.

The landscape contractor has the direct relationship with customers and is typically the entity customers listen to when making landscape and irrigation decisions. The program will educate contractors about the customer benefits of Smart Controllers along with proper installation of the devices.

Program Marketing

This program will be offered to all residential and non-residential customers. Cal Water will market the program through direct mail, print media, bill stuffers, and its website. Expected program participation levels (rounded up to nearest 10 units) are shown in the table to the right.

Year	Distribution Goal
2011	10
2012	0
2013	0
2014	0
2015	0

IMPLEMENTATION COST

Costs Per Rebate and Per AF of Water Savings: Program costs vary by rebate and customer class. Expected program costs per rebate (including marketing and administration) and per AF of water savings are shown below.

Customer Class	Program Cost ($/Rebate)	Water Savings ($/AF)
Single Family	$480	$2,840
Multi Family	$270	$1,610
Non-Residential	$410	$2,410

*Rebate cost rounded to nearest dollar. Water savings cost rounded to nearest $10.

Year	Annual Program Cost
2011	$2,700
2012	$ 0
2013	$ 0
2014	$ 0
2015	$ 0
Five-Year Cost	**$2,700**

*Annual cost rounded to nearest $100.

WATER SAVINGS

Rebate and Program Savings: Projected water savings per rebate vary by customer class. Projected savings per rebate, and annual and lifetime program water savings are shown below.

Customer Class	Unit Savings (gal/yr)	Lifetime Savings (AF/Rebate)
Single Family	6,200	0.2
Multi Family	6,200	0.2
Non-Residential	6,200	0.2

*Unit savings rounded to nearest 100 gal/yr.

Year	Water Savings (AF)
2011	0.1
2012	0.1
2013	0.1
2014	0.1
2015	0.1
Five-Year Total Savings	**0.5**

Commercial Kitchen Rebate Program

Antelope Valley District

Program Description

Potential water savings in commercial kitchens are significant. However, financial barriers often prevent these facilities from taking simple steps to improve water use efficiency.

This program will provide financial incentives for high-efficiency commercial dishwashers, food steamers, ice machines, and pre-rinse spray valves. The program will target commercial and institutional customers with significant kitchen water use.

Cal Water will centrally administer the program. The program will be offered in all Cal Water Districts starting in 2014.

Program Marketing

Cal Water will market this program through direct mail campaigns and its website. Commercial customers with significant kitchen water use participating in Cal Water's commercial survey program will be directed to the program as well. Expected program participation levels (rounded up to nearest 10 units) are shown in the table to the right.

Year	Rebate Goal
2011	0
2012	0
2013	0
2014	10
2015	10

IMPLEMENTATION COST

Costs per Rebate and per AF of Water Savings: Expected program costs per rebate (including marketing and administration) and per AF of water savings are shown below.

Customer Target	Program Cost ($/Rebate)*	Water Savings ($/AF)*
Commercial Kitchens	$350	$ 40

*Rounded to nearest $10. Average cost per rebate or AF based on expected mix of devices rebated.

Year	Annual Program Cost
2011	$ 0
2012	$ 0
2013	$ 0
2014	$300
2015	$300
Five-Year Cost	**$ 600**

*Annual cost rounded to nearest $100.

WATER SAVINGS

Fixture and Program Savings: Projected annual and lifetime water savings per fixture and from program implementation are shown below.

Customer Target	Unit Savings (gal/yr)*	Lifetime Savings (AF/Rebate)
Commercial Kitchens	305,600	9.4

*Rounded to nearest 100 gallons. Average for expected mix of devices rebated.

Year	Water Savings (AF)
2011	0.0
2012	0.0
2013	0.0
2014	0.9
2015	1.4
Five-Year Total Savings	**2.3**

Appendix 2
Conservation Program Modeling Results

Table A- 1. Antelope Valley District Minimum Activity Level Constraints

Activity ID	Activity Name	Customer Class	2011	2012	2013	2014	2015
1	HE Toilets: Cust Rebates or Vouchers	Single Family	12	17	17	17	17
2	HE Toilets: Cust Rebates or Vouchers	Multi Family	0	0	0	0	0
3	HE Toilets: Cust Rebates or Vouchers	Commercial	6	8	8	8	8
4	Clotheswasher: Cust Reb or Voucher	Single Family	6	10	10	10	10
5	CW common: Cust Reb or Voucher	Multi Family	0	0	0	0	0
6	CW in-unit: Cust Reb or Voucher	Multi Family	0	0	0	0	0
7	CW coin-op: Cust Reb or Voucher	Commercial	0	0	0	0	0
8	Urinals (0.25 gpf): Cust Rebates or Vouchers	Commercial	1	1	1	1	1
9	HE Toilets: Direct Install	Single Family	0	0	0	0	0
10	HE Toilets: Direct Install	Multi Family	0	0	0	0	0
11	HE Toilets: Direct Install	Commercial	0	0	0	0	0
12	Urinals: Direct Install	Commercial	0	0	0	0	0
13	Audits & Surveys (incl high bill contacts)	Single Family	25	25	25	25	25
14	Audits & Surveys (incl high bill contacts)	Multi Family	0	0	0	0	0
15	High Efficiency Pop-Up Nozzle Web Voucher	Single Family	150	150	150	150	150
16	High Efficiency Pop-Up Nozzle Web Voucher	Multi Family	25	25	25	25	25
17	High Efficiency Pop-Up Nozzle Web Voucher	Commercial	25	25	25	25	25
18	Showerhead/Aerator,Tablet Kit Dist	Single Family	25	25	25	25	25
19	Showerhead/Aerator,Tablet Kit Dist	Multi Family	0	0	0	0	0
20	WBIC Vendor, Dist, & Cont Inc	Single Family	0	0	0	0	0
21	WBIC Vendor, Dist, & Cont Inc	Multi Family	0	0	0	0	0
22	WBIC Vendor, Dist, & Cont Inc	Commercial	0	0	0	0	0
23	Large Landscape Water Use Reports	Irrigation	0	0	0	0	0
24	Lg Lndscp Surveys & Irrig Sys: Rebates	Irrigation	0	0	0	0	0
25	Comm Irrigation System: Rebates	Commercial	0	0	0	0	0
26	Dishwashers: Vendor, Dist & Cont Inc	Commercial	0	0	0	1	0
27	Cooling Tower Cond Cont: Cust Reb, Inc	Industrial	0	0	0	0	0
28	Cooling Tower pH Cont: Cust Reb, Inc	Industrial	0	0	0	0	0

Table A- 2. Antelope Valley District Maximum Activity Level Constraints

Activity ID	Activity Name	Customer Class	2011	2012	2013	2014	2015
1	HE Toilets: Cust Rebates or Vouchers	Single Family	51	51	51	51	51
2	HE Toilets: Cust Rebates or Vouchers	Multi Family	0	0	0	0	0
3	HE Toilets: Cust Rebates or Vouchers	Commercial	24	24	24	24	24
4	Clotheswasher: Cust Reb or Voucher	Single Family	26	26	26	26	26
5	CW common: Cust Reb or Voucher	Multi Family	0	0	0	0	0
6	CW in-unit: Cust Reb or Voucher	Multi Family	0	0	0	0	0
7	CW coin-op: Cust Reb or Voucher	Commercial	0	0	0	0	0
8	Urinals (0.25 gpf): Cust Rebates or Vouchers	Commercial	14	14	14	3	3
9	HE Toilets: Direct Install	Single Family	0	0	0	0	0
10	HE Toilets: Direct Install	Multi Family	0	0	0	0	0
11	HE Toilets: Direct Install	Commercial	0	0	0	0	0
12	Urinals: Direct Install	Commercial	0	0	0	0	0
13	Audits & Surveys (incl high bill contacts)	Single Family	50	50	50	50	50
14	Audits & Surveys (incl high bill contacts)	Multi Family	0	0	0	0	0
15	High Efficiency Pop-Up Nozzle Web Voucher	Single Family	300	300	300	300	300
16	High Efficiency Pop-Up Nozzle Web Voucher	Multi Family	50	50	50	50	50
17	High Efficiency Pop-Up Nozzle Web Voucher	Commercial	50	50	50	50	50
18	Showerhead/Aerator,Tablet Kit Dist	Single Family	75	75	75	75	75
19	Showerhead/Aerator,Tablet Kit Dist	Multi Family	0	0	0	0	0
20	WBIC Vendor, Dist, & Cont Inc	Single Family	25	25	25	25	25
21	WBIC Vendor, Dist, & Cont Inc	Multi Family	0	0	0	0	0
22	WBIC Vendor, Dist, & Cont Inc	Commercial	1	1	1	1	1
23	Large Landscape Water Use Reports	Irrigation	0	0	0	0	0
24	Lg Lndscp Surveys & Irrig Sys: Rebates	Irrigation	0	0	0	0	0
25	Comm Irrigation System: Rebates	Commercial	1	1	1	1	1
26	Dishwashers: Vendor, Dist & Cont Inc	Commercial	0	0	0	1	1
27	Cooling Tower Cond Cont: Cust Reb, Inc	Industrial	0	0	0	0	1
28	Cooling Tower pH Cont: Cust Reb, Inc	Industrial	0	0	0	0	0

Table A- 3. Antelope Valley District Program Savings and Cost Assumptions

Activity ID	Activity Name	Customer Class	Unit Savings (gal/yr)	Useful Life (yrs)	Free Riders (%)	Unit Costs ($)	Annual Natural Replacement Rate (%)
1	HE Toilets: Cust Rebates or Vouchers	Single Family	8,558 --- Based on toilet savings formula in CUWCC Costs & Savings Study. Varies with persons per household Assumes that replaced toilets are 25% ULFTs, 75% non ULFTS.	25		$140.00 --- $100 rebate + $40 administration	4.00%
2	HE Toilets: Cust Rebates or Vouchers	Multi Family	14,803 --- Based on toilet savings formula in CUWCC Costs & Savings Study. Varies with persons per household Assumes that replaced toilets are 25% ULFTs, 75% non ULFTS.	25		$125.00 --- $100 rebate + $25 administration	4.00%
3	HE Toilets: Cust Rebates or Vouchers	Commercial	9,878 --- CUWCC CII Toilet Savings Study and Zip Code Toilet Inventory. Assumes 25% of replaced toilets are ULFTs and 75% are not ULFTs.	25		$240.00 --- $200 rebate + $40 administration	4.00%
4	Clotheswasher: Cust Reb or Voucher	Single Family	7,079 --- CUWCC Cost and Savings Study, revised 2005.	12	20%	$165.00 --- $125 rebate + $40 administration	4.00%
5	CW common: Cust Reb or Voucher	Multi Family	25,310 --- Alliance for Water Efficiency Guide, p. 136.	8		$440.00 --- $400 rebate + $40 administration	4.17%
6	CW in-unit: Cust Reb or Voucher	Multi Family	5,244 --- CUWCC Cost and Savings Study, revised 2005.	12	20%	$165.00 --- $125 rebate + $40 administration	4.17%
7	CW coin-op: Cust Reb or Voucher	Commercial	31,435 --- Alliance for Water Efficiency Guide, p. 159.	8		$440.00 --- $400 rebate + $40 administration	4.17%
8	Urinals (0.25 gpf): Cust Rebates or Vouchers	Commercial	9,310 --- Savings estimate for 0.5 gpf urinal from Alliance for Water Efficiency Library. Savings for 0.25 gpf urinal is 1.5 x the AWE figure.	25		$340.00 --- $300 rebate + $40 administration	4.00%
9	HE Toilets: Direct Install	Single Family	10,198 --- Based on toilet savings formula in CUWCC Costs & Savings Study. Varies with persons per household. Based on Cal Water's existing direct install program, assumes that replaced toilets are 10% ULFTs, 50% 5 gpf and 40% 3.5 gpf.	25		$384.50 --- Based on Cal Water program experience.	4.00%
10	HE Toilets: Direct Install	Multi Family	17,640 --- Based on toilet savings formula in CUWCC Costs & Savings Study. Varies with persons per household. Based on Cal Water's existing direct install program, assumes that replaced toilets are 10% ULFTs, 50% 5 gpf and 40% 3.5 gpf.	25		$254.50 --- Based on Cal Water program experience.	4.00%
11	HE Toilets: Direct Install	Commercial	11,771 --- Based on toilet savings formula in CUWCC Costs & Savings Study. Varies with persons per household. Based on Cal Water's existing direct install program, assumes that replaced toilets are 10% ULFTs, 50% 5 gpf and 40% 3.5 gpf.	25		$479.50 --- Based on Cal Water program experience.	4.00%
12	Urinals: Direct Install	Commercial	6,207 --- Alliance for Water Efficiency Library.	25		$224.50 Based on experience of other water utilities.	4.00%

13	Audits & Surveys	Single Family	11,753 --- Chesnutt, T.W., C. N. McSpadden, and D. M. Pekelney, "What is the Reliable Yield from Residential Home Water Survey Programs? The Experience of the Los Angeles Department of Water and Power", Proceedings of the American Water Works Association Conference in Anaheim, June 1995.	5		$201.50 --- Whitcomb, J. Residential Water Survey Evaluation, Contra Costa Water District, May 2000	
14	Audits & Surveys	Multi Family	4,351 --- Assumes 5% of per-acct usage	5		$176.61 --- Based on $56 per AF of annual per-acct usage.	
15	High Efficiency Pop-Up Nozzle Web Voucher	Single Family	1,303 --- Source: MWDSC Save Water - Save A Buck program assumptions.	5		$3.53 --- $3 per nozzle material cost + $0.5 per nozzle marketing cost + $0.03 per nozzle to cover fixed setup costs.	
16	High Efficiency Pop-Up Nozzle Web Voucher	Multi Family	1,303 --- Source: MWDSC Save Water - Save A Buck program assumptions.	5		$3.53 --- $3 per nozzle material cost + $0.5 per nozzle marketing cost + $0.03 per nozzle to cover fixed setup costs.	
17	High Efficiency Pop-Up Nozzle Web Voucher	Commercial	1,303 --- Source: MWDSC Save Water - Save A Buck program assumptions.	5		$3.53 --- $3 per nozzle material cost + $0.5 per nozzle marketing cost + $0.03 per nozzle to cover fixed setup costs.	
18	Showerhead/Aerator,Tablet Kit Dist	Single Family	5,091 --- Based on Cal Water program experience: 2.628 gpy showerhead 821 gpy kitchen aerator 1,642 gpy bathroom aerator	5		$29.00 --- Based on Cal Water program experience: $26 for kit + $3 for marketing	12.00%
19	Showerhead/Aerator,Tablet Kit Dist	Multi Family	5,091 --- Based on Cal Water program experience: 2.628 gpy showerhead 821 gpy kitchen aerator 1,642 gpy bathroom aerator	5		$29.00 --- Based on Cal Water program experience: $26 for kit + $3 for marketing	12.00%
20	WBIC Vendor, Dist, & Cont Inc	Single Family	6,207 --- Based on district-specific landscape savings model.	10		$460.00 --- Required vendor incentive assumed to be less than estimated $530 customer rebate.	
21	WBIC Vendor, Dist, & Cont Inc	Multi Family	6,207 --- Based on district-specific landscape savings model.	10		$260.00 --- Required vendor incentive assumed to be less than estimated $530 customer rebate.	
22	WBIC Vendor, Dist, & Cont Inc	Commercial	6,207 --- Based on district-specific landscape savings model.	10		$390.00 --- Required vendor incentive assumed to be less than estimated $530 customer rebate.	

23	Large Landscape Water Use Reports	Irrigation	47,266 --- Based on district-specific landscape savings model.	1		$64.99 --- Set up cost of $142 amortized over 10 years, plus $48/year report cost.	
24	Lg Lndscp Surveys & Irrig Sys: Rebates	Irrigation	162,434 --- Based on district-specific landscape savings model.	5		$1,400.00	
25	Comm Irrigation System: Rebates	Commercial	11,753 --- Based on district-specific landscape savings model.	10		$515.00	
26	Dishwashers: Vendor, Dist & Cont Inc	Commercial	162,434 --- Source: Alliance for Water Efficiency Library	20		$330.00 --- Source: Alliance for Water Efficiency Library. Incentive is half the cost difference between conventional and water-efficient machines.	
27	Cooling Tower Cond Cont: Cust Reb, Inc	Industrial	336,129 --- Source: MOU pp. 45-46.	5		$1,000.00 --- Based on Cal Water program experience.	
28	Cooling Tower pH Cont: Cust Reb, Inc	Industrial	1,296,502 --- Source: MOU pp. 45-46.	5		$3,810.00 Industry data + admin costs	

Table A- 4. Antelope Valley District Program Activity Levels

Activity ID	Program	Class	Annual Activity Levels				
			2011	2012	2013	2014	2015
1	HE Toilets: Cust Rebates or Vouchers	Single Family	51	51	51	51	51
2	HE Toilets: Cust Rebates or Vouchers	Multi Family	0	0	0	0	0
3	HE Toilets: Cust Rebates or Vouchers	Commercial	24	8	8	8	8
4	Clotheswasher: Cust Reb or Voucher	Single Family	26	10	10	10	10
5	CW common: Cust Reb or Voucher	Multi Family	0	0	0	0	0
6	CW in-unit: Cust Reb or Voucher	Multi Family	0	0	0	0	0
7	CW coin-op: Cust Reb or Voucher	Commercial	0	0	0	0	0
8	Urinals (0.25 gpf): Cust Rebates or Vouchers	Commercial	14	1	1	1	1
9	HE Toilets: Direct Install	Single Family	0	0	0	0	0
10	HE Toilets: Direct Install	Multi Family	0	0	0	0	0
11	HE Toilets: Direct Install	Commercial	0	0	0	0	0
12	Urinals: Direct Install	Commercial	0	0	0	0	0
13	Audits & Surveys (incl high bill contacts)	Single Family	50	50	50	25	25
14	Audits & Surveys (incl high bill contacts)	Multi Family	0	0	0	0	0
15	High Efficiency Pop-Up Nozzle Web Voucher	Single Family	300	300	300	300	300
16	High Efficiency Pop-Up Nozzle Web Voucher	Multi Family	50	50	50	50	50
17	High Efficiency Pop-Up Nozzle Web Voucher	Commercial	50	50	50	50	50
18	Showerhead/Aerator,Tablet Kit Dist	Single Family	75	75	75	25	25
19	Showerhead/Aerator,Tablet Kit Dist	Multi Family	0	0	0	0	0
20	WBIC Vendor, Dist, & Cont Inc	Single Family	5	0	0	0	0
21	WBIC Vendor, Dist, & Cont Inc	Multi Family	0	0	0	0	0
22	WBIC Vendor, Dist, & Cont Inc	Commercial	1	0	0	0	0
23	Large Landscape Water Use Reports	Irrigation	0	0	0	0	0
24	Lg Lndscp Surveys & Irrig Sys: Rebates	Irrigation	0	0	0	0	0
25	Comm Irrigation System: Rebates	Commercial	1	0	0	0	0
26	Dishwashers: Vendor, Dist & Cont Inc	Commercial	0	0	0	1	1
27	Cooling Tower Cond Cont: Cust Reb, Inc	Industrial	0	0	0	0	1
28	Cooling Tower pH Cont: Cust Reb, Inc	Industrial	0	0	0	0	0

Table A- 5. Antelope Valley District Program Costs

Activity ID	Program	Class	Annual Cost				
			2011	2012	2013	2014	2015
1	HE Toilets: Cust Rebates or Vouchers	Single Family	$7,087	$7,087	$7,087	$7,087	$7,087
2	HE Toilets: Cust Rebates or Vouchers	Multi Family	$49	$49	$49	$49	$49
3	HE Toilets: Cust Rebates or Vouchers	Commercial	$5,755	$1,918	$1,918	$1,918	$1,918
4	Clotheswasher: Cust Reb or Voucher	Single Family	$4,336	$1,634	$1,634	$1,634	$1,634
5	CW common: Cust Reb or Voucher	Multi Family	$22	$22	$22	$8	$8
6	CW in-unit: Cust Reb or Voucher	Multi Family	$34	$13	$13	$13	$13
7	CW coin-op: Cust Reb or Voucher	Commercial	$0	$0	$0	$0	$0
8	Urinals (0.25 gpf): Cust Rebates or Vouchers	Commercial	$4,646	$340	$340	$340	$340
9	HE Toilets: Direct Install	Single Family	$0	$0	$0	$0	$0
10	HE Toilets: Direct Install	Multi Family	$0	$0	$0	$0	$0
11	HE Toilets: Direct Install	Commercial	$0	$0	$0	$0	$0
12	Urinals: Direct Install	Commercial	$0	$0	$0	$0	$0
13	Audits & Surveys (incl high bill contacts)	Single Family	$10,075	$10,033	$10,033	$5,038	$5,038
14	Audits & Surveys (incl high bill contacts)	Multi Family	$0	$0	$0	$0	$0
15	High Efficiency Pop-Up Nozzle Web Voucher	Single Family	$1,059	$1,059	$1,059	$1,059	$1,059
16	High Efficiency Pop-Up Nozzle Web Voucher	Multi Family	$177	$177	$177	$177	$177
17	High Efficiency Pop-Up Nozzle Web Voucher	Commercial	$177	$177	$177	$177	$177
18	Showerhead/Aerator,Tablet Kit Dist	Single Family	$2,175	$2,175	$2,175	$725	$725
19	Showerhead/Aerator,Tablet Kit Dist	Multi Family	$0	$0	$0	$0	$0
20	WBIC Vendor, Dist, & Cont Inc	Single Family	$2,214	$0	$0	$0	$0
21	WBIC Vendor, Dist, & Cont Inc	Multi Family	$47	$18	$18	$29	$29
22	WBIC Vendor, Dist, & Cont Inc	Commercial	$216	$81	$81	$135	$135
23	Large Landscape Water Use Reports	Irrigation	$0	$0	$0	$0	$0
24	Lg Lndscp Surveys & Irrig Sys: Rebates	Irrigation	$120	$120	$120	$100	$100
25	Comm Irrigation System: Rebates	Commercial	$515	$0	$0	$0	$0
26	Dishwashers: Vendor, Dist & Cont Inc	Commercial	$97	$97	$97	$330	$330

Activity ID	Program	Class	Annual Cost				
			2011	2012	2013	2014	2015
27	Cooling Tower Cond Cont: Cust Reb, Inc	Industrial	$0	$0	$0	$0	$1,000
28	Cooling Tower pH Cont: Cust Reb, Inc	Industrial	$0	$0	$0	$0	$0

MAILED
March 15, 2011

NOTICE OF INTENT TO ADOPT
AN URBAN WATER MANAGEMENT PLAN
AND
HOLD A PUBLIC MEETING
TO
RECEIVE COMMENTS ON THE PROPOSED PLAN

CALIFORNIA WATER SERVICE COMPANY'S
ANTELOPE VALLEY DISTRICT

California Water Code, Part 2.6 Chapters 1 through 4 (Sections 10610 through 10656), are known and may be cited as the "Urban Water Management Planning Act."

These California Water Code sections require all urban water suppliers that provide water for municipal purposes either directly or indirectly to more than 3,000 customers or supply more than 3,000 acre-feet of water annually to prepare an Urban Water Management Plan as outlined and identified in those sections. This requirement applies to public and privately owned water utilities.

The plan must describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation, and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan must address measures for residential, commercial, governmental, and industrial water demand management.

The act requires urban water suppliers to update their Urban Water Management Plans at least once every five years, and to file updated plans with the Department of Water Resources, the California State Library, and any city or county served by the supplier no later than 30 days after adoption.

California Water Service Company (Cal Water) is an investor-owned public utility providing water service throughout California. In addition, Cal Water is regulated by the California Public Utilities Commission (CPUC).

One of Cal Water's service areas is the Antelope Valley District, which consists of four hydraulically separated water systems in unincorporated areas in Los Angeles and Kern Counties. The Antelope Valley District serves the communities, Lake Hughes, and Leona Valley and a portion of the City of Lancaster in Los Angeles County. The community of Fremont Valley system is located in Kern County.

While the Antelope Valley District is not a defined urban water supplier, Cal Water is still preparing an update to its Urban Water Management Plan that will address the water service conditions in the Antelope Valley District. It is Cal Water's intent to adopt that plan and file that plan even though it is not required to do so, with the Department of Water Resources, the California State Library, and any city or county within which Cal Water provides service.

A key focus of this UWMP update is the conservation requirement set forth in Senate Bill 7 (SBx7-7) as passed in November 2009. SBx7-7 mandates a statewide 20% reduction in per capita urban water use by 2020. In order to quantify the objectives and identify the means of achieving this mandated demand reduction, Cal Water has prepared a Conservation Master Plan.

Cal Water is in the process of expanding current conservation programs and developing new programs for its 24 districts. Over the next five years, Cal Water conservation program expenditures are likely to increase, due in large measure to recently adopted state policies requiring future reductions in per capita urban water use. These state policies include SBx7-7, 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, as well as the *Memorandum of Understanding Regarding Urban Water Conservation in California* (MOU), of which Cal Water has been a signatory since 1991.

The Conservation Master Plan for the Antelope Valley District will be presented to the Cities, Counties and public served by Cal Water's Antelope Valley District in conjunction with the UWMP.

Schedule of upcoming actions:

On or about April 1, 2011, a copy of the Proposed Urban Water Management Plan and the Conservation Master Plan will be available for review during normal business hours at the Antelope Valley District's Customer Service Center, 5015 West Avenue L-14, Unit 2, Quartz Hill, CA 93536.

It is preferred that prior arrangements are made with the district's management for viewing the Proposed Urban Water Management Plan and/or the Conservation Master Plan. These arrangements can be made by calling (800) 680-1160.

As an alternative to reviewing the Proposed Urban Water Management Plan or Conservation Master Plan in Cal Water's Antelope Valley District Customer Service Center, Cal Water will make an electronic copy of the Proposed Urban Water Management Plan available on or about April 1, 2011.

It is Cal Water's intent to place the Antelope Valley UWMP on an FTP site, where City and County officials may access any portion of the plan for review. The site can be accessed at http://calwater.ftptoday.com ;
The user name is **cwsftp10** and the password is **Tran5er**.

The UWMP will be available at this FTP site on or about April 1, 2011 through June 15, 2011.

Cal Water will receive comments on the proposed UWMP and the Conservation Master Plan from April 1, 2011 through June 15, 2011.

If there are issues with accessing the electronic copy, you may contact Michael Bolzowski at the company's headquarters at 1720 North First Street, San Jose, California 95112-4598, by calling (408) 367-8200, or by email at mbolzowski@calwater.com.

The Public Meeting to receive comments on the Proposed Urban Water Management Plan and the Conservation Master Plan will be held on June 2, 2011, at 5:00 p.m. to 7:00 p.m., in The Leona Valley Community Center Building, located at 8367 Elizabeth Lake Road, Leona Valley, CA 93551.

If you are unable to attend the scheduled public meeting but want to provide comments regarding the proposed UWMP, you may send your comments in writing via mail to:

Thomas A. Salzano, Water Resource Planning Supervisor
California Water Service Company
1720 North First Street
San Jose, CA 95112-4598

Or by email at tsalzano@calwater.com

Comments regarding the Conservation Master Plan for Antelope Valley should be sent to:

Kenneth G. Jenkins, Conservation Manager
California Water Service Company
2632 West 237th Street
Torrance, CA 90505

Or by email at kjenkins@calwater.com

If there were any errors in the address to which notice was sent, please send corrections to Tom Salzano at the above address so that we can update our information.

Also, please share this with others on your staff that may have the need to know.

PAGE LEFT BLANK INTENTIONALLY

May 20, 2008

Antelope Valley East Kern Water Agency
Russell Fuller, General Manager
6500 W. Avenue N
Palmdale, CA 93553

Dear Mr. Fuller,

California Water Service Company (Cal Water) is in the process of preparing an update to the current Urban Water Management Plan (UWMP) for the Antelope Valley District as a part of its 2009 Public Utilities Commission General Rate Case filing. This UWMP will serve as a long term planning document for water supply and can be an important source of information for city and county General Plans.

Cal Water will file the complete updated Plan with the Department of Water Resources in 2010. We are requesting your participation in the updating of this Plan and are seeking comments on the previous version, which was completed and sent to you in 2005.

We intend to address these comments prior to the normal review period, which occurs in the second quarter of 2009. This will facilitate preparation of the final draft of the UWMP and insure that any issues have been resolved to the satisfaction of both our organizations. Please submit your comments by September 1, 2008 so that we have adequate time to address your concerns.

If necessary we are available for a meeting to discuss these concerns or to provide clarification on the contents of the Plan.

If you do not have a copy of the 2005 Antelope Valley District UWMP we would be happy to provide one to you. Please send any comments or questions to my attention:

Thomas Salzano
Water Resources Planning Supervisor
1720 North First Street, San Jose, CA 95112
(408) 367-8340 (phone) (408) 367-8427 (fax)
tsalzano@calwater.com

Thank you for your time,

Thomas Salzano

Thomas A. Salzano
Water Resources Planning Supervisor

May 20, 2008

Kern County, Planning Department
Ted James, Director
2700 M Street, Suite 100
Bakersfield, CA 93301

Dear Mr. James,

California Water Service Company (Cal Water) is in the process of preparing an update to the current Urban Water Management Plan (UWMP) for the Antelope Valley District as a part of its 2009 Public Utilities Commission General Rate Case filing. This UWMP will serve as a long term planning document for water supply and can be an important source of information for city and county General Plans.

Cal Water will file the complete updated Plan with the Department of Water Resources in 2010. We are requesting your participation in the updating of this Plan and are seeking comments on the previous version, which was completed and sent to you in 2005.

We intend to address these comments prior to the normal review period, which occurs in the second quarter of 2009. This will facilitate preparation of the final draft of the UWMP and insure that any issues have been resolved to the satisfaction of both our organizations. Please submit your comments by September 1, 2008 so that we have adequate time to address your concerns.

If necessary we are available for a meeting to discuss these concerns or to provide clarification on the contents of the Plan.

If you do not have a copy of the 2005 Antelope Valley District UWMP we would be happy to provide one to you. Please send any comments or questions to my attention:

Thomas Salzano
Water Resources Planning Supervisor
1720 North First Street, San Jose, CA 95112
(408) 367-8340 (phone) (408) 367-8427 (fax)
tsalzano@calwater.com

Thank you for your time,

Thomas Salzano

Thomas A. Salzano
Water Resources Planning Supervisor

May 20, 2008

Los Angeles County Department of Regional Planning
Bruce McClendon, Planning Director
320 West Temple Street
Los Angeles, CA 90012

Dear Mr. McClendon,

California Water Service Company (Cal Water) is in the process of preparing an update to the current Urban Water Management Plan (UWMP) for the Antelope Valley District as a part of its 2009 Public Utilities Commission General Rate Case filing. This UWMP will serve as a long term planning document for water supply and can be an important source of information for city and county General Plans.

Cal Water will file the complete updated Plan with the Department of Water Resources in 2010. We are requesting your participation in the updating of this Plan and are seeking comments on the previous version, which was completed and sent to you in 2005.

We intend to address these comments prior to the normal review period, which occurs in the second quarter of 2009. This will facilitate preparation of the final draft of the UWMP and insure that any issues have been resolved to the satisfaction of both our organizations. Please submit your comments by September 1, 2008 so that we have adequate time to address your concerns.

If necessary we are available for a meeting to discuss these concerns or to provide clarification on the contents of the Plan.

If you do not have a copy of the 2005 Antelope Valley District UWMP we would be happy to provide one to you. Please send any comments or questions to my attention:

Thomas Salzano
Water Resources Planning Supervisor
1720 North First Street, San Jose, CA 95112
(408) 367-8340 (phone) (408) 367-8427 (fax)
tsalzano@calwater.com

Thank you for your time,

Thomas Salzano

Thomas A. Salzano
Water Resources Planning Supervisor

Jacobson, Dana

From: Cheryl CASDORPH [CHERYLC@co.kern.ca.us]
Sent: Wednesday, December 01, 2010 3:44 PM
To: Jacobson, Dana
Cc: Shawn Beyeler
Subject: Re: Fwd: Planning Home Page

They are in our Housing Element on our website. the Housing Element is for all of unincorporated Kern and has to be updated every 5 years. we do a total of low income for the entire unincorporated kern county. We do not plan for each community. Here is the link. Call me if you have any questions.
http://www.co.kern.ca.us/planning/pdfs/he/HE2008_toc.pdf

click on Table of Contents. Click on Chapter 2: Housing Needs and go to regional housing needs at the end.

Cheryl Casdorph,
Supervising Planner

Kern County Planning and Community Development Department
2700 M Street, Suite 100
Bakersfield, CA 93301
(661) 862-8624
Fax (661) 862-8601
cherylc@co.kern.ca.us

>>> On 12/1/2010 at 12:36 PM, in message <4CF64160.BB64.0061.0@co.kern.ca.us>, Shawn Beyeler wrote:

> >>> Janet Bowtell 12/01/2010 12:03 PM >>>
>
> >>> "Jacobson, Dana" <djacobson@calwater.com> 12/01/2010 11:55 AM >>>
> Hi,
>
> Cal Water serves municipal water to several unicorporated communities in Kern County. In our 2010 Urban Water Management Plans we need to distinguish projected water demands from low income housing vs regular housing. Do you have a requirement (as a percent) of low income housing in these areas? I didn't see the relevent information in the general plan documents on your website. Thanks.
>
> Dana
>
> Dana Jacobson
> Water Resources Planning
> California Water Service Company

1720 North First Street
San Jose, CA 95112
Phone: (408) 367-8361

MAILED
April 1, 2011

NOTICE OF INTENT TO ADOPT
AN URBAN WATER MANAGEMENT PLAN
AND
HOLD A PUBLIC MEETING
TO
RECEIVE COMMENTS ON THE PROPOSED PLAN

CALIFORNIA WATER SERVICE COMPANY'S
ANTELOPE VALLEY DISTRICT

REMINDER MESSAGE

The Proposed Urban Water Management Plan is now available for review during normal business hours at the Antelope Valley District's Customer Service Center, 5015 West Avenue L-14, Unit 2, Quartz Hill, CA 93536.

It is preferred that prior arrangements are made with the district's management for viewing the Proposed Urban Water Management Plan. These arrangements can be made by calling (800) 680-1160.

Cal Water has placed the Antelope Valley UWMP on an FTP site, where City and County officials may access any portion of the plan for review. The site can be accessed at http://calwater.ftptoday.com ;
The user name is **cwsftp10** and the password is **Tran5er**.
The UWMP will be available at this FTP site on or about April 1, 2011 through June 15, 2011.

The Public Meeting to receive comments on the Proposed Urban Water Management Plan will be held on June 2, 2011, at 5:00 p.m. to 7:00 p.m., in The Leona Valley Community Center Building, located at 8367 Elizabeth Lake Road, Leona Valley, CA 93551.

If you are unable to attend the scheduled public meeting but want to provide comments regarding the proposed UWMP, you may send your comments in writing via mail or email to:

Thomas A. Salzano, Water Resource Planning Supervisor
California Water Service Company
1720 North First Street
San Jose, CA 95112-4598
tsalzano@calwater.com

Cal Water will receive comments on the proposed UWMP from April 1, 2011 through June 15, 2011.


Executive Summary

THIS PAGE LEFT INTENTIONALLY BLANK

This plan defines a clear vision and direction for the sustainable management of groundwater reserves in the Antelope Valley Region.

Executive Summary

ANTELOPE VALLEY INTEGRATED REGIONAL WATER MANAGEMENT PLAN OVERVIEW

The California Water Plan 2005 update is the basis for all Integrated Regional Water Management (IRWM) planning efforts underway throughout the State, including this IRWM Plan for the Antelope Valley Region. It represents a fundamental transition in how the State looks at water resource management, and how the State government needs to be more involved at a local and regional level with governing agencies and interest groups to better identify and address State-wide water concerns.

The State recognizes that there is a need to consider a broader range of resource management issues, competing water demands, new approaches to ensuring water supply reliability, and new ways of financing.

IRWM planning was derived from Proposition 50 which was passed by California voters in November 2002, authorizing $3.4 billion in general obligation bonds to fund a variety of specified water and wetlands projects. It set aside $380 million for grants related to the implementation of IRWM Plans and is jointly administered by the California Department of Water Resources (DWR) and the State Water Resources Control Board (SWRCB).

Proposition 50 states that IRWM Plans should include a description of the region and participants, regional objectives and priorities, water management strategies, implementation, impacts and benefits, data management, financing, stakeholder involvement, relationship to local planning, and state and federal coordination. This Antelope Valley Integrated Regional Water Management (IRWM) Plan includes a discussion of the specified elements, as summarized below.

INTRODUCTION (SECTION 1)

Several years ago, leaders and agencies in the Antelope Valley Region recognized the need for regional cooperation and planning. In an effort to represent the broad interests within the Antelope Valley Region, a number of organizations joined to form a Regional Water Management Group (RWMG) to work together and create this IRWM Plan. Members of the RWMG include the Antelope Valley-East Kern Water Agency (AVEK), Antelope Valley State Water Contractors Association (AVSWCA), City of Lancaster, City of Palmdale, Littlerock Creek Irrigation District, Los Angeles County Sanitation District (LACSD) Nos. 14 and 20, Los Angeles County Waterworks District No. 40 (LACWWD 40), Palmdale Water District (PWD), Quartz Hill Water District (QHWD), and Rosamond Community Services District (RCSD). These agencies agreed to contribute funds to help develop the AV IRWM Plan, provide and share information, review and comment on drafts, adopt the final AV IRWM Plan, and assist in future grant applications for the priority projects identified in this IRWM Plan.

"We have a responsibility for future generations, and we have a responsibility just as responsible citizens, to protect this groundwater resource and make sure that we use it in the best way possible."

– Adam Ariki,
Los Angeles County Waterworks District No. 40

In January 2007, the RWMG and other community participants (the Stakeholders) set about developing a broadly supported water resource management plan that defines a meaningful course of action to meet the expected demands for water within the entire Antelope Valley Region through 2035. They chose to create the water resource management plan consistent with the State sponsored Integrated Regional Water Management Program that makes grant funds available to support sound regional water management. The goals of the AV IRWM Plan are to address:

- How municipal and industrial (M&I) purveyors can reliably provide the quantity and quality of water that will be demanded by a growing population;
- Options to satisfy agricultural users' demand for reliable supplies of reasonable cost irrigation water; and
- Opportunities to protect and enhance the current water resources (including groundwater) and the environmental resources within the Antelope Valley Region.

The RWMG acknowledged that a separate process (called adjudication) related to groundwater management was also underway. Members of the RWMG and other stakeholders discussed at length whether it was possible (and if possible, how) to develop a Regional Water Management Plan before the adjudication was settled. The members of the RWMG agreed that since the IRWM Plan and the adjudication were focused on different aspects of water management, they could proceed in parallel. This IRWM Plan contains information to help take action to meet shared objectives for long-term water management for the entire region. The results of the adjudication will help provide important clarity and certainty between groundwater users about how the groundwater resources will be managed, but other important water management actions can and should be taken without waiting for a final adjudicated solution. Members of the RWMG agreed that no information developed for the purposes of the IRWM Plan should be interpreted to interfere in any way with the adjudication process. The data provided in this report were not prepared in a manner suitable to answer the questions being addressed in the adjudication.

REGION DESCRIPTION (SECTION 2)

The Antelope Valley Region of California is home to over 444,000 people living in many different communities. Residents within this Region have experienced tremendous changes over the past generation due to a rapid increase in population coming from nearby large cities. Current forecasts of population growth suggest even larger changes

Surface water for the Antelope Valley Region comes from the state aqueduct and Littlerock Reservoir

will occur before 2035. Water plays a central role in the health and well being of all residents within the Antelope Valley Region. People use water for drinking, bathing, household and outdoor activities, agriculture, business endeavors, recreation, and to sustain and enhance natural habitats. This common need for water links communities together in many ways. When anyone uses water, the ability of other people to use water within the Antelope Valley Region can be affected.

The Antelope Valley Region encompasses approximately 2,400 square miles in northern Los Angeles County, southern Kern County, and western San Bernardino County. Major communities within the Antelope Valley Region include Boron, California City, Edwards Air Force Base, Lancaster, Mojave, Palmdale and Rosamond. All of the water currently used in the Antelope Valley Region comes from two sources: (1) naturally occurring water within the Antelope Valley Region (surface water and groundwater accumulated from rain and snow that falls in the Antelope Valley and surrounding mountains), and (2) State Water Project water (surface water that is collected in northern California and imported into the Antelope Valley and other areas around the state).

"This plan is going to provide a long-range benefit to the Antelope Valley and will be able to continue to provide for economic development, particularly with residential development throughout the Antelope Valley Region."

– Gretchen Gutierrez,
Antelope Valley Building Industry Association

The number of residents within the Antelope Valley Region expanded more than 330 percent between 1970 and 2005, growing from 103,000 people in 1970 to 444,000 people in 2005. Forecasters expect the population to continue to swell, potentially reaching 1,174,000 residents by the year 2035. As the number of people living and working in the

Antelope Valley Region increases, the competition for water supply increases, and the challenge of maintaining good water quality and managing the interconnected water cycle becomes more challenging.

Creation of a proactive, "smart" design for the fast-developing Antelope Valley Region makes this IRWM Plan essential to efficient and effective water management.

ISSUES AND NEEDS (SECTION 3)

Water managers and local planners face many daunting challenges related to supporting the well being of the Antelope Valley Region. Past activities have created problems that need to be addressed and expected increases in population growth make resolving these problems even more difficult. In order to help address the broad challenges, the AV IRWM Plan was organized to address issues and needs in the following categories. Section 3 of the Plan describes these issues and needs in detail.

Supplies are Variable and Uncertain

Determining the amount of water available for use at any given time (now or in the future) is more challenging than one might imagine. The amount of water supply available varies considerably due to changes in weather, rain and snow, and other conditions. All water supplies within the Antelope Valley Region come from two sources: (1) local rain and snow, or (2) imports of water from outside the Antelope Valley Region. The local water supplies come from rainfall and snowmelt that percolate into the groundwater aquifers or are captured in Littlerock Reservoir. Current estimates of water supplies made available from local rainfall and snowmelt vary widely (30,300 to 81,400 acre-feet per year (AFY).[1,2] Imported water comes from the State Water Project, which has historically varied. The currently available supplies from imported water can also vary widely from year to year (6,400 to 74,300 AFY).

Demand is Greater than Supply

One fundamental challenge in the Antelope Valley Region is that demand for water exceeds available supplies. The

The expected rapid growth in the Antelope Valley Region will affect water demand and increase the threat of water contamination from additional wastewater and urban runoff without proper management.

demand for water clearly exceeds even the higher estimates of currently available supplies. By 2010 the demand for water in an average year by 2010 will be 274,000 AFY and by 2035 could be 447,000 AFY. Even using the higher estimates of available supply, this means demand could exceed supply by 73,600 AFY in 2010 and by 236,800 AFY in 2035. The expected imbalance between supply and demand in 2035 is about the same as currently available supplies. If communities do not begin conserving water more effectively, the Region will need twice the water as it currently has in order to meet demand in 2035.

Historically, water supplies within the Antelope Valley Region have been used primarily for agriculture; however, due to population growth, water demands from residential and business uses have increased significantly and this trend is expected to continue. The expected continuation of rapid growth in the Antelope Valley Region will affect water demand and increase the threat of water contamination from additional wastewater and urban runoff. More residents will also lead to higher demand for water-based recreation.

Much of the water used within the Antelope Valley Region is extracted from groundwater aquifers. The amount of water pumped within the Antelope Valley Region has varied tremendously since the early 1900s. The United States Geological Survey estimated that groundwater pumping in 1919 was about 29,000 AFY and reached as high as 400,000 AFY in the 1950's. For many of those years, the amount of water being pumped was greater than the amount of water being replenished, creating an imbalance within the groundwater aquifers. Because the amounts pumped were greater than the amounts being replenished, groundwater levels have declined significantly throughout the Antelope Valley Region. The long-term depletion of aquifers cannot be continued indefinitely without serious

1 An acre-foot per year is enough water to cover an acre of land one foot deep and meet the water needs of a family of four for one year.

2 The analyses provided in the IRWM Plan are strictly for long-term planning purposes and have not been conducted to answer the questions being addressed within the adjudication. Once the detailed analysis of available local water supply are completed within the adjudication, the supply numbers for the IRWM Plan will need to be updated.

consequences. The historical declines in groundwater levels within the Antelope Valley Region have caused permanent damage to aquifers in some areas through land subsidence, or sinking.

In order to prevent further damage from declining groundwater levels, many water providers and managers within the Antelope Valley Region recognize the need to balance the water being pumped from the aquifers with the water being put back. In response to this need, a legal process called adjudication is currently underway. If the adjudication process is successful, groundwater users within the Antelope Valley Region will create and abide by a plan to stabilize groundwater levels and prevent further damage that can result from declining groundwater levels. While determining a method to balance groundwater use with the amount of water being replenished is a necessary piece to creating a viable water management strategy within the Antelope Valley Region, the adjudication likely will not provide any additional water supplies needed to meet the growing demands within the Antelope Valley Region.

Recognizing the need to identify meaningful actions beyond the adjudication, members of the Group and other community participants agreed to focus on actions beyond the adjudication in the Plan. Participants in developing the AV IRWM Plan encourage a quick and collaborative settlement of the adjudication process, but the contents of the AV IRWM Plan identify and recommend actions that go well beyond the adjudication. The actions identified in the AV IRWM Plan can help meet the larger needs of the Antelope Valley Region but will require a solution from the adjudication to stabilize groundwater levels. Nothing in the IRWM Plan shall be interpreted to interfere in any way with the adjudication process.

Water Quality and Flood Management

The groundwater basin within the Antelope Valley Region is an undrained, closed basin, meaning there is no outlet for water to flow to the ocean. When water enters a closed basin, any minerals or chemicals in the water typically accumulate in the basin. Currently, groundwater quality is excellent within the principal aquifer but is not as good toward the northern portion of the dry lake areas. Some portions of the basin contain groundwater with high fluoride, boron, total dissolved solids, and nitrate concentrations. Arsenic is another emerging contaminant of concern in the Antelope Valley Region and has been observed in LACWWD 40, PWD, Boron, and QHWD wells. Research conducted by the LACWWD and the United States Geological Survey has shown the problem to reside primarily in the deep aquifer,

The need for regional coordination of flood control efforts is readily apparent with the increase of paved surfaces, along with the increase of local flood events.

The preservation of the Antelope Valley Region's unique environmental features can be achieved through integrated surface and groundwater management actions.

and it is not anticipated that the existing arsenic problem will lead to future loss of groundwater as a water supply resource for the Antelope Valley.

Portions of the Antelope Valley Region are also subject to flooding from uncontrolled runoff in the nearby foothills, which can be aggravated by lack of proper drainage facilities and defined flood channels. This runoff can negatively affect the water quality of the underlying groundwater basin, and can create stagnant ponds in places where clay soils beneath the surface do not allow for percolation to occur. The need for regional coordination of flood control efforts becomes more readily apparent as urban development and paved surfaces increase throughout the Antelope Valley Region, along with the frequency of local flood events.

Environmental Resources

The Antelope Valley Region has many unique environmental features, and several plant and animal species are only found in this area. As the pressure for growth expands out into undeveloped or agricultural lands, the need to balance industry and growth against protection of endangered species and sensitive ecosystems requires difficult decisions and trade-offs, each resulting in a variety of unique impacts on water demands and supplies in the Region. The actions identified in the AV IRWM Plan can help to preserve open space and natural habitats in the greater the Antelope Valley Region while maximizing surface water and groundwater management efforts.

Water Management and Land Use

What people do on the land of the Antelope Valley and how they do it directly impacts many aspects of life, including the water cycle, within the Antelope Valley Region. Historically throughout California, land use planning and water use planning have been done almost independently of one another. The challenges identified within the Plan clearly show a need for much closer collaboration between

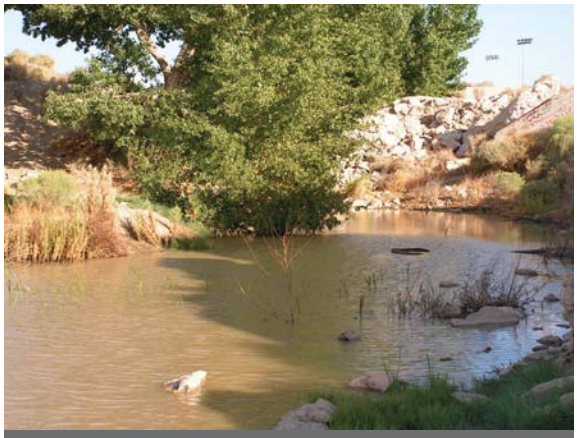
The expected rapid growth in the Antelope Valley Region will affect water demand and increase the threat of water contamination from additional wastewater and urban runoff without proper management.

land use planning efforts and water management planning efforts. Continued development within the Antelope Valley Region depends heavily on the successful completion of the objectives presented in the Plan to meet the growing demand for recreational opportunities while minimizing or avoiding the loss of local culture and values.

OBJECTIVES (SECTION 4)

The Stakeholders worked together to identify clear objectives and planning targets they want to accomplish by implementing the AV IRWM Plan (see Table ES-1). Although the AV IRWM Plan is intended to address the Antelope Valley Region's water resource management needs, this document also identifies several open space, recreation, and habitat targets as well. Refer to Section 4 of the AV IRWM Plan for details on how the objectives and targets were determined.

These objectives and planning targets represent the most important things the Stakeholders have chosen to work together to accomplish over the next several years. Everything done within the context of this IRWM Plan should contribute in some way to achieving these objectives. Also, because the planning targets are measurable, residents within the Antelope Valley Region can monitor how well the Plan is being implemented.



Stephen Sorenson County Park, a community recreation facility within the Antelope Valley, is home to "Lovejoy Springs" as it is known by the community.

Apollo Park Lake

Table ES-1 Antelope Valley Region Objectives and Planning Targets

Objectives	Planning Targets
Water Supply Management	
Provide reliable water supply to meet the Antelope Valley Region's expected demand between now and 2035.	Reduce (73,600 to 236,800 AFY) mismatch of expected supply and demand in average years by providing new water supply and reducing demand, starting 2009.
	Provide adequate reserves (50,600 to 57,400 AFY) to supplement average condition supply to meet demands during single-dry year conditions, starting 2009.[3]
	Provide adequate reserves (0 to 62,000 AF/4 year period) to supplement average condition supply to meet demands during multi-dry year conditions, starting 2009.[4]
Establish a contingency plan to meet water supply needs of the Antelope Valley Region during a plausible disruption of SWP water deliveries.	Demonstrate ability to meet regional water demands without receiving SWP water for 6 months over the summer, by June 2010.
Stabilize groundwater levels at current conditions.	Manage groundwater levels throughout the basin such that a 10-year moving average of change in observed groundwater levels is greater than or equal to 0, starting January 2010.
Water Quality Management	
Provide drinking water that meets customer expectations.	Continue to meet Federal and State water quality standards as well as customer standards for taste and aesthetics throughout the planning period.
Protect aquifer from contamination.	Prevent unacceptable degradation of aquifer according to the Basin Plan throughout the planning period.
	Map contaminated sites and monitor contaminant movement, by December 2008.
	Identify contaminated portions of aquifer and prevent migration of contaminants, by June 2009.
Protect natural streams and recharge areas from contamination.	Prevent unacceptable degradation of natural streams and recharge areas according to the Basin Plan throughout the planning period.
Maximize beneficial use of recycled water.	Increase infrastructure and establish policies to use 33% of recycled water to help meet expected demand by 2015, 66% by 2025, and 100% by 2035.
Flood Management	
Reduce negative impacts of stormwater, urban runoff, and nuisance water.	Coordinate a regional flood management plan and policy mechanism by the year 2010.
Environmental Resource Management	
Preserve open space and natural habitats that protect and enhance water resources and species in the Antelope Valley Region.	Contribute to the preservation of an additional 2,000 acres of open space and natural habitat, to integrate and maximize surface water and groundwater management by 2015.
Land Use Planning/Management	
Maintain agricultural land use within the Antelope Valley Region.	Preserve 100,000 acres of farmland in rotation[5] through 2035.
Meet growing demand for recreational space.	Contribute to local and regional General Planning documents to provide 5,000 acres[6] of recreational space by 2035.
Improve integrated land use planning to support water management.	Coordinate a regional land use management plan by the year 2010.

3 Dry year reserves determined by taking the dry year mismatch and adding the average year supplement. Assumes that the average year supplement equals the average year mismatch for any given year. Range determined from the maximum and minimum reserves.

4 As with single-dry year, multi-dry year reserves determined by summing the 4-year dry year mismatch and adding the 4-year average year supplement. Assumes that the average year supplement equals the average year mismatch for any given year. Range determined from the maximum and minimum reserves.

5 The phrase "in-rotation" means that not all 100,000 acres will be in agricultural production at one time rather the land will be rotated in cycles to make most efficient use of the land.

6 The City of Palmdale and City of Lancaster's General Plans provide a standard of 5 acres of parkland per 1,000 City residents. The Kern County General Plan provides a standard of 2.5 acres per 1,000 residents. The other local and regional General Plans do not provide a standard for "recreation or parkland" preservation. This planning target assumes a 2035 population of 1.17 million residents in the Antelope Valley Region.

WATER MANAGEMENT STRATEGIES (SECTION 5)

An overview and description of each of the Proposition 50 Water Management Strategies required to be considered in the AV IRWM Plan is provided in Section 5. These water management strategies include those that are currently utilized by the agencies and organizations in the Antelope Valley Region on an ongoing basis, the strategies now being implemented, and those that are planned for the future.

Additionally, in the AV IRWM Plan, the 20 different water management strategies identified in the IRWM Plan Guidelines (CWC §§ 79562.5 and 79564) were compared with those identified in the California Water Plan and then grouped into the AV IRWM Plan's five regional and broad-based water management strategy areas: water supply management; water quality management; flood management; environmental resource management; and land use management.

To help identify the many potential projects in the Antelope Valley Region and to assess the contribution of these projects towards meeting the AV IRWM Plan objectives and planning targets (as identified in Table ES-1, above), a "Call for Projects" form was sent out to all the Stakeholders to give them the opportunity to submit their project concepts for consideration. The Call for Projects provided an avenue to engage the Stakeholders in the information-sharing aspect of Plan development, and resulted in identification of many projects that provide multiple benefits that span more than one water management strategy.

IRWM PLAN AND PROJECTS INTEGRATION, EVALUATION AND PRIORITIZATION (SECTIONS 6 AND 7)

Many local agencies and other community participants have worked well together to create a Plan that identifies challenging issues and needs being faced by all Antelope Valley residents. Fortunately, this IRWM Plan also identifies actions that can help meet the objectives for the Antelope Valley Region and identifies methods for cooperative implementation of those actions.

Table ES-2 lists the projects and actions that the Stakeholders believe will help meet the Regional objectives. Implementing the high priority actions will require focused effort, broad community support, political resolve, and money. The Stakeholders are actively pursuing financial assistance through several grant programs to help leverage local investments. The RWMG is also working to establish a secure and long-lasting way to coordinate resources to meet the growing needs of the entire Antelope Valley Region.

Table ES-2 Stakeholder Prioritized Projects

Priority	Project	Project Sponsor
Water Supply Groundwater Recharge/Banking Infrastructure Projects		
High	Antelope Valley Water Bank	Western Development and Storage
	Aquifer Storage and Recovery Project - Injection Well Development	LACWWD 40
	Upper Amargosa Creek Recharge, Flood Control & Riparian Habitat Restoration Project	City of Palmdale, AVEK
	Water Supply Stabilization Project – Westside	AVEK/AVSWCA/ LACWWD 40
Medium	Aquifer Storage and Recovery Project: Additional Storage Capacity	LACWWD 40
	Lower Amargosa Creek Recharge & Flood Control Project	J. Goit/City of Palmdale
	Water Supply Stabilization Project – Eastside Project	AVEK
Water Infrastructure Projects		
High	Avenue K Transmission Main, Phases I-IV	LACWWD 40
	Littlerock Dam Sediment Removal Project	PWD
	Wastewater Pipeline	RCSD
Low	Avenue M and 60th Street West Tanks	LACWWD 40
	Place Valves and Turnouts on Reclaimed Water Pipeline	RCSD

Table ES-2 Stakeholder Prioritized Projects (continued)

Priority	Project	Project Sponsor
Recycled Water Projects		
High	Antelope Valley Recycled Water Project Phase 2	LACWWD 40/Palmdale/ LACSD
	Groundwater Recharge Using Recycled Water Project	City of Lancaster
Medium	Groundwater Recharge – Recycled Water Project	PWD
	Kern County and Los Angeles County Interconnection Pipeline	RCSD
	Regional Recycled Water Project Phase 3	LACWWD 40/Palmdale/LACSD
	Tertiary Treated Water Conveyance and Incidental Groundwater Recharge of Amargosa Creek Avenue M to Avenue H	City of Lancaster
Low	Regional Recycled Water Project Phase 4	LACWWD 40/Palmdale/ LACSD
Water Conservation/Water Use Efficiency		
High	Comprehensive Water Conservation/Efficient Water Use Program	Antelope Valley Water Conservation Coalition/ LACWWD/PWD
Water Quality Projects		
High	Lancaster Water Reclamation Plan Stage V	LACSD
	Palmdale Water Reclamation Plan Existing Effluent Management Sites	LACSD
	Palmdale Water Reclamation Plan Stage V	LACSD
	Partial Well Abandonment of Groundwater Wells for Arsenic Mitigation	LACWWD 40
Medium	Lancaster Water Reclamation Plan Stage VI	LACSD
	Lancaster Water Reclamation Plan Proposed Effluent Management Sites	LACSD
	Palmdale Water Reclamation Plan Stage VI	LACSD
	Palmdale Water Reclamation Plan Proposed Effluent Management Sites	LACSD
	Palmdale Water District New Treatment Plant	PWD
Low	42nd Street East, Sewer Installation	City of Palmdale
Flood Management Projects		
High	Development of Coordinated Antelope Valley Flood Control Plan	Cities of Lancaster, Palmdale, Los Angeles Department of Public Works (LADPW), Kern County
Medium	Quartz Hill Storm Drain	LADPW
	Anaverde Detention Basin, Dam & Spillway at Pelona Vista Park	City of Palmdale
	Barrel Springs Detention Basin and Wetlands	City of Palmdale
	Hunt Canyon Groundwater Recharge and Flood Control Basin	City of Palmdale
Low	45th Street East Flood Control Basin (Q East Basin)	City of Palmdale
	Avenue Q and 20th Street East Basin (Q West Basin)	City of Palmdale
	Storm water Harvesting	Leona Valley Town Council
Environmental Resource Management Projects		
High	Ecosystem and Riparian Habitat Restoration of Amargosa Creek; Avenue J to Avenue H	City of Lancaster
Medium	Tropico Park Pipeline Project	RCSD
Land Use Management Projects		
High	Development of a Coordinated Land Use Management Plan	Cities of Lancaster, Palmdale, LADPW, Kern County /Antelope Valley Conservancy
	Amargosa Creek Pathways Project	City of Lancaster

FRAMEWORK FOR IMPLEMENTATION (SECTION 8)

The AV IRWM Plan is a dynamic document that identifies monitoring guidelines and sets forth procedures for measuring the success, benefits, and impacts of the AV IRWM Plan. An ongoing management process is proposed for evaluating, updating and maintaining the Plan, and a comprehensive implementation framework has been developed to establish and identify a capital improvement program and financial plan for both construction and operation and maintenance of the projects and management actions selected as "high priority" (see Table ES-2, for a list of the high priority projects).

The 11 public agencies that have joined together to create the RWMG have recognized the value of working collectively towards meeting the regional goals identified in this Plan. In order to do this, they have signed a Memorandum of Understanding (MOU) to define what their roles and responsibilities are in developing and moving forward with implementation of the AV IRWM Plan. The decision-making structure of the MOU provides the RWMG with the responsibility to make formal decisions regarding the scope and content of the AV IRWM Plan. While the structure and approach has been successful to create the plan, the RWMG discussed whether the MOU and facilitated broad agreement approach would work well to implement and update the Plan after it is adopted. Several potential options were discussed including selection of one willing existing agency within the RWMG, (the City of Palmdale for example), that would serve on behalf of the entire stakeholder group, or creation of a new legal entity, such as a new Joint Powers Authority (JPA) to lead the collaboration with the stakeholder group and help implement the IRWM Plan.

The stakeholders decided that they would like to continue using the current approach of facilitated broad agreement to implement and update the AV IRWM Plan. However, several of the RWMG Members expressed a desire to form a more formal governance structure to implement the Plan over the next several years. The stakeholders understand that creating a new, more formal governance structure that will maintain the positive momentum the group has demonstrated during the past year until the year 2035 will likely require a few years.

Implementation of the high priority projects in the IRWM Plan is currently the responsibility of the individual lead agency with the jurisdictional authority to approve the project. The Stakeholders and RWMG have chosen these projects because they want to take action on them within the next two to three years, and they directly address the objectives and targets of better management of resources within the Antelope Valley Region. Furthermore, implementing the projects together yield greater benefits to the Region then if each agency implemented on their own.

The collection, management, distribution and use of data collected as part of this IRWM Planning effort, and through implementation, are essential to making this a sustainable effort that will benefit the Antelope Valley Region for years to come. Data regarding water quantity and quality are currently collected and distributed by a number of different agencies. The Stakeholders have identified strategies in this IRWM Plan to ensure quick identification of data gaps, avoiding duplicative (and costly) studies that result in the same information, and integrating with other important regional, statewide programs, and federal needs.

This IRWM Plan identifies performance measures that will be used to evaluate strategy performance, monitoring systems that will be used to gather actual performance data, and mechanisms to change these strategies if the data collected shows the Antelope Valley Region's IRWM planning targets are not being met. The Stakeholders also recognized that additional technical detail is needed for several of the IRWM Plan's performance measures to be properly implemented and measurable. The Stakeholder group has agreed to continue to refine these performance measures as the AV IRWM Plan is implemented.

This IRWM Plan is necessarily a Stakeholder-driven Plan. The RWMG invites the public and interested Stakeholders to become active participants in the Region's ongoing efforts to:

- Identify, evaluate, prioritize, and implement solutions to the Region's complex water management issues, challenges, and conflicts; and
- Continue the development and evolution of this Plan.

The San Gabriel Mountains provide a beautiful, natural backdrop to many Antelope Valley households.

CALIFORNIA WATER SERVICE COMPANY
LANDSCAPE GUIDELINES

The Water Conservation Landscape Guide is intended to apply to all Cal Water landscape projects. As Cal Water has been active in promoting water conserving landscaping to its customers, so should those same principles be adopted and applied within, to company projects involving landscape installations and renovations.

Although these guidelines will apply in most cases, some flexibility may be allowed to accommodate individual site constraints and changes in technology that are rapidly developing in the landscape industry.

Whether your landscape project is put out to bid or performed by district personnel, landscape designs should include the following considerations:

I. Design - Addresses site planning considerations, plant material selection, and earthwork/mounding as they impact water use on-site.

II. Soils - Specifies soil testing (if needed), preparation and amendment requirements to make the best use of the water delivered to the plant material. Soil preparation is an important element in assuring the success of drought-tolerant, low water use planting designs.

III. Irrigation Management - Addresses the key irrigation considerations which produce a design capable of delivering the amount of water appropriate to the plant materials in the most efficient way possible. In addition, this section addresses concerns relative to the long-term operation and maintenance of the irrigation systems by establishing long-term operational schedules.

WATER CONSERVATION LANDSCAPE GUIDELINES

I. DESIGN

a) Site Planning - Landscape planting is required for erosion control, fire clearance zones, screening, solar control, etc., as well as for design continuity and aesthetic enhancement of the individual site and its surrounding area. If feasible, the design may incorporate existing, established on-site plant material into the new design.

b) Plant Material Selection - Drought tolerant plant materials (xeriscape) should be provided in all projects. Plant materials shal1 he capable of healthy growth in their specific location and capable of producing the desired effect. Plant materials should be grouped by water needs for maximum irrigation efficiency. Little or no turf should be included in the design. If turf is included, a drought tolerant species should be considered.

c) Earthwork - Lawn should be discouraged on bermed areas. Terracing of large mounds or slope areas should be reviewed as a design possibility to reduce irrigation water runoff.

II. SOILS

a) A determination of soil type, depth, and uniformity present on-site should be made at which time soil amendment consistent with findings should be addressed. Decomposed organic matter or polymer water retention products should be incorporated in the soil to improve water infiltration and retention on all sites.

b) Two or three inches of organic mulch should be added on top of non-turf planted areas to reduce evaporation, moderate soil temperatures, and discourage weeds. Sheet plastic and other non-porous materials should not be placed under the mulch.

WATER CONSERVATION LANDSCAPE GUIDELINES (cont)

III. IRRIGATION MANAGEMENT

a) All irrigation systems should be designed to avoid runoff, low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, or structures.

b) The design of the irrigation system should take into account the soil's water holding capacity to determine appropriate water application rates, timing, and quantities.

c) All landscaped areas should be serviced by an automatic irrigation system operated by a multiple programmable controller. Irrigation plans and specifications should include watering schedules for each zone area and valve system based on the actual needs of the plant material and the zone climatic conditions. Schedules should call for early morning watering.

d) The irrigation design should utilize separate valve systems for high water use and low water use areas and sprinkler headtypes (spray heads, bubblers, drip emitters, etc.) capable of emitting the amount of water appropriate to the plant material zone.

e) Adjustments in watering schedules should be made for the establishment of new plant materials, maintenance of plant material after the initial establishment period, and weather changes.

f) Irrigation plans should include provisions for the long-term maintenance of the systems including periodic inspection to assure long-term water use efficiency.

CALIFORNIA WATER SERVICE COMPANY

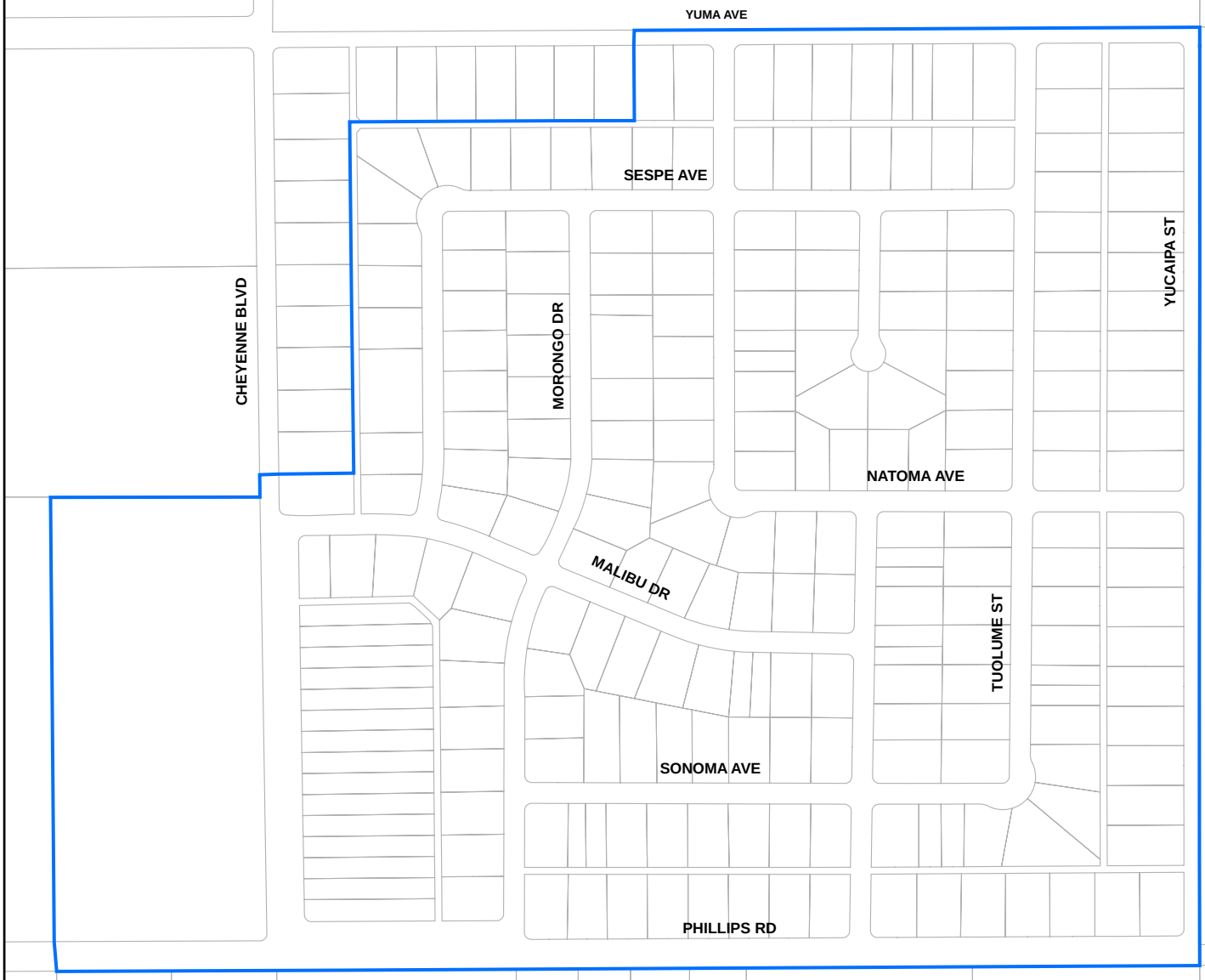
1720 North First Street, San Jose, CA 95112

(408) 367 - 8200

Revised Cal. P.U.C. Sheet No. .

Cancelling Revised Cal. P.U.C. Sheet No. .

NOTE :
This map may not be considered by the Public Utilities Commission of the State of California as a final conclusive determination or establishment of the dedicated area of service or any other portion thereof.



PENDING CPUC APPROVAL

Legend
- Service Area
- Parcels

N W E S

SERVICE AREA MAP
FOR
ANTELOPE VALLEY DISTRICT
FREMONT VALLEY SYSTEM
Updated On : May 2011

DWG. NO. DistName- DWG#

(To be inserted by Utility)

Advice Letter No. : .

Decision No. : .

Issued By

Thomas F. Smegal
NAME

Vice President of Rates
TITLE

(To be inserted by Cal. P.U.C.)

Date Filed : .

Effective : .

Resolution No. :

CALIFORNIA WATER SERVICE COMPANY

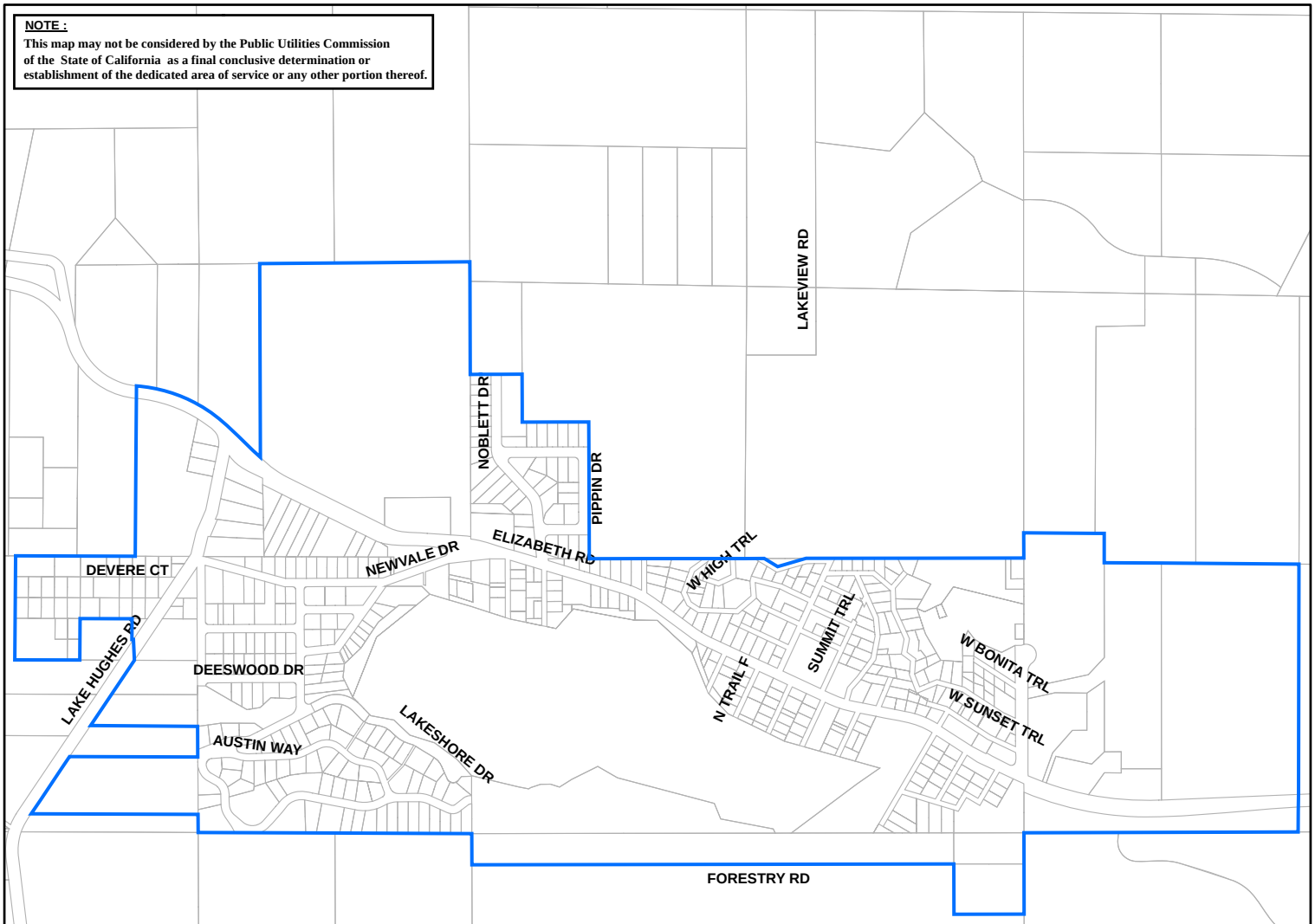
1720 North First Street, San Jose, CA 95112

(408) 367 - 8200

Revised Cal. P.U.C. Sheet No. .

Cancelling Revised Cal. P.U.C. Sheet No. .

NOTE :
This map may not be considered by the Public Utilities Commission of the State of California as a final conclusive determination or establishment of the dedicated area of service or any other portion thereof.



PENDING CPUC APPROVAL

Legend
- Service Area
- Parcels

N W E S

SERVICE AREA MAP

FOR
ANTELOPE VALLEY DISTRICT
LAKE HUGHES SYSTEM
Updated On : May 2011

DWG. NO. DistName- DWG#

(To be inserted by Utility)

Advice Letter No. : .

Decision No. : .

Issued By

Thomas F. Smegal
NAME

Vice President of Rates
TITLE

(To be inserted by Cal. P.U.C.)

Date Filed : .

Effective : .

Resolution No. :

CALIFORNIA WATER SERVICE COMPANY

1720 North First Street, San Jose, CA 95112

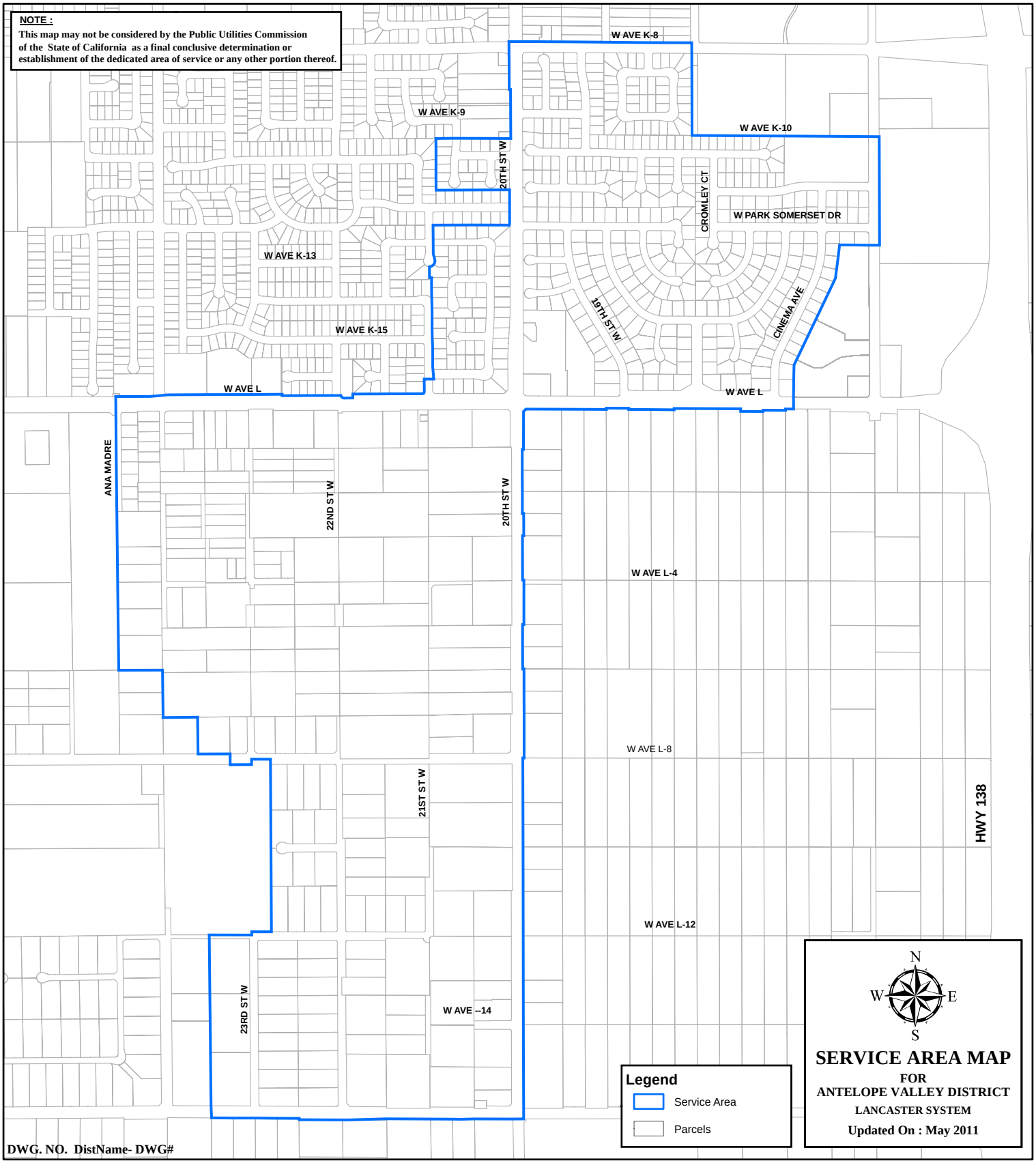
(408) 367 - 8200

Revised Cal. P.U.C. Sheet No. .

Cancelling Revised Cal. P.U.C. Sheet No. .

NOTE :

This map may not be considered by the Public Utilities Commission of the State of California as a final conclusive determination or establishment of the dedicated area of service or any other portion thereof.



SERVICE AREA MAP

FOR

ANTELOPE VALLEY DISTRICT

LANCASTER SYSTEM

Updated On : May 2011

DWG. NO. DistName- DWG#

(To be inserted by Utility)

Advice Letter No. : .

Decision No. : .

Issued By

Thomas F. Smegal

NAME

Vice President of Rates

TITLE

(To be inserted by Cal. P.U.C.)

Date Filed :

Effective :

Resolution No. :

PENDING CPUC APPROVAL

CALIFORNIA WATER SERVICE COMPANY

1720 North First Street, San Jose, CA 95112

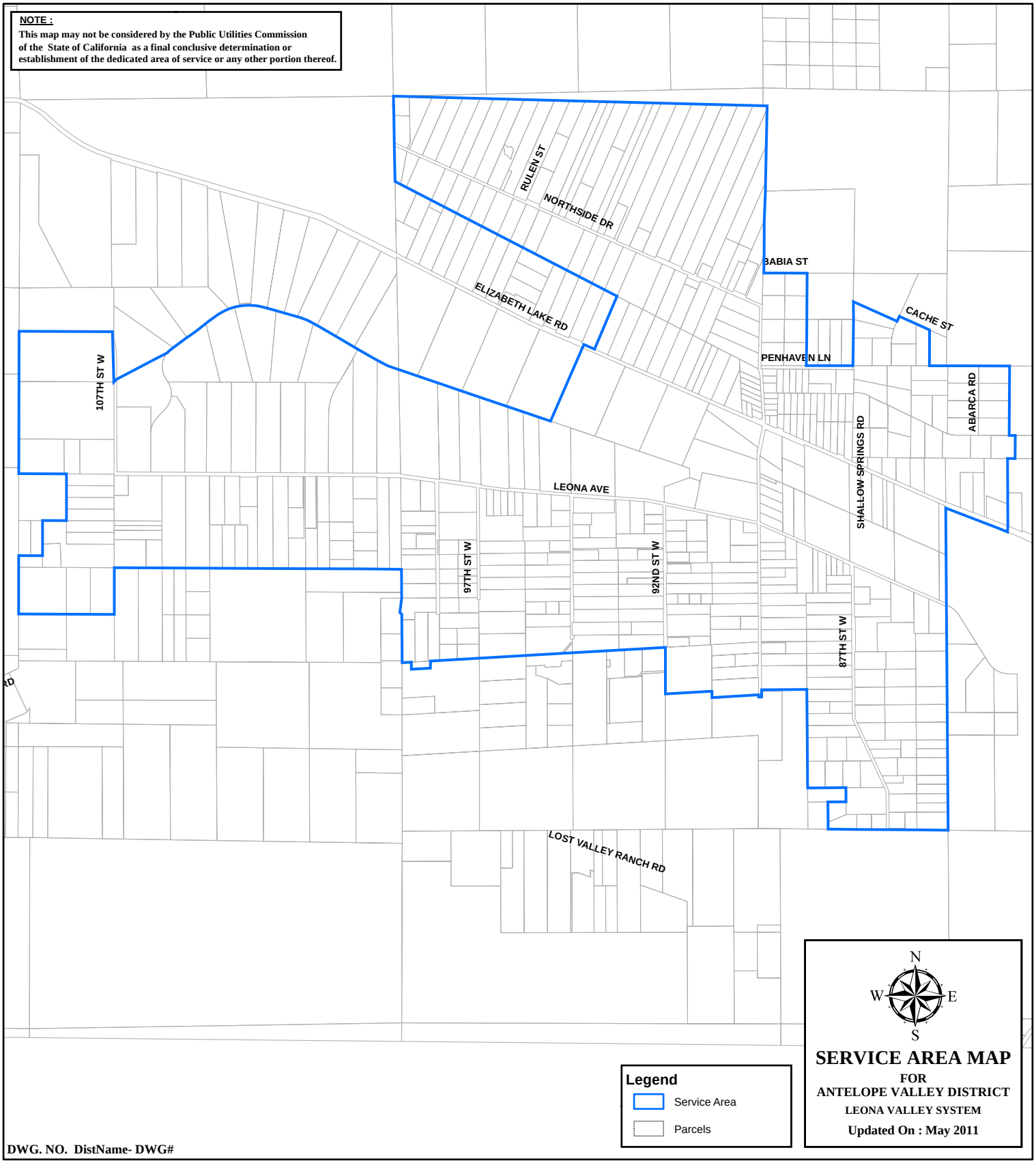
(408) 367 - 8200

Revised Cal. P.U.C. Sheet No. .

Cancelling Revised Cal. P.U.C. Sheet No. .

NOTE :

This map may not be considered by the Public Utilities Commission of the State of California as a final conclusive determination or establishment of the dedicated area of service or any other portion thereof.



SERVICE AREA MAP

FOR

ANTELOPE VALLEY DISTRICT

LEONA VALLEY SYSTEM

Updated On : May 2011

DWG. NO. DistName- DWG#

(To be inserted by Utility)

Advice Letter No. : .

Decision No. : .

Issued By

Thomas F. Smegal

NAME

Vice President of Rates

TITLE

(To be inserted by Cal. P.U.C.)

Date Filed : .

Effective : .

Resolution No. :

PENDING CPUC APPROVAL

Agenda
Public Meeting

California Water Service Company
Antelope Valley District

Urban Water Management Plan & Conservation Master Plan

June 2, 2011
5:00 to 7:00 pm

- Purpose of this Meeting
- Introduction of California Water Service Company Staff
- Presentation of the Urban Water Management Plan
- Presentation of the Conservation Master Plan
- Public Comments & Questions

Where to send comments - comments in writing will be accepted through June 15, 2011

Urban Water Management Plan to:

Thomas A. Salzano, Water Resource Planning Supervisor
California Water Service Company
1720 North First Street
San Jose, CA 95112-4598
tsalzano@calwater.com

Conservation Master Plan to:

Kenneth G. Jenkins, Conservation Manager
California Water Service Company
2632 West 237th Street
Torrance, CA 90505
Or by email at kjenkins@calwater.com

Antelope Valley District 2010 UWMP and SBx7-7 Target Method Joint Public Meeting

Name	Organization/Affiliation	Email Address	Telephone Number (optional)
John Seymour		Mrugly#1@aol.com	270-0339
Karl Pearcy		Weathertop@RPMWIN.com	-1629
TERRY ZINGER		tzinger@goldenstatelc.com	661-270-1379
Larry Tyler		tccprez@roadrunner.com	270-1070
CHRISTINE STODDARD		LVCHAT@earthlink.net	270-9260
Anne Breight		Breight1@aol.com	270-9015
Tom Sturgeon		10504 Elizabeth Lk Rd	270 1631
Maureen Sturgeon			
Glenda Gonzalez-Tunin		pilargandalus@yahoo.com	661-270-1281
Dahlia Grossman	Mountain Yodeler	dahlia.grossman@verizon.net	
Chris Whitley	CWS		
Tom Salzano	"		
Sue Cordone	"		
Dana Jacobson	"		
Ken Jenkins	"		

PROOF OF PUBLICATION

(2015.5 C.C.P.)

The space above for filing stamp only

STATE OF CALIFORNIA } ss

County of Los Angeles

NOTICE OF INTENT TO ADOPT

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer of the **Antelope Valley Press**, a newspaper of general circulation, printed and published **daily** in the **City of Palmdale**, County of Los Angeles, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Los Angeles, State of California, under date of October 24, 1931, Case Number 328601; Modified Case Number 657770 April 11, 1956; also operating as the Ledger-Gazette, adjudicated a legal newspaper June 15, 1927, by Superior Court decree No. 224545; also operating as the Desert Mailer News, formerly known as the South Antelope Valley Foothill News, adjudicated a newspaper of general circulation by the Superior Court of the County of Los Angeles, State of California on May 29, 1967, Case Number NOC564 and adjudicated a newspaper of general circulation for the **City of Lancaster,** State of California on January 26, 1990, Case Number NOC10714, Modified October 22, 1990; that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

April 29, May 6, 2011

I certify (or declare) under penalty of perjury that the fore-going is true and correct.

Signature

Dated: May 6, 2011
Executed at Palmdale, California

Valley Press
37404 SIERRA HWY., PALMDALE CA 93550
Telephone (661)267-4112/Fax (661)947-4870

NOTICE OF INTENT TO ADOPT
AN URBAN WATER MANAGEMENT PLAN
AND
HOLD A PUBLIC MEETING
TO
RECEIVE COMMENTS ON THE PROPOSED PLAN
CALIFORNIA WATER SERVICE COMPANY'S
ANTELOPE VALLEY DISTRICT

California Water Code, Part 2.6 Chapters 1 through 4 (Sections 10610 through 10656), are known and may be cited as the "Urban Water Management Planning Act."

These California Water Code sections require all urban water suppliers that provide water for municipal purposes either directly or indirectly to more than 3,000 customers or supply more than 3,000 acre-feet of water annually to prepare an Urban Water Management Plan as outlined and identified in those sections. This requirement applies to public and privately owned water utilities.

The plan must describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation, and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan must address measures for residential, commercial, governmental, and industrial water demand management.

The act requires urban water suppliers to update their Urban Water Management Plans at least once every five years, and to file updated plans with the Department of Water Resources, the California State Library, and any city or county served by the supplier no later than 30 days after adoption.

California Water Service Company (Cal Water) is an investor-owned public utility providing water service throughout California. In addition, Cal Water is regulated by the California Public Utilities Commission (CPUC).

One of Cal Water's service areas is the Antelope Valley District, which consists of four hydraulically separated water systems in unincorporated areas in Los Angeles and Kern Counties. The Antelope Valley District serves the communities, Lake Hughes, and Leona Valley, a portion of the City of Lancaster in Los Angeles County, and the community of Fremont Valley located in Kern County.

While the Antelope Valley District is not a defined urban water supplier, Cal Water is still preparing an update to its Urban Water Management Plan that will address the water service conditions in the Antelope Valley District. It is Cal Water's intent to adopt that plan and file that plan even though it is not required to do so, with the Department of Water Resources, the California State Library, and any city or county within which Cal Water provides service.

A key focus of this UWMP update is the conservation requirement set forth in Senate Bill 7 (SBx7-7) as passed in November 2009. SBx7-7 mandates a statewide 20% reduction in per capita urban water use by 2020. In order to quantify the objectives and identify the means of achieving this mandated demand reduction, Cal Water has prepared a Conservation Master Plan.

Cal Water is in the process of expanding current conservation programs and developing new programs for its 24 districts. Over the next five years, Cal Water conservation program expenditures are likely to increase, due in large measure to recently adopted state policies requiring future reductions in per capita urban water use. These state policies include SBx7-7, 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, as well as the *Memorandum of Understanding Regarding Urban Water Conservation in California* (MOU), of which Cal Water has been a signatory since 1991.

The Conservation Master Plan for the Antelope Valley District will be presented to the Cities, Counties and public served by Cal Water's Antelope Valley District in conjunction with the UWMP.

Schedule of upcoming actions:

On April 1, 2011, a copy of the Proposed Urban Water Management Plan and the Conservation Master Plan were made available for review during normal business hours at the Antelope Valley District's Customer Service Center, 5015 West Avenue L-14, Unit 2, Quartz Hill, CA 93536.

It is preferred that prior arrangements are made with the district's management for viewing the Proposed Urban Water Management Plan and/or the Conservation Master Plan. These arrangements can be made by calling (800) 680-1160.

As an alternative to reviewing the Proposed Urban Water Management Plan in Cal Water's Antelope Valley District Customer Service Center, Cal Water has placed an electronic copy of the Proposed Urban Water Management Plan on an FTP site, where the plan may be reviewed and/or downloaded.

The site can be accessed at http://calwater.ftptoday.com ;
The user name is **cwsftp10** and the password is **Tran5er**.
The UWMP will be available at this FTP site from April 1, 2011 through June 15, 2011.

If there are issues with accessing the electronic copy, you may contact Michael Bolzowski at the company's headquarters at 1720 North First Street, San Jose, California 95112-4598, by calling (408) 367-8200, or by email at mbolzowski@calwater.com.

A Public Meeting to receive comments on the Proposed Urban Water Management Plan and the Conservation Master Plan will be held on June 2, 2011, at 5:00 p.m. to 7:00 p.m., in The Leona Valley Community Center Building, located at 8367 Elizabeth Lake Road, Leona Valley, CA 93551.

If you are unable to attend the scheduled public meeting but want to provide comments regarding the proposed UWMP, you may send your comments in writing via mail or email to:
Thomas A. Salzano, Water Resource Planning Supervisor
California Water Service Company
1720 North First Street
San Jose, CA 95112-4598
tsalzano@calwater.com

Cal Water will receive comments on the proposed UWMP and the Conservation Master Plan from April 1, 2011 through June 15,

PAGE LEFT BLANK INTENTIONALLY

Monday, May 2, 2011 1:01 PM

Antelope Valley Press

Acct: 300577 **Name:** AV WATER CO/CALIFORN
1720 N FIRST STREET
Phone: 661-943-5331
Fax:
Reply:
SAN JOSE CA 95112

Your Sales Rep is: **Alison Adams** **@ 661-267-4112**

My Fax # is: **661-947-4870**

PayType: CC **Source:** EML **TFN:**
Rate: Z48 Legal Ope **Class:** 0990 Legals
Days: 2 **Rate Issues:** 2 **Start:** Fri, Apr 29, 2011
Stop: Fri, May 6, 2011

Editions WB/VP/

$0.00	**Words:**	951	**Price**	$1,654.40
$0.00	**Lines:**	125	**Discount**	$0.00
$0.00	**Depth:**	744.3	**Commissio**	$0.00
$0.00	**Columns:**	2	**Net Price**	$0.00
$0.00	**Graphics...**	1	**Tax**	$0.00
	St Words:	16	**Total**	$1,654.40

☑ **Boxed Ad**

Applied Credit $0.00

Copy Line NOTICEOFINTE
On Hold 0
Product Code
Sort String
PO # INTENTTOADO

Tear Sheets 0

NOTICE OF INTENT TO ADOPT
AN URBAN WATER MANAGEMENT PLAN
AND
HOLD A PUBLIC MEETING
TO
RECEIVE COMMENTS ON THE PROPOSED PLAN
CALIFORNIA WATER SERVICE COMPANY'S
ANTELOPE VALLEY DISTRICT

California Water Code, Part 2.6 Chapters 1 through 4 (Sections 10610 through 10656), are known and may be cited as the "Urban Water Management Planning Act."
These California Water Code sections require all urban water suppliers that provide water for municipal purposes either directly or indirectly to more than 3,000 customers or supply more than 3,000 acre-feet of water annually to prepare an Urban Water Management Plan as outlined and identified in those sections. This requirement applies to public and privately owned water utilities.
The plan must describe and evaluate sources of supply; reasonable and practical efficient uses, reclamation, and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan must address measures for residential, commercial, governmental, and industrial water demand management.
The act requires urban water suppliers to update their Urban Water Management Plans at least once every five years, and to file updated plans with the Department of Water Resources, the California State Library, and any city or county served by the supplier no later than 30 days after adoption.
California Water Service Company (Cal Water) is an investor-owned public utility providing water service throughout California. In addition, Cal Water is regulated by the California Public Utilities Commission (CPUC).
One of Cal Water's service areas is the Antelope Valley District, which consists of four hydraulically separated water systems in unincorporated areas in Los Angeles and Kern Counties. The Antelope Valley District serves the communities, Lake Hughes, and Leona Valley, a portion of the City of Lancaster in Los Angeles County, and the community of Fremont Valley located in Kern County.
While the Antelope Valley District is not a defined urban water supplier, Cal Water is still preparing an update to its Urban Water Management Plan that will address the water service conditions in the Antelope Valley District. It is Cal Water's intent to adopt that plan and file that plan even though it is not required to do so, with the Department of Water Resources, the California State Library, and any city or county within which Cal Water provides service.
A key focus of this UWMP update is the conservation requirement set forth in Senate Bill 7 (SBx7-7) as passed in November 2009. SBx7-7 mandates a statewide 20% reduction in per capita urban water use by 2020. In order to quantify the objectives and identify the means of achieving this mandated demand reduction, Cal Water has prepared a Conservation Master Plan.
Cal Water is in the process of expanding current conservation programs and developing new programs for its 24 districts. Over the next five years, Cal Water conservation program expenditures are likely to increase, due in large measure to recently adopted state policies requiring future reductions in per capita urban water use. These state policies include SBx7-7, 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, as well as the *Memorandum of Understanding Regarding Urban Water Conservation in California* (MOU), of which Cal Water has been a signatory since 1991.
The Conservation Master Plan for the Antelope Valley District will be presented to the Cities, Counties and public served by Cal Water's Antelope Valley District in conjunction with the UWMP.
Schedule of upcoming actions:
On April 1, 2011, a copy of the Proposed Urban Water Management Plan and the Conservation Master Plan were made available for review during normal business hours at the Antelope Valley District's Customer Service Center, 5015 West Avenue L-14, Unit 2, Quartz Hill, CA 93536.
It is preferred that prior arrangements are made with the district's management for viewing the Proposed Urban Water Management Plan and/or the Conservation Master Plan. These arrangements can be made by calling (800) 680-1160.
As an alternative to reviewing the Proposed Urban Water Management Plan in Cal Water's Antelope Valley District Customer Service Center, Cal Water has placed an electronic copy of the Proposed Urban Water Management Plan on an FTP site, where the plan may be reviewed and/or downloaded.
The site can be accessed at http://calwater.ftptoday.com ;
The user name is **cwaftp10** and the password is **Tran5er.**
The UWMP will be available at this FTP site from April 1, 2011 through June 15, 2011.
If there are issues with accessing the electronic copy, you may contact Michael Bolzowski at the company's headquarters at 1720 North First Street, San Jose, California 95112-4598, by calling (408) 367-8200, or by email at mbolzowski@calwater.com.
A Public Meeting to receive comments on the Proposed Urban Water Management Plan and the Conservation Master Plan will be held on June 2, 2011, at 5:00 p.m. to 7:00 p.m., in The Leona Valley Community Center Building, located at 8367 Elizabeth Lake Road, Leona Valley, CA 93551.
If you are unable to attend the scheduled public meeting but want to provide comments regarding the proposed UWMP, you may send your comments in writing via mail or email to:
Thomas A. Salzano, Water Resource Planning Supervisor
California Water Service Company
1720 North First Street
San Jose, CA 95112-4598
tsalzano@calwater.com
Cal Water will receive comments on the proposed UWMP and the Conservation Master Plan from April 1, 2011 through June 15, 2011.
Comments regarding the Conservation Master Plan for Antelope Valley should be sent to:
Kenneth G. Jenkins, Conservation Manager
California Water Service Company
2632 West 237th Street
Torrance, CA 90505
kjenkins@calwater.com
Publish: 4/29, 5/6, 2011

Adid: **31124521 Ad shown is not actual print size**

PAGE LEFT BLANK INTENTIONALLY

ANTELOPE VALLEY-EAST KERN WATER AGENCY
AVEK
ESTABLISHED 1959

December 24, 1975

for filing

Antelope Valley Water Company
Post Office Box 9351
Long Beach, California 90810

Gentlemen:

Enclosed is your copy of executed Water Service Agreement between this agency and Antelope Valley Water Company.

Concerning the comments in your letter of December 18, 1975, we offer the following:

1. The Leona Valley Feeder was funded in the DAWN Project $71 million bond authorization on the basis of the engineers estimate for a facility terminating in the vicinity of 90th Street West and Elizabeth Lake Canyon Road.

2. Pursuant to Section 3 (a) of the Rules and Regulations For Distribution of Water you will have the opportunity to review and comment on the design of your service connection. Your approval is required before construction commences.

3. Article 12 of the Water Service Agreement refers to water quality as may be modified by treatment by the agency. The agency treatment plants will be operated under permit from the California Department of Health which will set the standards for the quality of the finished water supply. California standards are equal to, or greater than those of the Environmental Protection Agency.

4. Although you may accept the competence of the present Board of Directors and management of the agency, these people are subject to replacement in the future. Setting of water and tax rates, and the underlying fiscal rationale

554 WEST LANCASTER BOULEVARD • LANCASTER, CALIFORNIA 93534 • (805) 942-8439

may well become the subject of future debate for which agency customers will want full access to the records. On the otherside, an agency customer which may become delinquent in payments could plead poverty while arguing the public necessity to continue water service for the health and safety of the residents of their service area. The agency should have access to the records to verify the pleading of poverty. However, if both parties fulfill their responsibilities under the agreement there should be no need to exercise the provisions of this article.

We look forward to a mutually beneficial relationship through this agreement.

Very truly yours,

Wallace G. Spinarski

Wallace G. Spinarski
General Manager

WGS;bj

Attach:

WATER SERVICE AGREEMENT

BETWEEN

ANTELOPE VALLEY-EAST KERN WATER AGENCY

AND

ANTELOPE VALLEY WATER CO.

FOR WATER SERVICE

DATED December 18, 1975

TABLE OF CONTENTS

		Page
Witnesseth		1
Article 1.	Definitions	3
Article 2.	Term of Agreement	5
Article 3.	Relationship to Master Contract, and Application of Agency Law	6
Article 3a.	Water Rights	7
Article 4.	Delivery of Water	8
Article 5.	Water Service Connections	9
Article 6.	Water Delivery Schedules	10
Article 7.	Measurement	11
Article 8.	Limitations on Obligation of Agency to Furnish Water	12
Article 9.	Water Shortages	13
Article 10.	Curtailment of Delivery for Maintenance Purposes	14
Article 11.	Responsibilities for Delivery and Distribution of Water Beyond Water Service Connection(s)	15
Article 12.	Water Quality	16
Article 13.	Payments	17
Article 14.	Excess Lands	18
Article 15.	Default	19
Article 16.	Interest on Overdue Payments	20
Article 17.	Changes in Organization of Consumer	21
Article 18.	Remedies Not Exclusive	22

Table of Contents (continued)

Article 19.	Amendments	23
Article 20.	Opinions and Determinations	24
Article 21.	Waiver of Rights	25
Article 22.	Notices	26
Article 23.	Assignment	27
Article 24.	Inspection of Books and Records	28
Article 25.	Validation	29
Article 26.	Uniformity of Provisions	30

WATER SERVICE AGREEMENT

THIS AGREEMENT, made and entered into this 18th day of December 1975, by and between the Antelope Valley-East Kern Water Agency, established by Chapter 2146 of the 1959 Statutes of the State of California, hereinafter referred to as the "Agency" and Antelope Valley Water Co _____, hereinafter referred to as the "Consumer;"

W I T N E S S E T H :

WHEREAS, water is needed within the Agency to supplement existing water supplies and for new areas requiring water supplies; and

WHEREAS, groundwater supplies within the Agency are seriously depleted; and

WHEREAS, the Agency and the State of California entered into an agreement entitled "Water Supply Contract Between the State of California, Department of Water Resources, and Antelope Valley-East Kern Water Agency," dated September 20, 1962, as amended by Amendment No. 1, dated September 22, 1964; Amendment No. 2, dated August 24, 1965; Amendment No. 3, dated February 16, 1967; and Amendment No. 4, dated May 11, 1967, whereby the State of California will furnish a water supply to the Agency; and

WHEREAS, the Agency desires to make available under terms and conditions which, as far as practicable and consistent with the ultimate use of water made available pursuant to said Contract and Amendments, shall be fair and equitable; and

WHEREAS, the inhabitants and lands of the Consumer are in need of additional water for beneficial uses; and

WHEREAS, the Consumer desires to contract with the Agency for a water supply to be for the use and benefit of the Consumer, and for which Consumer will make payment to the Agency upon the terms and conditions hereinafter set forth:

NOW, THEREFORE, IT IS HEREBY MUTUALLY AGREED by and between the parties hereto as follows:

Article 1. Definitions

When used in this Agreement, the following terms shall have the meanings hereinafter set forth:

(a) "Agency" as used herein shall mean Antelope Valley-East Kern Water Agency.

(b) "Consumer" as used herein shall mean any public body, including the United States of America and the State of California, and any of their agencies and departments empowered to contract, counties, cities, districts, local agencies or political subdivisions of the State of California; corporations, public utility water companies, mutual water companies or persons; or any other entity or individual able to and which does execute a Water Service Agreement with the Agency for a water supply; but shall not include any party with whom the Agency may contract to deliver water for a term of years and under special provisions which require the joint use of facilities for the particular benefit of said party and the Agency.

(c) "Agreement" as used herein shall mean this agreement for water service between Agency and Consumer.

(d) "Master Contract" shall mean the contract entitled "Water Supply Contract between the State of California Department of Water Resources and the Antelope Valley-East Kern Water Agency," dated September 20, 1962, as amended by Amendment No. 1, dated September 22, 1964, Amendment No. 2, dated August 24, 1965, Amendment No. 3, dated February 16, 1967, and Amendment No. 4, dated May 11, 1967, and any revisions, amendments or supplements thereto hereafter made.

(e) "Agency Law" shall mean the Antelope Valley-East Kern Water Agency Law, Chapter 2146, Statutes of 1959 of the State of California, as

amended and as the same may be hereafter amended, supplemented, re-enacted, or codified.

(f) "Project Water" shall mean water made available to the Agency by the State of California pursuant to the terms of the Master Contract.

(g) "Treatment and Distribution System" means all fixed installations owned and operated by the Agency having the purpose of treatment, conveyance, control, measurement, spreading and delivery of water.

(h) "Rules and Regulations" means the Rules and Regulations for Distribution of Water, Antelope Valley-East Kern Water Agency, as they may be amended and supplemented from time to time by the Board of Directors of the Agency. The Rules and Regulations set forth the conditions under which water will be distributed to the Consumer.

(i) "Year" means the same as the term "Year" means in the Master Contract.

Article 2. Term of Agreement

This Agreement shall become effective on the date first above written and shall remain in effect during the period necessary to repay any bonds designed to finance the Agency's water system.

Article 3. Relationship to Master Contract, and Application of Agency Law

(a) Consumer acknowledges having read the Master Contract and having general familiarity with its terms and that Agency's ability to supply water is governed by said Master Contract and any subsequent modification and supplements thereof.

(b) Consumer also agrees that this Agreement and the rights and obligations of the parties hereunder shall be subject to the Agency Law as it now exists and as it may be hereafter amended or codified by the Legislature of the State of California.

Article 3a. Water Rights

Because it may be necessary that consumer maintain and operate his own wells to provide for his own system peak demands and as an emergency reserve water supply, it is advisable that consumer retain and protect his rights to groundwater.

In the event there is an adjudication of the groundwater basin or any of its sub-units, the Agency will assist the Consumers, if the latter so desire, in retaining their rights in the groundwater supply.

Those Consumers who wish the assistance of the Agency, in the event there is an adjudication of the groundwater basin or any of its sub-units, shall submit evidence of the amount of water pumped from each individual well during at least the preceding five-year period and longer if the information is available. This information may be submitted to the Agency at the time of execution of this Agreement or to the State Water Resources Control Board. The Consumer shall also keep continuous records of the amount of water pumped from each individual well for each year following execution of this Agreement. Each year the Consumer may file this information in writing with the Agency, or with the State Water Resources Control Board.

Agency agrees that in the event of such an adjudication as is mentioned in this Article, the evidence of groundwater use of the basin by the Consumers as may have been filed with the Agency will be presented to the Court or other reviewing officer in aid of the Consumers' retention of their rights in the groundwater supply.

This section is not intended in any way to relieve Consumer of any rights or responsibilities it may have under the Recordation Act of 1955 (Water Code, Sec. 4999, et seq.).

Article 4. Delivery of Water

Agency will deliver water to Consumer through the Agency's treatment and distribution system at water service connections. Water delivered pursuant to this Agreement will be delivered to Consumer in accordance with the conditions and procedures set forth in the Rules and Regulations. Consumer shall make application for water delivery turn-ons and shut-offs in accordance with the procedures set forth in the Rules and Regulations. Consumer agrees to be bound by such Rules and Regulations insofar as the same pertain to the subject matter of this Agreement and by any subsequent amendments or supplements thereof that may be adopted by the Board of Directors of the Agency hereafter from time to time. Agency agrees that amendments or supplements to said Rules and Regulations shall not be made without providing Consumer at least 45 days prior written notice of each such proposed amendment or supplement and of the meeting of the Board at which such amendment or supplement is to be acted upon by said Board.

Despite the foregoing provisions and other terms and conditions contained in other Articles of this Agreement, it is understood and acknowledged that Agency's obligations to deliver water pursuant to this Agreement is conditioned upon its being able to provide a water distribution system with which Consumer can be served and that if Agency is unable to provide such a water system, neither it nor its officers, directors or agents shall have any liability to provide water to Consumer nor be subject to any claims, demands or causes of actions on such account.

Article 5. Water Service Connection(s)

Consumer shall make application to Agency for water service connections through which all or a portion of the water to be delivered pursuant to this Agreement shall be delivered to Consumer. Consumer agrees to pay any and all costs incurred by Agency for the design, construction, inspection, operation and maintenance of water service connection(s) serving Consumer. Application and payment for water service connections shall be in accordance with the procedures set forth in the Rules and Regulations. After the same have been constructed, Agency shall own the water service connections and all appurtenances and facilities a part thereof and related thereto. The water service connection, appurtenances and facilities do not include any portion of consumer's water delivery system designed, constructed, acquired or otherwise owned, operated and maintained by Consumer.

Article 6. Water Delivery Schedules

On or before August 1 of each year, Consumer shall submit in writing to the Agency its requested water deliveries by month from each water service connection for the succeeding five years. All requests shall be submitted in the manner set forth in the Rules and Regulations. All water orders, emergency turnoff, and any other request by Consumer which may alter the requested water delivery schedule shall be reported to Agency so that Agency can revise its delivery schedule with the State pursuant to the Master Contract. Because of the fact that the Agency anticipates being in a position to first deliver water in 1972, a Schedule 1 is attached hereto and hereby made a part hereof by reference whereby Consumer indicates its requested water deliveries by month from each water service connection for the succeeding five-year period, such requests, if this contract is dated before 1972, being shown as zero for each of the months involved prior to 1972. If the contract is entered into after the Agency is in a position to deliver water then the requested water deliveries will reflect Consumer's anticipated water requirements for the entire five-year period. Consumer agrees to take from the Agency when the latter is in a position to deliver water to Consumer, the water requested for the first year of service, and the Agency agrees to deliver such water to the Consumer, subject to the other provisions contained in this Agreement and to the Agency's Rules and Regulations.

Article 7. Measurement

All water furnished pursuant to this Agreement shall be measured by the Agency at each water service connection established pursuant to Article 5 hereof with equipment satisfactory to the Agency. Said equipment shall be installed, owned, operated and maintained by the Agency. All determinations relative to the measuring of water shall be made by the Agency and upon request by the Consumer, the accuracy of such measurement shall be investigated by the Agency in the manner set forth in the Rules and Regulations. Any error appearing therein will be adjusted pursuant to conditions set forth in the Rules and Regulations. The Agency will install, or cause to be installed, backflow prevention devices in connection with such measuring devices to prevent water delivered to the Consumer or other consumers from returning to the Agency's treatment and distribution system.

Article 8. Limitations on Obligation of Agency to Furnish Water.

(a) Notwithstanding any provisions of this Agreement to the contrary, the obligation of the Agency to furnish water hereunder shall be limited to the times and to the extent that water and facilities necessary for furnishing the same are available to the Agency pursuant to the Master Contract with the State of California.

(b) The Agency shall not be liable for the failure to perform any portion of this Agreement to the extent that such failure is caused by the failure of the State of California to perform any obligation imposed on the State of California by the Master Contract; provided, however, that the Agency shall diligently and promptly pursue all rights and remedies available to it to enforce the rights of the Agency, the Consumer and other consumers against the State of California under the Master Contract relative to such failure to perform.

Article 9. Water Shortages

(a) No Liability for Shortages.

Neither the Agency, nor any of its officers, agents or employees, shall be liable for any damage, direct or indirect, arising from any shortages which may occur from time to time in the amount of water to be made available for delivery to the Consumer pursuant to the Master Contract or any other cause beyond the control of the Agency.

(b) Allocation of Water in Times of Shortage.

The Agency reserves the right in the event that at any time the quantity of water available to the Agency pursuant to the Master Contract is less than the aggregate of the requests of all consumers to allocate the quantity of water available to the Agency to the extent permitted by law.

Article 10. Curtailment of Delivery for Maintenance Purposes

The Agency may temporarily discontinue or reduce the amount of water to be furnished to the Consumer for purposes of maintaining, repairing, replacing and investigating or inspecting, any of the facilities necessary for the furnishing of such water to the Consumer. Insofar as it is feasible the Agency will give the Consumer due notice in advance of any such temporary discontinuance or reduction, except in the case of emergency, in which case no notice need be given. In the event of such discontinuance or reduction, the Agency will make available upon resumption of service, as nearly as may be feasible, and to the extent water is available to it, the quantity of water which would have been available to the Consumer in the absence of such discontinuance or reduction.

Article 11. Responsibilities for Delivery and Distribution of Water Beyond Water Service Connection(s)

After such water has passed the Water Service Connection(s) established in accordance with Article 5, neither the Agency nor its officers, agents, or employees shall be liable for the control, carriage, handling, use, disposal, distribution or changes occurring in the quality of such water supplied to the Consumer or for claim of damages of any nature whatsoever, including but not limited to property damage, personal injury or death, arising out of or connected with the control, carriage, handling, use, disposal, distribution or changes occurring in the quality of such water beyond said Water Service Connection; and the Consumer shall indemnify and hold harmless the Agency and its officers, agents, and employees from any such damages or claims of damages, and including reasonable attorneys' fees incurred as against the unsuccessful party in defending against any claims or actions for damages on such account.

Article 12. Water Quality

The quality of water delivered by the Agency to the Consumer pursuant to this Agreement shall depend upon the quality of the water furnished to the Agency under the Master Contract, except as the same may be modified by the Agency's local treatment of water. The Agency undertakes no responsibility to Consumer to furnish water pursuant to this Agreement of any particular quality except as may result from the above-mentioned source of supply and any treatment provided by the Agency.

Article 13. Payments

Payment of all charges shall be made at the rates, times and in the manner provided for in the "Rules and Regulations for Distribution of Water, Antelope Valley-East Kern Water Agency," as the same may be amended and supplemented from time to time by the Board of Directors of the Agency. On or before July 1st of each year, the Agency shall adopt by resolution of the Board of Directors the water rate in dollars per acre-foot which will be charged for water to be delivered inthe next succeeding year. At this time, the Agency shall make available to the Consumers the estimated water rates in dollars per acre-foot to be charged for water to be delivered in the second and third succeeding years.

Article 14. Excess Lands

The provisions of Article 30 of the Master contract to the extent applicable shall be binding upon Consumer, and Consumer agrees to obtain and furnish to the Agency such certifications and information as are required to be furnished by the Agency to the State of California by said Article 30.

Article 15. Default

In the event of default by the Consumer in payment to the Agency of any money required to be paid hereunder and pursuant to the Rules and Regulations, the Agency may in its discretion, and in accordance with the Rules and Regulations, suspend delivery of water to the Consumer during the period that the latter is delinquent in its payments.

Article 16. Interest on Overdue Payments.

Upon each charge to be paid by the Consumer to the Agency pursuant to this Agreement which shall remain unpaid after the same shall have become due and payable, interest shall accrue at the rate of one-half of one percent (1/2%) per month of the amount of such delinquent payment from and after the date when the same becomes due until paid, and the Consumer hereby agrees to pay such interest. In no event shall such interest be compounded.

Article 17. Changes in Organization of Consumer

The Consumer will furnish the Agency with maps showing the territorial limits of the Consumer and the service area or areas of its water distribution system. Throughout the term of this Agreement, the Consumer will promptly notify the Agency of any changes, either by inclusion or exclusion, in said territorial limits and service area or areas. Consumer agrees to conform to the requirement of Article 15 (a) of the Master Contract that any water wholly or partly delivered by the Agency to Consumer will not be delivered outside of the territorial boundaries of the Agency without written consent having first been obtained.

Article 18. Remedies Not Exclusive

Remedies provided in this Agreement for enforcement of its terms are intended and shall be construed as cumulative rather than exclusive and shall not be deemed to deprive the party using the same from also using any other remedies provided by this Agreement or by law.

Article 19. Amendments

This Agreement may be amended or supplemented at any time by mutual written agreement of the parties in any manner that may be consistent with the applicable law. In amending or supplementing this Agreement, however, the Agency will bear in mind that substantial uniformity of Agreements between the various Consumers of the Agency is thought to be desirable as to the main contracting concepts and principles that are to be used and therefore will attempt to maintain uniformity between the various Consumers' Agreements in such respects.

Article 20. Opinions and Determinations

Where the terms of this Agreement provide for action to be based upon opinion, judgment, approval, review, or determination of either party hereto, such terms are not intended to be and shall never be construed as permitting such opinion, judgment, approval, review, or determination to be arbitrary, capricious, or unreasonable. In the event legal action is brought to enforce or determine the rights of either party under this agreement, the prevailing party in such action shall be entitled to court costs and reasonable attorney's fees.

Article 21. Waiver of Rights

Any waiver at any time by either party hereto of its rights with respect to a breach or default, or any other matter arising in connection with this Agreement shall not be deemed to be a waiver with respect to any other breach, default or matter.

Article 22. Notices

All notices that are required either expressly or by implication to be given by any party to the other under this Agreement shall be signed for the Agency and for the Consumer by such officers and persons as they may, from time to time, authorize in writing to so act. All such notices shall be deemed to have been given and delivered if delivered personally or if enclosed in a properly addressed envelope and deposited in a United States Post Office for delivery by registered or certified mail. Unless and until formally notified otherwise, all notices shall be addressed to the parties at their addresses as shown on the signature page of this Agreement.

Article 23. Assignment

The provisions of this Agreement shall apply to and bind the successors and assigns of the respective parties, but no assignment or transfer of this Agreement, nor any part hereof nor interest herein by the Consumer shall be valid until and unless approved by the Agency, except an assignment to an affiliate of the Consumer, or to a party or parties, which by merger, consolidation, dissolution, purchase or otherwise, shall succeed to substantially all of the assets and business of the Consumer. Affiliate, as used herein, shall mean a corporation that directly or indirectly, through one or more intermediaries, controls, or is controlled by, or is under common control with, the assigning party.

Article 24. Inspection of Books and Records

The proper officers or agents of the Consumer shall have full and free access at all reasonable times to the account books and official records of the Agency insofar as the same pertain to the matters and things provided for in this Agreement, with the right at any time during office hours to make copies thereof at the Consumer's expense, and the proper representatives of the Agency and designated personnel and agents shall have similar rights in respect to the account books and records of the Consumer.

Article 25. Validation

At any time after the execution of this Agreement, either party may if it so desires submit this Agreement to a Court of competent jurisdiction for a determination of its validity, and whichever party elects to follow such a procedure the other party agrees to cooperate therein to any extent that may be necessary or advisable and that shall be requested by the plaintiff. The plaintiff shall bear the costs and attorneys' fees incurred in such a proceeding.

Article 26. Uniformity of Provisions

It is intended by the parties that this Agreement shall be uniform as to form and content as between the Agency and the various Consumers entering into this Agreement with the Agency and for this reason any subsequent amendments and supplements hereof that may be entered into that will substantially affect the interests of Agency's Consumers generally in the Agency's opinion shall as provided in Article 19 hereof be made available to all Consumers entering into this Agreement with the Agency on an equal basis.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the date first above written.

Approved as to Form and Sufficiency

By: _____
Attorney for Agency

ATTEST:

By: _____
Secretary
Antelope Valley-East Kern Water Agency

ANTELOPE VALLEY-EAST KERN WATER AGENCY
554 West Lancaster Boulevard
Lancaster, California 93534
(805) 942-8439

By: _____
President

Approved as to Form and Sufficiency

By: _____
Attorney for Consumer

Antelope Valley Water Co.
21718 South Alameda Street
Post Office Box 9351
Long Beach, California 90810

ATTEST:

By: _____
Secretary

By: _____
President

ANTELOPE VALLEY - EAST KERN WATER AGENCY

SCHEDULE NO. 1

REQUESTED 5-YEAR WATER DELIVERY
for

_____ _____
(Name of Consumer) (Service Connection)

(Acre-Feet per Month) Sheet _____ of _____

	~~1971~~	~~1972~~	~~1973~~	~~1974~~	~~1975~~
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					
TOTAL					

Submitted by _____ _____ _____
(Name) (Title) (Date)

FOR AGENCY USE

APPROVED: (Initial Year Only)

_____ As submitted above
_____ As amended above

_____ _____
(General Manager) (Date)

CALIFORNIA WATER SERVICE COMPANY
1720 NORTH FIRST STREET • SAN JOSE, CA 95112-4598
(408) 367-8200

June 24, 2011

Mr. Peter Brostrom
California Department of Water Resources
Water Use Efficiency Unit
P.O. Box 942836
Sacramento, CA 94236

Dear Mr. Brostrom:

This letter serves as notice that California Water Service Company (Cal Water) has formally adopted the Adopted Urban Water Management Plan (UWMP) for the Antelope Valley District. Cal Water's Board of Director's resolution on September 28, 2005 (included) delegated authority to approve the Urban Water Management Plan to, among others, the Vice President of Engineering and Water Quality. I have approved the attached Plan, which was developed by staff under my supervision in accordance with the Urban Water Management Planning Act contained in California Water Code 6, Part 2.6. If you have any questions regarding this Plan please contact Mr. Thomas A. Salzano by telephone at (408) 367-8340 or by email at tsalzano@calwater.com.

Sincerely,

Michael J. Rossi
Vice President, Engineering and Water Quality
California Water Service Company
1720 North First Street
San Jose, CA 95112

PAGE LEFT BLANK INTENTIONALLY

CALIFORNIA WATER SERVICE COMPANY

RESOLVED, that this Board of Directors delegates its authority to approve Urban Water Management Plans as required under the Urban Water Management Planning Act contained in California Water Code 6, Part 2.6 to the President and Chief Executive Officer, any Vice President, the Corporate Secretary and any Assistant Secretary of California Water Service Company.

--oOo--

I, DAN L. STOCKTON, Corporate Secretary of California Water Service Company, a California corporation, do hereby certify that the foregoing is a full, true and correct copy of certain resolution adopted by the Board of Directors of said corporation at a regular meeting of said Board duly called and held September 28, 2005, at which a quorum was present, that all Directors present voted in favor of said resolution, and that said resolution has never been annulled or revoked but is still in full force and effect.

IN WITNESS WHEREOF, I have hereunto signed my name this 7th day of September, 2005.

Dan L. Stockton
Corporate Secretary

CALIFORNIA PUBLIC UTILITIES COMMISSION

Water Division

INSTRUCTIONS FOR WATER CONSERVATION, RATIONING AND SERVICE CONNECTION MORATORIA

Standard Practice U-40-W

Launch Internet Explorer Browser.lnk

SAN FRANCISCO, CALIFORNIA

July 2007

Doc. Mgmt. #106683
v.2
Issued July 2007
Revising July 2004

INSTRUCTIONS FOR WATER CONSERVATION,
RATIONING AND SERVICE CONNECTION MORATORIA

A—PURPOSE AND SCOPE

1. The purpose of this standard practice is to provide guidance to Water Division staff, to the public and to utilities as to steps to be taken when the utility suffers from a water shortage. The three levels of action are voluntary rationing, mandatory rationing and a service connection moratorium.

B—BACKGROUND

2. General Order 103, Chart 1, and Standard Practice U-22-W, Determination of Water Supply Requirements of Water Systems, address water supply requirements, but supply can be affected temporarily due to drought or decreased production of a utility's wells. When this happens, utilities may have to resort to mandatory conservation or may have to institute a service connection moratorium.

3. Parties may also protest service area extensions (see Standard Practice U-14-W) over concern that the available supplies may be inadequate to serve the new customers, which would be the equivalent of a service connection moratorium (see Section F)[1].

4. The position of the Commission in overall water supply planning was set forth in Decision 99-04-061, April 22, 1999 (see Appendix A to this Standard Practice).

C—DEVELOPMENT OF CONSERVATION AND RATIONING

5. In mid-1976, due to a drought, the Commission opened an Order Instituting Investigation (OII, Case No. 10114, June 8, 1976) to determine what actions to take. In early 1977, the Commission issued an emergency decision that allowed water utilities to distribute water conservation kits and to implement cost effective water conservation programs.

6. The Commission was once again faced with drought conditions in mid-1988. The Commission opened OII 89-03-005 that allowed all classes of water utilities to file a water conservation and rationing plan consisting of two distinct parts: Rule 14.1 (a "voluntary conservation" program) and Schedule 14.1 (the mandatory rationing and penalty part). This plan was based primarily upon the Department of Water Resources and Metropolitan Water District's model plans, but also

[1] In Resolution No. 4154, August 5, 1999, the Sierra Club protested Valencia Water Company's Advice Letters 84 and 85 for service area extension. The Commission found in the favor of Valencia, that it had adequate supplies, but ordered the utility to file its Water Management Program by application so the long-term water availability issues could be heard.

incorporated aspects of the North Marin Water District, East Bay Municipal Utility District, and California Water Service Company's existing conservation and rationing plans. The main objective of Rule 14.1 and Schedule 14.1 was to have a plan readily available for any utility that needed conservation and/or rationing methods. This plan allowed regulated utilities to achieve conservation of 17.5% to 26%.

7. The drought was officially declared over in February 1993 and the OII was closed. Because history shows that drought occurs in California about once every ten years, Rule 14.1 has remained in place. When conditions become severe, the utility may file an advice letter to institute Schedule 14.1. The Commission must approve implementation of this schedule by resolution.

D—VOLUNTARY RATIONING

8. Voluntary rationing consists of the steps described in Rule 14.1 (Appendix B). This Tariff Rule should be in the tariff book of every utility that might suffer from a water shortage.

E—MANDATORY RATIONING

9. Mandatory rationing consists of the steps described in Schedule 14.1. The utility adds schedule 14.1 to its tariff book by filing an advice letter with full justification. Staff will prepare a resolution for consideration by the Commission. The Commission must approve the imposition of mandatory conservation.

10. Schedule 14.1 may be modified to fit the needs of the utility and its particular water shortage situation. The following provisions are examples of what might be included in a typical Schedule 14.1:

A. Prohibit nonessential and unauthorized water use, including:
   i. use for more than minimal landscaping in connection with new construction;
   ii. use through any meter when the company has notified the customer in writing to repair a broken or defective plumbing, sprinkler, watering or irrigation system and the customer has failed to effect such repairs within five days;
   iii. use of water which results in flooding or runoff in gutters or streets;
   iv. use of water through a hose for washing cars, buses, boats, trailers or other vehicles without a positive automatic shut-off valve on the outlet end of the hose;
   v. use of water through a hose for washing buildings, structures, sidewalks, walkways, driveways, patios, parking lots, tennis courts, or other hard-surfaced areas;
   vi. use of water to clean, fill or maintain levels in decorative fountains;

vii. use of water for construction purposes unless no other source of water or other method can be used;
viii. service of water by any restaurant except upon the request of a patron; and
ix. use of water to flush hydrants, except where required for public health or safety.

B. Establish customer water allocations at a percentage of historical usage with the corresponding billing periods of a non-drought year being the base.

C. Establish an allocation of a percentage of historical usage with the corresponding billing periods of a non-drought year being the base for consumption for users of process water (water used to manufacture, alter, convert, clean, grow, heat or cool a product, including water used in laundries and car wash facilities that recycle the water used).

D. Establish a minimum allocation of a number of Ccf per month (one Ccf is one hundred cubic feet) for any customer regardless of historical usage.

E. Establish an exceptions procedure for customers with no prior billing period record or where unusual circumstances dictate a change in allocation.

F. Establish a penalty ("conservation fee") of $2.00 per Ccf for usage over allocated amounts, provided, however, that banking of underusage from month to month is allowed.

G. Provide that penalty funds are not to be accounted for as income, but are to be kept in a separate reserve account for disposition as directed by the Commission.

H. Provide that, after written warning for nonessential or unauthorized water use, for subsequent violations the utility may install a flow restrictor to be left in a minimum of three days. The second time a flow restrictor is installed it may be left in until rationing ends.

I. Establish charges of $25, $50, or actual cost depending on meter size for removing restrictors, and provide that continuing nonessential or unauthorized use may result in disconnection.

J. Establish an appeal procedure first through the utility, then to the Commission staff through the Executive Director, then to the Commission via a formal complaint.

F—SERVICE CONNECTION MORATORIUM

11. A service connection moratorium is sometimes imposed by the California Department of Health Services. The California Water Code, Section 350 et seq.,

provides that any public water supplier may, after public notice and hearing, declare a water shortage emergency within its service area whenever it determines that the ordinary demands and requirements of its consumers cannot be satisfied without depleting the water supply to the extent that there would be insufficient water for human consumption, sanitation, and fire protection. After it has declared a water shortage emergency, it must adopt such regulations and restrictions on water delivery and consumption as it finds will conserve its water supply for the greatest public benefit. Section 357 requires that suppliers which are subject to regulation by the CPUC shall secure its approval before making such regulations and restrictions effective.

12. Section 2708 of the Public Utilities Code states:

> **2708**. Whenever the commission, after a hearing had upon its own motion or upon complaint, finds that any water company which is a public utility operating within this State has reached the limit of its capacity to supply water and that no further consumers of water can be supplied from the system of such utility without injuriously withdrawing the supply wholly or in part from those who have theretofore been supplied by the corporation, the commission may order and require that no such corporation shall furnish water to any new or additional consumers until the order is vacated or modified by the commission. The commission, after hearing upon its own motion or upon complaint, may also require any such water company to allow additional consumers to be served when it appears that service to additional consumers will not injuriously withdraw the supply wholly or in part from those who theretofore had been supplied by such public utility.

13. To establish a service connection moratorium the utility must:

a. Hold a public meeting under Section 350 and 351 of the Water Code
b. Add the following language to each service schedule:

> "MORATORIUM
> No service shall be provided to any premises not previously served within the _____ Service Area as defined on the Service Area Map filed as a part of these tariffs."

G—EXEMPTIONS

14. Some decisions to impose a moratorium contain exceptions. For example in Citizen's Utilities (CUCC) Montara District:

> "The moratorium shall not apply to owners of real property who are customers of CUCC on or before the date of this order, or their successors in interest, if any change in the use of their property

will not increase their demand upon the system." (D.86-05-078, Ordering Paragraph 3.)

15. D.86-05-078 also provided that prospective customers could seek an exemption from the moratorium by filing an application with the Commission showing that extraordinary circumstances required an exemption.

16. In D.00-06-020, June 8, 2000 the Commission granted an application and authorized Citizens Utilities to install a water service connection to applicant's property at APN 037-278-090 following cessation of service at applicant's property at 888 Ocean Boulevard in Montara. Costs were to be borne by applicant. The order made it clear that water service could not be reinstated at 888 Ocean Boulevard absent a lifting or easing of the moratorium. Such determinations were also delegated to staff[2].

[2] D.86-05-078, May 28, 1986, Ordering Paragraph 4.

The Commission's Role in Water Planning

The two state agencies primarily responsible for overseeing water planning are the California Department of Water Resources, which is manages the State Water Project and produces the California Water Plan, and the State Water Quality Control Board and Regional Water Quality Control Boards which have authority over water allocation and water quality protection.

In addition to the state agencies which have broad planning and management powers, local government also has a part in water use decisions. For example, county boards of supervisors, county water agencies, land use planning agencies, city governments, municipal water districts and many special districts all have a role in the use of water in California.

In this context, the Commission has recognized the futility of one party taking unilateral action to protect a groundwater basin:

> Rehabilitation of the Santa Maria Groundwater Basin is not the responsibility of, and is beyond the physical and financial resources of any single individual, company, or agency. Even if [Southern California Water Company] were to stop drawing from the basin entirely and injected into the basin the entire 7,900 AFY it desires to obtain from the [Central Coast Water Authority], the basin's fundamental problems of declining quantity and water quality would not be solved. Most simply put, the basin's salvation as a water resource requires the immediate, undivided, sincere and selfless attention of all its users.

(Re Southern California Water Company, 48 CPUC2d 511, 519 (D.93-03-066)(emphasis in original).)

The Commission's role is limited to ensuring that each jurisdictional water utility provides its customers with "just and reasonable service, . . . and facilities as are necessary to promote the safety, health, comfort and convenience of its patrons, employees, and the public." (§ 451.) The Commission has further delineated the service standard in its General Order 103 where it proscribes Standards of Service

including water quality, water supply, and water pressure, as well as many other details of service.

The Commission has not, however, dictated to investor-owned utilities what method of obtaining water must be used to meet its present and future responsibility of providing safe and adequate supply of water at reasonable rates. (Southern California Water, 48 CPUC2d at 517.)

Which is not to suggest that the Commission ignores issues of water availability in its regulation of water utilities. The Commission requires that all water utilities prepare, file, and update a water management plan which includes identification of water sources as well as consumption projections over 15 years. These plans are updated by the utility as part of its general rate case.

RULE N0. 14.1
WATER CONSERVATION AND RATIONING PLAN

GENERAL INFORMATION

If water supplies are projected to be insufficient to meet normal customer demand, and are beyond the control of the utility, the utility may elect to implement voluntary conservation using the portion of this plan set forth in Section A of this Rule after notifying the Commission's Water Division of its intent. If, in the opinion of the utility, more stringent water measures are required, the utility shall request Commission authorization to implement the mandatory conservation and rationing measures set forth in Section B.

The Commission shall authorize mandatory conservation and rationing by approving Schedule No. 14.1, Mandatory Water Conservation and Rationing. When Schedule No. 14.1 has expired, or is not in effect, mandatory conservation and rationing measures will not be in force. Schedule No. 14.1 will set forth water use violation fines, charges for removal of flow restrictors, and the period during which mandatory conservation and rationing measures will be in effect.

When Schedule No. 14.1 is in effect and the utility determines that water supplies are again sufficient to meet normal demands, and mandatory conservation and rationing measures are no longer necessary, the utility shall seek Commission approval to rescind Schedule No. 14.1 to discontinue rationing.

In the event of a water supply shortage requiring a voluntary or mandatory program, the utility shall make available to its customers water conservation kits as required by Rule 20. The utility shall notify all customers of the availability of conservation kits.

(continued)

RULE N0. 14.1
(continued)

WATER CONSERVATION AND RATIONING PLAN

A. CONSERVATION - NON-ESSENTIAL OR UNAUTHORIZED WATER USE

No customer shall use utility-supplied water for non-essential or unauthorized uses as defined below:

1. Use of water through any connection when the utility has notified the customer in writing to repair a broken or defective plumbing, sprinkler, watering or irrigation system and the customer has failed to make such repairs within 5 days after receipt of such notice.

2. Use of water which results in flooding or run-off in gutters, waterways, patios, driveway, or streets.

3. Use of water for washing aircraft, cars, buses, boats, trailers or other vehicles without a positive shut-off nozzle on the outlet end of the hose. Exceptions include washing vehicles at commercial or fleet vehicle washing facilities operated at fixed locations where equipment using water is properly maintained to avoid wasteful use.

4. Use of water through a hose for washing buildings, structures, sidewalks, walkways, driveways, patios, parking lots, tennis courts, or other hard-surfaced areas in a manner which results in excessive run-off or waste.

5. Use of water for watering streets with trucks, except for initial wash-down for construction purposes (if street sweeping is not feasible), or to protect the health and safety of the public.

6. Use of water for construction purposes, such as consolidation of backfill, dust control, or other uses unless no other source of water or other method can be used.

7. Use of water for more than minimal landscaping in connection with any new construction.

(continued)

RULE N0. 14.1
(continued)

WATER CONSERVATION AND RATIONING PLAN

A. CONSERVATION – NON-ESSENTIAL OR UNAUTHORIZED WATER USE (CONT.)

8. Use of water for outside plants, lawn, landscape, and turf areas more often than every other day, with even numbered addresses watering on even numbered days of the month and odd numbered addresses watering on the odd numbered days of the month, except that this provision shall not apply to commercial nurseries, golf courses and other water-dependent industries.

9. Use of water for watering outside plants, lawn, landscape and turf areas during certain hours if and when specified in Schedule No. 14.1 when the schedule is in effect.

10. Use of water for watering outside plants and turf areas using a hand-held hose without a positive shut-off valve.

11. Use of water for decorative fountains or the filling or topping off of decorative lakes or ponds. Exceptions are made for those decorative fountains, lakes, or ponds which utilize recycled water.

12. Use of water for the filling or refilling of swimming pools.

13. Service of water by any restaurant except upon the request of the patron.

B. RATIONING OF WATER USAGE

In the event the conservation measures required by Section A are insufficient to control the water shortage, the utility shall, upon Commission approval, imposed mandatory conservation and rationing. Rationing shall be in accordance with the conditions set forth in Schedule No. 14.1 as filed at the time such rationing is approved by the Commission.

Before mandatory conservation and rationing is authorized by the Commission, the utility shall hold public meetings and takes all other applicable steps required by Sections 350 through 358 of the California Water Code.

(continued)

RULE N0. 14.1
(continued)

WATER CONSERVATION AND RATIONING PLAN

C. ENFORCEMENT OF MANDATORY CONSERVATION AND RATIONING

1. The water use restrictions of the conservation program, in Section A of this rule, become mandatory when the rationing program goes into effect. In the event a customer is observed to be using water for any nonessential or unauthorized use as defined in Section A of this rule, the utility may charge a water use violation fine in accordance with Schedule No. 14.1.

2. The utility may, after one verbal and one written warning, install a flow-restricting device on the service line of any customer observed by utility personnel to be using water for any non-essential or unauthorized use as defined in Section A above.

3. A flow restrictor shall not restrict water delivery by greater than 50% of normal flow and shall provide the premise with a minimum of 6 Ccf/month. The restricting device may be removed only by the utility, only after a three-day period has elapsed, and only upon payment of the appropriate removal charge as set forth in Schedule No. 14.1.

4. After the removal of the restricting device, if any non-essential or unauthorized use of water shall continue, the utility may install another flow-restricting device. This device shall remain in place until water supply conditions warrant its removal and until the appropriate charge for removal has been paid to the utility.

5. If, despite installation of such flow-restricting device pursuant to the provisions of the previous enforcement conditions, any such non-essential or unauthorized use of water shall continue, then the utility may discontinue water service to such customer. In such latter event, a charge as provided in Rule No. 11 shall be paid to the utility as a condition to restoration of service.

6. Any monies collected by the utility through water use violation fines shall not be accounted for as income, but shall be accumulated by the utility in a separate account for disposition as directed or authorized from time to time by the Commission.

7. The charge for removal of a flow-restricting device shall be in accordance with Schedule No. 14.1.

(continued)

RULE N0. 14.1
(continued)

WATER CONSERVATION AND RATIONING PLAN

D. APPEAL PROCEDURE

Any customer who seeks a variance from any of the provisions of this water conservation and rationing plan shall notify the utility in writing, explaining in detail the reason for such a variation. The utility shall respond to each such request.

Any customer not satisfied with the utility's response may file an appeal with the staff of the Commission. The customer and the utility will be notified of the disposition of such appeal by letter from the Executive Director of the Commission.

If the customer disagrees with such disposition, the customer shall have the right to file a formal complaint with the Commission. Except as set forth in this Section, no person shall have any right or claim in law or in equity, against the utility because of, or as a result of, any matter or thing done or threatened to be done pursuant to the provisions of this water conservation and rationing plan.

E. PUBLICITY

In the event the utility finds it necessary to implement this plan, it shall notify customers and hold public hearings concerning the water supply situation, in accordance with Chapter 3, Water Shortage Emergencies, Sections 350 to 358, of the California Water Code. The utility shall also provide each customer with a copy of this plan by means of billing inserts or special mailings; notification shall take place prior to imposing any fines associated with this plan. In addition, the utility shall provide customers with periodic updates regarding its water supply status and the results of customers' conservation efforts. Updates may be by bill insert, special mailing, poster, flyer, newspaper, television or radio spot/advertisement, community bulletin board, or other appropriate methods.

SCHEDULE NO. 14.1
MANDATORY WATER CONSERVATION AND RATIONING

APPLICABILITY

This schedule applies to all water customers served under all tariff rates schedules authorized by the Commission. It is only effective in times of rationing, as required by Rule No. 14.1, and only for the period noted in the Special Conditions section below.

TERRITORY

This schedule is applicable within the entire territory served by the utility.

WATER USE VIOLATION FINE

When this schedule is in effect, the water use restrictions of the conservation program, in Section A of Rule 14.1, become mandatory. If a customer is seen violating the water usage restrictions, as outlined in Rule No. 14.1 and the Special Conditions below, the customer will be subject to the following fine structure:

First offense - written warning	
Second offense - (of the same restriction)	$25
Third offense - (of the same restriction)	$50
Each additional offense - (of the same restriction)	$25 more than the previous fine imposed.

Offenses for separate water use restrictions will each start at the warning stage.

The water use violation fine is in addition to the regular rate schedule charges.

(continued)

SCHEDULE NO. 14.1
MANDATORY WATER CONSERVATION AND RATIONING (CONT.)

FLOW RESTRICTOR REMOVAL CHARGE

The charge for removal of a flow-restricting device shall be:

Connection Size	Removal Charges
5/8" to 1"	$25.00
1-1/2" to 2"	$50.00
3" and larger	Actual cost

SPECIAL CONDITIONS

1. This tariff schedule shall remain in effect for period of six (6) months from the effective date set forth below.

2. There shall be no use of utility-supplied water for outside plants, lawn, landscape, and turf areas between the hours of 3:00 a.m. to 8:00 p.m., regardless of address or day of the month.

3. Water use violation fines may be applied to violations of Section A of Rule No. 14.1, which prohibits non-essential and unauthorized uses of water.

4. Water use violation fines must be separately identified on each bill.

5. All bills are subject to the reimbursement fee set forth on Schedule No. UF.

PAGE LEFT BLANK INTENTIONALLY

Chapter 8.48 - WASTE OF WATER

Sections:

8.48.010 - Waste of water prohibited.
8.48.020 - Definitions.
8.48.030 - Prohibited acts.
8.48.040 - Public nuisance.
8.48.050 - Presumption.
8.48.060 - Variance.
8.48.070 - Severability.

8.48.010 - Waste of water prohibited.

Waste of water or excessive and unauthorized use of water in the city is hereby prohibited and declared unlawful.

(Ord. 905 § 1 (Exh. A (part)), 2008)

8.48.020 - Definitions.

As used in this chapter:

"Customer" means any person who is an owner, occupant, or user of real property to which water is supplied by a public water system. Customer shall also mean any person who uses water supplied by a public water system, or to any person who is billed for the supply of water from a public water system, or to any person who is responsible for or otherwise has the right or permission to utilize the supply of water provided by a public water system.

"Person" means any natural person, any group of persons, any firm, partnership, association, corporation, company, public agency or any other organization or entity.

"Public water system" means any network of pipes, conduits, wells, machinery, reservoirs, holding tanks, and any other components, including any combination thereof, which supplies water to customers who are charged a fee of any kind or nature for such service, or which is designed to supply or is capable of supplying water to customers for a fee at two or more dwellings, buildings, structures, or lots.

Public Water Utility. The term "public water utility" as herein used shall mean and embrace all corporations, companies, individuals, associations, their lessees, trustees or receivers, that now or may hereafter own, operate, or control any plant or equipment, or any part of a plant or equipment within the city for the production, delivery, or furnishing for or to other persons, firms, associations or corporations, partly or wholly, from an artesian well or wells, or imported water sources water for business, manufacturing, agricultural, domestic or household use.

"Recycled water" means highly treated effluent from any sewage treatment plant operated by a governmental or private entity.

"Water" means all water, including wastewater and recycled water, supplied to any customer who uses water.

"Water supply shortage" means durations of time when water supplies are not available to meet normal water demand as during periods of drought or natural disaster.

(Ord. 905 § 1 (Exh. A (part)), 2008)

8.48.030 - Prohibited acts.

Any one of the following acts shall constitute a waste of water, as the term is used in this chapter, and shall be prohibited at all times:

A. Permitting a hydrant, tap, cock, or valve connected with any water system belonging to any public utility, to leak into the ground or into any sink, bowl, toilet, or tub connected with a sewer or cesspool, or permitting water to drain from a person's premises into any street, alley, or road, after the person permitting the same has been notified to remedy such leak or to prevent such draining by any public officer, or an agent of any public utility, as hereinafter defined.

B. Permitting water from any water system belonging to any public utility to flow from any hose, tap, valve, hydrant, pipe, or cock directly into any gutter, storm water drain, sewer or cesspool for two minutes or longer without first putting such water to a beneficial use.

C. Permitting water to leak from any water main in a water system belonging to any public utility for an unreasonable length of time.

D. Allowing runoff into streets, gutters or other paved areas, from irrigating landscaped improvements, whether because of broken or misdirected sprinkler systems, to persist for more than two minutes total duration.

E. Irrigating lawns and/or landscaped improvements between ten (10) a.m. and ten (10) p.m. except from October 31st through the following March 1st.

F. Washing vehicles with a free running hose where the water is allowed to run into the street, gutter or storm water drain. Hoses that are fitted with operable on/off nozzles or washing vehicles solely using a bucket are permissible.

G. Washing, cleaning or hosing down buildings, driveways, patios, parking lots, sidewalks, alleys, etc., provided this subsection shall not prohibit the washing of windows.

H. Allowing water, at or as a result of its point of use, to pond deeper than one-quarter inch on any paved or unpaved surface. This section shall not apply to swimming pools, fountains or other similar decorative or recreational water features.

(Ord. 905 § 1 (Exh. A (part)), 2008)

8.48.040 - Public nuisance.

Any act that constitutes a waste of water in violation of this chapter shall constitute a public nuisance and shall be subject to abatement in the manner provided in Chapter 8.28.

(Ord. 905 § 1 (Exh. A (part)), 2008)

8.48.050 - Presumption.

In any prosecution charging a waste of water or excessive and unauthorized use of water as set forth in this chapter, the waste of water or excessive and unauthorized use of water, together with proof that such waste originated at any residence or place of business, shall constitute in evidence a prima facie presumption that the owner, or occupant for the time being of such residence or place of business, was responsible for such waste.

(Ord. 905 § 1 (Exh. A (part)), 2008)

8.48.060 - Variance.

Upon application of a property owner or occupant, the city manager may grant a variance to the provisions of this chapter.

(Ord. 905 § 1 (Exh. A (part)), 2008)

8.48.070 - Severability.

If any part or provision of this chapter is found to be invalid or unenforceable by a court of law, such invalidity shall not affect any other part or provision herein, and all remaining provisions of this chapter will be

valid and enforceable to the fullest extent permitted by law.

(Ord. 905 § 1 (Exh. A (part)), 2008)

Water Resources Planning Department

Water Supply / Demand Analysis and Projections for Antelope Valley District

2010

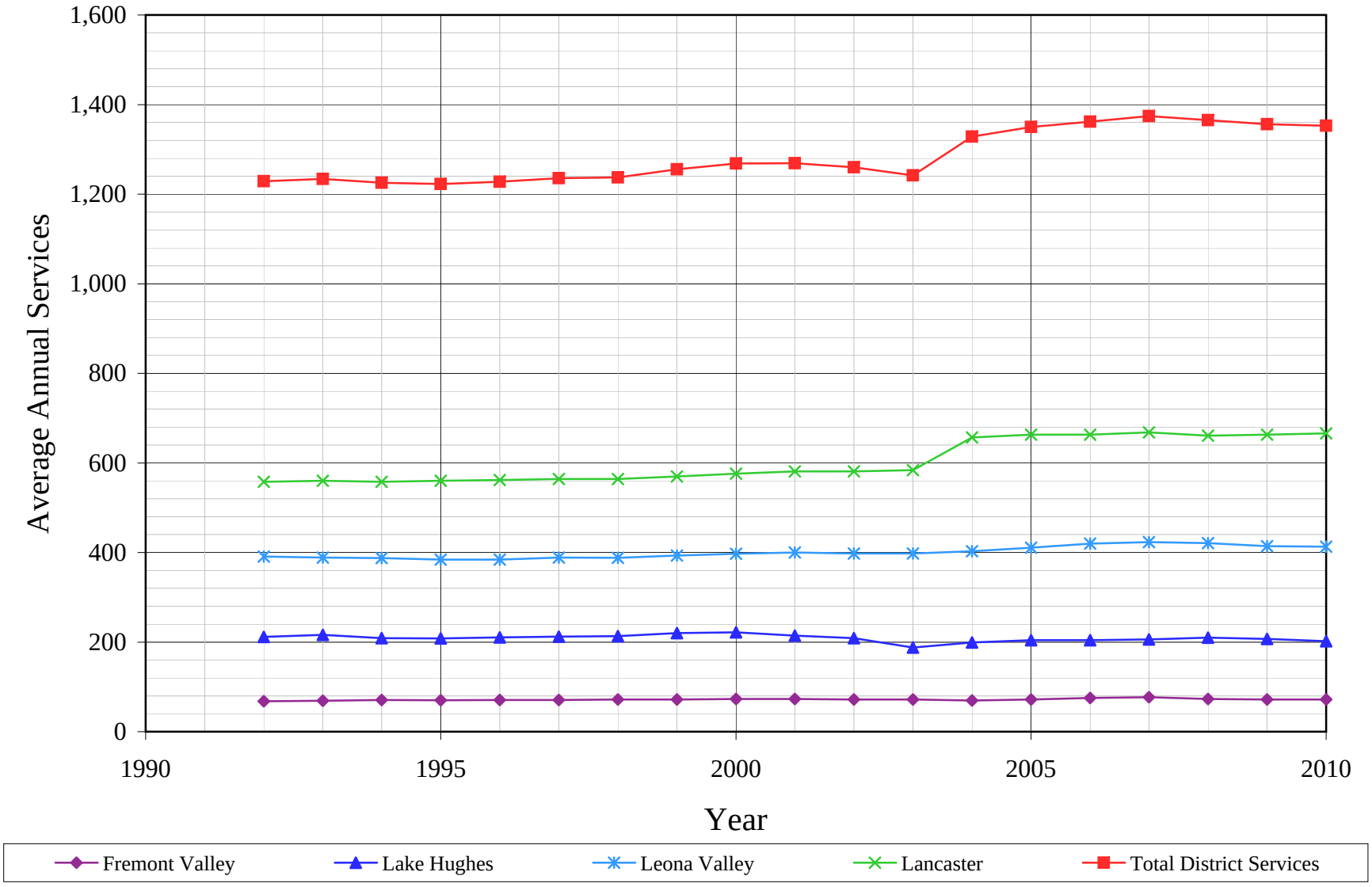
Table of Contents for Worksheets

Worksheet	Title
1	Annual Services
2	Service Growth Percentage
3	District Sales (ccf)
4	District Sales (AF)
5	Demand per Service (Gallons/Service/Year)
6	Demand per Service (Gallons per Day)
7	Percentage Change in Annual Demand
8	Percentage of Total Sales
9	Percentage of Total Demand
10	Demand Scenario 1 (Low Demand Projection)
11	Demand Scenario 2 (Average Demand Projection)
12	Demand Scenario 3 (High Demand Projection)
13	Demand Scenario 4 (Alternate Service Projection)
14	Not used
15	Actual & Projected Annual Average Services
16	Actual & Projected Demand in Acre-Feet
17	Projected Annual Supply by Source
18	Historical and Projected Average Day, Maximum Day, and Peak Demands
19	Population as of the 2000 Average Annual Services
20	Temperature & Rainfall History
21	Groundwater Facilities (if available)
22	Per Capita Water Demand Calculation
23	Indoor/Outdoor Water Usage
24	SB-7 Compliance Demand Worksheet

Antelope Valley District
Distribution of Services (2010)

Antelope Valley District

Historical Annual Services



California Water Service Company - Antelope Valley District

Worksheet 1

Water Supply and Demand Analysis and Projections

Annual Services

Year	Residential	Multi-Residential	Multi-Res. units	Commercial	Industrial	Government	Irrigation/ Recreation	Other	Total	Annual Change
1990										
1991										
1992	1,172	3		31	0	9	12	2	1,229	
1993	1,173	6		31	0	10	12	2	1,234	5
1994	1,169	11		32	0	10	3	2	1,226	-9
1995	1,166	11		31	0	10	3	1	1,223	-3
1996	1,172	10		32	0	10	3	1	1,228	5
1997	1,180	10		32	0	10	3	1	1,235	8
1998	1,183	9		31	0	10	3	1	1,237	2
1999	1,199	9		35	0	10	2	1	1,255	18
2000	1,211	10		32	0	12	2	1	1,268	13
2001	1,213	10		32	0	12	2	1	1,269	1
2002	1,206	7	10	33	0	12	1	1	1,260	-9
2003	1,186	6	17	38	0	11	0	1	1,242	-18
2004	1,269	6	17	39	0	12	0	2	1,328	87
2005	1,291	6	17	38	0	12	0	3	1,350	22
2006	1,305	6	17	37	0	11	0	3	1,362	12
2007	1,319	6	17	36	0	10	2	1	1,374	12
2008	1,308	6	17	37	0	13	0	1	1,365	-9
2009	1,298	6	17	38	0	14	0	0	1,356	-9
2010	1,297	5	0	37	0	14	0	0	1,353	-3
5 Yr Avg.	1,304	6	17	37	0	12	0	2	1,361	6
10 Yr Avg.	1,261	7	16	36	0	12	1	1	1,317	10

Five year average is from years 2005 through 2009.

Ten year average is from years 2000 through 2009.

California Water Service Company - Antelope Valley District

Worksheet 2

Water Supply and Demand Analysis and Projections

Service Growth Percentage

Year	Residential	Multi-Residential	Multi-Res. units	Commercial	Industrial	Government	Irrigation/ Recreation	Other	Total
1991									
1992									
1993	0.14%	83.33%		0.59%	0.00%	11.11%	0.00%	0.00%	0.44%
1994	-0.40%	87.70%		1.17%	0.00%	0.00%	-76.52%	-4.55%	-0.69%
1995	-0.23%	3.42%		-0.29%	0.00%	0.00%	6.45%	-38.10%	-0.24%
1996	0.49%	-9.09%		1.73%	0.00%	0.00%	0.00%	-15.38%	0.42%
1997	0.71%	-1.82%		-1.42%	0.00%	0.00%	0.00%	0.00%	0.63%
1998	0.26%	-12.04%		-0.58%	0.00%	0.00%	0.00%	0.00%	0.14%
1999	1.33%	2.11%		10.14%	0.00%	0.00%	-30.30%	0.00%	1.47%
2000	1.03%	8.25%		-6.05%	0.00%	20.00%	-4.35%	100.00%	1.03%
2001	0.12%	0.05%		-1.40%	0.00%	0.00%	-22.73%	0.00%	0.04%
2002	-0.57%	-26.70%		3.13%	0.00%	0.00%	-35.29%	0.00%	-0.71%
2003	-1.66%	-14.29%		15.15%	0.00%	-8.33%	-100.00%	0.00%	-1.43%
2004	7.05%	0.00%	0.00%	2.63%	0.00%	9.09%	0.00%	100.00%	6.97%
2005	1.71%	0.00%	0.00%	-2.56%	0.00%	0.00%	-	50.00%	1.63%
2006	1.08%	0.00%	0.00%	-2.63%	0.00%	-8.33%	0.00%	0.00%	0.89%
2007	1.07%	0.00%	0.00%	-2.70%	0.00%	-9.09%	0.00%	-66.67%	0.88%
2008	-0.83%	0.00%	0.00%	2.78%	0.00%	30.00%	0.00%	0.00%	-0.66%
2009	-0.76%	0.00%	0.00%	2.70%	0.00%	7.69%	0.00%	0.00%	-0.66%
2010	-0.08%	-16.67%	-100.00%	-2.63%	0.00%	0.00%	-	#DIV/0!	-0.22%
5 Yr. Avg.	0.45%	0.00%	0.00%	-0.48%	0.00%	4.05%	0.00%	-3.33%	0.42%
10 Yr. Avg.	0.82%	-3.27%	0.00%	1.11%	0.00%	4.10%	-18.04%	18.33%	0.80%

Five year average is from years 2005 through 2009. Ten year average is from years 2000 through 2009.

California Water Service Company - Antelope Valley District

Worksheet 3

Water Supply and Demand Analysis and Projections

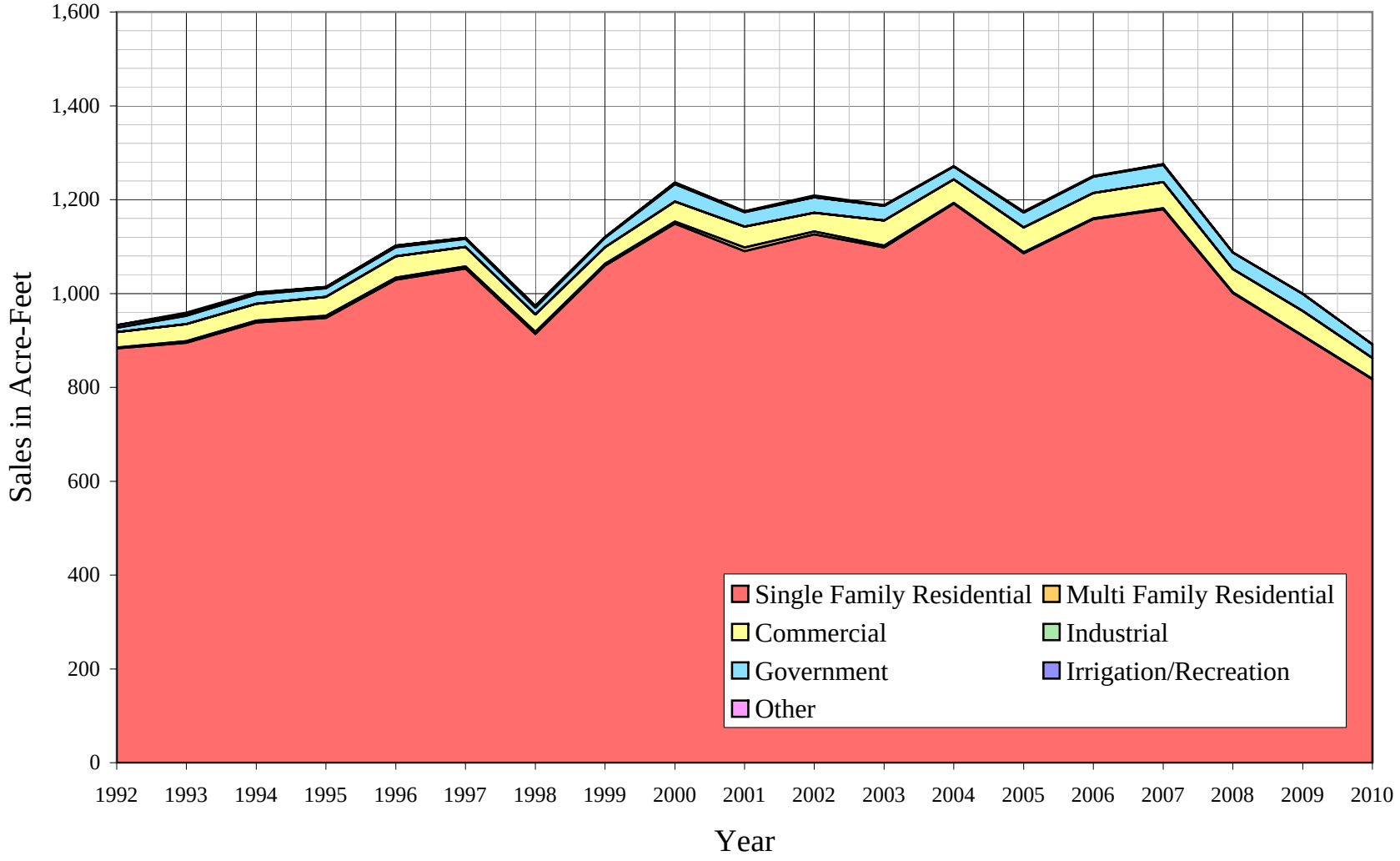
Sales (ccf)

Year	Residential	Multi-Residential	Commercial	Industrial	Government	Irrigation/Recreation	Other	Unaccounted Water	Total(ccf) Sales	Total(ccf) Demand	Total(kgal) Demand
1990											
1991											
1992	384,562	866	14,400	0	3,921	2,452	85	22,813	406,286	429,099	320,988
1993	389,772	1,565	15,835	0	7,660	1,947	1,101	26,406	417,880	444,286	332,349
1994	408,712	1,739	15,719	0	8,550	1,494	430	40,696	436,644	477,340	357,075
1995	413,005	1,997	17,522	0	7,884	1,180	86	38,879	441,674	480,553	359,479
1996	448,297	1,982	19,794	0	8,605	1,344	10	49,188	480,032	529,220	395,884
1997	458,693	2,126	17,943	0	7,538	988	71	49,518	487,359	536,877	401,612
1998	397,957	2,129	16,108	0	6,101	1,889	3	36,279	424,187	460,466	344,452
1999	461,449	1,677	15,428	0	8,777	622	30	39,901	487,983	527,884	394,885
2000	500,424	2,082	18,576	0	16,118	1,171	392	21,782	538,763	560,545	419,317
2001	474,767	3,591	19,230	0	13,378	759	309	30,087	512,034	542,121	405,535
2002	490,599	2,541	17,379	0	14,493	56	1726	15,089	526,794	541,883	405,357
2003	478,247	1,853	23,187	0	13,735	0	638	-1,378	517,660	516,282	386,206
2004	518,954	881	21,731	0	11,975	0	333	38,204	553,874	592,078	442,905
2005	472,976	991	22,894	0	13,996	0	958	57,998	511,815	569,813	426,250
2006	504,664	759	23,442	0	15,125	0	896	3,313	544,886	548,199	410,081
2007	513,835	903	24,277	0	15,870	810	65	13,521	555,760	569,281	425,852
2008	436,024	698	21,586	0	15,227	0	163	38,240	473,698	511,938	382,956
2009	396,163	468	22,833	0	15,821	0	216	9,432	435,501	444,933	332,833
2010	355,882	603	19,370		12,583		36	22,535	388,474	411,009	307,456
5 Yr. Avg.	464,732	764	23,006	0	15,208	162	460	24,501	504,332	528,833	395,594
10 Yr. Avg.	478,665	1,477	21,514	0	14,574	280	570	22,629	517,079	539,707	403,729

Five year average is from years 2005 through 2009.

Ten year average is from years 2000 through 2009.

Antelope Valley District
Historical Sales



California Water Service Company - Antelope Valley District

Worksheet 4

Water Supply and Demand Analysis and Projections

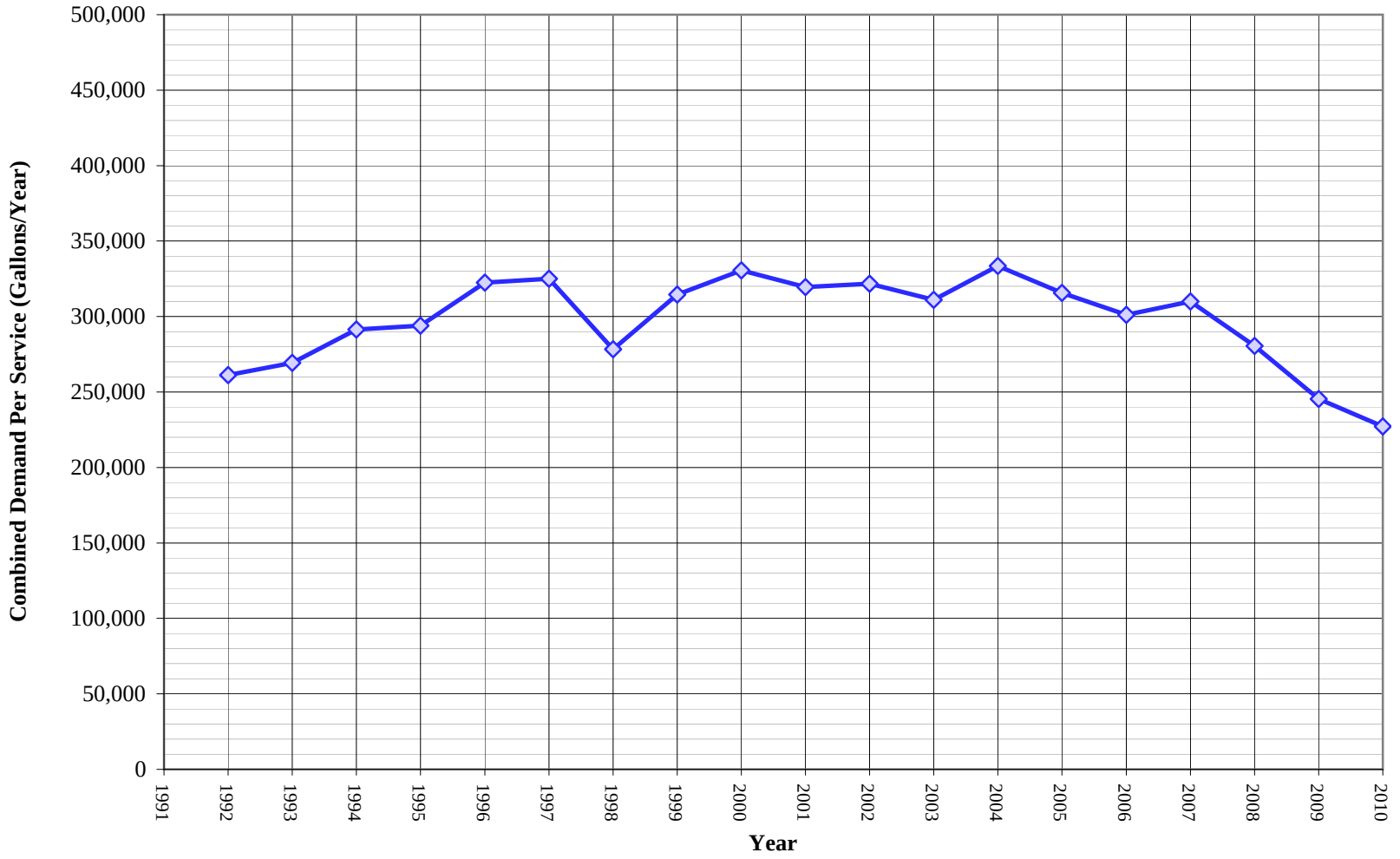
Sales (AF)

Year	Residential	Multi-Residential	Commercial	Industrial	Government	Irrigation/Recreation	Other	Unaccounted Water	Total(AF) Sales	Total(AF) Demand	Total(Mgal) Demand
1990											
1991											
1992	882.8	2.0	33.1	0.0	9.0	5.6	0.2	52.4	932.7	985.1	321.0
1993	894.8	3.6	36.4	0.0	17.6	4.5	2.5	60.6	959.3	1,019.9	332.3
1994	938.3	4.0	36.1	0.0	19.6	3.4	1.0	93.4	1,002.4	1,095.8	357.1
1995	948.1	4.6	40.2	0.0	18.1	2.7	0.2	89.3	1,013.9	1,103.2	359.5
1996	1,029.1	4.6	45.4	0.0	19.8	3.1	0.0	112.9	1,102.0	1,214.9	395.9
1997	1,053.0	4.9	41.2	0.0	17.3	2.3	0.2	113.7	1,118.8	1,232.5	401.6
1998	913.6	4.9	37.0	0.0	14.0	4.3	0.0	83.3	973.8	1,057.1	344.5
1999	1,059.3	3.8	35.4	0.0	20.1	1.4	0.1	91.6	1,120.3	1,211.9	394.9
2000	1,148.8	4.8	42.6	0.0	37.0	2.7	0.9	50.0	1,236.8	1,286.8	419.3
2001	1,089.9	8.2	44.1	0.0	30.7	1.7	0.7	69.1	1,175.5	1,244.5	405.5
2002	1,126.3	5.8	39.9	0.0	33.3	0.1	4.0	34.6	1,209.4	1,244.0	405.4
2003	1,097.9	4.3	53.2	0.0	31.5	0.0	1.5	-3.2	1,188.4	1,185.2	386.2
2004	1,191.4	2.0	49.9	0.0	27.5	0.0	0.8	87.7	1,271.5	1,359.2	442.9
2005	1,085.8	2.3	52.6	0.0	32.1	0.0	2.2	133.1	1,175.0	1,308.1	426.2
2006	1,158.5	1.7	53.8	0.0	34.7	0.0	2.1	7.6	1,250.9	1,258.5	410.1
2007	1,179.6	2.1	55.7	0.0	36.4	1.9	0.1	31.0	1,275.8	1,306.9	425.9
2008	1,001.0	1.6	49.6	0.0	35.0	0.0	0.4	87.8	1,087.5	1,175.2	383.0
2009	909.5	1.1	52.4	0.0	36.3	0.0	0.5	21.7	999.8	1,021.4	332.8
2010	817.0	1.4	44.5	0.0	28.9	0.0	0.1	51.7	891.8	943.5	307.5
5 Yr. Avg.	1,066.9	1.8	52.8	0.0	34.9	0.4	1.1	56.2	1,157.8	1,214.0	395.6
10 Yr. Avg.	1,098.9	3.4	49.4	0.0	33.5	0.6	1.3	51.9	1,187.0	1,239.0	403.7

Five year average is from years 2005 through 2009.

Ten year average is from years 2000 through 2009.

Antelope Valley District
Historical Demand Per Service



California Water Service Company - Antelope Valley District

Worksheet 5

Water Supply and Demand Analysis and Projections

Demand per Service (Gallons per Year)

Year	Residential	Multi-Residential (Service)	Multi-Residential (Unit)	Commercial	Industrial	Government	Irrigation/ Recreation	Total Other	Unaccounted/ Total Services	Combined Demand/Service
1980										
1981										
1982										
1983										
1984										
1985										
1986										
1987										
1988										
1989										
1990										
1991										
1992	245,530	209,587		347,482	0	325,901	152,852	31,792	13,888	261,236
1993	248,510	206,594		379,882	0	573,008	121,371	411,803	16,006	269,300
1994	261,619	122,303		372,752	0	639,584	396,564	168,490	24,840	291,360
1995	264,965	135,805		416,708	0	589,764	294,234	54,435	23,788	294,020
1996	286,201	148,264		462,717	0	643,699	335,127	7,481	29,970	322,453
1997	290,763	161,981		425,491	0	563,882	246,358	53,112	29,983	325,072
1998	251,603	184,407		384,191	0	456,387	471,023	2,244	21,936	278,417
1999	287,918	142,261		334,080	0	656,565	222,529	11,221	23,777	314,558
2000	309,049	163,161		428,162	0	1,004,759	437,984	293,236	12,848	330,621
2001	292,853	281,283		449,532	0	833,953	367,382	231,148	17,738	319,615
2002	304,368	271,543		393,951	0	903,460	41,891	1,291,138	8,960	321,774
2003	301,709	231,023	81,538	456,450	0	934,045	0	477,257	-830	311,016
2004	305,833	109,839	38,767	416,818	0	746,494	0	124,551	21,515	333,429
2005	274,059	123,553	43,607	450,682	0	872,478	0	238,878	32,137	315,741
2006	289,283	94,629	33,398	473,941	0	1,028,572	0	223,418	1,819	301,088
2007	291,414	112,582	39,735	504,457	0	1,187,159	302,961	0	7,361	309,936
2008	249,364	87,023	30,714	436,418	0	876,199	0	0	20,956	280,554
2009	228,313	58,348	20,593	449,481	0	845,352	0	0	5,203	245,452
2010	205,257	90,215		391,615	0	672,338	0	0	12,459	227,240
5 Yr. Avg.	266,487	95,227	33,610	462,996	0	961,952	60,592	92,459	13,496	290,554
10 Yr. Avg.	284,625	153,298	41,193	445,989	0	923,247	115,022	287,963	12,771	306,923

Five year average is from years 2005 through 2009. Ten year average is from years 2000 through 2009.

California Water Service Company - Antelope Valley District

Worksheet 6

Water Supply and Demand Analysis and Projections

Demand per Service (Gallons per Day)

Year	Residential	Multi-Residential (Service)	Multi-Residential (Unit)	Commercial	Industrial	Government	Irrigation/ Recreation	Total Other	Unaccounted/ Total Services	Combined Demand/Serv
1980										
1981										
1982										
1983										
1984										
1985										
1986										
1987										
1988										
1989										
1990										
1991										
1992	673	574	0	952	0	893	419	87	38	716
1993	681	566	0	1,041	0	1,570	333	1,128	44	738
1994	717	335	0	1,021	0	1,752	1,086	462	68	798
1995	726	372	0	1,142	0	1,616	806	149	65	806
1996	784	406	0	1,268	0	1,764	918	20	82	883
1997	797	444	0	1,166	0	1,545	675	146	82	891
1998	689	505	0	1,053	0	1,250	1,290	6	60	763
1999	789	390	0	915	0	1,799	610	31	65	862
2000	847	447	0	1,173	0	2,753	1,200	803	35	906
2001	802	771	0	1,232	0	2,285	1,007	633	49	876
2002	834	744	0	1,079	0	2,475	115	3,537	25	882
2003	827	633	223	1,251	0	2,559	0	1,308	-2	852
2004	838	301	106	1,142	0	2,045	0	341	59	914
2005	751	339	119	1,235	0	2,390	0	654	88	865
2006	793	259	92	1,298	0	2,818	0	612	5	825
2007	798	308	109	1,382	0	3,252	830	0	20	849
2008	683	238	84	1,196	0	2,401	0	0	57	769
2009	626	160	56	1,231	0	2,316	0	0	14	672
2010	562	247		1,073	0	1,842	0	0	34	623
5 Yr. Avg.	730	261	92	1,268	0	2,635	166	253	37	796
10 Yr. Avg.	780	420	79	1,222	0	2,529	315	789	35	841

Five year average is from years 2005 through 2009. Ten year average is from years 2000 through 2009.

California Water Service Company - Antelope Valley District

Worksheet 7

Water Supply and Demand Analysis and Projections

Percentage Change in Annual Demand

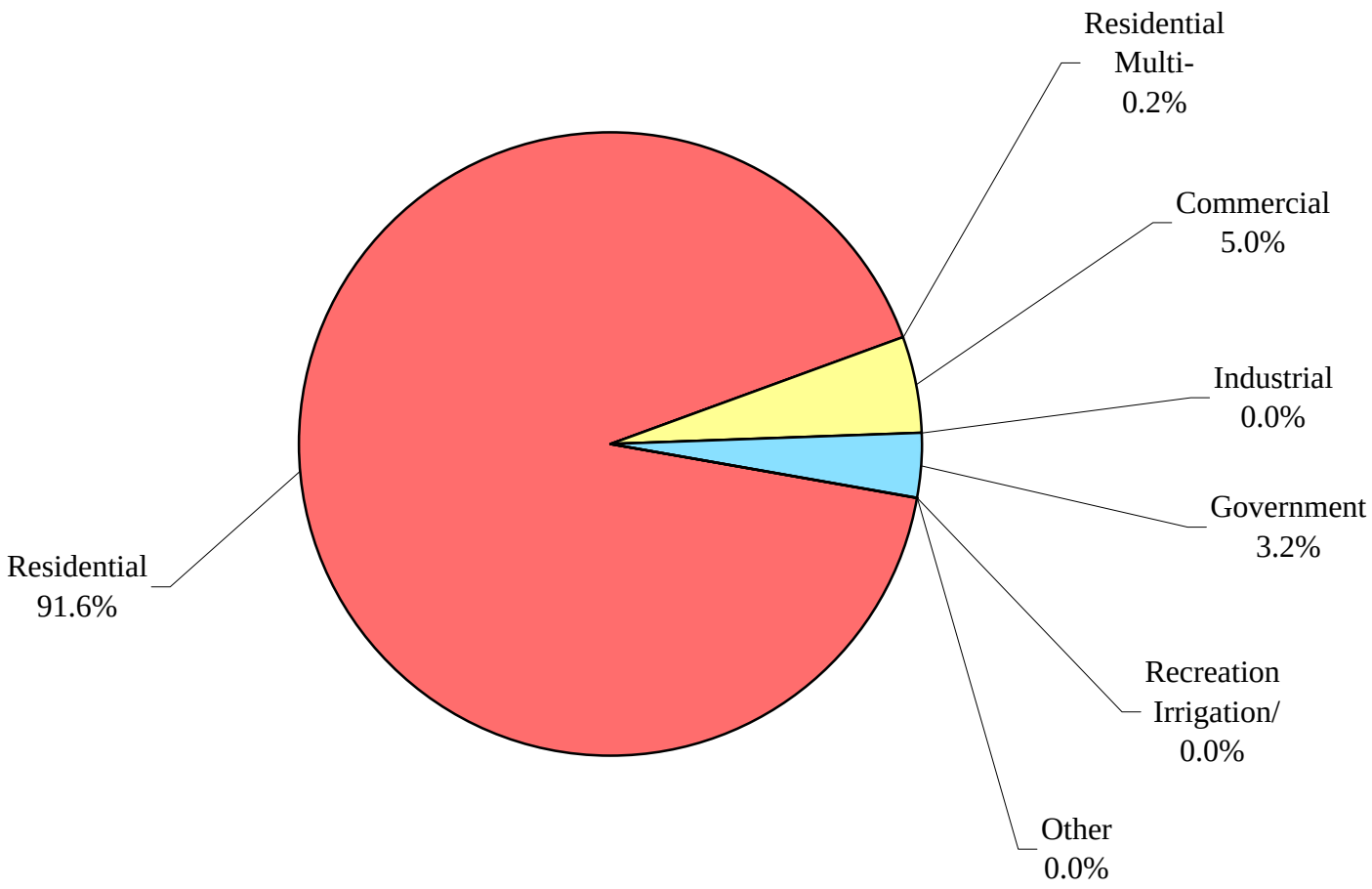
Year	Residential	Multi-Residential	Commercial	Industrial	Government	Irrigation/Recreation	Other	Unaccounted Water	Total
1993	1.35%	80.72%	9.97%	0.00%	95.36%	-20.60%	1195.29%	15.75%	3.54%
1994	4.86%	11.12%	-0.73%	0.00%	11.62%	-23.27%	-60.94%	54.12%	7.44%
1995	1.05%	14.84%	11.47%	0.00%	-7.79%	-21.02%	-80.00%	-4.46%	0.67%
1996	8.55%	-0.75%	12.97%	0.00%	9.15%	13.90%	-88.37%	26.51%	10.13%
1997	2.32%	7.27%	-9.35%	0.00%	-12.40%	-26.49%	610.00%	0.67%	1.45%
1998	-13.24%	0.14%	-10.23%	0.00%	-19.06%	91.19%	-95.77%	-26.74%	-14.23%
1999	15.95%	-21.23%	-4.22%	0.00%	43.86%	-67.07%	900.00%	9.99%	14.64%
2000	8.45%	24.15%	20.40%	0.00%	83.64%	88.26%	1206.67%	-45.41%	6.19%
2001	-5.13%	72.48%	3.52%	0.00%	-17.00%	-35.18%	-21.17%	38.12%	-3.29%
2002	3.33%	-29.24%	-9.63%	0.00%	8.33%	-92.62%	458.58%	-49.85%	-0.04%
2003	-2.52%	-27.08%	33.42%	0.00%	-5.23%	-100.00%	-63.04%	-109.13%	-4.72%
2004	8.51%	-52.46%	-6.28%	0.00%	-12.81%	0.00%	-47.81%	-2873.40%	14.68%
2005	-8.86%	12.49%	5.35%	0.00%	16.88%	0.00%	187.69%	51.81%	-3.76%
2006	6.70%	-23.41%	2.39%	0.00%	8.07%	0.00%	-6.47%	-94.29%	-3.79%
2007	1.82%	18.97%	3.56%	0.00%	4.93%	0.00%	-92.75%	308.15%	3.85%
2008	-15.14%	-22.70%	-11.08%	0.00%	-4.05%	-100.00%	150.77%	182.82%	-10.07%
2009	-9.14%	-32.95%	5.78%	0.00%	3.90%	0.00%	32.52%	-75.34%	-13.09%
2010	-10.17%	28.85%	-15.17%	0.00%	-20.47%	0.00%	-83.33%	138.92%	-7.62%
5 Yr. Avg.	-1.39%	-13.42%	-1.21%	0.00%	2.60%	-20.00%	38.29%	-484.98%	0.18%
10 Yr. Avg.	-0.32%	-2.98%	4.63%	0.00%	9.20%	-26.62%	196.94%	-331.86%	-0.11%

Five year average is from years 2004 through 2008.

Ten year average is from years 1999 through 2008.

Antelope Valley District

Percent of Total Sales by Type of Use (2010)



California Water Service Company - Antelope Valley District

Worksheet 8

Water Supply and Demand Analysis and Projections

Percentage of Total Sales

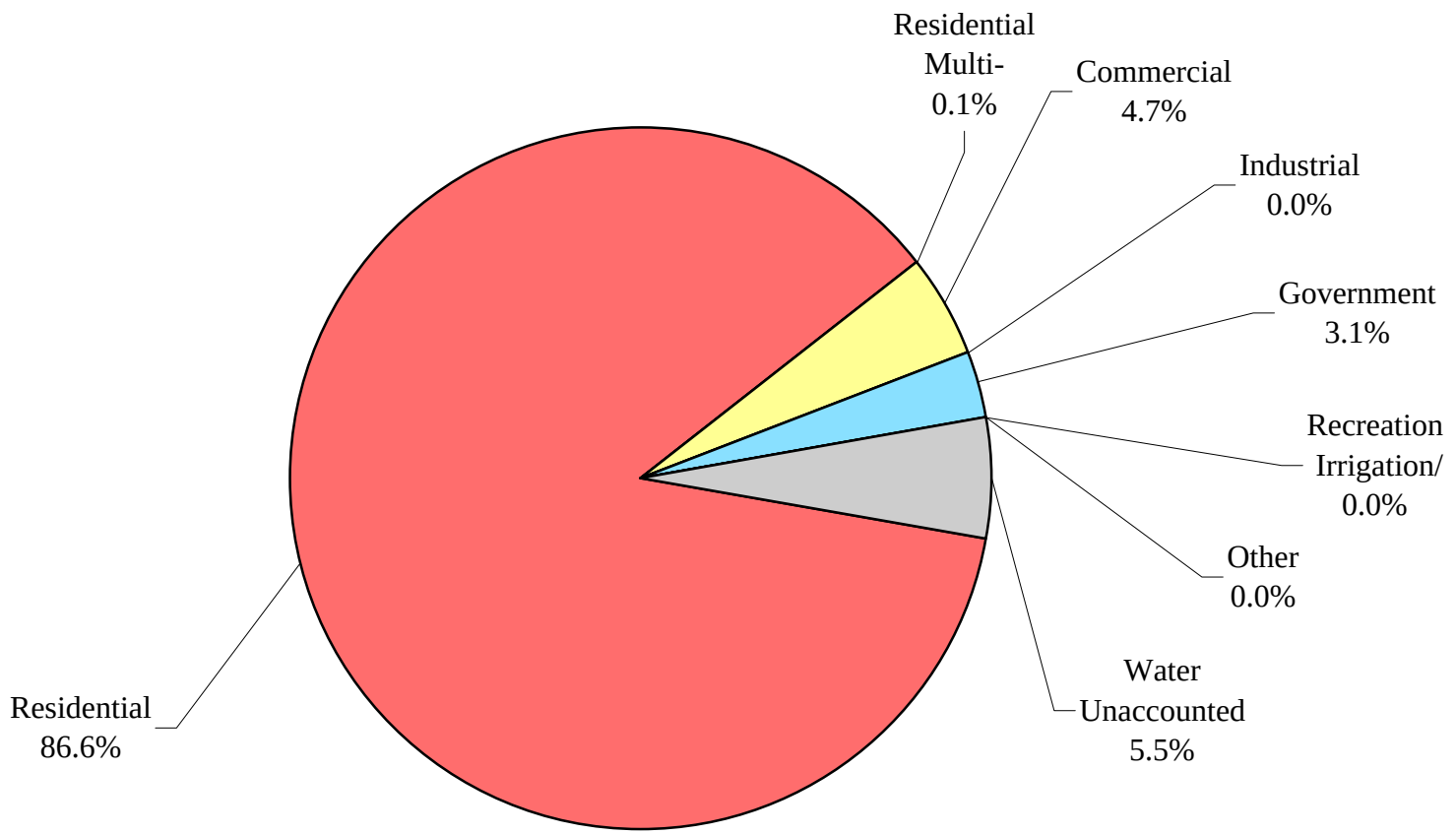
Year	Residential	Multi-Residential	Commercial	Industrial	Government	Irrigation/Recreation	Other	Percent Total
1992	94.65%	0.21%	3.54%	0.00%	0.97%	0.60%	0.02%	100.00%
1993	93.27%	0.37%	3.79%	0.00%	1.83%	0.47%	0.26%	100.00%
1994	93.60%	0.40%	3.60%	0.00%	1.96%	0.34%	0.10%	100.00%
1995	93.51%	0.45%	3.97%	0.00%	1.79%	0.27%	0.02%	100.00%
1996	93.39%	0.41%	4.12%	0.00%	1.79%	0.28%	0.00%	100.00%
1997	94.12%	0.44%	3.68%	0.00%	1.55%	0.20%	0.01%	100.00%
1998	93.82%	0.50%	3.80%	0.00%	1.44%	0.45%	0.00%	100.00%
1999	94.56%	0.34%	3.16%	0.00%	1.80%	0.13%	0.01%	100.00%
2000	92.88%	0.39%	3.45%	0.00%	2.99%	0.22%	0.07%	100.00%
2001	92.72%	0.70%	3.76%	0.00%	2.61%	0.15%	0.06%	100.00%
2002	93.13%	0.48%	3.30%	0.00%	2.75%	0.01%	0.33%	100.00%
2003	92.39%	0.36%	4.48%	0.00%	2.65%	0.00%	0.12%	100.00%
2004	93.70%	0.16%	3.92%	0.00%	2.16%	0.00%	0.06%	100.00%
2005	92.41%	0.19%	4.47%	0.00%	2.73%	0.00%	0.19%	100.00%
2006	92.62%	0.14%	4.30%	0.00%	2.78%	0.00%	0.16%	100.00%
2007	92.46%	0.16%	4.37%	0.00%	2.86%	0.15%	0.01%	100.00%
2008	92.05%	0.15%	4.56%	0.00%	3.21%	0.00%	0.03%	100.00%
2009	90.97%	0.11%	5.24%	0.00%	3.63%	0.00%	0.05%	100.00%
2010	91.61%	0.16%	4.99%	0.00%	3.24%	0.00%	0.01%	100.00%
5 Yr. Avg.	92.65%	0.16%	4.32%	0.00%	2.75%	0.03%	0.09%	100.00%
10 Yr. Avg.	92.89%	0.31%	3.98%	0.00%	2.65%	0.06%	0.10%	100.00%

Five year average is from years 2004 through 2008.

Ten year average is from years 1999 through 2008.

Antelope Valley District

Percent of Total Demand by Type of Use (2010)



California Water Service Company - Antelope Valley District

Worksheet 9

Water Supply and Demand Analysis and Projections

Percentage of Total Demand

Year	Residential	Multi-Residential	Commercial	Industrial	Government	Irrigation/ Recreation	Other	Unaccounted Water	Percent Total
1992	89.62%	0.20%	3.36%	0.00%	0.91%	0.57%	0.02%	5.32%	100.00%
1993	87.73%	0.35%	3.56%	0.00%	1.72%	0.44%	0.25%	5.94%	100.00%
1994	85.62%	0.36%	3.29%	0.00%	1.79%	0.31%	0.09%	8.53%	100.00%
1995	85.94%	0.42%	3.65%	0.00%	1.64%	0.25%	0.02%	8.09%	100.00%
1996	84.71%	0.37%	3.74%	0.00%	1.63%	0.25%	0.00%	9.29%	100.00%
1997	85.44%	0.40%	3.34%	0.00%	1.40%	0.18%	0.01%	9.22%	100.00%
1998	86.42%	0.46%	3.50%	0.00%	1.32%	0.41%	0.00%	7.88%	100.00%
1999	87.41%	0.32%	2.92%	0.00%	1.66%	0.12%	0.01%	7.56%	100.00%
2000	89.27%	0.37%	3.31%	0.00%	2.88%	0.21%	0.07%	3.89%	100.00%
2001	87.58%	0.66%	3.55%	0.00%	2.47%	0.14%	0.06%	5.55%	100.00%
2002	90.54%	0.47%	3.21%	0.00%	2.67%	0.01%	0.32%	2.78%	100.00%
2003	92.63%	0.36%	4.49%	0.00%	2.66%	0.00%	0.12%	-0.27%	100.00%
2004	87.65%	0.15%	3.67%	0.00%	2.02%	0.00%	0.06%	6.45%	100.00%
2005	83.01%	0.17%	4.02%	0.00%	2.46%	0.00%	0.17%	10.18%	100.00%
2006	92.06%	0.14%	4.28%	0.00%	2.76%	0.00%	0.16%	0.60%	100.00%
2007	90.26%	0.16%	4.26%	0.00%	2.79%	0.14%	0.01%	2.38%	100.00%
2008	85.17%	0.14%	4.22%	0.00%	2.97%	0.00%	0.03%	7.47%	100.00%
2009	89.04%	0.11%	5.13%	0.00%	3.56%	0.00%	0.05%	2.12%	100.00%
2010	86.59%	0.15%	4.71%	0.00%	3.06%	0.00%	0.01%	5.48%	100.00%
5 Yr. Avg.	87.63%	0.15%	4.09%	0.00%	2.60%	0.03%	0.09%	5.42%	100.00%
10 Yr. Avg.	88.56%	0.29%	3.79%	0.00%	2.53%	0.06%	0.10%	4.66%	100.00%

Five year average is from years 2004 through 2008.

Ten year average is from years 1999 through 2008.

California Water Service Company - Antelope Valley District

Worksheet 10

Water Supply and Demand Analysis and Projections

2000's Projections

Scenario #1: Based on Maintaining Growth at the ☒ Low ☐ High Average Annual Growth and ☒ Low ☐ Average ☐ High Demand per Service for each Customer Class.

Summary of Historical Growth Rate from Worksheet 2			
Customer Type	10 Yr. Avg. Historical Growth Rate	Estimated Growth Rate Selected	Notes
Single Family Residential	0.82%	0.61%	
Multi Family Residential		0.00%	
Commercial	1.11%	0.79%	
Industrial			
Government	4.10%	0.95%	
Irrigation/Recreation			
Other	18.33%	#DIV/0!	
Overall	0.80%	0.62%	

Summary of Lowest Demand per Service from Worksheets 5 and 6										
Demand/Serv. Units	Residential	Multi-Residential (service)	Multi-Residential (unit)	Commercial	Industrial	Government	Reclaimed	Total Other	Unaccounted Total Serv.	Combined Demand/Serv.
Gal/Service/Yr	228,313	58,348	20,593	393,951	0	746,494	0	0	0	245,452
AF/Service/Yr	0.701	0.179	0.063	1.209	0.000	2.291	0.000	0.000	0.000	0.753
Gal/Service/Day	626	160	56	1,079	0	2,045	0	0	0	672

California Water Service Company - Antelope Valley District

Worksheet 10

Water Supply and Demand Analysis and Projections

30-year projection Summary

Scenario #1: Based on Maintaining Growth at the ☒ Low ☐ High Average Annual Growth and ☒ Low ☐ Average ☐ High Demand per Service for each Customer Class.

Customer Type	Projected Services 2010	Projected Services 2015	Projected Services 2020	Projected Services 2025	Projected Services 2030	Projected Services 2035	Projected Services 2040	Services projected to be added from 2010 - 2040
Single Family Residential	1,306	1,346	1,388	1,431	1,475	1,521	1,568	262
Multi Family Residential	6	6	6	6	6	6	6	0
Commercial	38	40	41	43	44	46	48	10
Industrial	0	0	0	0	0	0	0	0
Government	14	15	15	16	17	18	19	5
Irrigation/Recreation	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0
Total	1,364	1,406	1,450	1,495	1,542	1,591	1,641	277

Customer Type	Projected Demand 2010 (ccf)	Projected Demand 2015 (ccf)	Projected Demand 2020 (ccf)	Projected Demand 2025 (ccf)	Projected Demand 2030 (ccf)	Projected Demand 2035 (ccf)	Projected Demand 2040 (ccf)	Projected demand to be added from 2010 - 2040 (ccf)
Single Family Residential	398,525	410,558	422,963	435,751	448,935	462,526	476,539	78,014
Multi Family Residential	468	468	468	468	468	468	468	0
Commercial	19,925	21,272	22,731	24,312	26,024	27,876	29,881	9,956
Industrial	0	0	0	0	0	0	0	0
Government	13,117	13,896	14,731	15,629	16,594	17,631	18,746	5,629
Irrigation/Recreation	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0
Unaccounted	26,866	27,715	28,594	29,503	30,444	31,418	32,427	5,560
Total	458,901	473,909	489,488	505,664	522,465	539,920	558,061	99,160

Customer Type	Projected Demand 2010 (AF)	Projected Demand 2015 (AF)	Projected Demand 2020 (AF)	Projected Demand 2025 (AF)	Projected Demand 2030 (AF)	Projected Demand 2035 (AF)	Projected Demand 2040 (AF)	Projected demand to be added from 2010 - 2040 (AF)
Single Family Residential	915	943	971	1,000	1,031	1,062	1,094	179
Multi Family Residential	1	1	1	1	1	1	1	0
Commercial	46	49	52	56	60	64	69	23
Industrial	0	0	0	0	0	0	0	0
Government	30	32	34	36	38	40	43	13
Irrigation/Recreation	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0
Unaccounted	62	64	66	68	70	72	74	13
Total	1,053	1,088	1,124	1,161	1,199	1,239	1,281	228

California Water Service Company - Antelope Valley District

Worksheet 10

Water Supply and Demand Analysis and Projections

2000's Projections

Scenario #1: Based on Maintaining Growth at the ☒ Low ☐ High Average Annual Growth and ☒ Low ☐ Average ☐ High Demand per Service for each Customer Class.

Customer Type	Actual Services 2001	Actual Services 2002	Actual Services 2003	Actual Services 2004	Actual Services 2005	Actual Services 2006	Actual Services 2007	Actual Services 2008	Actual Services 2009	Projected Services 2010
Resident	1,213	1,207	1,186	1,272	1,291	1,305	1,319	1,308	1,298	1,306
Multi- Residential	10	7	6	6	6	6	6	6	6	6
Commercial	32	33	38	39	38	37	36	37	38	38
Industrial	0	0	0	0	0	0	0	0	0	0
Government	12	12	11	12	12	11	10	13	14	14
Irrigation/Recreation	2	1	0	0	0	0	2	0	0	0
Other	1	1	1	2	3	3	1	1	0	0
Total	292	287	287	277	288	1,359	1,369	1,364	1,356	1,364

Customer Type	Demand 2001(ccf)	Demand 2002(ccf)	Demand 2003(ccf)	Demand 2004(ccf)	Demand 2005(ccf)	Demand 2006(ccf)	Demand 2007(ccf)	Demand 2008(ccf)	Demand 2009(ccf)	Demand 2010(ccf)
Resident	362,388	361,756	359,938	389,629	394,997	398,190	401,723	398,071	396,161	398,525
Multi- Residential	589	546	468	468	468	468	468	468	468	468
Commercial	15,481	15,713	18,841	19,073	18,841	18,865	18,633	19,437	19,668	19,925
Industrial	0	0	0	0	0	0	0	0	0	0
Government	10,680	10,680	10,529	10,680	10,680	10,529	10,378	12,817	12,968	13,117
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	2	2	2	0	4	6	2	2	0	0
Unaccounted	4,071	4,002	4,002	3,867	4,015	26,789	26,982	26,744	26,700	26,866
Total	393,211	392,699	393,780	423,717	429,006	454,847	458,187	457,539	455,966	458,901

Customer Type	Demand 2001(AF)	Demand 2002(AF)	Demand 2003(AF)	Demand 2004(AF)	Demand 2005(AF)	Demand 2006(AF)	Demand 2007(AF)	Demand 2008(AF)	Demand 2009(AF)	Demand 2010(AF)
Resident	832	830	826	894	907	914	922	914	909	915
Multi- Residential	1	1	1	1	1	1	1	1	1	1
Commercial	36	36	43	44	43	43	43	45	45	46
Industrial	0	0	0	0	0	0	0	0	0	0
Government	25	25	24	25	25	24	24	29	30	30
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Unaccounted	9	9	9	9	9	61	62	61	61	62
Total	903	902	904	973	985	1,044	1,052	1,050	1,047	1,053

California Water Service Company - Antelope Valley District

Worksheet 10

Water Supply and Demand Analysis and Projections

2010's Projections

Scenario #1: Based on Maintaining Growth at the ☒ Low ☐ High Average Annual Growth and ☒ Low ☐ Average ☐ High Demand per Service for each Customer Class.

Customer Type	Projected Services 2011	Projected Services 2012	Projected Services 2013	Projected Services 2014	Projected Services 2015	Projected Services 2016	Projected Services 2017	Projected Services 2018	Projected Services 2019	Projected Services 2020
Resident	1,314	1,322	1,330	1,338	1,346	1,354	1,363	1,371	1,379	1,388
Multi- Residential	6	6	6	6	6	6	6	6	6	6
Commercial	38	39	39	39	40	40	40	40	41	41
Industrial	0	0	0	0	0	0	0	0	0	0
Government	14	14	14	15	15	15	15	15	15	15
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Total	1,373	1,381	1,389	1,398	1,406	1,415	1,424	1,432	1,441	1,450

Customer Type	Demand 2011(ccf)	Demand 2012(ccf)	Demand 2013(ccf)	Demand 2014(ccf)	Demand 2015(ccf)	Demand 2016(ccf)	Demand 2017(ccf)	Demand 2018(ccf)	Demand 2019(ccf)	Demand 2020(ccf)
Resident	400,902	403,294	405,701	408,122	410,558	413,009	415,475	417,956	420,452	422,963
Multi- Residential	468	468	468	468	468	468	468	468	468	468
Commercial	20,186	20,451	20,720	20,994	21,272	21,554	21,841	22,133	22,430	22,731
Industrial	0	0	0	0	0	0	0	0	0	0
Government	13,268	13,422	13,578	13,735	13,896	14,058	14,223	14,390	14,559	14,731
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Unaccounted	27,034	27,203	27,372	27,543	27,715	27,889	28,063	28,239	28,416	28,594
Total	461,858	464,837	467,839	470,863	473,909	476,978	480,071	483,186	486,325	489,488

Customer Type	Demand 2011(AF)	Demand 2012(AF)	Demand 2013(AF)	Demand 2014(AF)	Demand 2015(AF)	Demand 2016(AF)	Demand 2017(AF)	Demand 2018(AF)	Demand 2019(AF)	Demand 2020(AF)
Resident	920	926	931	937	943	948	954	960	965	971
Multi- Residential	1	1	1	1	1	1	1	1	1	1
Commercial	46	47	48	48	49	49	50	51	51	52
Industrial	0	0	0	0	0	0	0	0	0	0
Government	30	31	31	32	32	32	33	33	33	34
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Unaccounted	62	62	63	63	64	64	64	65	65	66
Total	1,060	1,067	1,074	1,081	1,088	1,095	1,102	1,109	1,116	1,124

California Water Service Company - Antelope Valley District

Worksheet 10

Water Supply and Demand Analysis and Projections

2020's Projections

Scenario #1: Based on Maintaining Growth at the ☒ Low ☐ High Average Annual Growth and ☒ Low ☐ Average ☐ High Demand per Service for each Customer Class.

Customer Type	Projected Services 2021	Projected Services 2022	Projected Services 2023	Projected Services 2024	Projected Services 2025	Projected Services 2026	Projected Services 2027	Projected Services 2028	Projected Services 2029	Projected Services 2030
Resident	1,396	1,405	1,413	1,422	1,431	1,439	1,448	1,457	1,466	1,475
Multi- Residential	6	6	6	6	6	6	6	6	6	6
Commercial	41	42	42	42	43	43	43	44	44	44 #
Industrial	0	0	0	0	0	0	0	0	0	0
Government	16	16	16	16	16	16	16	17	17	17
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Total	1,459	1,468	1,477	1,486	1,495	1,505	1,514	1,523	1,533	1,542

Customer Type	Demand 2021(ccf)	Demand 2022(ccf)	Demand 2023(ccf)	Demand 2024(ccf)	Demand 2025(ccf)	Demand 2026(ccf)	Demand 2027(ccf)	Demand 2028(ccf)	Demand 2029(ccf)	Demand 2030(ccf)
Resident	425,490	428,032	430,589	433,163	435,751	438,356	440,977	443,613	446,266	448,935
Multi- Residential	468	468	468	468	468	468	468	468	468	468
Commercial	23,037	23,348	23,665	23,986	24,312	24,644	24,980	25,323	25,670	26,024
Industrial	0	0	0	0	0	0	0	0	0	0
Government	14,906	15,083	15,262	15,445	15,629	15,817	16,007	16,200	16,396	16,594
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Unaccounted	28,773	28,954	29,136	29,319	29,503	29,689	29,875	30,064	30,253	30,444
Total	492,674	495,885	499,120	502,380	505,664	508,973	512,308	515,668	519,053	522,465

Customer Type	Demand 2021(AF)	Demand 2022(AF)	Demand 2023(AF)	Demand 2024(AF)	Demand 2025(AF)	Demand 2026(AF)	Demand 2027(AF)	Demand 2028(AF)	Demand 2029(AF)	Demand 2030(AF)
Resident	977	983	989	994	1,000	1,006	1,012	1,018	1,024	1,031
Multi- Residential	1	1	1	1	1	1	1	1	1	1
Commercial	53	54	54	55	56	57	57	58	59	60
Industrial	0	0	0	0	0	0	0	0	0	0
Government	34	35	35	35	36	36	37	37	38	38
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Unaccounted	66	66	67	67	68	68	69	69	69	70
Total	1,131	1,138	1,146	1,153	1,161	1,168	1,176	1,184	1,192	1,199

California Water Service Company - Antelope Valley District

Worksheet 10

Water Supply and Demand Analysis and Projections

2030's Projections

Scenario #1: Based on Maintaining Growth at the ☒ Low ☐ High Average Annual Growth and ☒ Low ☐ Average ☐ High Demand per Service for each Customer Class.

Customer Type	Projected Services 2031	Projected Services 2032	Projected Services 2033	Projected Services 2034	Projected Services 2035	Projected Services 2036	Projected Services 2037	Projected Services 2038	Projected Services 2039	Projected Services 2040
Resident	1,484	1,493	1,502	1,511	1,521	1,530	1,539	1,549	1,558	1,568
Multi- Residential	6	6	6	6	6	6	6	6	6	6
Commercial	45	45	46	46	46	47	47	48	48	48
Industrial	0	0	0	0	0	0	0	0	0	0
Government	17	17	17	18	18	18	18	18	19	19
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Total	1,552	1,561	1,571	1,581	1,591	1,601	1,611	1,621	1,631	1,641

Customer Type	Demand 2031(ccf)	Demand 2032(ccf)	Demand 2033(ccf)	Demand 2034(ccf)	Demand 2035(ccf)	Demand 2036(ccf)	Demand 2037(ccf)	Demand 2038(ccf)	Demand 2039(ccf)	Demand 2040(ccf)
Resident	451,620	454,322	457,040	459,775	462,526	465,295	468,080	470,883	473,702	476,539
Multi- Residential	468	468	468	468	468	468	468	468	468	468
Commercial	26,383	26,747	27,118	27,494	27,876	28,265	28,659	29,060	29,467	29,881
Industrial	0	0	0	0	0	0	0	0	0	0
Government	16,796	17,000	17,207	17,418	17,631	17,848	18,067	18,290	18,517	18,746
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Unaccounted	30,636	30,829	31,024	31,220	31,418	31,617	31,817	32,019	32,222	32,427
Total	525,902	529,367	532,857	536,375	539,920	543,492	547,092	550,720	554,376	558,061

Customer Type	Demand 2031(AF)	Demand 2032(AF)	Demand 2033(AF)	Demand 2034(AF)	Demand 2035(AF)	Demand 2036(AF)	Demand 2037(AF)	Demand 2038(AF)	Demand 2039(AF)	Demand 2040(AF)
Resident	1,037	1,043	1,049	1,056	1,062	1,068	1,075	1,081	1,087	1,094
Multi- Residential	1	1	1	1	1	1	1	1	1	1
Commercial	61	61	62	63	64	65	66	67	68	69
Industrial	0	0	0	0	0	0	0	0	0	0
Government	39	39	40	40	40	41	41	42	43	43
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Unaccounted	70	71	71	72	72	73	73	74	74	74
Total	1,207	1,215	1,223	1,231	1,239	1,248	1,256	1,264	1,273	1,281

California Water Service Company -Antelope Valley District

Worksheet 10

Water Supply and Demand Analysis and Projections

2000's Projections

Scenario #1: Based on Maintaining Growth at the ☒ Low ☐ High Average Annual Growth and ☐ Low ☒ Average ☐ High Demand per Service for each Customer Class.

Summary of Historical Growth Rate from Worksheet 2			
Customer Type	10 Yr. Avg. Historical Growth Rate	Estimated Growth Rate Selected	Notes
Single Family Residential	0.82%	0.61%	
Multi Family Residential		0.00%	
Commercial	1.11%	0.79%	
Industrial			
Government	4.10%	0.95%	
Irrigation/Recreation			
Other	18.33%		
Overall	0.80%	0.62%	

Summary of Lowest Demand per Service from Worksheets 5 and 6										
Demand/Serv. Units	Residential	Multi-Residential (service)	Multi-Residential (unit)	Commercial	Industrial	Government	Reclaimed	Total Other	Unaccounted Total Serv.	Combined Demand/Serv.
Gal/Service/Yr	276,853	158,010	41,193	421,289	0	760,070	188,349	201,122	17,328	301,424
AF/Service/Yr	0.850	0.485	0.126	1.293	0.000	2.333	0.578	0.617	0.053	0.925
Gal/Service/Day	759	433	113	1,154	0	2,082	516	551	47	826

California Water Service Company - Antelope Valley District

Worksheet 10

Water Supply and Demand Analysis and Projections

30-year projection Summary

Scenario #1: Based on Maintaining Growth at the ☒ Low ☐ High Average Annual Growth and ☐ Low ☒ Average ☐ High Demand per Service for each Customer Class.

Customer Type	Projected Services 2010	Projected Services 2015	Projected Services 2020	Projected Services 2025	Projected Services 2030	Projected Services 2035	Projected Services 2040	Services projected to be added from 2010 - 2040
Single Family Residential	1,306	1,346	1,388	1,431	1,475	1,521	1,568	262
Multi Family Residential	6	6	6	6	6	6	6	0
Commercial	38	40	41	43	44	46	48	10
Industrial	0	0	0	0	0	0	0	0
Government	14	15	15	16	17	18	19	5
Irrigation/Recreation	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0
Total	1,364	1,406	1,450	1,495	1,542	1,591	1,641	277

Customer Type	Projected Demand 2010 (ccf)	Projected Demand 2015 (ccf)	Projected Demand 2020 (ccf)	Projected Demand 2025 (ccf)	Projected Demand 2030 (ccf)	Projected Demand 2035 (ccf)	Projected Demand 2040 (ccf)	Projected demand to be added from 2010 - 2040 (ccf)
Single Family Residential	478,511	492,970	507,876	523,242	539,084	555,417	572,256	93,745
Multi Family Residential	808	808	808	808	808	808	808	0
Commercial	23,793	25,312	26,959	28,744	30,677	32,770	35,035	11,242
Industrial	0	0	0	0	0	0	0	0
Government	17,396	18,416	19,512	20,690	21,956	23,317	24,781	7,385
Irrigation/Recreation	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0
Unaccounted	52,406	54,033	55,716	57,458	59,261	61,127	63,059	10,653
Total	572,914	591,539	610,871	630,942	651,786	673,439	695,939	123,025

Customer Type	Projected Demand 2010 (AF)	Projected Demand 2015 (AF)	Projected Demand 2020 (AF)	Projected Demand 2025 (AF)	Projected Demand 2030 (AF)	Projected Demand 2035 (AF)	Projected Demand 2040 (AF)	Projected demand to be added from 2010 - 2040 (AF)
Single Family Residential	1,099	1,132	1,166	1,201	1,238	1,275	1,314	215
Multi Family Residential	2	2	2	2	2	2	2	0
Commercial	55	58	62	66	70	75	80	26
Industrial	0	0	0	0	0	0	0	0
Government	40	42	45	47	50	54	57	17
Irrigation/Recreation	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0
Unaccounted	120	124	128	132	136	140	145	24
Total	1,315	1,358	1,402	1,448	1,496	1,546	1,598	282

California Water Service Company - Antelope Valley District

Worksheet 10

Water Supply and Demand Analysis and Projections

2000's Projections

Scenario #1: Based on Maintaining Growth at the ☒ Low ☐ High Average Annual Growth and ☐ Low ☒ Average ☐ High Demand per Service for each Customer Class.

Customer Type	Actual Services 2001	Actual Services 2002	Actual Services 2003	Actual Services 2004	Actual Services 2005	Actual Services 2006	Actual Services 2007	Actual Services 2008	Actual Services 2009	Projected Services 2010
Resident	1,213	1,207	1,186	1,272	1,291	1,305	1,319	1,308	1,298	1,306
Multi- Residential	10	7	6	6	6	6	6	6	6	6
Commercial	32	33	38	39	38	37	36	37	38	38
Industrial	0	0	0	0	0	0	0	0	0	0
Government	12	12	11	12	12	11	10	13	14	14
Irrigation/Recreation	2	1	0	0	0	0	2	0	0	0
Other	1	1	1	2	3	3	1	1	0	0
Total	292	287	287	277	288	1,359	1,369	1,364	1,356	1,364

Customer Type	Demand 2001(ccf)	Demand 2002(ccf)	Demand 2003(ccf)	Demand 2004(ccf)	Demand 2005(ccf)	Demand 2006(ccf)	Demand 2007(ccf)	Demand 2008(ccf)	Demand 2009(ccf)	Demand 2010(ccf)
Resident	436,077	435,206	432,610	467,569	474,105	478,071	482,407	478,157	475,672	478,511
Multi- Residential	1,017	943	808	808	808	808	808	808	808	808
Commercial	18,639	18,988	22,619	22,968	22,619	22,653	22,304	23,155	23,504	23,793
Industrial	0	0	0	0	0	0	0	0	0	0
Government	14,169	14,169	13,882	14,169	14,169	13,882	13,594	16,913	17,200	17,396
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	185	185	185	0	371	556	185	185	0	0
Unaccounted	7,766	7,634	7,634	7,376	7,660	52,178	52,561	52,106	52,087	52,406
Total	477,854	477,125	477,739	512,891	519,733	568,148	571,860	571,325	569,271	572,914

Customer Type	Demand 2001(AF)	Demand 2002(AF)	Demand 2003(AF)	Demand 2004(AF)	Demand 2005(AF)	Demand 2006(AF)	Demand 2007(AF)	Demand 2008(AF)	Demand 2009(AF)	Demand 2010(AF)
Resident	1,001	999	993	1,073	1,088	1,098	1,107	1,098	1,092	1,099
Multi- Residential	2	2	2	2	2	2	2	2	2	2
Commercial	43	44	52	53	52	52	51	53	54	55
Industrial	0	0	0	0	0	0	0	0	0	0
Government	33	33	32	33	33	32	31	39	39	40
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	1	1	0	0	0	0
Unaccounted	18	18	18	17	18	120	121	120	120	120
Total	1,097	1,095	1,097	1,177	1,193	1,304	1,313	1,312	1,307	1,315

California Water Service Company - Antelope Valley District

Worksheet 10

Water Supply and Demand Analysis and Projections

2010's Projections

Scenario #1: Based on Maintaining Growth at the ☒ Low ☐ High Average Annual Growth and ☐ Low ☒ Average ☐ High Demand per Service for each Customer Class.

Customer Type	Projected Services 2011	Projected Services 2012	Projected Services 2013	Projected Services 2014	Projected Services 2015	Projected Services 2016	Projected Services 2017	Projected Services 2018	Projected Services 2019	Projected Services 2020
Resident	1,314	1,322	1,330	1,338	1,346	1,354	1,363	1,371	1,379	1,388
Multi- Residential	6	6	6	6	6	6	6	6	6	6
Commercial	38	39	39	39	40	40	40	40	41	41
Industrial	0	0	0	0	0	0	0	0	0	0
Government	14	14	14	15	15	15	15	15	15	15
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Total	1,373	1,381	1,389	1,398	1,406	1,415	1,424	1,432	1,441	1,450

Customer Type	Demand 2011(ccf)	Demand 2012(ccf)	Demand 2013(ccf)	Demand 2014(ccf)	Demand 2015(ccf)	Demand 2016(ccf)	Demand 2017(ccf)	Demand 2018(ccf)	Demand 2019(ccf)	Demand 2020(ccf)
Resident	481,368	484,242	487,134	490,043	492,970	495,915	498,878	501,859	504,858	507,876
Multi- Residential	808	808	808	808	808	808	808	808	808	808
Commercial	24,087	24,386	24,690	24,998	25,312	25,631	25,955	26,284	26,619	26,959
Industrial	0	0	0	0	0	0	0	0	0	0
Government	17,594	17,795	17,999	18,206	18,416	18,629	18,845	19,064	19,286	19,512
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Unaccounted	52,727	53,050	53,376	53,703	54,033	54,365	54,699	55,036	55,375	55,716
Total	576,584	580,281	584,006	587,759	591,539	595,348	599,185	603,052	606,947	610,871

Customer Type	Demand 2011(AF)	Demand 2012(AF)	Demand 2013(AF)	Demand 2014(AF)	Demand 2015(AF)	Demand 2016(AF)	Demand 2017(AF)	Demand 2018(AF)	Demand 2019(AF)	Demand 2020(AF)
Resident	1,105	1,112	1,118	1,125	1,132	1,138	1,145	1,152	1,159	1,166
Multi- Residential	2	2	2	2	2	2	2	2	2	2
Commercial	55	56	57	57	58	59	60	60	61	62
Industrial	0	0	0	0	0	0	0	0	0	0
Government	40	41	41	42	42	43	43	44	44	45
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Unaccounted	121	122	123	123	124	125	126	126	127	128
Total	1,324	1,332	1,341	1,349	1,358	1,367	1,376	1,384	1,393	1,402

California Water Service Company - Antelope Valley District

Worksheet 10

Water Supply and Demand Analysis and Projections

2020's Projections

Scenario #1: Based on Maintaining Growth at the ☒ Low ☐ High Average Annual Growth and ☐ Low ☒ Average ☐ High Demand per Service for each Customer Class.

Customer Type	Projected Services 2021	Projected Services 2022	Projected Services 2023	Projected Services 2024	Projected Services 2025	Projected Services 2026	Projected Services 2027	Projected Services 2028	Projected Services 2029	Projected Services 2030
Resident	1,396	1,405	1,413	1,422	1,431	1,439	1,448	1,457	1,466	1,475
Multi- Residential	6	6	6	6	6	6	6	6	6	6
Commercial	41	42	42	42	43	43	43	44	44	44
Industrial	0	0	0	0	0	0	0	0	0	0
Government	16	16	16	16	16	16	16	17	17	17
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Total	1,459	1,468	1,477	1,486	1,495	1,505	1,514	1,523	1,533	1,542

Customer Type	Demand 2021(ccf)	Demand 2022(ccf)	Demand 2023(ccf)	Demand 2024(ccf)	Demand 2025(ccf)	Demand 2026(ccf)	Demand 2027(ccf)	Demand 2028(ccf)	Demand 2029(ccf)	Demand 2030(ccf)
Resident	510,912	513,966	517,039	520,131	523,242	526,372	529,521	532,689	535,877	539,084
Multi- Residential	808	808	808	808	808	808	808	808	808	808
Commercial	27,305	27,656	28,013	28,376	28,744	29,119	29,499	29,886	30,278	30,677
Industrial	0	0	0	0	0	0	0	0	0	0
Government	19,741	19,973	20,208	20,447	20,690	20,935	21,185	21,438	21,695	21,956
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Unaccounted	56,060	56,406	56,754	57,105	57,458	57,814	58,172	58,532	58,895	59,261
Total	614,825	618,809	622,823	626,867	630,942	635,048	639,185	643,353	647,553	651,786

Customer Type	Demand 2021(AF)	Demand 2022(AF)	Demand 2023(AF)	Demand 2024(AF)	Demand 2025(AF)	Demand 2026(AF)	Demand 2027(AF)	Demand 2028(AF)	Demand 2029(AF)	Demand 2030(AF)
Resident	1,173	1,180	1,187	1,194	1,201	1,208	1,216	1,223	1,230	1,238
Multi- Residential	2	2	2	2	2	2	2	2	2	2
Commercial	63	63	64	65	66	67	68	69	70	70
Industrial	0	0	0	0	0	0	0	0	0	0
Government	45	46	46	47	47	48	49	49	50	50
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Unaccounted	129	129	130	131	132	133	134	134	135	136
Total	1,411	1,421	1,430	1,439	1,448	1,458	1,467	1,477	1,487	1,496

California Water Service Company - Antelope Valley District

Worksheet 10

Water Supply and Demand Analysis and Projections

2030's Projections

Scenario #1: Based on Maintaining Growth at the ☒ Low ☐ High Average Annual Growth and ☐ Low ☒ Average ☐ High Demand per Service for each Customer Class.

Customer Type	Projected Services 2031	Projected Services 2032	Projected Services 2033	Projected Services 2034	Projected Services 2035	Projected Services 2036	Projected Services 2037	Projected Services 2038	Projected Services 2039	Projected Services 2040
Resident	1,484	1,493	1,502	1,511	1,521	1,530	1,539	1,549	1,558	1,568
Multi- Residential	6	6	6	6	6	6	6	6	6	6
Commercial	45	45	46	46	46	47	47	48	48	48
Industrial	0	0	0	0	0	0	0	0	0	0
Government	17	17	17	18	18	18	18	18	19	19
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Total	1,552	1,561	1,571	1,581	1,591	1,601	1,611	1,621	1,631	1,641

Customer Type	Demand 2031(ccf)	Demand 2032(ccf)	Demand 2033(ccf)	Demand 2034(ccf)	Demand 2035(ccf)	Demand 2036(ccf)	Demand 2037(ccf)	Demand 2038(ccf)	Demand 2039(ccf)	Demand 2040(ccf)
Resident	542,311	545,557	548,824	552,110	555,417	558,743	562,090	565,458	568,847	572,256
Multi- Residential	808	808	808	808	808	808	808	808	808	808
Commercial	31,083	31,495	31,913	32,338	32,770	33,209	33,655	34,108	34,568	35,035
Industrial	0	0	0	0	0	0	0	0	0	0
Government	22,220	22,488	22,760	23,037	23,317	23,601	23,890	24,183	24,480	24,781
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Unaccounted	59,629	59,999	60,373	60,748	61,127	61,508	61,892	62,278	62,667	63,059
Total	656,050	660,348	664,678	669,042	673,439	677,870	682,335	686,835	691,370	695,939

Customer Type	Demand 2031(AF)	Demand 2032(AF)	Demand 2033(AF)	Demand 2034(AF)	Demand 2035(AF)	Demand 2036(AF)	Demand 2037(AF)	Demand 2038(AF)	Demand 2039(AF)	Demand 2040(AF)
Resident	1,245	1,252	1,260	1,267	1,275	1,283	1,290	1,298	1,306	1,314
Multi- Residential	2	2	2	2	2	2	2	2	2	2
Commercial	71	72	73	74	75	76	77	78	79	80
Industrial	0	0	0	0	0	0	0	0	0	0
Government	51	52	52	53	54	54	55	56	56	57
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Unaccounted	137	138	139	139	140	141	142	143	144	145
Total	1,506	1,516	1,526	1,536	1,546	1,556	1,566	1,577	1,587	1,598

California Water Service Company -Antelope Valley District

Worksheet 10

Water Supply and Demand Analysis and Projections

2000's Projections

Scenario #1: Based on Maintaining Growth at the ☒ Low ☐ High Average Annual Growth and ☐ Low ☐ Average ☒ High Demand per Service for each Customer Class.

Summary of Historical Growth Rate from Worksheet 2			
Customer Type	10 Yr. Avg. Historical Growth Rate	Estimated Growth Rate Selected	Notes
Single Family Residential	0.82%	0.61%	
Multi Family Residential		0.00%	
Commercial	1.11%	0.79%	
Industrial			
Government	4.10%	0.95%	
Irrigation/Recreation			
Other	18.33%		
Overall	0.80%	0.62%	

Summary of Lowest Demand per Service from Worksheets 5 and 6										
Demand/Serv. Units	Residential	Multi-Residential (service)	Multi-Residential (unit)	Commercial	Industrial	Government	Reclaimed	Total Other	Unaccounted Total Serv.	Combined Demand/Serv.
Gal/Service/Yr	309,049	281,283	81,538	504,457	0	1,187,159	437,984	1,291,138	32,137	333,429
AF/Service/Yr	0.949	0.864	0.250	1.549	0.000	3.646	1.345	3.965	0.099	1.024
Gal/Service/Day	847	771	223	1,382	0	3,252	1,200	3,537	88	914

California Water Service Company - Antelope Valley District

Worksheet 10

Water Supply and Demand Analysis and Projections

30-year projection Summary

Scenario #1: Based on Maintaining Growth at the ☒ Low ☐ High Average Annual Growth and ☐ Low ☐ Average ☒ High Demand per Service for each Customer Class.

Customer Type	Projected Services 2010	Projected Services 2015	Projected Services 2020	Projected Services 2025	Projected Services 2030	Projected Services 2035	Projected Services 2040	Services projected to be added from 2010 - 2040
Single Family Residential	1,306	1,346	1,388	1,431	1,475	1,521	1,568	262
Multi Family Residential	6	6	6	6	6	6	6	0
Commercial	38	40	41	43	44	46	48	10
Industrial	0	0	0	0	0	0	0	0
Government	14	15	15	16	17	18	19	5
Irrigation/Recreation	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0
Total	1,364	1,406	1,450	1,495	1,542	1,591	1,641	277

Customer Type	Projected Demand 2010 (ccf)	Projected Demand 2015 (ccf)	Projected Demand 2020 (ccf)	Projected Demand 2025 (ccf)	Projected Demand 2030 (ccf)	Projected Demand 2035 (ccf)	Projected Demand 2040 (ccf)	Projected demand to be added from 2010 - 2040 (ccf)
Single Family Residential	532,727	548,875	565,523	582,689	600,388	618,637	637,455	104,728
Multi Family Residential	991	991	991	991	991	991	991	0
Commercial	28,011	29,721	31,577	33,589	35,769	38,129	40,684	12,673
Industrial	0	0	0	0	0	0	0	0
Government	21,287	22,481	23,764	25,142	26,624	28,217	29,931	8,644
Irrigation/Recreation	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0
Unaccounted	88,261	90,958	93,748	96,635	99,622	102,714	105,916	17,655
Total	671,276	693,026	715,603	739,046	763,394	788,689	814,977	143,701

Customer Type	Projected Demand 2010 (AF)	Projected Demand 2015 (AF)	Projected Demand 2020 (AF)	Projected Demand 2025 (AF)	Projected Demand 2030 (AF)	Projected Demand 2035 (AF)	Projected Demand 2040 (AF)	Projected demand to be added from 2010 - 2040 (AF)
Single Family Residential	1,223	1,260	1,298	1,338	1,378	1,420	1,463	240
Multi Family Residential	2	2	2	2	2	2	2	0
Commercial	64	68	72	77	82	88	93	29
Industrial	0	0	0	0	0	0	0	0
Government	49	52	55	58	61	65	69	20
Irrigation/Recreation	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0
Unaccounted	203	209	215	222	229	236	243	41
Total	1,541	1,591	1,643	1,697	1,753	1,811	1,871	330

California Water Service Company - Antelope Valley District

Worksheet 10

Water Supply and Demand Analysis and Projections

2000's Projections

Scenario #1: Based on Maintaining Growth at the ☒ Low ☐ High Average Annual Growth and ☐ Low ☐ Average ☒ High Demand per Service for each Customer Class.

Customer Type	Actual Services 2001	Actual Services 2002	Actual Services 2003	Actual Services 2004	Actual Services 2005	Actual Services 2006	Actual Services 2007	Actual Services 2008	Actual Services 2009	Projected Services 2010
Resident	1,213	1,207	1,186	1,272	1,291	1,305	1,319	1,308	1,298	1,306
Multi- Residential	10	7	6	6	6	6	6	6	6	6
Commercial	32	33	38	39	38	37	36	37	38	38
Industrial	0	0	0	0	0	0	0	0	0	0
Government	12	12	11	12	12	11	10	13	14	14
Irrigation/Recreation	2	1	0	0	0	0	2	0	0	0
Other	1	1	1	2	3	3	1	1	0	0
Total	292	287	287	277	288	1,359	1,369	1,364	1,356	1,364

Customer Type	Demand 2001(ccf)	Demand 2002(ccf)	Demand 2003(ccf)	Demand 2004(ccf)	Demand 2005(ccf)	Demand 2006(ccf)	Demand 2007(ccf)	Demand 2008(ccf)	Demand 2009(ccf)	Demand 2010(ccf)
Resident	486,464	485,431	482,326	520,290	527,642	532,237	537,182	532,542	529,556	532,727
Multi- Residential	1,247	1,156	991	991	991	991	991	991	991	991
Commercial	22,078	22,547	26,736	27,205	26,736	26,770	26,301	27,216	27,686	28,011
Industrial	0	0	0	0	0	0	0	0	0	0
Government	17,514	17,514	16,999	17,514	17,514	16,999	16,484	20,543	21,058	21,287
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	398	398	398	0	797	1,195	398	398	0	0
Unaccounted	13,063	12,840	12,840	12,407	12,884	87,795	88,449	87,727	87,732	88,261
Total	540,764	539,886	540,291	578,406	586,563	665,988	669,806	669,419	667,022	671,276

Customer Type	Demand 2001(AF)	Demand 2002(AF)	Demand 2003(AF)	Demand 2004(AF)	Demand 2005(AF)	Demand 2006(AF)	Demand 2007(AF)	Demand 2008(AF)	Demand 2009(AF)	Demand 2010(AF)
Resident	1,117	1,114	1,107	1,194	1,211	1,222	1,233	1,223	1,216	1,223
Multi- Residential	3	3	2	2	2	2	2	2	2	2
Commercial	51	52	61	62	61	61	60	62	64	64
Industrial	0	0	0	0	0	0	0	0	0	0
Government	40	40	39	40	40	39	38	47	48	49
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	1	1	1	0	2	3	1	1	0	0
Unaccounted	30	29	29	28	30	202	203	201	201	203
Total	1,241	1,239	1,240	1,328	1,347	1,529	1,538	1,537	1,531	1,541

California Water Service Company - Antelope Valley District

Worksheet 10

Water Supply and Demand Analysis and Projections

2010's Projections

Scenario #1: Based on Maintaining Growth at the ☒ Low ☐ High Average Annual Growth and ☐ Low ☐ Average ☒ High Demand per Service for each Customer Class.

Customer Type	Projected Services 2011	Projected Services 2012	Projected Services 2013	Projected Services 2014	Projected Services 2015	Projected Services 2016	Projected Services 2017	Projected Services 2018	Projected Services 2019	Projected Services 2020
Resident	1,314	1,322	1,330	1,338	1,346	1,354	1,363	1,371	1,379	1,388
Multi- Residential	6	6	6	6	6	6	6	6	6	6
Commercial	38	39	39	39	40	40	40	40	41	41
Industrial	0	0	0	0	0	0	0	0	0	0
Government	14	14	14	15	15	15	15	15	15	15
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Total	1,373	1,381	1,389	1,398	1,406	1,415	1,424	1,432	1,441	1,450

Customer Type	Demand 2011(ccf)	Demand 2012(ccf)	Demand 2013(ccf)	Demand 2014(ccf)	Demand 2015(ccf)	Demand 2016(ccf)	Demand 2017(ccf)	Demand 2018(ccf)	Demand 2019(ccf)	Demand 2020(ccf)
Resident	535,917	539,127	542,356	545,606	548,875	552,164	555,473	558,803	562,153	565,523
Multi- Residential	991	991	991	991	991	991	991	991	991	991
Commercial	28,342	28,678	29,020	29,368	29,721	30,081	30,446	30,817	31,194	31,577
Industrial	0	0	0	0	0	0	0	0	0	0
Government	21,519	21,754	21,993	22,235	22,481	22,730	22,983	23,239	23,500	23,764
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Unaccounted	88,793	89,329	89,868	90,411	90,958	91,508	92,062	92,620	93,182	93,748
Total	675,562	679,879	684,229	688,611	693,026	697,474	701,955	706,470	711,019	715,603

Customer Type	Demand 2011(AF)	Demand 2012(AF)	Demand 2013(AF)	Demand 2014(AF)	Demand 2015(AF)	Demand 2016(AF)	Demand 2017(AF)	Demand 2018(AF)	Demand 2019(AF)	Demand 2020(AF)
Resident	1,230	1,238	1,245	1,253	1,260	1,268	1,275	1,283	1,291	1,298
Multi- Residential	2	2	2	2	2	2	2	2	2	2
Commercial	65	66	67	67	68	69	70	71	72	72
Industrial	0	0	0	0	0	0	0	0	0	0
Government	49	50	50	51	52	52	53	53	54	55
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Unaccounted	204	205	206	208	209	210	211	213	214	215
Total	1,551	1,561	1,571	1,581	1,591	1,601	1,611	1,622	1,632	1,643

California Water Service Company - Antelope Valley District

Worksheet 10

Water Supply and Demand Analysis and Projections

2020's Projections

Scenario #1: Based on Maintaining Growth at the ☒ Low ☐ High Average Annual Growth and ☐ Low ☐ Average ☒ High Demand per Service for each Customer Class.

Customer Type	Projected Services 2021	Projected Services 2022	Projected Services 2023	Projected Services 2024	Projected Services 2025	Projected Services 2026	Projected Services 2027	Projected Services 2028	Projected Services 2029	Projected Services 2030
Resident	1,396	1,405	1,413	1,422	1,431	1,439	1,448	1,457	1,466	1,475
Multi- Residential	6	6	6	6	6	6	6	6	6	6
Commercial	41	42	42	42	43	43	43	44	44	44 #
Industrial	0	0	0	0	0	0	0	0	0	0
Government	16	16	16	16	16	16	16	17	17	17
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Total	1,459	1,468	1,477	1,486	1,495	1,505	1,514	1,523	1,533	1,542

Customer Type	Demand 2021(ccf)	Demand 2022(ccf)	Demand 2023(ccf)	Demand 2024(ccf)	Demand 2025(ccf)	Demand 2026(ccf)	Demand 2027(ccf)	Demand 2028(ccf)	Demand 2029(ccf)	Demand 2030(ccf)
Resident	568,914	572,326	575,759	579,213	582,689	586,185	589,703	593,243	596,804	600,388
Multi- Residential	991	991	991	991	991	991	991	991	991	991
Commercial	31,967	32,363	32,765	33,174	33,589	34,011	34,440	34,876	35,319	35,769
Industrial	0	0	0	0	0	0	0	0	0	0
Government	24,031	24,303	24,579	24,858	25,142	25,430	25,722	26,018	26,319	26,624
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Unaccounted	94,317	94,891	95,468	96,049	96,635	97,224	97,817	98,415	99,016	99,622
Total	720,221	724,874	729,562	734,286	739,046	743,841	748,674	753,543	758,450	763,394

Customer Type	Demand 2021(AF)	Demand 2022(AF)	Demand 2023(AF)	Demand 2024(AF)	Demand 2025(AF)	Demand 2026(AF)	Demand 2027(AF)	Demand 2028(AF)	Demand 2029(AF)	Demand 2030(AF)
Resident	1,306	1,314	1,322	1,330	1,338	1,346	1,354	1,362	1,370	1,378
Multi- Residential	2	2	2	2	2	2	2	2	2	2
Commercial	73	74	75	76	77	78	79	80	81	82
Industrial	0	0	0	0	0	0	0	0	0	0
Government	55	56	56	57	58	58	59	60	60	61
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Unaccounted	217	218	219	221	222	223	225	226	227	229
Total	1,653	1,664	1,675	1,686	1,697	1,708	1,719	1,730	1,741	1,753

California Water Service Company - Antelope Valley District

Worksheet 10

Water Supply and Demand Analysis and Projections

2030's Projections

Scenario #1: Based on Maintaining Growth at the ☒ Low ☐ High Average Annual Growth and ☐ Low ☐ Average ☒ High Demand per Service for each Customer Class.

Customer Type	Projected Services 2031	Projected Services 2032	Projected Services 2033	Projected Services 2034	Projected Services 2035	Projected Services 2036	Projected Services 2037	Projected Services 2038	Projected Services 2039	Projected Services 2040
Resident	1,484	1,493	1,502	1,511	1,521	1,530	1,539	1,549	1,558	1,568
Multi- Residential	6	6	6	6	6	6	6	6	6	6
Commercial	45	45	46	46	46	47	47	48	48	48
Industrial	0	0	0	0	0	0	0	0	0	0
Government	17	17	17	18	18	18	18	18	19	19
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Total	1,552	1,561	1,571	1,581	1,591	1,601	1,611	1,621	1,631	1,641

Customer Type	Demand 2031(ccf)	Demand 2032(ccf)	Demand 2033(ccf)	Demand 2034(ccf)	Demand 2035(ccf)	Demand 2036(ccf)	Demand 2037(ccf)	Demand 2038(ccf)	Demand 2039(ccf)	Demand 2040(ccf)
Resident	603,993	607,620	611,270	614,942	618,637	622,355	626,095	629,859	633,645	637,455
Multi- Residential	991	991	991	991	991	991	991	991	991	991
Commercial	36,226	36,691	37,163	37,642	38,129	38,624	39,127	39,638	40,157	40,684
Industrial	0	0	0	0	0	0	0	0	0	0
Government	26,933	27,247	27,566	27,889	28,217	28,550	28,888	29,230	29,578	29,931
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Unaccounted	100,232	100,846	101,465	102,087	102,714	103,346	103,982	104,622	105,267	105,916
Total	768,376	773,396	778,454	783,552	788,689	793,866	799,083	804,340	809,638	814,977

Customer Type	Demand 2031(AF)	Demand 2032(AF)	Demand 2033(AF)	Demand 2034(AF)	Demand 2035(AF)	Demand 2036(AF)	Demand 2037(AF)	Demand 2038(AF)	Demand 2039(AF)	Demand 2040(AF)
Resident	1,387	1,395	1,403	1,412	1,420	1,429	1,437	1,446	1,455	1,463
Multi- Residential	2	2	2	2	2	2	2	2	2	2
Commercial	83	84	85	86	88	89	90	91	92	93
Industrial	0	0	0	0	0	0	0	0	0	0
Government	62	63	63	64	65	66	66	67	68	69
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Unaccounted	230	232	233	234	236	237	239	240	242	243
Total	1,764	1,775	1,787	1,799	1,811	1,822	1,834	1,847	1,859	1,871

California Water Service Company -Antelope Valley District

Worksheet 13

Water Supply and Demand Analysis and Projections

2000's Projections

Scenario #4: Based on Maintaining Growth at the ☐ 10-Year ☒ 5-Year Average Annual Growth

Summary of Historical Growth Rate from Worksheet 2			
Customer Type	5 Yr. Avg. Historical Growth Rate	Individual Growth Rate Selected	Notes
Single Family Residential	0.45%	0.45%	Historical growth rate used
Multi Family Residential	0.00%	0.42%	Percent changed to overall growth rate
Commercial	-0.48%	-0.48%	Historical growth rate used
Industrial	0.00%	0.42%	Percent changed to overall growth rate
Government	4.05%	4.05%	Historical growth rate used
Irrigation/Recreation	0.00%	0.42%	Percent changed to overall growth rate
Other	-3.33%	0.42%	Percent changed to overall growth rate
Overall	0.42%	0.42%	

California Water Service Company - Antelope Valley District

Worksheet 13

Water Supply and Demand Analysis and Projections

30-year projection Summary

Scenario #4: Based on Maintaining Growth at the ☐ 10-Year ☒ 5-Year Average Annual Growth

Customer Type	Projected Services 2010	Projected Services 2015	Projected Services 2020	Projected Services 2025	Projected Services 2030	Projected Services 2035	Projected Services 2040	Services projected to be added from 2010 - 2040
Single Family Residential	1,298	1,371	1,449	1,532	1,619	1,711	1,809	511
Multi Family Residential	6	6	7	7	7	7	8	2
Commercial	38	40	41	43	44	46	48	10
Industrial	0	0	0	0	0	0	0	0
Government	14	18	24	32	43	60	84	70
Irrigation/Recreation	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0
Total	1,356	1,435	1,521	1,613	1,714	1,825	1,949	593

California Water Service Company - Antelope Valley District

Worksheet 13

Water Supply and Demand Analysis and Projections

2000's Projections

Scenario #4: Based on Maintaining Growth at the ☐ 10-Year ☒ 5-Year Average Annual Growth

Customer Type	Actual Services 2001	Actual Services 2002	Actual Services 2003	Actual Services 2004	Actual Services 2005	Actual Services 2006	Actual Services 2007	Actual Services 2008	Actual Services 2009	Projected Services 2010
Resident	1,213	1,207	1,186	1,272	1,291	1,305	1,319	1,308	1,298	1,298
Multi- Residential	10	7	6	6	6	6	6	6	6	6
Commercial	32	33	38	39	38	37	36	37	38	38
Industrial	0	0	0	0	0	0	0	0	0	0
Government	12	12	11	12	12	11	10	13	14	14
Irrigation/Recreation	2	1	0	0	0	0	2	0	0	0
Other	1	1	1	2	3	3	1	1	0	0
Total	292	287	287	277	288	1,359	1,369	1,364	1,356	1,356

2010's Projections

Customer Type	Projected Services 2011	Projected Services 2012	Projected Services 2013	Projected Services 2014	Projected Services 2015	Projected Services 2016	Projected Services 2017	Projected Services 2018	Projected Services 2019	Projected Services 2020
Resident	1,312	1,327	1,342	1,356	1,371	1,387	1,402	1,418	1,433	1,449
Multi- Residential	6	6	6	6	6	6	6	6	7	7
Commercial	38	39	39	39	40	40	40	40	41	41
Industrial	0	0	0	0	0	0	0	0	0	0
Government	15	15	16	17	18	19	20	21	22	24
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Total	1,372	1,387	1,403	1,419	1,435	1,452	1,469	1,486	1,503	1,521

California Water Service Company - Antelope Valley District

Worksheet 13

Water Supply and Demand Analysis and Projections

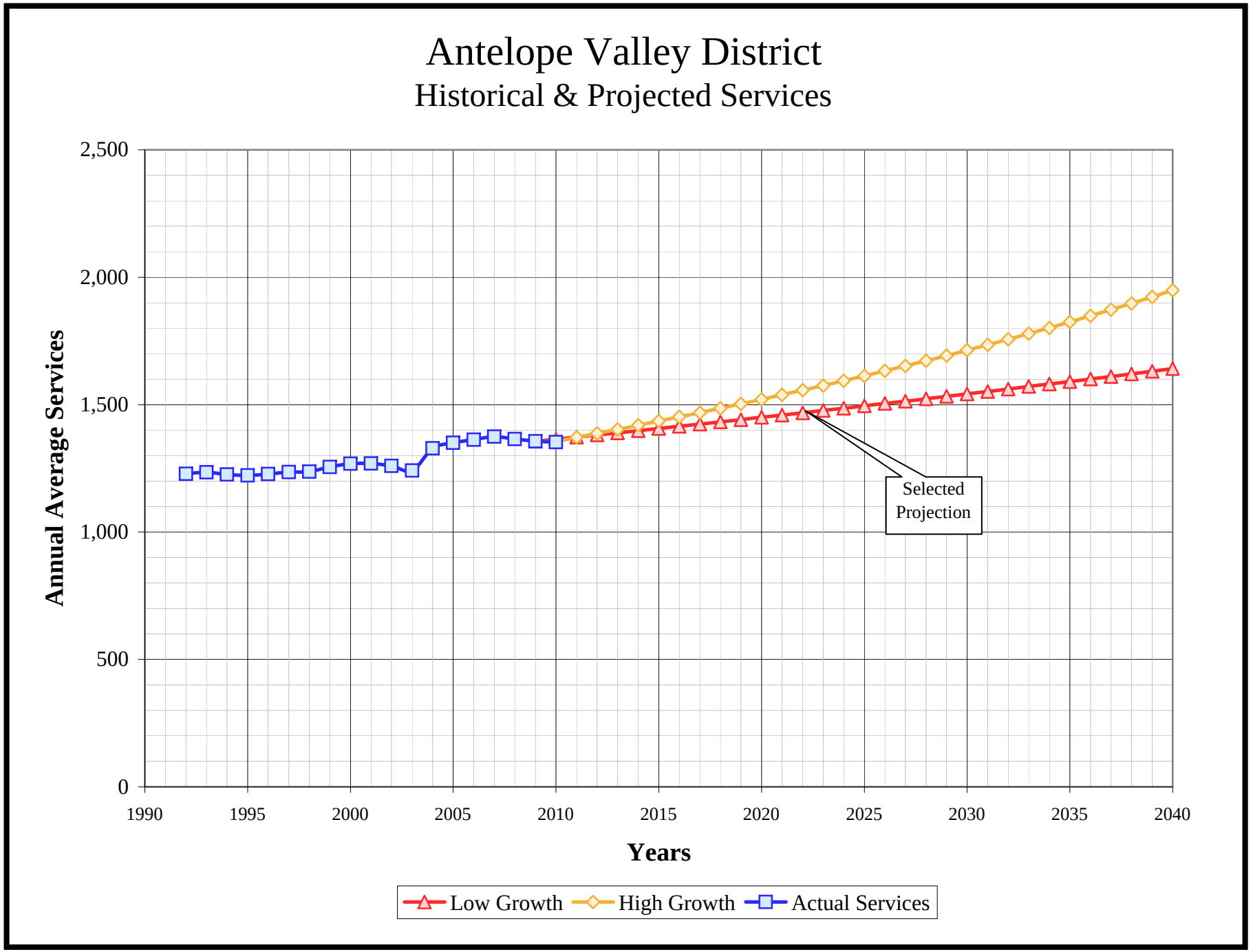
2020's Projections

Scenario #4: Based on Maintaining Growth at the ☐ 10-Year ☒ 5-Year Average Annual Growth

Customer Type	Projected Services 2021	Projected Services 2022	Projected Services 2023	Projected Services 2024	Projected Services 2025	Projected Services 2026	Projected Services 2027	Projected Services 2028	Projected Services 2029	Projected Services 2030
Resident	1,465	1,482	1,498	1,515	1,532	1,549	1,566	1,583	1,601	1,619
Multi- Residential	7	7	7	7	7	7	7	7	7	7
Commercial	41	42	42	42	43	43	43	44	44	44
Industrial	0	0	0	0	0	0	0	0	0	0
Government	25	27	28	30	32	34	36	38	41	43
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Total	1,538	1,557	1,575	1,594	1,613	1,632	1,652	1,672	1,693	1,714

2030's Projections

Customer Type	Projected Services 2031	Projected Services 2032	Projected Services 2033	Projected Services 2034	Projected Services 2035	Projected Services 2036	Projected Services 2037	Projected Services 2038	Projected Services 2039	Projected Services 2040
Resident	1,637	1,655	1,674	1,692	1,711	1,730	1,750	1,769	1,789	1,809
Multi- Residential	7	7	7	7	7	7	8	8	8	8
Commercial	45	45	45	46	46	47	47	47	48	48
Industrial	0	0	0	0	0	0	0	0	0	0
Government	46	49	53	56	60	64	69	73	78	84
Irrigation/Recreation	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Total	1,735	1,757	1,779	1,802	1,825	1,848	1,873	1,897	1,923	1,949


Antelope Valley District
Historical & Projected Services
Annual Average Services
2,500
2,000
1,500
1,000
500
0
1990
1995
2000
2005
2010
2015
2020
2025
2030
2035
2040
Years
Selected Projection
Low Growth
High Growth
Actual Services

California Water Service Company - Antelope Valley District

Worksheet 15

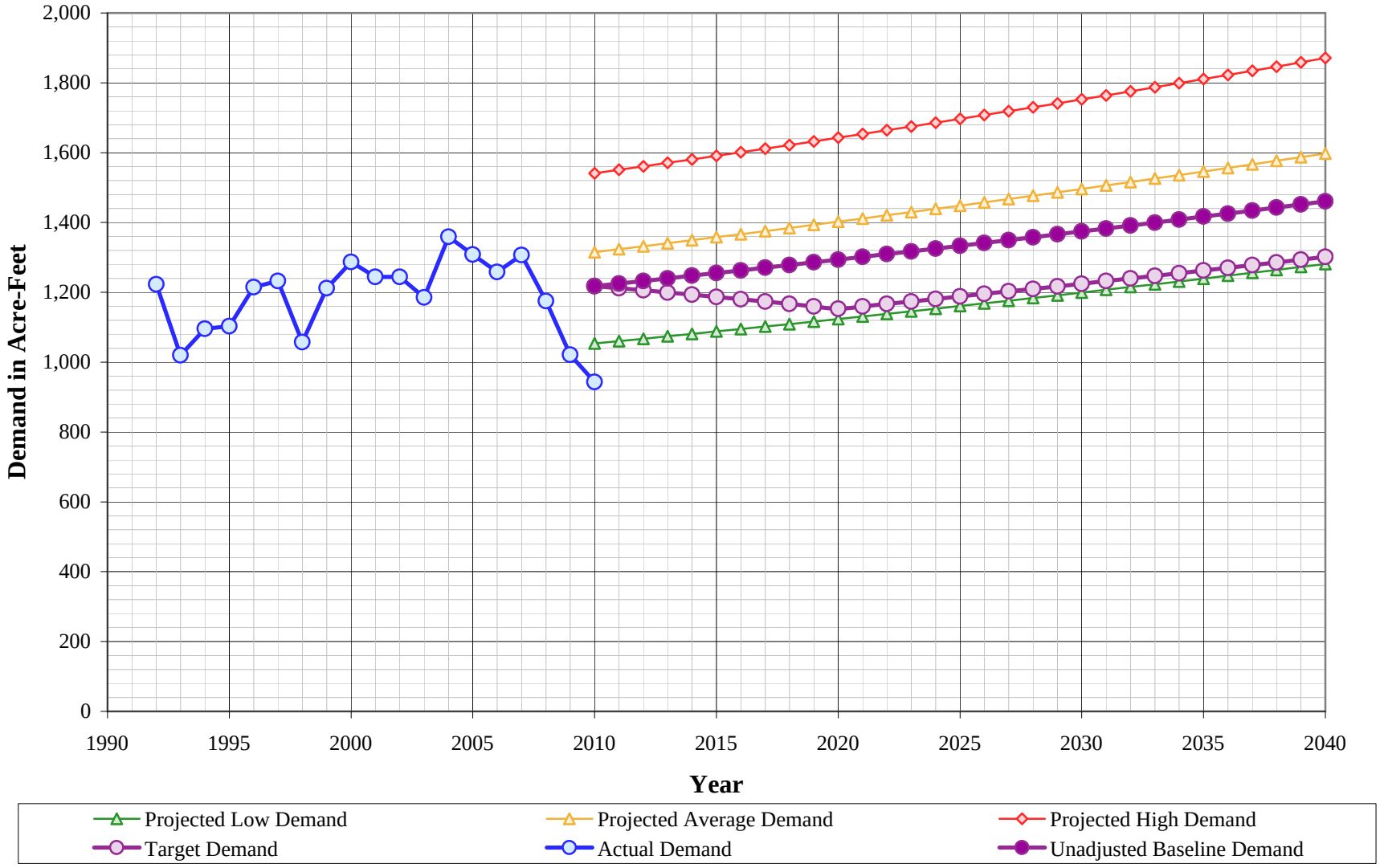
Water Supply and Demand Analysis and Projections

Projected Annual Average Services

Year	Actual Services	Projected Services Low Growth	Projected Services High Growth
1990			
1991			
1992	1,229		
1993	1,234		
1994	1,226		
1995	1,223		
1996	1,228		
1997	1,235		
1998	1,237		
1999	1,255		
2000	1,268		
2001	1,269		
2002	1,260		
2003	1,242		
2004	1,328		
2005	1,350		
2006	1,362		
2007	1,374		
2008	1,365		
2009	1,356	1,356	1,356
2010	1,353	1,364	1,356
2011		1,373	1,372
2012		1,381	1,387
2013		1,389	1,403
2014		1,398	1,419
2015		1,406	1,435
2016		1,415	1,452
2017		1,424	1,469
2018		1,432	1,486
2019		1,441	1,503
2020		1,450	1,521
2021		1,459	1,538
2022		1,468	1,557
2023		1,477	1,575
2024		1,486	1,594
2025		1,495	1,613
2026		1,505	1,632
2027		1,514	1,652
2028		1,523	1,672
2029		1,533	1,693
2030		1,542	1,714
2031		1,552	1,735
2032		1,561	1,757
2033		1,571	1,779
2034		1,581	1,802
2035		1,591	1,825
2036		1,601	1,848
2037		1,611	1,873
2038		1,621	1,897
2039		1,631	1,923
2040		1,641	1,949

Antelope Valley District

Historical & Projected Demand



California Water Service Company - Antelope Valley District

Worksheet 16

Water Supply and Demand Analysis and Projections

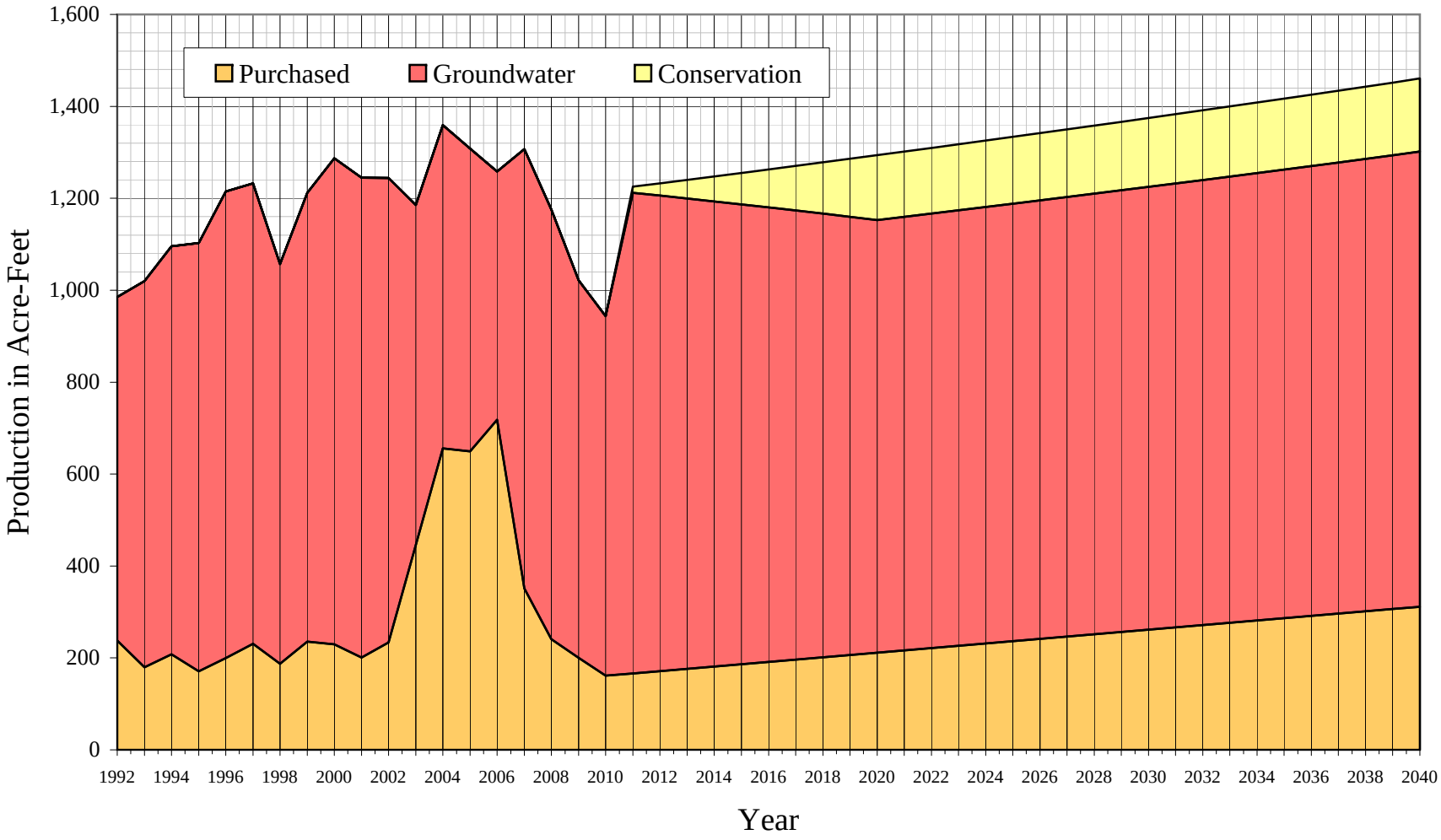
Projected Demand in Acre-Feet

	Actual Demand	Projection			Unadjusted Baseline Demand	Target Demand
		Low	Average	High		
1990						
1991						
1992	1,223					
1993	1,020					
1994	1,096					
1995	1,103					
1996	1,215					
1997	1,232					
1998	1,057					
1999	1,212					
2000	1,287					
2001	1,245					
2002	1,244					
2003	1,185					
2004	1,359					
2005	1,308					
2006	1,258					
2007	1,307					
2008	1,175					
2009	1,021					
2010	944	1,053	1,315	1,541	1,218	1,218
2011		1,060	1,324	1,551	1,225	1,212
2012		1,067	1,332	1,561	1,233	1,206
2013		1,074	1,341	1,571	1,240	1,200
2014		1,081	1,349	1,581	1,248	1,193
2015		1,088	1,358	1,591	1,255	1,187

	Actual Demand	Projection			Unadjusted Baseline Demand	Target Demand
		Low	Average	High		
2016		1,095	1,367	1,601	1,180	
2017		1,102	1,376	1,611	1,174	
2018		1,109	1,384	1,622	1,167	
2019		1,116	1,393	1,632	1,160	
2020		1,124	1,402	1,643	1,153	
2021		1,131	1,411	1,653	1,160	
2022		1,138	1,421	1,664	1,167	
2023		1,146	1,430	1,675	1,174	
2024		1,153	1,439	1,686	1,181	
2025		1,161	1,448	1,697	1,188	
2026		1,168	1,458	1,708	1,195	
2027		1,176	1,467	1,719	1,203	
2028		1,184	1,477	1,730	1,210	
2029		1,192	1,487	1,741	1,217	
2030		1,199	1,496	1,753	1,225	
2031		1,207	1,506	1,764	1,232	
2032		1,215	1,516	1,775	1,240	
2033		1,223	1,526	1,787	1,247	
2034		1,231	1,536	1,799	1,255	
2035		1,239	1,546	1,811	1,263	
2036		1,248	1,556	1,822	1,270	
2037		1,256	1,566	1,834	1,278	
2038		1,264	1,577	1,847	1,286	
2039		1,273	1,587	1,859	1,294	
2040		1,281	1,598	1,871	1,301	

Antelope Valley District

Historical and Projected Distribution of Demand by Source



California Water Service Company - Antelope Valley District

Worksheet 17

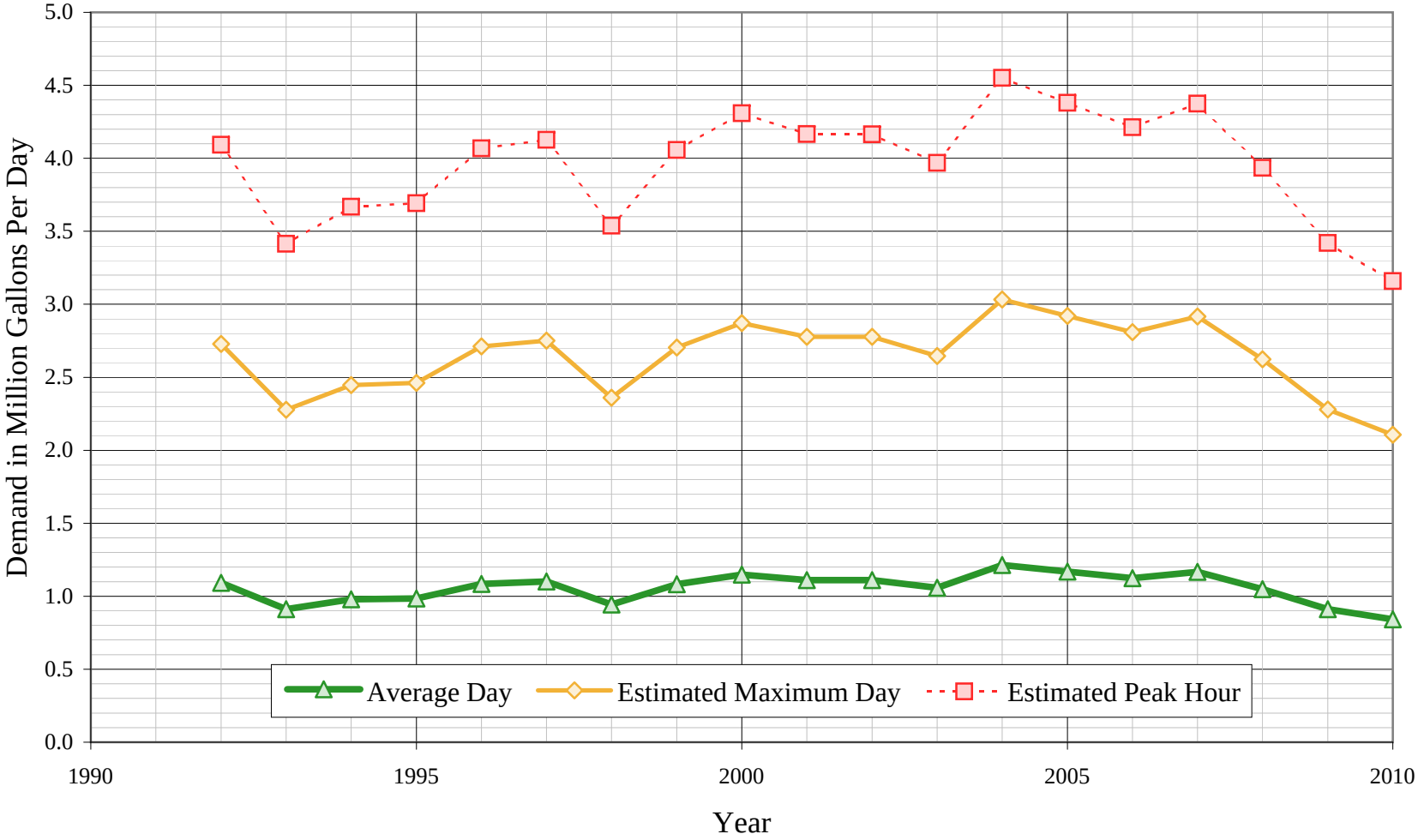
Water Supply and Demand Analysis and Projections

Historical and Projected Distribution of Demand by Source

Year	Purchased Water kGal	Purchased Water AFY	Groundwater kGal	Groundwater AFY	Conservation kGal	Conservation AFY	Total Supply kGal	Total Supply AFY
1990								
1991								
1992	77,437	238	243,551	747			320,988	985
1993	58,616	180	273,733	840			332,349	1,020
1994	67,675	208	289,400	888			357,075	1,096
1995	55,647	171	303,706	932			359,353	1,103
1996	65,134	200	330,750	1,015			395,884	1,215
1997	75,260	231	326,352	1,002			401,612	1,232
1998	61,020	187	283,432	870			344,452	1,057
1999	76,804	236	318,081	976			394,885	1,212
2000	74,716	229	344,601	1,058			419,317	1,287
2001	65,529	201	340,006	1,043			405,535	1,245
2002	76,187	234	329,170	1,010			405,357	1,244
2003	145,276	446	240,930	739			386,206	1,185
2004	213,777	656	229,128	703			442,905	1,359
2005	211,611	649	214,639	659			426,250	1,308
2006	233,927	718	176,155	541			410,081	1,258
2007	114,390	351	311,461	956			425,852	1,307
2008	78,527	241	304,429	934			382,956	1,175
2009	65,192	200	267,641	821			332,833	1,021
2010	52,588	161	254,868	782			307,456	944
2011	54,218	166	340,704	1,046	4,350	13	399,264	1,225
2012	55,847	171	337,090	1,034	8,753	27	401,681	1,233
2013	57,476	176	333,437	1,023	13,208	41	404,114	1,240
2014	59,105	181	329,747	1,012	17,718	54	406,562	1,248
2015	60,735	186	326,017	1,000	22,282	68	409,026	1,255
2016	62,364	191	322,248	989	26,900	83	411,505	1,263
2017	63,993	196	318,440	977	31,574	97	413,999	1,271
2018	65,623	201	314,592	965	36,303	111	416,510	1,278
2019	67,252	206	310,703	953	41,089	126	419,036	1,286
2020	68,881	211	306,774	941	45,931	141	421,578	1,294
2021	70,510	216	307,424	943	46,210	142	424,136	1,302
2022	72,140	221	308,088	945	46,490	143	426,710	1,310
2023	73,769	226	308,767	948	46,772	144	429,301	1,317
2024	75,398	231	309,461	950	47,056	144	431,907	1,325
2025	77,027	236	310,169	952	47,342	145	434,531	1,334
2026	78,657	241	310,892	954	47,630	146	437,170	1,342
2027	80,286	246	311,630	956	47,919	147	439,827	1,350
2028	81,915	251	312,383	959	48,210	148	442,500	1,358
2029	83,545	256	313,151	961	48,504	149	445,190	1,366
2030	85,174	261	313,934	963	48,799	150	447,898	1,375
2031	86,803	266	314,732	966	49,095	151	450,622	1,383
2032	88,432	271	315,545	968	49,394	152	453,363	1,391
2033	90,062	276	316,374	971	49,695	153	456,122	1,400
2034	91,691	281	317,219	973	49,997	153	458,899	1,408
2035	93,320	286	318,079	976	50,301	154	461,693	1,417
2036	94,950	291	318,956	979	50,608	155	464,504	1,426
2037	96,579	296	319,847	982	50,916	156	467,334	1,434
2038	98,208	301	320,755	984	51,226	157	470,181	1,443
2039	99,837	306	321,679	987	51,538	158	473,047	1,452
2040	101,467	311	322,620	990	51,853	159	475,930	1,461

Antelope Valley District

Average Day, Maximum Day, & Peak Hour Demand



California Water Service Company - Antelope Valley District

Worksheet 18

Water Supply and Demand Analysis and Projections

Historical and Projected Average Day, Maximum Day, and Peak Demand

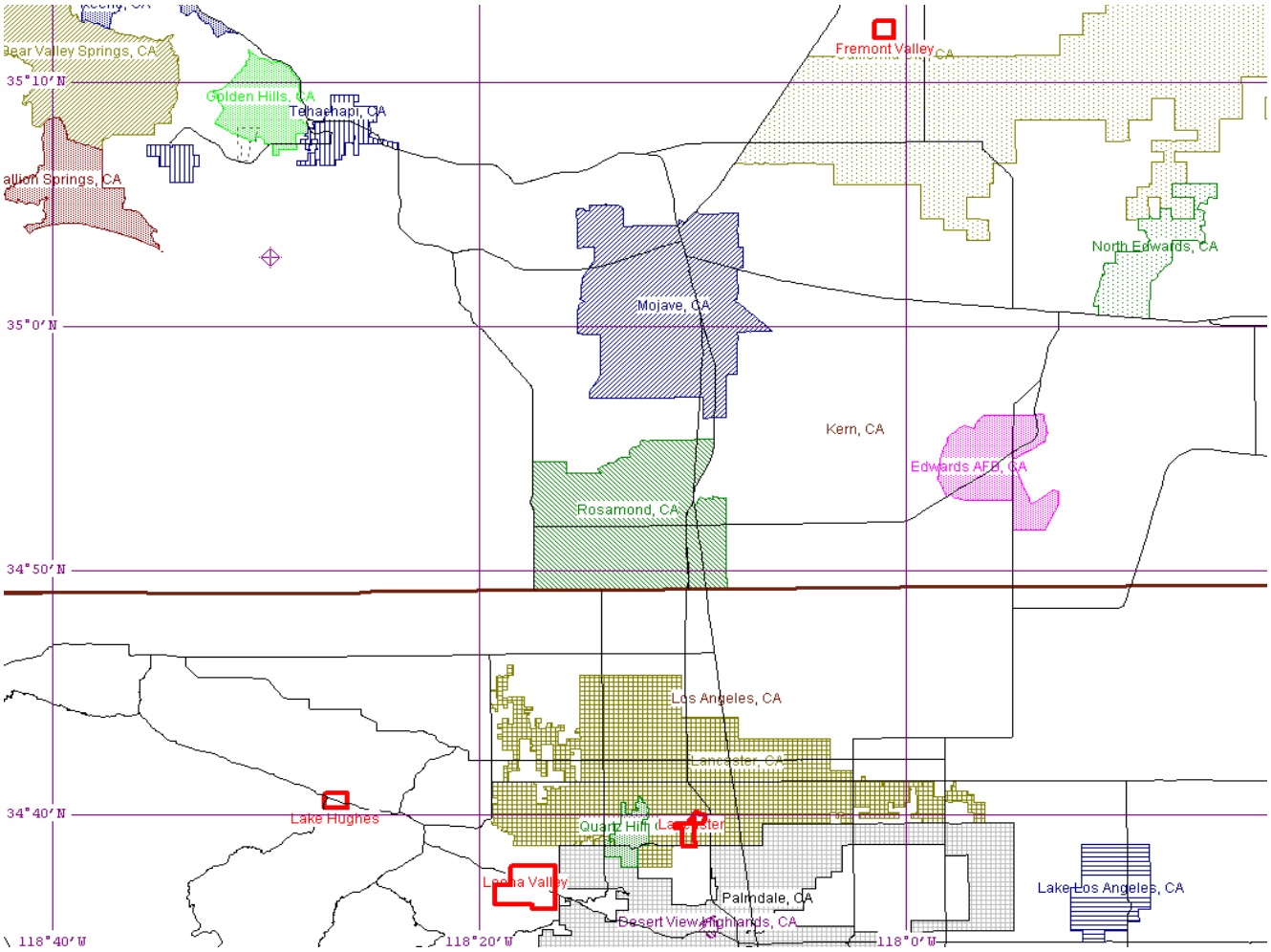
Year	Historical Annual Demand (AF)	Historical Annual Demand (MG)	Average Day Demand (MG)	Average Day Use Per Service (gal)	Estimated Maximum Day Demand (MG)	Estimated Maximum Day Use Per Service (gal)	Max Day : Ave. Day Ratio	Peak Hour Demand (GPM)	Peak Hour Demand (MGD)	Peak to Ave Day Ratio	Peak to Max Day Ratio
1990											
1991											
1992	1,223	398	1.1	888	2.7	2,221	2.50	2,843	4.09	3.75	1.50
1993	1,020	332	0.9	738	2.3	1,845	2.50	2,371	3.41	3.75	1.50
1994	1,096	357	1.0	798	2.4	1,996	2.50	2,548	3.67	3.75	1.50
1995	1,103	359	1.0	805	2.5	2,013	2.50	2,564	3.69	3.75	1.50
1996	1,215	396	1.1	883	2.7	2,209	2.50	2,824	4.07	3.75	1.50
1997	1,232	402	1.1	891	2.8	2,227	2.50	2,865	4.13	3.75	1.50
1998	1,057	344	0.9	763	2.4	1,907	2.50	2,458	3.54	3.75	1.50
1999	1,212	395	1.1	862	2.7	2,154	2.50	2,817	4.06	3.75	1.50
2000	1,287	419	1.1	906	2.9	2,265	2.50	2,992	4.31	3.75	1.50
2001	1,245	406	1.1	876	2.8	2,189	2.50	2,893	4.17	3.75	1.50
2002	1,244	405	1.1	882	2.8	2,204	2.50	2,892	4.16	3.75	1.50
2003	1,185	386	1.1	852	2.6	2,130	2.50	2,755	3.97	3.75	1.50
2004	1,359	443	1.2	913	3.0	2,284	2.50	3,160	4.55	3.75	1.50
2005	1,308	426	1.2	865	2.9	2,163	2.50	3,041	4.38	3.75	1.50
2006	1,258	410	1.1	825	2.8	2,062	2.50	2,926	4.21	3.75	1.50
2007	1,307	426	1.2	849	2.9	2,123	2.50	3,038	4.38	3.75	1.50
2008	1,175	383	1.0	769	2.6	1,922	2.50	2,732	3.93	3.75	1.50
2009	1,021	333	0.9	672	2.3	1,681	2.50	2,375	3.42	3.75	1.50
2010	944	307	0.8	623	2.1	1,556	2.50	2,194	3.16	3.75	1.50
5 year Average (2006-2010)			1.02	748	2.55	1,869	2.50	2,653	3.82	3.75	1.50
10 year Average (2001-2010)			1.08	813	2.69	2,031	2.50	2,801	4.03	3.75	1.50

California Water Service Company - Antelope Valley District

Worksheet 19

Water Supply and Demand Analysis and Projections

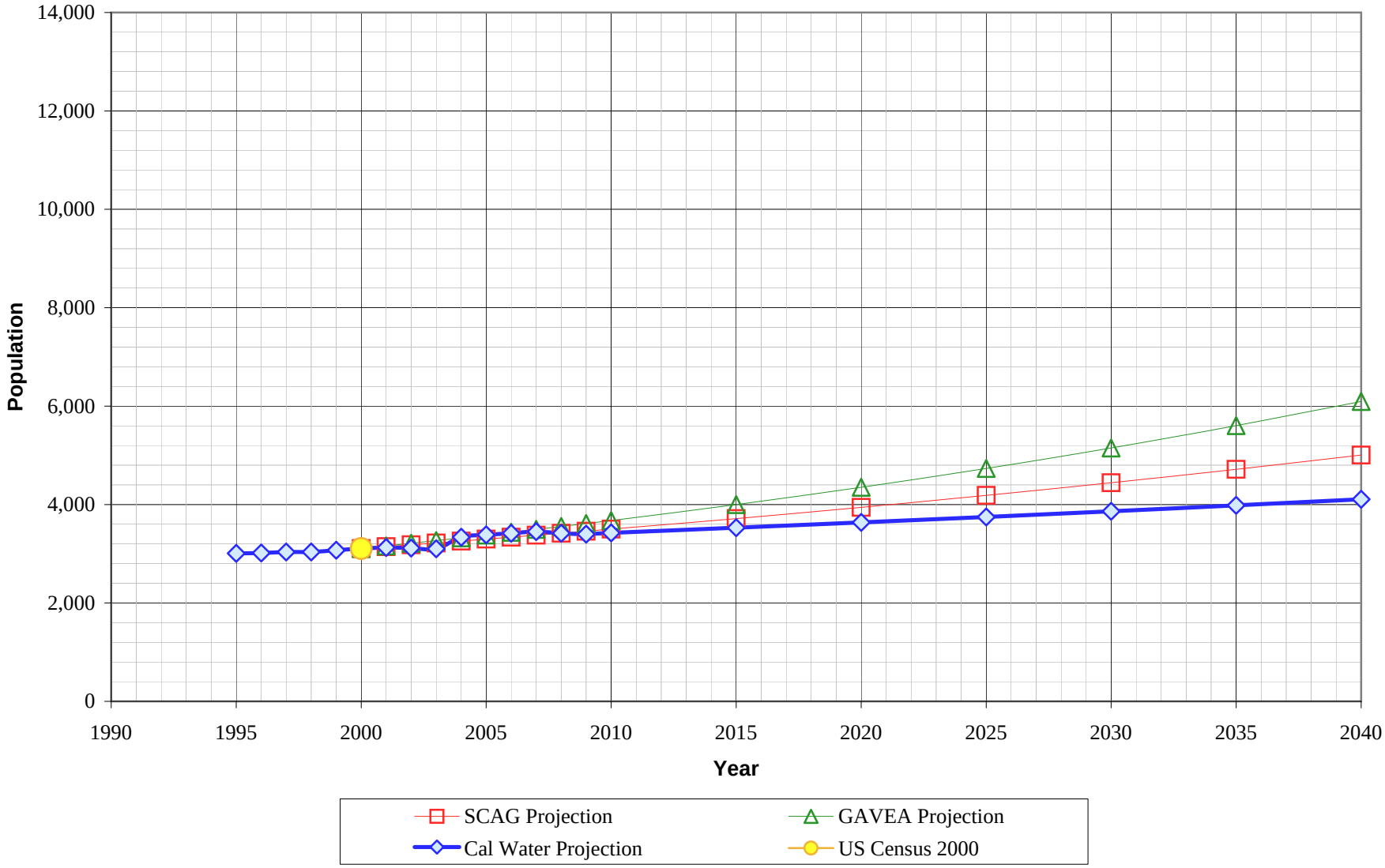
US Census 2000 Tract Map Summary



US Census 2000 Summary				
Division	**Census Tract Blocks**	**Population**	**Housing Units**	**Density**
Fremont Valley	15	129	72	1.79
Lake Hughes	18	159	113	1.41
Lancaster	35	1,715	743	2.31
Leona Valley	9	1,103	423	2.61
	77	3,106	1,351	2.30

Antelope Valley District

Population Projections



California Water Service Company - Antelope Valley District

Worksheet 19

Water Supply and Demand Analysis and Projections

Population as of the 2000 Average Annual Services
Estimated District Population based on 2000 U.S. Census Data & Annual Service Count

District Communities Served:
Antelope Valley, Fremont Velley - Mojave, Lancaster, Lake Hughes, Leona Valley

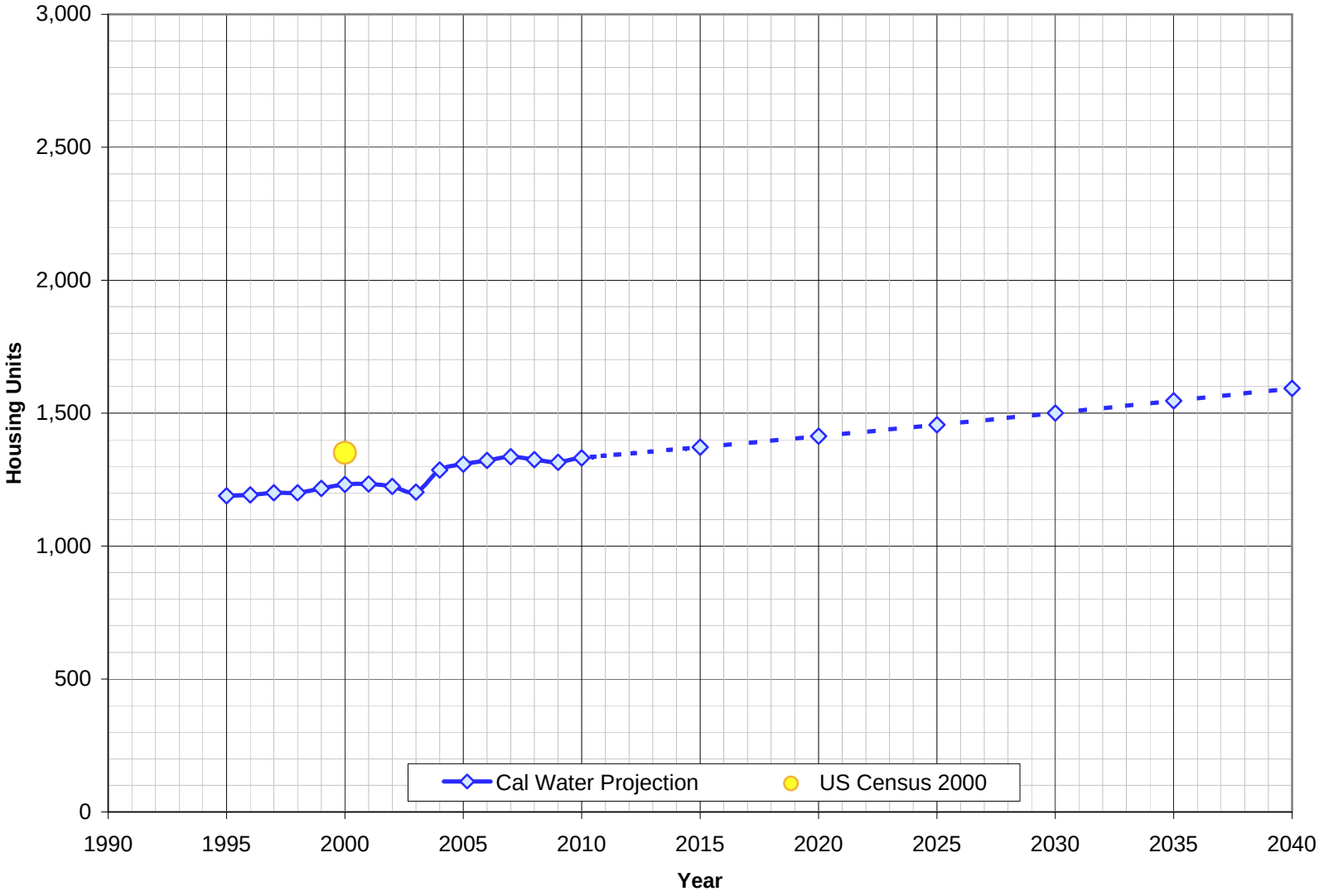
Year	Metered Single Family Residential Services (DU)	Multi Family Residential			Flat Rate Residential Services (DU)	Total Residential Services (DU)	Estimated District Population
		Services	Residential Units (DU)	Unit Density			
1995	1,166	9	23	2.6	0	1,189	3,008
1996	1,172	8	21	2.6	0	1,192	3,015
1997	1,180	8	20	2.6	0	1,201	3,035
1998	1,183	7	18	2.6	0	1,201	3,037
1999	1,199	7	18	2.7	0	1,217	3,072
2000	1,211	8	21	2.7	0	1,232	3,106
2001	1,213	8	21	2.7	0	1,233	3,125
2002	1,206	7	19	2.7	0	1,225	3,116
2003	1,186	6	17	2.8	0	1,203	3,100
2004	1,269	6	17	2.8	0	1,286	3,335
2005	1,291	6	17	2.8	0	1,308	3,385
2006	1,305	6	17	2.8	0	1,322	3,416
2007	1,319	6	17	2.8	0	1,336	3,449
2008	1,308	6	17	2.8	0	1,325	3,416
2009	1,298	6	17	2.8	0	1,315	3,397
2010	1,306	6	17	2.8	0	1,331	3,423
2015	1,346	6	17	2.8	0	1,372	3,528
2020	1,388	6	17	2.8	0	1,413	3,637
2025	1,431	6	17	2.8	0	1,456	3,748
2030	1,475	6	17	2.8	0	1,500	3,864
2035	1,521	6	17	2.8	0	1,546	3,983
2040	1,568	6	17	2.8	0	1,593	4,106

US Census 2000		Calculated Persons per CWS DU	Calculated Persons per US Census Housing Unit
Population	Housing Units		
3,106	1,351	2.521	2.299

Note: Insufficient data for MFR Units for year 1995 to 2001. Linear regression performed for year 2002 to 2006 on unit density and used to estimate MFR DU for years prior to 2002 and projection for 2010 to 2040.

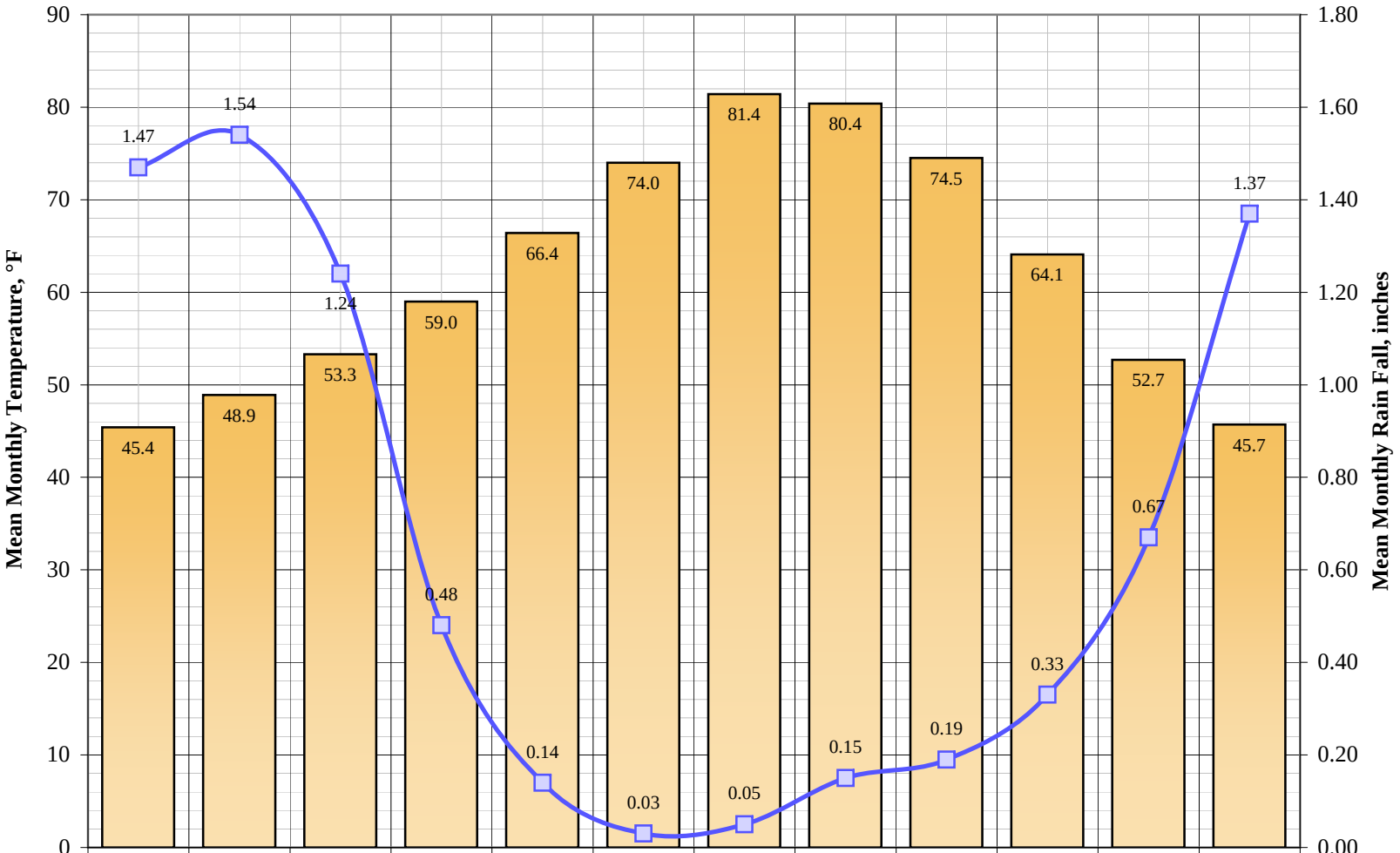
Antelope Valley District

Housing Units



Antelope Valley District

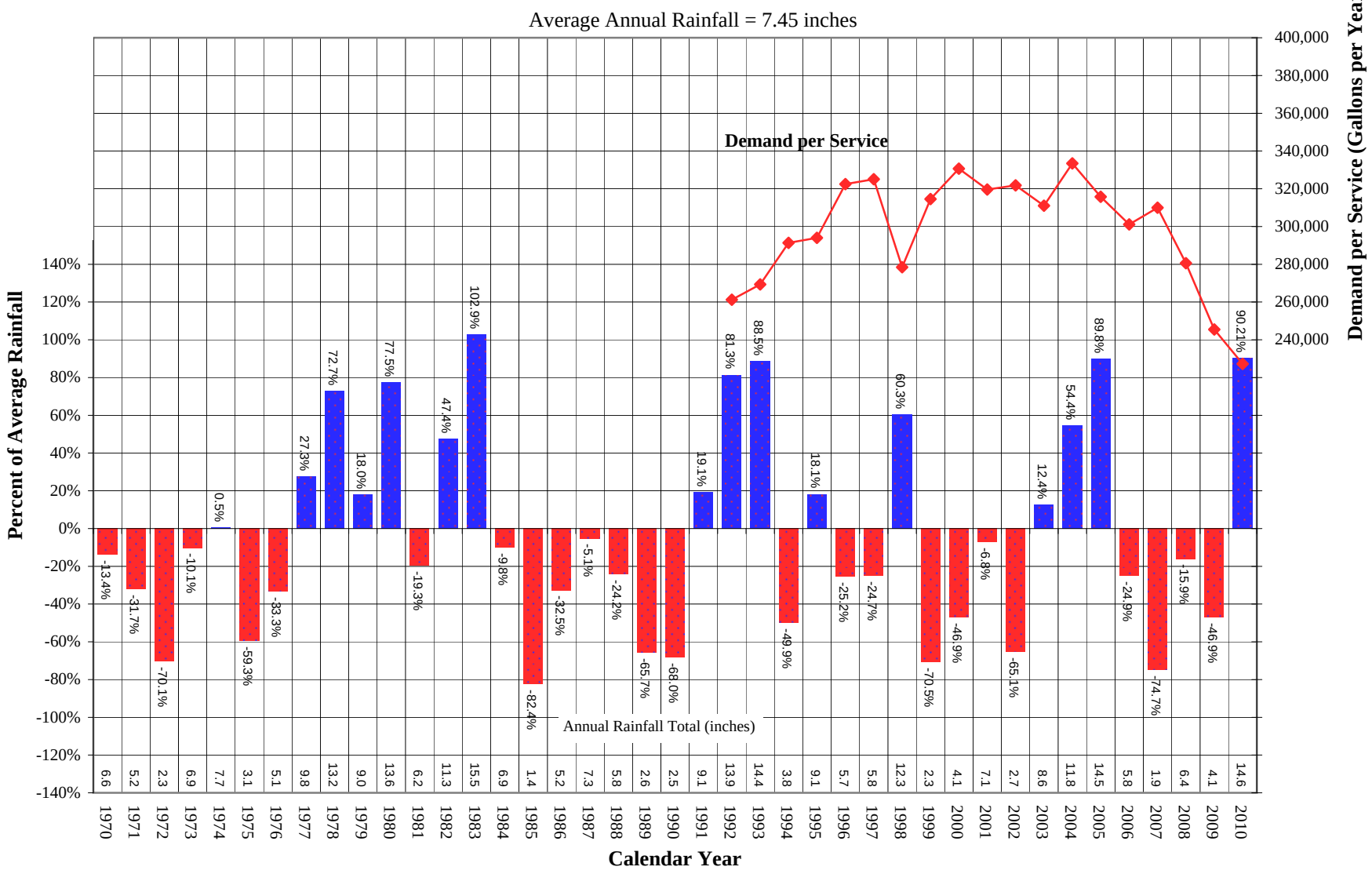
Average Monthly Temperature and Rainfall



	January	February	March	April	May	June	July	August	September	October	November	December
Temperature	45	49	53	59	66	74	81	80	75	64	53	46
Rainfall	1	2	1	0	0	0	0	0	0	0	1	1

Antelope Valley District

Comparison of Annual Rainfall to Historic Average



California Water Service Company - Antelope Valley District

Worksheet 20

Water Supply and Demand Analysis and Projections

Temperature & Rainfall History (Fahrenheit, Inches)

Year		Annual Average Temp.	Annual Average Rainfall	Rainfall Percent Variation	Demand per Service (Gal / Yr)	Percent of Normal Demand
1970		62.2	6.63	-13.4%		
1971		60.1	5.23	-31.7%		
1972		61.5	2.29	-70.1%		
1973		61.0	6.89	-10.1%		
1974		61.6	7.70	0.5%		
1975		60.7	3.12	-59.3%		
1976		61.4	5.11	-33.3%		
1977		62.1	9.75	27.3%		
1978		60.9	13.23	72.7%		
1979		60.0	9.04	18.0%		
1980		61.3	13.60	77.5%		
1981		62.7	6.18	-19.3%		
1982		59.9	11.29	47.4%		
1983		60.3	15.54	102.9%		
1984		61.7	6.91	-9.8%		
1985		63.2	1.35	-82.4%		
1986		62.6	5.17	-32.5%		
1987		62.1	7.27	-5.1%		
1988		63.2	5.81	-24.2%		
1989		63.2	2.63	-65.7%		
1990		62.8	2.45	-68.0%		
1991		62.9	9.12	19.1%		
1992		63.1	13.89	81.3%	261,236	86.7%
1993		62.7	14.44	88.5%	269,300	89.3%
1994		63.9	3.84	-49.9%	291,360	96.7%

Year		Annual Average Temp.	Annual Average Rainfall	Rainfall Percent Variation	Demand per Service (Gal / Yr)	Percent of Normal Demand
1995		64.5	9.05	18.1%	294,020	97.5%
1996		65.8	5.73	-25.2%	322,453	107.0%
1997		64.7	5.77	-24.7%	325,072	107.8%
1998		61.4	12.28	60.3%	278,417	92.4%
1999		63.9	2.26	-70.5%	314,558	104.4%
2000		64.7	4.07	-46.9%	330,621	109.7%
2001		64.2	7.14	-6.8%	319,615	106.0%
2002		63.9	2.67	-65.1%	321,774	106.8%
2003		64.1	8.61	12.4%	311,016	103.2%
2004		63.4	11.83	54.4%	333,429	110.6%
2005		62.8	14.54	89.8%	315,741	104.7%
2006		63.0	5.75	-24.9%	301,088	99.9%
2007		63.9	1.94	-74.7%	309,936	102.8%
2008		70.9	6.44	-15.9%	280,554	93.1%
2009		67.0	4.07	-46.9%	245,452	81.4%
2010		63.6	14.57	90.21%	227,240	75.4%
2011						
2012						
2013						
2014						
2015						
2016						
2017						
2018						
2019						

Source: Western Regional Climate Center: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca6624

	Average Water Year		Normal Water Year	Single-Dry Water Year	Multiple-Dry Water Years			
					1	2	3	4
Calendar Year	-		2003	2007	2006	2007	2008	2009
Demand per Service (gal/yr)	301,424		311,016	309,936	301,088	309,936	280,554	245,452
Difference from Average	100.0%		100.0%	99.7%	96.8%	99.7%	90.2%	78.9%

California Water Service Company - Antelope Valley District
Water Supply and Demand Analysis and Projections

Worksheet 20

Temperature Data

Station:(046624) PALMDALE															
From Year=1903 To Year=2010															
	Monthly Averages			Daily Extremes				Monthly Extremes				Max. Temp.		Min. Temp.	
	Max.	Min.	Mean	High	Date	Low	Date	Highest Mean	Year	Lowest Mean	Year	>= 90 F	<= 32 F	<= 32 F	<= 0 F
	F	F	F	F	dd/yyyy or yyyymmdd	F	dd/yyyy or yyyymmdd	F	-	F	-	# Days	# Days	# Days	# Days
January	58	32	45	81	15/1943	6	13/1963	52	2,003	33	1,937	0	0	16	0
February	62	36	49	84	28/1999	15	4/1979	56	1,995	42	1,939	0	0	9	0
March	67	39	53	91	20/1997	14	2/1971	65	2,008	46	1,948	0	0	5	0
April	74	44	59	98	7/1989	20	23/1971	71	2,008	47	1,967	2	0	1	0
May	82	51	66	107	31/1950	28	1/1988	75	1,997	59	1,953	7	0	0	0
June	90	58	74	112	21/1961	35	2/1967	81	1,960	65	1,944	17	0	0	0
July	98	65	81	113	10/1961	43	5/1948	87	1,931	75	1,983	28	0	0	0
August	97	64	80	112	13/1933	38	19/1931	85	1,958	75	1,976	28	0	0	0
September	91	58	75	111	2/1950	34	20/1978	80	1,995	67	1,986	20	0	0	0
October	80	48	64	105	5/1980	23	30/1971	71	2,003	59	1,946	5	0	0	0
November	67	38	53	93	1/1970	14	19/1964	61	1,995	47	1,964	0	0	7	0
December	59	33	46	84	4/1958	9	15/1971	55	1,950	39	1,984	0	0	16	0
Annual	77	47	62	113	19610710	6	19630113	66	1,996	59	1,944	106	0	55	0

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Monthly Average ETo Report	2.02	2.61	4.55	6.19	7.3	8.85	9.77	8.99	6.52	4.66	2.68	2.05	66.19

1) California Irrigation Management Information System (CIMIS), http://wwwcimis.water.ca.gov/cimis/ welcome.jsp, EvapoTranspiration (Eto) Zones Map, Zone 17, Statin 197, Palmdale

California Water Service Company - Antelope Valley District
Water Supply and Demand Analysis and Projections

Worksheet 20

Precipitaion Data

Station:(046624) PALMDALE														
From Year=1903 To Year=2010														
	Precipitation											Total Snowfall		
	Mean	High	Year	Low	Year	1 Day Max.		>= 0.01 in.	>= 0.10 in.	>= 0.50 in.	>= 1.00 in.	Mean	High	Year
	in.	in.	-	in.	-	in.	dd/yyyy or yyyymmdd	# Days	# Days	# Days	# Days	in.	in.	-
January	1	8	1993	0	1945	2.44	18/1952	4	3	1	0	1	19	1,974
February	2	7	1944	0	1933	2.43	22/1944	4	3	1	0	0	4	1,944
March	1	5	1983	0	1933	2.39	3/1938	4	3	1	0	0	2	1,937
April	0	2	1982	0	1920	1.05	16/1903	2	1	0	0	0	0	1,931
May	0	2	1930	0	1903	1.1	8/1977	1	1	0	0	0	0	1,931
June	0	1	1987	0	1903	0.6	6/1987	0	0	0	0	0	0	1,931
July	0	1	2010	0	1903	0.68	16/2010	0	0	0	0	0	0	1,931
August	0	1	1968	0	1903	1.46	7/1968	1	0	0	0	0	0	1,931
September	0	2	1976	0	1903	1.63	10/1976	1	0	0	0	0	0	1,931
October	0	4	2004	0	1903	1.78	27/2004	1	1	0	0	0	0	1,932
November	1	6	1965	0	1903	1.89	22/1965	2	1	0	0	0	10	1,964
December	1	8	1943	0	1930	3.43	11/1943	4	3	1	0	0	4	1,955
Annual	8	18	1941	1.35	1985	3.43	19431211	25	16	5	2	1	19	1,974

California Water Service Company - Antelope Valley District
Water Supply and Demand Analysis and Projections

Worksheet 21

Groundwater Production Facilities

Location	Well No.	Design Capacity (gpm)	
		Active	Inactive
LANCASTER	Well 1-01	485	
	Well 1-02		unk
	Well 1-03	600	
FREMONT VALLEY	Well 1-01	110	
LEONA VALLEY	Well 1-05	70	
	Well 1-07	30	
LAKE HUGHES	Well 1-01	50	
	Well 1-02	60	
	Well 2-01		70
	Well 2-02	75	
Total units:	10	8	2
Design Capacity (GPM)	1,550	1,480	70
Design Capacity (MGD)	2.2	2.1	0.1
Design Capacity (AFY)	2,500	2,387	113

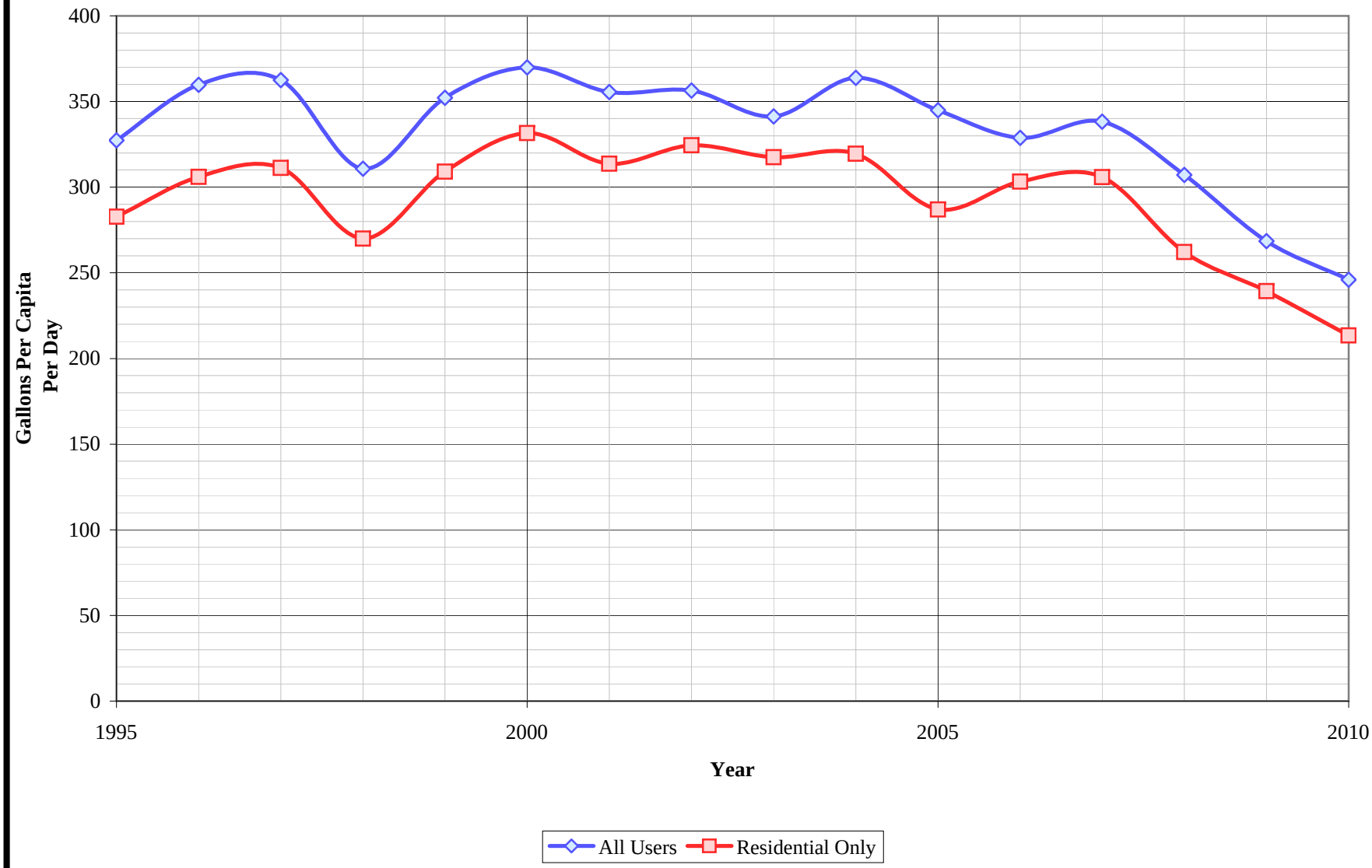
Notes:
1) Listed pump capacities on this worksheet represent design flowrates, actual flowrates are highly dependent on local system pressures, well characteristics, and other design criteria

2) Values in bold are estimated

Updated 1/1/2011

Antelope Valley District

Per Capita Consumption



California Water Service Company - Antelope Valley District

Worksheet 22

Water Supply and Demand Analysis and Projections

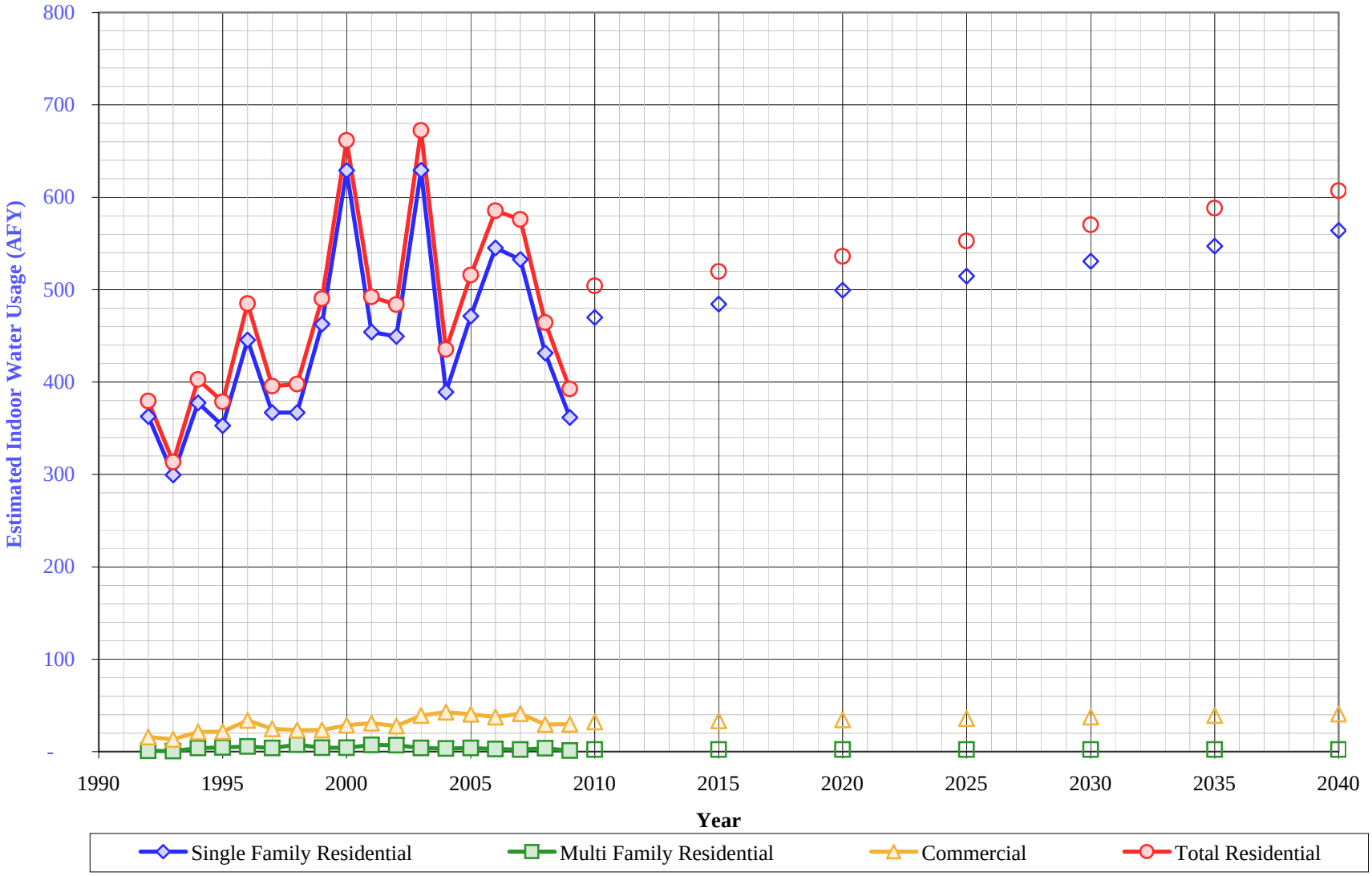
Per Capita Water Demand

Year	Usage - All Users			Usage - Residential Only		
	AFY	MGY	Gallons Per Capita Per Day	AFY	MGY	Gallons Per Capita Per Day
1995	1,103	359	327.4	953	310	282.7
1996	1,215	396	359.7	1,034	337	306.0
1997	1,233	402	362.5	1,058	345	311.2
1998	1,057	344	310.8	918	299	270.0
1999	1,212	395	352.2	1,063	346	309.0
2000	1,287	419	369.9	1,154	376	331.6
2001	1,245	406	355.6	1,098	358	313.8
2002	1,244	405	356.4	1,132	369	324.4
2003	1,185	386	341.3	1,102	359	317.4
2004	1,359	443	363.8	1,193	389	319.4
2005	1,308	426	345.0	1,088	355	286.9
2006	1,258	410	328.9	1,160	378	303.2
2007	1,307	426	338.3	1,182	385	305.9
2008	1,175	383	307.2	1,003	327	262.0
2009	1,021	333	268.5	911	297	239.3
2010	944	307	246.1	818	267	213.4
5 Yr. Avg.	1,141	372	297.8	1,015	331	264.8
10 Yr. Avg.	1,205	393	325.1	1,069	348	288.6

Five year average is from years 2006 through 2010.
Ten year average is from years 2001 through 2010.

Antelope Valley District

Estimated Indoor Water Usage



California Water Service Company - Antelope Valley District

Worksheet 23

Water Supply and Demand Analysis and Projections

Estimated Indoor/Outdoor Water Usage

Year	Single Family Residential (SFR)							Multi Family Residential (MFR)				Commercial (COM)				Est. Indoor Usage
	Metered Single Family Residential Indoor Use (Annualized 90% of January Total)			Indoor Flat Rate Usage (AFY)	Total SFR Indoor Usage			Multi Family Residential January Usage	Multi Family Residential Indoor Use (Annualized 90% of January Total)			Commercial	Commercial Indoor Use (Annualized 90% of January Total)			
	JAN (CCF)	AFY	AFY/Service		AFY	GPD/Service	%	(CCF)	AFY	GPD/Service	%	(CCF)	AFY	GPD/Service	%	AFY
1990																
1991																
1992	14,632	363	0.31	0	363	276	41%	32	0.79	229	40%	642	16	458	48%	379
1993	12,080	300	0.26	0	300	228	33%	20	0.50	78	14%	542	13	385	37%	313
1994	15,228	378	0.32	0	378	288	40%	155	3.84	323	96%	866	21	608	59%	403
1995	14,226	353	0.30	0	353	270	37%	178	4.41	358	96%	868	22	611	54%	379
1996	17,964	445	0.38	0	445	339	43%	223	5.53	494	122%	1,367	34	946	75%	485
1997	14,801	367	0.31	0	367	278	35%	158	3.92	356	80%	997	25	700	60%	396
1998	14,804	367	0.31	0	367	277	40%	300	7.44	769	152%	935	23	660	63%	398
1999	18,668	463	0.39	0	463	345	44%	169	4.19	424	109%	939	23	602	66%	490
2000	25,366	629	0.52	0	629	464	55%	169	4.19	392	88%	1,149	28	784	67%	662
2001	18,313	454	0.37	0	454	334	42%	295	7.31	684	89%	1,247	31	863	70%	492
2002	18,126	449	0.37	0	449	333	40%	279	6.92			1,115	28	748	69%	484
2003	25,381	629	0.53	0	629	474	57%	160	3.97			1,574	39	917	73%	672
2004	15,692	389	0.31	0	389	274	33%	139	3.45	513	170%	1,726	43	980	86%	435
2005	19,012	471	0.37	0	471	326	43%	161	3.99	594	175%	1,632	40	951	77%	516
2006	21,992	545	0.42	0	545	373	47%	112	2.78	413	159%	1,507	37	902	69%	585
2007	21,485	533	0.40	0	533	361	45%	88	2.18	325	105%	1,658	41	1,019	74%	576
2008	17,397	431	0.33	0	431	294	43%	140	3.47	516	217%	1,189	29	711	59%	464
2009	14,585	362	0.28	0	362	249	40%	50	1.24	184	115%	1,199	30	698	57%	393
2010	-	-	-	-	470	321	42%	-	2.10	312	86%	-	32	752	65%	504
2015	-	-	-	-	484	321	42%	-	2.10	312	86%	-	33	752	65%	520
2020	-	-	-	-	499	321	42%	-	2.10	312	86%	-	35	752	65%	536
2025	-	-	-	-	515	321	42%	-	2.10	312	86%	-	36	752	65%	553
2030	-	-	-	-	531	321	42%	-	2.10	312	86%	-	37	752	65%	570
2035	-	-	-	-	547	321	42%	-	2.10	312	86%	-	39	752	65%	588
2040	-	-	-	-	564	321	42%	-	2.10	312	86%	-	41	752	65%	607

Note: MFR estimates appear erroneous possibly due to bi-monthly bill schedule and seasonal vacancy of dwelling units. Projections based on 75% of average GOD/Service

California Water Service Company - Antelope Valley District

Workheet 2

Water Supply and Demand Analysis and Projections

Comparison of Projected Demand and Conservation Savings Between SBx7-7 Compliance Targets and Actual Proposed Programs

Year	SBx7-7 Compliance Target (gpcd)	Anticipated GPCD with Proposed Programs*	Estimated Population	Undadjusted Baseline Demand (AFY)	SBx7-7 Compliance Target Demand (AFY)	Anticipated Demand with Proposed Programs (AFY)	Compliance Target Savings Requirement (AFY)	Savings Due to Proposed Programs (AFY)
2005-2009 Average	318	318	3,412	1,214	1,214	1,214	0	0
2010	318	318	3,423	1,218	1,218	1,218	0	0
2011	314	312	3,444	1,225	1,212	1,204	13	22
2012	311	306	3,465	1,233	1,206	1,188	27	45
2013	307	301	3,486	1,240	1,200	1,175	41	65
2014	304	300	3,507	1,248	1,193	1,179	54	69
2015	300	298	3,528	1,255	1,187	1,178	68	77
2016	297	291	3,550	1,263	1,180	1,157	83	105
2017	293	284	3,571	1,271	1,174	1,137	97	134
2018	290	277	3,593	1,278	1,167	1,116	111	162
2019	286	270	3,615	1,286	1,160	1,095	126	191
2020	283	283	3,637	1,294	1,153	1,153	141	141
2021	283	283	3,659	1,302	1,160	1,160	142	142
2022	283	283	3,681	1,310	1,167	1,167	143	143
2023	283	283	3,703	1,317	1,174	1,174	144	144
2024	283	283	3,726	1,325	1,181	1,181	144	144
2025	283	283	3,748	1,334	1,188	1,188	145	145
2026	283	283	3,771	1,342	1,195	1,195	146	146
2027	283	283	3,794	1,350	1,203	1,203	147	147
2028	283	283	3,817	1,358	1,210	1,210	148	148
2029	283	283	3,840	1,366	1,217	1,217	149	149
2030	283	283	3,864	1,375	1,225	1,225	150	150
2031	283	283	3,887	1,383	1,232	1,232	151	151
2032	283	283	3,911	1,391	1,240	1,240	152	152
2033	283	283	3,935	1,400	1,247	1,247	153	153
2034	283	283	3,959	1,408	1,255	1,255	153	153
2035	283	283	3,983	1,417	1,263	1,263	154	154
2036	283	283	4,007	1,426	1,270	1,270	155	155
2037	283	283	4,031	1,434	1,278	1,278	156	156
2038	283	283	4,056	1,443	1,286	1,286	157	157
2039	283	283	4,081	1,452	1,294	1,294	158	158
2040	283	283	4,106	1,461	1,301	1,301	159	159

*Note: The district is projected to achieve its district-specific 2015 SBx7-7 compliance target through a combination of passive and active savings. 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. GPCD will remain flat from 2020 through 2040.