Alameda County
Water District

URBAN WATER MANAGEMENT PLAN 2010-2015

ACWD
ALAMEDA COUNTY WATER DISTRICT

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TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF TABLES
(Continued)

LIST OF FIGURES

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ACRONYMS AND ABBREVIATIONS

ABAG	Association of Bay Area Governments
ACWD	Alameda County Water District
ADWF	average dry-weather flow
AF	acre-foot (325,900 gallons)
AF/Yr	acre-feet per year
AHF	above the Hayward Fault (aquifer)
ARP	Aquifer Reclamation Program
BDCP	Bay Delta Conservation Plan
BHF	below the Hayward Fault (aquifer)
BMP	Water Conservation Best Management Practices
ccf	hundred cubic feet (748 gallons)
cfs	cubic foot (feet) per second
CII	Commercial, Industrial and Institutional
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
DFG	(California) Department of Fish and Game
DWR	(California) Department of Water Resources
EBDA	East Bay Dischargers Authority
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
FERC	Federal Energy Regulatory Committee
GIS	Geographic Information System
gpd	gallons per day
gpm	gallons per minute
IRP	integrated resources planning
IRPM	(District's) Integrated Resources Planning Model
MCL	Maximum Contaminant Level
mg/l	milligrams per liter
mgd	million gallons per day
MOU	Memorandum of Understanding on Urban Water Conservation
MSJWTP	(District's) Mission San Jose Water Treatment Plant
MFR	multi-family residential
NMFS	National Marine Fisheries Service
ppm	part per million
RWQCB	Regional Water Quality Control Board
SBA	South Bay Aqueduct
SBP	Salinity Barrier Program
SDWA	Safe Drinking Water Act
SEP	Salt Evaporator Pond
SFPUC	San Francisco Public Utilities Commission
SFR	single-family residential
SFWD	San Francisco Water Department
sq. ft.	square foot (feet)
SWP	State Water Project
SWRCB	State Water Resources Control Board
TAF	1,000 acre-feet
TDS	total dissolved solids
ULFT	ultra low flow toilet
USBR	U.S. Bureau of Reclamation
USD	Union Sanitary District
USGS	U.S. Geological Survey
UWMP	Urban Water Management Plan
WTP	water treatment plant
WTP 2	(District's) Water Treatment Plant Number 2
WWTP	Wastewater Treatment Plant
Zone 7	Zone 7 of the Alameda County Flood Control and Water Conservation District

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CHAPTER 1
INTRODUCTION

1.1 PURPOSE

This update to Alameda County Water District's (ACWD or District) Urban Water Management Plan (UWMP or Plan) has been prepared in response to the State of California's Urban Water Management Planning Act, Water Code Sections 10610 through 10656. The Act requires that every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to prepare and adopt an urban water management plan. The Act also requires that water suppliers provide updates to their Plan every five years.

1.2 PLAN PREPARATION

This UWMP Update covers the period from 2010 through 2015, and is the sixth plan adopted by the ACWD Board of Directors[1]. Several changes have occurred since ACWD's first UWMP was adopted in 1985, which have resulted in the need for a broader, more sophisticated representation of the District's water supply, demand management and operational alternatives. Accordingly, in 1992, the District began implementation of a planning effort that would apply the approaches and techniques of integrated resources planning (IRP) to ensure that appropriate facility and resource decisions are made. IRP is an inclusive process that begins with the premise that a wide range of traditional and innovative supply-side and demand-side (conservation) resources must be considered. The process also provides information on potential consequences and aids in judging the value of trade-offs among resource strategies.

In August 1995, the ACWD Board of Directors adopted the recommendations of ACWD's Integrated Resources Planning Study as its road-map for both supply and demand-side planning through the year 2030. Because this planning process involves assessment and treatment of conservation as a resource that is evaluated as rigorously as supply-side options, the IRP process and results form the foundation for this and future urban water management plans. In 2006 ACWD completed a 10-Year Review of the IRP which confirmed the recommended strategy and its implementation. However, because of changes in water supply and demand assumptions that have occurred since 2006, ACWD is currently in the process of conducting a second IRP review (2010 IRP Review). As part of the 2010 IRP Review process, ACWD has completed its analysis of the projected water supply availability and demands under average year, single dry year, and multiple dry year conditions, and these analyses form the core of this report. Table 1-1 provides a comparison of the key components of the District's IRP and 2010-2015 UWMP Update.

A key policy criterion used in the formulation and evaluation of water supply strategies in the IRP process is to maximize local control of resources while maintaining a high level of service reliability. This is especially important for ACWD because of the reliance on imported water supplies from the State Water Project (SWP) and San Francisco Regional Water Supply System for approximately 60% of the District's total supplies. As described in this UWMP, ACWD's water supply strategy includes maximizing the use of local water supplies (local groundwater and surface water, brackish groundwater desalination and recycled water), together with off-site groundwater banking of SWP supplies and a strong demand management program to minimize dependency on imported supplies.

[1] The normal UWMP submittal cycle requires that Urban Water Management Plans be prepared and submitted in December of years ending in five and zero. However, because of recent changes in UWMP requirements, State law has extended the deadline for the 2010 Plans to July 1, 2011.

Table 1-1
Comparison of UWMP and
ACWD's Integrated Resources Plan (IRP)

Item	*2010-2015 UWMP*	*2010 IRP Review*
Planning Horizon	2035 (25 Years)	2040
Planning Criteria	* Reliability * Water Quality * Environmental Impacts *Local Control	*Reliability *Water Quality *Environmental Impacts *Local Control *Cost
Demand Projections	Yes	Yes
Existing Water Supply Availability	Yes	Yes
Supply Opportunities: -Demand Management -Recycled Water -Water Transfers	Yes	Yes
Long-Term Water Supply Strategy	Yes	Yes
Water Quality Considerations	Yes	Yes
Treatment & Production Facilities	No	Yes
Shortage Contingency Plan	Yes	No

ACWD has coordinated with all appropriate agencies in the development of the District's IRP and this Urban Water Management Plan Update. Table 1-2 below provides a summary of the agencies that ACWD has coordinated with and the relevant information incorporated in this UWMP.

Table 1-2
Agency Coordination

Agency ACWD has coordinated with…	*Relevant information incorporated in the UWMP*
California Department of Water Resources	Estimated future reliability of State Water Project supplies
San Francisco Public Utilities Commission	Estimated future reliability of San Francisco Regional Water System supplies
Bay Area Water Supply and Conservation Agency	Estimated future reliability of San Francisco Regional Water System supplies
Union Sanitary District	Potential future recycled water supplies and projects
City of Fremont	Projected future land use conditions (City General Plan) in Fremont
City of Union City	Projected future land use conditions (City General Plan) in Union City
City of Newark	Projected future land use conditions (City General Plan) in Newark

As per section 10621 (b) of the Urban Water Management Planning Act, all cities within the District's service area (Cities of Fremont, Newark and Union City) were notified of ACWD's UWMP planning process, as was the County of Alameda. In addition, other agencies that ACWD coordinates with regarding water supply issues were also notified. These agencies include: Semitropic Water Storage District, State Water Contractors, Santa Clara Valley Water District, Zone 7 Water Agency, East Bay Regional Park District and the neighboring Cities of Hayward, Milpitas and San Jose.

1.3 PUBLIC REVIEW AND ADOPTION OF PLAN

Section 10642 of the Urban Water Management Planning Act requires urban water suppliers to make the Plan available for public review and hold a public hearing prior to adopting the Plan. The Draft Plan was distributed for review and comment beginning on April 12, 2011. In order to encourage the active involvement of diverse social, cultural, and economic elements of the population within ACWD's service area, including both residential and non-residential customers, ACWD made copies of the Draft Plan available on the District's web-site, and made copies available for review at the District's headquarters and city libraries. Comments were received through June 9, 2011. A public hearing was also held on both the Plan and the District's approach for SBX7-7 compliance on June 9, 2011. Notice of the public hearing was provided to Alameda County and the Cities of Fremont, Newark and Union City on April 7, 2011 (at least 60 days prior to the public hearing), and two notices of the public hearing were also published in the local newspaper (The Argus) at least once a week for two successive weeks prior to the public hearing. The Plan and the District's approach for SBX7-7 compliance were adopted on June 9, 2011 by ACWD Board of Directors Resolution No. 11-037 (Appendix F).

As per the requirements in Water Code section 10644(a) a copy of ACWD's Urban Water Management Plan will be provided to the following entities: the California Department of Water Resources, the California State Library, Alameda County and the Cities of Fremont, Newark and Union City on or before July 9, 2011, within 30 days of the Plan's adoption.

ACWD will periodically review its Urban Water Management Plan to ensure that it accurately reflects the District's water management activities. Changes will be adopted and incorporated into the plan via amendments or other appropriate means as set forth in Water Code sections 10640 through 10645.

1.4 REPORT FORMAT AND ORGANIZATION

This UWMP provides an update of the elements contained in the District's Integrated Resources Planning Study, and discusses the status of projects, programs, and studies in water supply planning, water conservation and recycled water that were recommended as part of the IRP.

Chapter 1: Introduction - This chapter provides an overview of the Urban Water Management Planning Act requirements, the preparation and organization of this report, and background information on ACWD.

Chapter 2: Past, Current & Future Water Use - This chapter provides an overview of historical and current water use in the District, as well as a summary of future projected water demands.

Chapter 3: Sources of Supply - This chapter provides a summary of the District's sources of supply and their availability, as well as an overview of the management of these supplies.

Chapter 4: Groundwater - This chapter describes the Niles Cone Groundwater Basin, the District's reliance on it as a source of water supply, and the District's policy and activities for managing it.

Chapter 5: Desalination – This chapter describes the Newark Desalination Facility and the District's recent expansion of this source of water supply.

Chapter 6: Water Recycling - This chapter describes the Union Sanitary District's wastewater system (which serves the ACWD service area), and the opportunities for the use of recycled water.

Chapter 7: SBX7-7 ("20 x 2020") Compliance – This chapter provides a review of the SBX7-7 legislation regarding water use targets, potential approaches to demonstrate compliance, and ACWD's approach for compliance.

Chapter 8: Demand Management - This chapter provides an overview of the District's demand management strategy and a summary of the implementation of the District's water conservation programs.

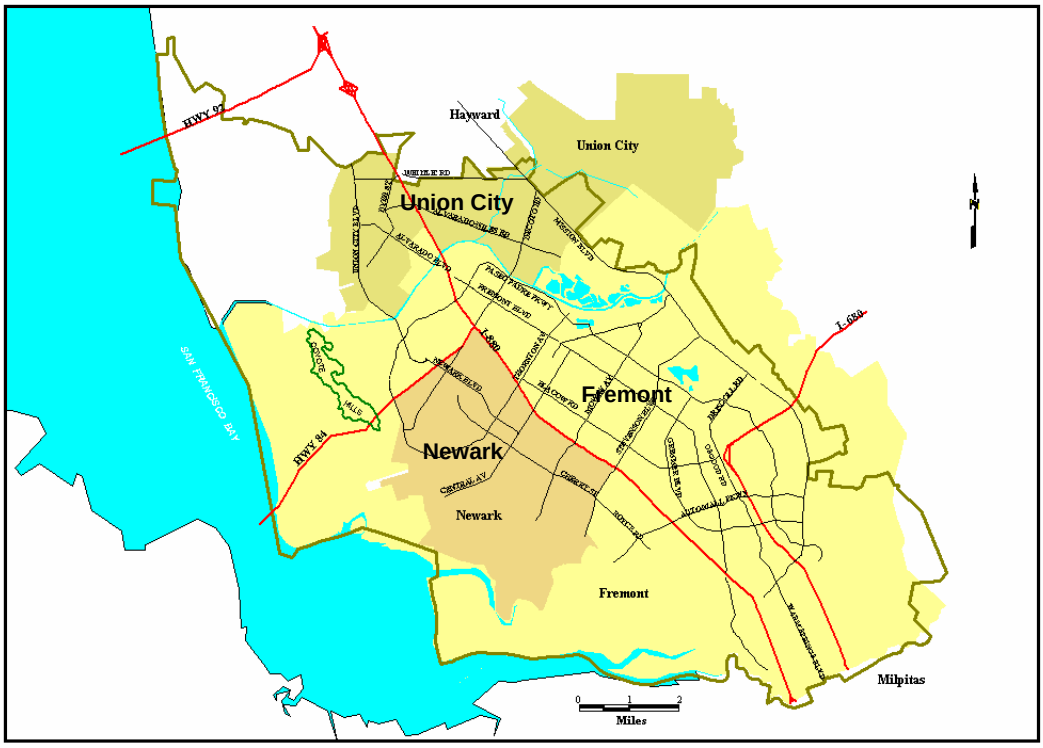
Chapter 9: Water Supply Strategy - This chapter summarizes the planning criteria utilized by the District in developing the District's water supply strategy (as part of the IRP process), followed by a summary of the recommended water supply strategy for the District and the implementation status of key IRP programs.

Chapter 10: Water Shortage Contingency Plan - This chapter provides the District's water shortage contingency plan, as required under the Urban Water Management Planning Act. This contingency plan includes scenarios for shortages of up to 50%.

1.5 ACWD BACKGROUND

The Alameda County Water District is a retail water purveyor with a service area of approximately 100 square miles encompassing the Cities of Fremont, Newark and Union City (Figure 1-1). The District was established in 1914 under the California County Water District Act and is governed by a five-member Board of Directors. It was originally created to protect the groundwater basin, conserve the waters of the Alameda Creek Watershed and develop supplemental water supplies, primarily for agricultural use. In 1930, urban distribution became an added function of the District. Today, the District provides water primarily to urban customers: approximately 70% of supplies are used by residential customers, with the balance (approximately 30%) utilized by commercial, industrial, institutional and large landscape customers. Total distribution system water use (including non-revenue water) was approximately 47,000 Acre-Feet in fiscal year 2009-2010.

Figure 1-1
ACWD Service Area



The Niles Cone Groundwater Basin was the principal source of water supply for the District until 1962. Up to that time, groundwater use by the District and numerous private pumpers exceeded recharge, and this imbalance permitted salt water from the Bay to intrude into the basin, severely limiting its use. In 1962, the District was the first state contractor to receive water from the State Water Project (SWP). ACWD's State Water Project supply was originally used solely to recharge the groundwater basin. As a result, groundwater levels rose and prevented additional saltwater intrusion. However, certain areas within the groundwater basin remain brackish due to past years of seawater intrusion.

Today, the District's primary sources of supply come from: the Bay-Delta (via the SWP); the San Francisco Regional Water System; and local supplies including groundwater from the Niles Cone Groundwater Basin.

1.6 SERVICE AREA DESCRIPTION AND POPULATION PROJECTIONS

As part of the San Francisco Bay Area, the District's service area of Fremont, Newark and Union City ("Tri-Cities") is home to a population of over 340,000, and over 7,500 businesses. As indicated in Table 1-3, the projections provided by the Association of Bay Area Governments indicate that the population in the service area may grow to over 400,000 by the year 2035.

Table 1-3
Projected Population in the ACWD Service Area
(source: ABAG, 2009)

City	*Year*				
	2015	*2020*	*2025*	*2030*	*2035*
Fremont	221,200	230,600	238,100	247,400	256,200
Newark	45,800	47,800	50,000	52,100	54,300
Union City	79,700	85,200	90,100	95,100	100,400
Total	346,700	363,600	378,200	394,600	410,900

Numerous high-tech, bio-tech and other industries are located in the service area. The Tri-Cities is also home to numerous retail and commercial businesses that support the local and surrounding Bay Area communities. The 2009-10 assessed valuation (land, improvements and personal property) of the Tri-Cities area was over $46 billion.

The District's service area is located approximately 20 miles southeast of San Francisco on the southeastern shores of the San Francisco Bay. The District is bounded by San Francisco Bay on the west, by the hills of the Diablo Range on the east, by the Hayward Plain to the north and by Coyote Creek Slough to the south. The western portion of the District area (adjacent to San Francisco Bay) consists primarily of salt evaporation ponds and saltwater marshes. These ponds and marshes extend from one to four miles inland and cover an area of approximately 35 square miles.

Most of the District area is relatively flat with an average elevation of approximately 20-50 feet above mean-sea-level (MSL). The highest elevations (1,500 feet MSL) occur on the eastern boundary of the District, along the easterly slopes of the Diablo Range. In addition, elevations in the Coyote Hills, located adjacent to the salt evaporation ponds are up to 300 feet MSL.

ACWD is in the San Francisco Bay Hydrologic Region as defined by the California Department of Water Resources. The mean annual precipitation within the District is geographically variable due to the Diablo Range on the eastern boundary of the District. Along the Diablo Range the mean annual precipitation is the highest at approximately 20 inches. However, along the western boundary, adjacent to San Francisco Bay, the mean annual precipitation is approximately 13 to 15 inches. The mean annual precipitation at the Niles precipitation gauging station is approximately 19 inches. The precipitation in the area is highly seasonal with over 75% of the rainfall occurring in the winter months between November and March. Climate data for the ACWD service area is provided in Table 1-4.

Table 1-4
Climate Data for ACWD Service Area

Climate Data	*Monthly Average Data*				*Annual Total*
	November - March	*April-June*	*July – Aug*	*Sept-October*	
Rainfall (in)	2.9"	1.2"	0.1"	0.6"	18.4"
Evapotranspiration (in)	1.9"	5.2"	5.9"	3.7"	44.5"
Temperature (°F)	49.3° F	58.6° F	64.3° F	61.2° F	56.1° F
Maximum Daily Temperature (°F)	61.6° F	69.1° F	75.6° F	73.9° F	67.8° F

Note: Data represents period of record for CIMIS Station #171 (Union City), Feb 2001 to Feb 2011.

1.7 REGIONAL INTEGRATED PLANNING

ACWD water supply planning is coordinated with other agencies throughout the Bay Area region. Examples of ACWD's participation in regional integrated planning include the following:

Bay Area Integrated Regional Water Management Plan: Water Quality and Water Supply Element: ACWD participates with a diverse group of water supply, water quality, wastewater, stormwater, flood management, watershed and habitat agencies, local governments, environmental groups, business groups and other interested parties to develop a Bay Area Integrated Regional Water Management Plan (Bay Area IRWMP). The purpose of this Bay Area planning effort is to (1) facilitate regional cooperation in water management planning and (2) foster coordination, collaboration, and communication among the participating agencies to achieve greater efficiencies, enhance public services and build public support for vital plans and projects. The Bay Area IRWMP was completed in 2006, and served as the basis for Proposition 50, Chapter 8 grant funding within the nine-county Bay Area region.

Alameda Creek Watershed Planning: ACWD participates in stakeholder-based Alameda Creek Watershed management planning efforts including: (1) a watershed management planning effort (Alameda Creek Watershed Council) to coordinate watershed management planning for the Alameda Creek Watershed; and (2) the Alameda Creek Fisheries Restoration Workgroup, which is focused on restoring steelhead trout, a federally listed threatened species, to the Alameda Creek Watershed.

1.8 URBAN WATER MANAGEMENT PLAN CHECKLIST

In order to ensure compliance with the Urban Water Management Planning Act, and to provide a guide for review of this UWMP update, a checklist of all required components of the UWMP, and their location in this document, is provided in Table 1-5. This checklist is consistent with the DWR Guidelines for Developing Urban Water Management Plans (DWR, March 2011.)

Table 1-5
2010 Urban Water Management Plan checklist, organized by subject

NO.	UWMP REQUIREMENT Source: DWR Guidelines for Developing Urban Water Management Plans	CA Water Code	UWMP Location
CONTINGENCY			
35	Provide an urban water shortage contingency analysis that specifies stages of action, including up to a 50-percent water supply reduction, and an outline of specific water supply conditions at each stage	10632(a)	Sect. 10.1, 10.3
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)	Sect. 10.2
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)	Sect. 10.5
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)	Sect. 10.3, Appendix E
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)	Sect. 10.3, Appendix E
40	Indicated penalties or charges for excessive use, where applicable.	10632(f)	Sect. 10.4
41	Provide 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)	Sect. 10.4
42	Provide a draft water shortage contingency resolution or ordinance.	10632(h)	Appendix E
43	Indicate a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	10632(i)	Sect. 10.4
DEMAND MANAGEMENT MEASURES			
26	Describe how each water demand management measures is being implemented or scheduled for implementation. Use the list provided.	10631(f)(1)	Sect. 7.2
27	Describe the methods the supplier uses to evaluate the effectiveness of DMMs implemented or described in the UWMP.	10631(f)(3)	Sect. 7.1
28	Provide 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 ability to further reduce demand.	10631(f)(4)	Sect. 9.2
29	Evaluate each water demand management measure that is not currently being implemented or scheduled for implementation. The evaluation should include economic and non-economic factors, cost-benefit analysis, available funding, and the water suppliers' legal authority to implement the work.	10631(g)	Sect. 7.2, Appendix D
32	Include the annual reports submitted to meet the Section 6.2 requirements, if a member of the CUWCC and signer of the December 10, 2008 MOU. Signers of the MOU that submit the biannual reports are deemed compliant with Items 28 and 29.	10631(j)	Appendix D

Table 1-5 (continued)
2010 Urban Water Management Plan checklist, organized by subject

NO.	UWMP REQUIREMENT	CA Water Code	UWMP Location
EXTERNAL COORDINATION AND OUTREACH			
4	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)	Sect. 1.2
6	Notify, at least 60 days prior to the public hearing on the plan required by Section 10642, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Any city or county receiving the notice may be consulted and provide comments.	10621(b)	Sect. 1.3
7	Provide supporting documentation that the UWMP or any amendments to, or changes in, have been adopted as described in Section 10640 et seq.	10621(c)	Sect. 1.3
54	Provide supporting documentation that the urban water management plan has been or will be provided to any city or county within which it provides water, no later than 60 days after the submission of this urban water management plan.	10635(b)	Sect. 1.3
55	Provide supporting documentation that the water supplier has encouraged 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	Sect. 1.3
56	Provide supporting documentation that the urban water supplier made the plan available for public inspection and held a public hearing about the plan. For public agencies, the hearing notice is to be provided pursuant to Section 6066 of the Government Code. The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water. Privately-owned water suppliers shall provide an equivalent notice within its service area.	10642	Sect. 1.3
57	Provide supporting documentation that the plan has been adopted as prepared or modified	10642	Sect. 1.3
58	Provide supporting documentation as to how the water supplier plans to implement its plan.	10643	Sect. 1.1, 9.2
59	Provide supporting documentation that, in addition to submittal to DWR, the urban water supplier has submitted this UWMP to 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. This also includes amendments or changes.	10644(a)	Sect. 1.3
60	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the urban water supplier has or will make the plan available for public review during normal business hours	10645	Sect. 1.3

Table 1-5 (continued)
2010 Urban Water Management Plan checklist, organized by subject

NO.	UWMP REQUIREMENT	CA Water Code	UWMP Location
RECYCLED WATER			
44	Provide information on recycled water and its potential for use as a water source in the service area of the urban water supplier. Coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	10633	Sect. 6.1, 6.4
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)	Sect. 6.2
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)	Sect. 6.2
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)	Sect. 6.3
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)	Sect. 6.4
49	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.	10633(e)	Sect. 9.2
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)	Sect. 6.5
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)	Sect. 6.5
RELIABILITY			
22	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage and provide data for (A) an average water year, (B) a single dry water year, and (C) multiple dry water years.	10631(c)(1)	Sect. 3.1, 9.3
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)	Sect. 3.1, 9.2
53	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing 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. Base the assessment on the information compiled under Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.	10635(a)	Sect. 9.3

Table 1-5 (continued)
2010 Urban Water Management Plan checklist, organized by subject

NO.	UWMP REQUIREMENT	CA Water Code	UWMP Location
SERVICE AREA			
8	Describe the water supplier service area.	10631(a)	Sect. 1.6
9	Describe the climate and other demographic factors of the service area of the supplier	10631(a)	Sect. 1.6
10	Indicate the current population of the service area	10631(a)	Sect. 1.6
11	Provide population projections for 2015, 2020, 2025, and 2030, based on data from State, regional, or local service area population projections.	10631(a)	Sect. 1.6
12	Describe other demographic factors affecting the supplier's water management planning.	10631(a)	Sect. 1.6
WATER CONSERVATION			
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)	Sect. 8.1
2	Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions.	10608.36	Sect. 7.2, 8.2, 9.2
3	Report progress in meeting urban water use targets using the standardized form.	10608.40	Sect. 8.1
WATER DEMANDS			
25	Quantify past, current, and projected water use, identifying the uses among water use sectors, for the following: (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, conjunctive use, and (I) agriculture.	10631(e)	Sect. 2.2, 2.3
34	Include projected water use for single-family and multifamily residential housing needed for lower income households, as identified in the housing element of any city, county, or city and county in the service area of the supplier.	10631.1(a)	Sect. 2.3
WATER SUPPLY			
5	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	10620(f)	Sect. 9.2
13	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, and 2030.	10631(b)	Sect. 9.2
14	Indicate whether groundwater is an existing or planned source of water available to the supplier.	10631(b)	Sect. 3.1, 4.1,4.4, 9.2
15	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)	Sect. 4.2, Appendix C

Table 1-5 (continued)
2010 Urban Water Management Plan checklist, organized by subject

NO.	UWMP REQUIREMENT	CA Water Code	UWMP Location
WATER SUPPLY (continued)			
16	Describe the groundwater basin.	10631(b)(2)	Sect. 4.1
17	Indicate whether the groundwater basin is adjudicated? Include a copy of the court order or decree.	10631(b)(2)	Sect. 4.1
18	Describe the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. If the basin is not adjudicated, indicate "not applicable" in the UWMP location column.	10631(b)(2)	Not Applicable
19	For groundwater basins that are not adjudicated, provide information as to whether DWR 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. If the basin is adjudicated, indicate "not applicable" in the UWMP location column.	10631(b)(2)	Sect. 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	10631(b)(3)	Sect. 4.4
21	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	10631(b)(4)	Sect. 9.2
24	Describe the opportunities for exchanges or transfers of water on a short term or long-term basis.	10631(d)	Sect. 9.2
30	Include a detailed description of all water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years, excluding demand management programs addressed in (f)(1). Include specific projects, describe water supply impacts, and provide a timeline for each project.	10631(h)	Sect. 9.2
31	Describe desalinated water project opportunities for long-term supply, including, but not limited to, ocean water, brackish water, and groundwater.	10631(i)	Sect. 5.1, 5.2, 9.2
33	Provide documentation that either the retail agency provided the wholesale agency with water use projections for at least 20 years, if the UWMP agency is a retail agency, OR, if a wholesale agency, it provided its urban retail customers with future planned and existing water source available to it from the wholesale agency during the required water-year types	10631(k)	Sect. 3.1
52	Provide information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments, and the manner in which water quality affects water management strategies and supply reliability	10634	Sect. 3.4

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CHAPTER 2
PAST, CURRENT AND FUTURE WATER USE

This chapter provides an overview of historical and current water use in the District, as well as a summary of projected future water demands.

2.1 WATER USE CATEGORIES

Water use in the ACWD service area is divided into two categories: 1) distribution system use, and 2) groundwater system use. The distribution system use includes all water uses supplied by ACWD's treatment and production facilities, and this use is further subdivided into the categories of single family residential (SFR), multi-family residential (MFR), commercial, industrial, institutional, landscape and other use.

Groundwater system use includes private (non-ACWD) groundwater pumping (primarily for industrial, agricultural and municipal landscape irrigation uses), ACWD's Aquifer Reclamation Program pumping, and saline groundwater outflow to San Francisco Bay. The Aquifer Reclamation Program (ARP) pumping is an ongoing ACWD program to pump saline groundwater out of the aquifer system and replace it with fresh water recharged at the District's groundwater recharge facilities. Saline groundwater outflow to San Francisco Bay represents the groundwater outflow required to maintain a bayward groundwater flow direction to prevent seawater intrusion into the local aquifer system and to flush saline groundwater (from historical seawater intrusion) back to San Francisco Bay.

The District's groundwater system use is not anticipated to change significantly in the future. Therefore, the following discussions of water use are focused on the District's distribution system water use.

2.2 HISTORICAL AND CURRENT WATER USE

Table 2-1 provides a summary of the last ten years of water use within the District. Table 2-2 provides a summary of the existing and forecast water accounts by customer classification in the ACWD service area. Figure 2-1 provides a summary of water consumption by customer classification. As indicated in Figure 2-1, residential water use comprises approximately 70% of District water use, with the remaining 30% used by commercial, industrial, dedicated landscape and institutional customers.

Water consumption patterns in the ACWD service area are a function of many independent factors including growth, weather conditions, economic conditions and water conservation behaviors. The District saw dramatic declines in consumption during the 1987-1992 drought due to voluntary conservation and District-sponsored demand management efforts. However, during the drought recovery period after 1992, several significant factors have influenced consumption. From 1993-2001 accelerated growth of both residential and business customers (including the high technology industry) occurred due to a strong economy. During this period, vacancy rates decreased and water consumption rose. From 2001 to 2007 the overall consumption in the District was relatively flat, attributed primarily to less robust local economic conditions, mild weather and on-going water conservation programs. Since 2007, ACWD has seen significant declines in overall water consumption, which is attributed to a combination of continued economic downturn, 2007-2009 successive dry year conditions, and statewide conservation campaigns. The resulting substantive reduction in demand for water has changed ACWD's near and mid-term anticipated level of new demands from those reported in the previous UWMP (2006-2010 UWMP). Figure 2-2 provides a summary of the trends in per capita water use in the service area from 1986 to 2010.

Table 2-1
ACWD Past and Current Water Use (Acre-Feet)

Water Use Category	*Fiscal Year*									
	00-01	*01-02*	*02-03*	*03-04*	*04-05*	*05-06*	*06-07*	*07-08*	*08-09*	*09-10*
Distribution System										
Single Family Residential	25,700	25,200	25,300	26,200	23,700	25,000	25,200	24,600	24,100	21,500
Multi-Family Residential	8,900	8,200	8,500	8,500	8,200	8,000	8,100	8,100	7,400	7,600
Commercial	5,600	5,200	5,000	5,200	5,300	5,500	5,300	5,200	5,100	4,700
Industrial	4,600	4,300	4,100	3,900	3,400	3,500	3,400	3,100	2,800	2,500
Institutional	2,300	2,200	2,200	2,300	2,000	2,100	2,100	2,100	2,100	1,800
Landscape	5,300	5,700	5,600	6,300	5,600	5,200	5,700	6,000	5,600	4,800
Other	100	100	100	100	100	200	100	100	200	100
Total Consumption	52,500	50,900	50,800	52,500	48,300	49,500	49,900	49,200	47,300	43,000
Non-Revenue Water	3,100	4,200	3,600	3,900	3,300	3,700	5,100	5,800	3,500	4,100
Distribution System Total	**55,600**	**55,100**	**54,400**	**56,400**	**51,600**	**53,200**	**55,000**	**55,000**	**50,800**	**47,100**
Groundwater System										
Private Groundwater	3,800	3,100	3,400	3,600	3,800	3,000	3,000	2,200	2,100	1,900
Groundwater Reclamation										
-ARP Pumping	4,300	7,400	7,700	11,100	9,400	11,600	9,900	6,600	4,900	7,000
-Saline Outflow	6,600	6,300	5,800	7,200	6,600	8,400	6,800	7,400	7,400	6,800
Groundwater System Total	**14,700**	**16,800**	**16,900**	**21,900**	**19,800**	**23,000**	**19,700**	**16,200**	**14,400**	**15,700**
Grand Total	***70,300***	***71,900***	***71,300***	***78,300***	***71,400***	***76,200***	***74,700***	***71,200***	***65,200***	***62,800***

Notes:
1. Annual consumption is based on units billed during the Fiscal Year (July 1 to June 30). ACWD uses a bi-monthly billing cycle.
2. All values rounded to the nearest 100 AF.
3. Total Consumption values may not equal sum of individual components due to rounding.
4. Multi-Family Residential, Commercial, Industrial, and Institutional categories do not include dedicated landscape irrigation water use within these categories.
5. Landscape water use includes all dedicated landscape accounts for Multi-Family Residential, Commercial, Industrial and Institutional customers.
6. Distribution System Total represents total water production, as reported in ACWD's Annual Groundwater Survey Reports.
7. Non-Revenue Water is calculated as the difference between Distribution System Total (total production) and Total Measured Consumption, and includes distribution system losses.
8. Groundwater System demands are based on annual reported values in ACWD's Annual Survey Report on Groundwater Conditions.
9. Groundwater Reclamation demands represent groundwater system demands to protect and reclaim the groundwater system from seawater intrusion.
10. Groundwater System demands do not include "Other Outflows" as reported in ACWD's Annual Survey Report on Groundwater Conditions.

Table 2-2
ACWD Water Accounts by Customer Classification
(Number of Accounts)

Water Use Category	*Historical (Fiscal Year)*						*Projected*				
	04-05	*05-06*	*06-07*	*07-08*	*08-09*	*09-10*	*2015*	*2020*	*2025*	*2030*	*2035*
Single Family Residential	69,224	69,636	70,091	70,857	71,085	71,394	72,245	73,749	75,011	76,239	76,894
Multi-Family Residential	2,133	2,027	2,031	2,049	2,061	2,063	2,243	2,363	2,478	2,593	2,783
Commercial	3,254	2,324	2,346	2,712	2,726	2,729	2,781	2,840	2,881	2,921	2,961
Industrial	1,166	726	720	844	846	851	896	1,011	1,190	1,359	1,455
Institutional	595	445	445	704	708	701	718	765	807	874	877
Landscape	1,858	1,883	1,903	2,086	2,105	2,141	2,198	2,327	2,473	2,645	2,703
Other	159	151	149	258	258	260	210	210	220	220	220
Grand Total	**78,389**	**77,192**	**77,685**	**79,510**	**79,789**	**80,139**	**81,081**	**83,055**	**84,840**	**86,631**	**87,673**

Notes:
1. Number of historical accounts represents accounts at mid-point of fiscal year.
2. Multi-Family Residential, Commercial, Industrial, and Institutional categories do not include dedicated landscape irrigation accounts within these categories
3. Landscape includes all dedicated landscape accounts for Multi-Family Residential, Commercial, Industrial and Institutional customers.
4. Other accounts include temporary hydrant meters.
5. Estimates of projected future accounts are based on forecast demands (Section 2.3). Assumptions include: (a) current ratio of equivalent 2" meter per acre of development for non-residential use; (b) current ratio of landscape to non-landscape accounts for Multi-Family Residential, Commercial, Industrial and Institutional customers; (c) one account per 1.25 residential dwelling units forecast; and (d) current ratio of Other accounts to sum of Multi-Family Residential, Commercial and Industrial accounts.

Figure 2-1
Relative Water Consumption by Customer Classification, FY09/10

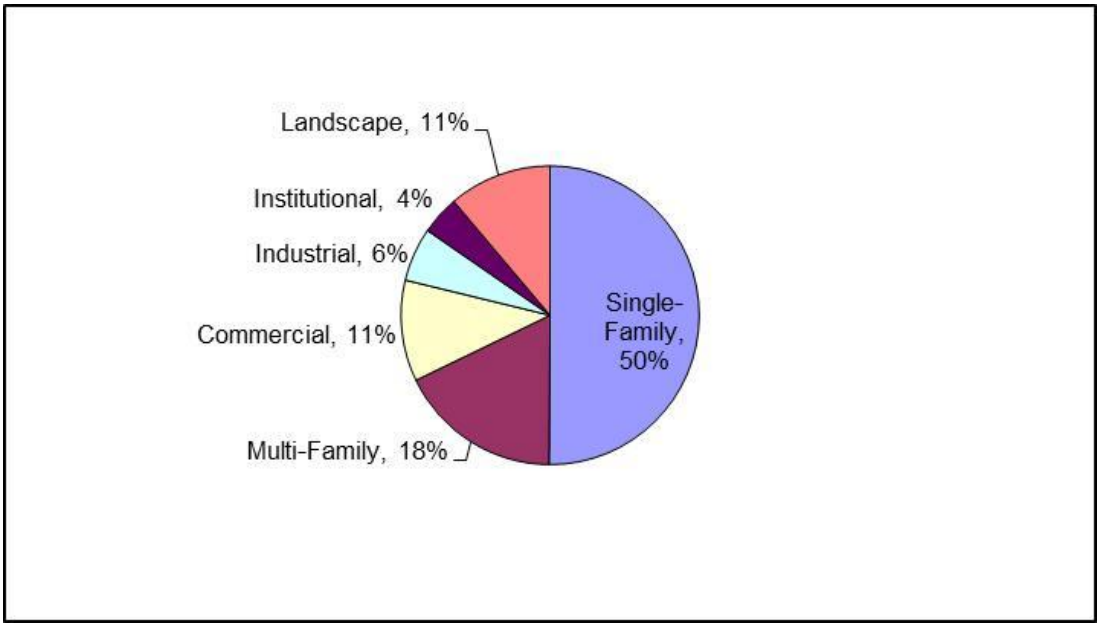
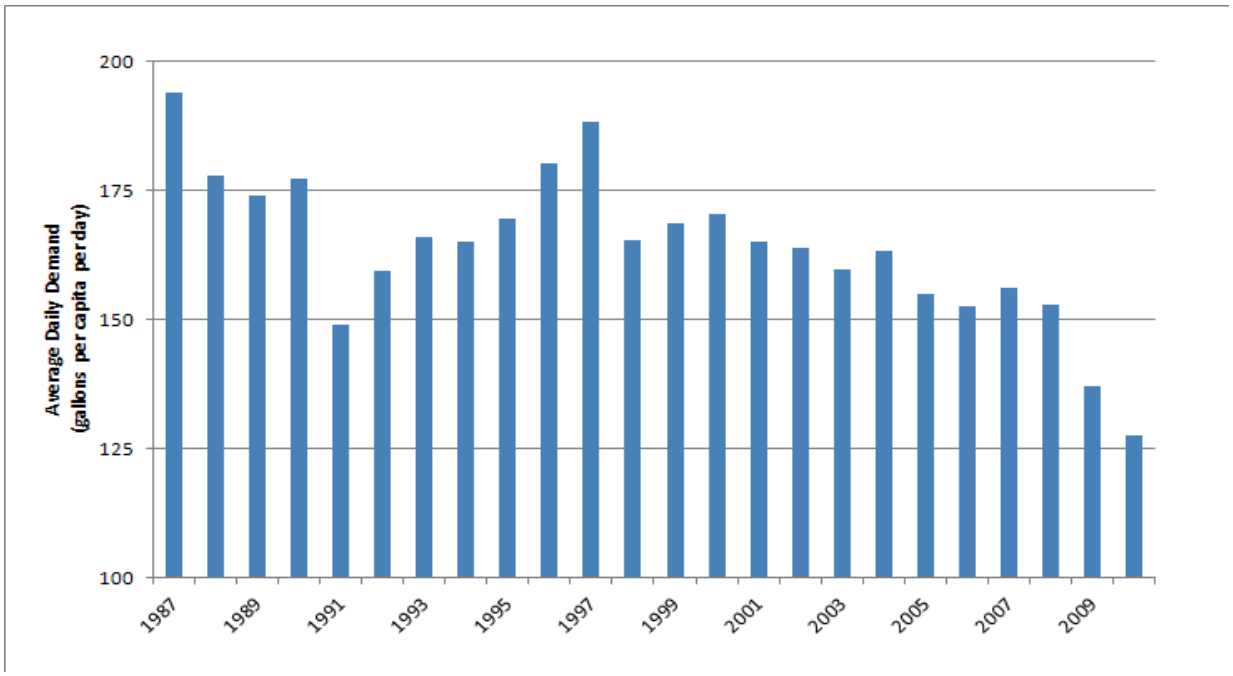


Figure 2-2
Water Use Trends - Per Capita Water Use:
Distribution System and Private Groundwater Pumping



2.3 PROJECTED FUTURE WATER DEMANDS

The forecast of future water demands is an integral part of ACWD planning for water supplies and water production facilities. In 1993, ACWD completed a comprehensive investigation of projected water demands to the year 2030 (1993 Forecast). The water demand projections from this investigation served as the basis for the District's Integrated Resources Plan which was completed in 1995. In 1999, District staff refined the 1993 Forecast with updated information on land use and water use trends (1999 Forecast). The District's demand forecast was updated again in 2004 and, most recently, in 2009. Although the 2009 Forecast serves as the basis for this UWMP Update, the demand forecast presented in this UWMP Update reflects adjustments to the 2009 Forecast based on land use planning assumptions, economic conditions, and actual water consumption as of January 2011.

ACWD's approach to water demand forecasting for the UWMP is to: 1) evaluate existing demands of lands already developed in the service area; 2) estimate future demands of currently undeveloped lands that are designated for development; and 3) combine the existing and future demands to estimate the overall District-wide future demands. This demand forecasting is done for six primary land use categories: single family residential, multi-family residential, commercial, industrial, institutional, and "other". In order to estimate future demands of currently undeveloped lands in each of these categories, ACWD obtains the most recent zoning information for these lands. The land use information is provided by the planning staff from the Cities of Fremont, Newark and Union City, and includes general plan land use designations and, when available, more detailed information from specific plans or other planning documents. A District-wide water demand forecast for each land use category is then developed by multiplying the planned land use under each land use category by a District-wide average unit water use specific to that land use category. Additional potential future land use is also accounted for in the demand projections, and is based on city-approved plans for redevelopment and/or intensification of specific areas. The demand forecast also considers future demands associated with Association of Bay Area Governments (ABAG) Smart Growth projections.

Actual unit water use for any specific land use project may vary significantly from the District-wide average. However, determining the actual unit water use for each specific development project in the service area is beyond the scope of ACWD's UWMP demand forecast. Rather than providing demand forecasts for specific land use projects, the UWMP provides an aggregated, District-wide demand forecast for each land use category, as well as the total District-wide demand. This approach is proven sufficiently accurate for long-term, District-wide demand forecasting and is consistent with the California Water Code requirements for urban water management planning. However, if the District has detailed information about the water demands of a specific project during the time it is preparing the UWMP, the District will account for the specific project's water demands in the UWMP in lieu of the District-wide average.

ACWD's 2009 Forecast is substantially revised from the 2004 Forecast in several key areas with a combined effect of reduced long-term demand. Key changes since 2004 are a slower rate of growth in the service area, continued restructuring of the local economy with a net loss of high water use industry (manufacturing), prolonged economic recovery from the recession, increased water use efficiency with plumbing code updates ("natural conservation"), and accelerated conservation effect resulting from recent drought message and public awareness.

The 2009 Forecast was revisited in January 2011, with adjustments made to baseline water consumption (based on 2010 actual water demands), timing of an economic recovery (and associated increase in business and industrial demands) and assumptions for "rebounding" of residential water demands to pre-2007 conditions. For planning purposes, ACWD is assuming that the average residential water demands will not fully recover to pre-2007 conditions. Rather, approximately 40% of the recent residential demand reduction is assumed to become permanent. This is consistent with the level of post-drought "rebound" in water consumption after the 1987-1992 drought.

The projected future demands in the ACWD service area are summarized in Figure 2-3 and Table 2-3 (for the years 2010, 2015, 2020, 2025, 2030 and 2035). The water demand forecast also includes projected savings from "baseline" conservation savings (or conservation savings due to programs already implemented) and from "natural conservation", resulting from new plumbing code standards. Also called "code-based savings" or "passive conservation", these demand reductions come about due to the replacement of old inefficient plumbing fixtures with low flow fixtures. ACWD is a signatory to the California Urban Water Conservation Council's (CUWCC) MOU on Urban Water Conservation and is committed to the implementation of locally cost-effective water conservation best management practices. A complete description of ACWD's water conservation program is provided in Chapter 7. Assumptions regarding additional conservation savings due to the implementation of ACWD's on-going conservation program are listed in Table 2-3, and a discussion of these savings assumptions is provided in Chapter 9.

Impacts of drought on demands

Dry periods may impact water demands in the ACWD service area in several ways. Because approximately 40% of the District's residential demand is for landscape irrigation, dry periods may result in an increase in demands due to less local rainfall available to meet the evapotranspiration requirements of lawns and other landscaping. However, demands may also be reduced due to customer efforts to be more water efficient during dry periods. As an example, during the 1987-1992 drought, ACWD customers reduced overall water use by approximately 20%. This response to the drought was due both to voluntary efforts and mandatory restrictions imposed by ACWD. However, because many customers have retained a "water conservation ethic" since the 1987-92 drought and the more recent 2007-09 dry conditions, and because of increased efficiencies of plumbing fixtures and the implementation of on-going District-sponsored water conservation programs, the ability to reduce overall water use during future droughts by similar levels may be lessened.

Figure 2-3
Historical and Projected Distribution System Demands
(with Additional Conservation Savings and Non-Revenue Water)

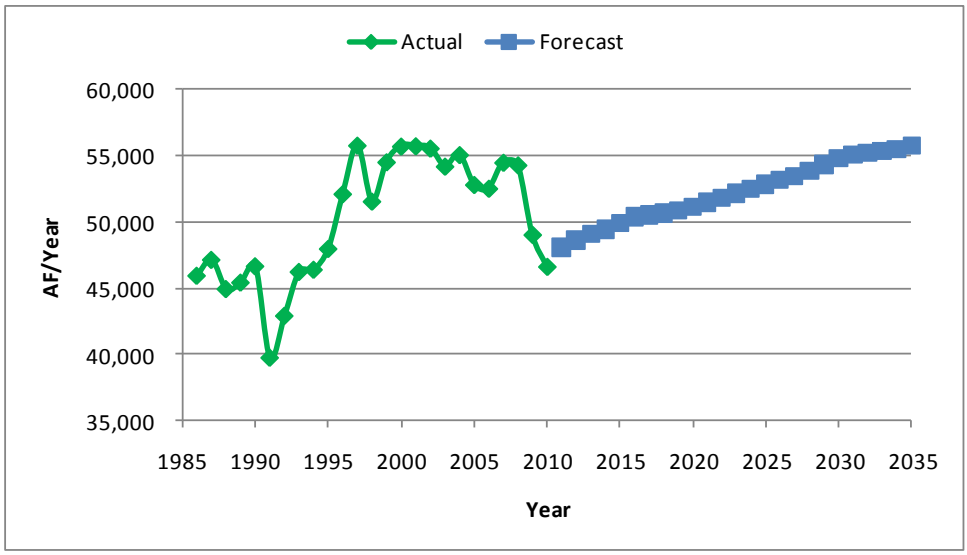


Table 2-3
ACWD Estimated Future Water Demands (AF/Yr)

Water Use Category	***Year***				
	2015	***2020***	***2025***	***2030***	***2035***
Distribution System					
Single Family Residential	23,600	24,300	24,600	24,900	25,100
Multi-Family Residential	9,600	9,900	10,200	10,500	11,100
Commercial	6,500	7,100	7,500	7,900	8,100
Industrial	3,700	4,400	5,000	5,800	5,900
Institutional	3,600	4,100	4,600	5,300	5,300
Other	100	100	100	100	100
Sub-Total	***47,100***	***49,900***	***51,900***	***54,500***	***55,600***
Adjustment for plumbing code implementation	(800)	(1500)	(2000)	(2400)	(2700)
Distribution System Demand (without Non-Revenue Water)	46,300	48,400	49,900	52,100	52,900
Total Distribution System Demand (with Non-Revenue Water)	**50,900**	**53,000**	**54,800**	**57,000**	**58,000**
Additional conservation savings	**(800)**	**(1400)**	**(1400)**	**(1400)**	**(1400)**
Groundwater System Demand	**16,200**	**16,200**	**16,200**	**16,200**	**16,200**
Grand Total	***66,300***	***67,800***	***69,600***	***71,800***	***72,800***

Notes:
1. All values rounded to the nearest 100. Total values may not equal sum of individual components due to rounding errors.
2. Landscape Irrigation included within Multi-Family Residential, Commercial, Industrial, and Institutional categories.
3. Adjustment for plumbing code implementation represents estimated savings due to retrofit of pre-1994 plumbing fixtures (showerheads, toilets) with water efficient models.
4. Total Distribution System Demand (with Non-Revenue Water) includes estimated Non-Revenue Water of 9.5%.
5. Groundwater System demands include: (1) private pumping (2,000 AF/Yr), (2) ARP pumping (7,000 AF/Yr) and (3) saline groundwater outflows (7,200 AF/Yr).
6. See Section 9.2 of this UWMP regarding assumptions for Additional Water Conservation Savings.

For planning purposes, it is assumed that during drought periods water demands for ACWD's distribution system customers do not change from those during normal years. However, the groundwater system demands are typically lower in dry years as lower groundwater levels, caused by reduced local recharge and increased reliance on groundwater storage, result in reduced saline groundwater outflows. ACWD will often minimize ARP pumping as well during dry periods. Summaries of projected demands under single dry year and multiple dry year conditions are provided in Tables 9-3 through 9-8 (Chapter 9).

Low Income Housing Water Demand

ACWD will be able to meet projected water demands for all customers in its service area through 2035, including the projected water use for single family and multi-family residential housing needed for low income households. California Water Code (Section 10631.1) requires 2010 UWMPs to include projected water demands for lower income single-family and multi-family residential households to assist water purveyors in complying with the requirements of Government Code Section 65589.7, which requires water purveyors to grant a priority for the provision of service to housing units affordable to lower income households. Health and Safety Code Section 50079.5 defines lower income households, for all geographic areas of the state, at 80 percent of area median income or less, adjusted for family size and revised annually.

ACWD's service area cities, Fremont, Union City and Newark, have made low income housing development a priority. Each city has assessed current stock and needs of affordable housing in their most recent General Plan Housing Elements. ACWD used this information to estimate projected demands of low income residential (single and multi-family) customers in ACWD's service area. The number of affordable units (both current and planned) were compared to total units to estimate the percentage of low income units, this percentage was applied to ACWD's estimated future single family and multi-family residential water demands in Table 2-3 to estimate future low income residential demands in Table 2-4.

Table 2-4 Low Income Residential Demand Projections

Year	*Low-income Residential Demand (AF/Yr)*
2010	1,600
2015	1,840
2020	1,890
2025	1,920
2030	1,960
2035	2,000

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CHAPTER 3
SOURCES OF SUPPLY

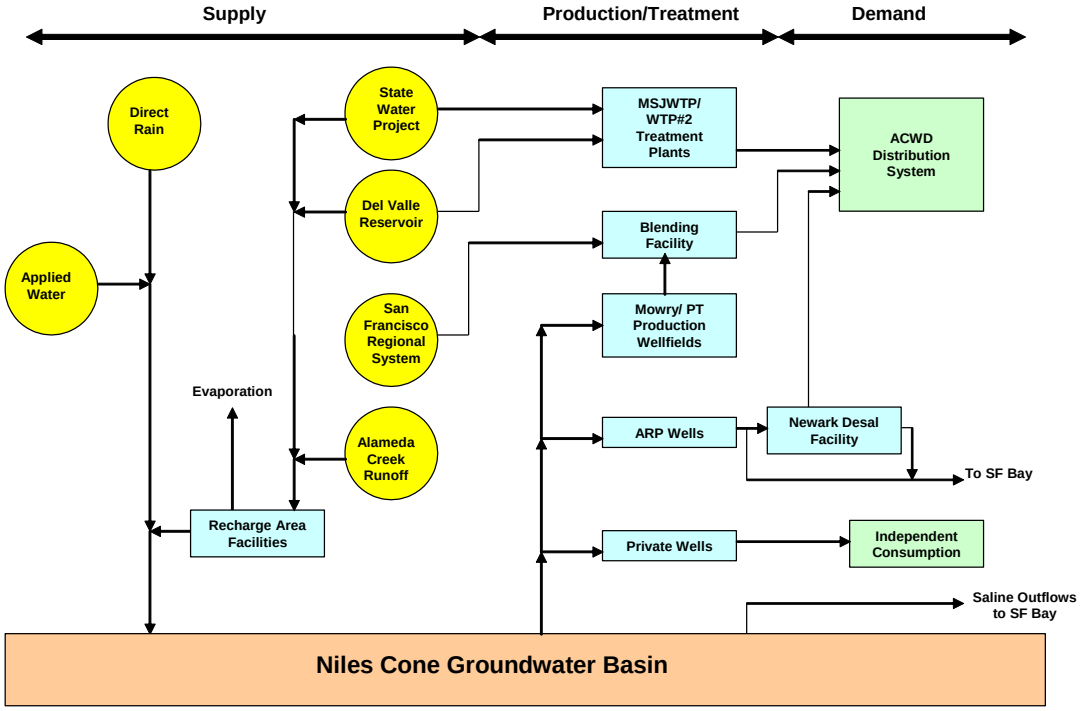
This chapter provides a summary of the District's sources of supply and their availability, as well as an overview of the management of these supplies and how water quality may impact future water supply reliability. A summary of ACWD's water supply strategy is provided in Chapter 9 – Water Supply Strategy.

3.1 SOURCES OF SUPPLY AND SUPPLY AVAILABILITY

ACWD currently has three primary sources of water supply: (1) the State Water Project (SWP), (2) San Francisco's Regional Water System and (3) local supplies. The SWP and San Francisco Regional Water Supplies are imported into the District service area through the South Bay Aqueduct and Hetch-Hetchy Aqueduct, respectively. Local supplies include fresh groundwater from the Niles Cone Groundwater Basin (underlying the District service area), desalinated brackish groundwater from portions of the groundwater basin previously impacted by seawater intrusion, and surface water from the Del Valle Reservoir. The primary source of recharge for the Niles Cone Groundwater Basin is from percolation of runoff from the Alameda Creek watershed. To a lesser degree, a portion of ACWD's SWP supplies are also used for local groundwater percolation. Infiltration of rainfall and applied water also contribute to local groundwater recharge.

Before being supplied to ACWD's customers, the source water supplies are treated to meet and surpass all state and federal drinking water standards. ACWD operates two surface water treatment plants that treat SWP and local surface water from Del Valle Reservoir. The Newark Desalination Facility treats brackish groundwater to remove salts and other impurities, and the Blending Facility blends San Francisco water with local fresh groundwater (with higher hardness) to provide a blended supply with lower overall hardness. Figure 3-1 provides a schematic of the District's sources of supply and production facilities.

Figure 3-1
ACWD Water Supply and Production Schematic



Over the FY1999/00-FY2009/10 period, 27% of the total in-District water demands (distribution system and groundwater system demands) have been met by State Water Project supplies, 19% from San Francisco Regional supplies and 54% from local supplies. When considering only the distribution system demands (potable water), over the same time period, about 36% of the District's distribution system water supply was from the State Water Project. This water was either treated at one of ACWD's two water treatment plants or used to recharge local aquifers. Water from the San Francisco Regional System provided approximately 25% of the distribution system water supply and local supplies accounted for the balance (about 39%) of the distribution system supplies. Figures 3-2 and 3-3 provide a summary of the District's sources of supply. Table 3-1 provides a summary of ACWD's historical use of each supply source.

Figure 3-2
Average Sources of Supply (FY99/00-09/10)
Distribution and Groundwater System Demands

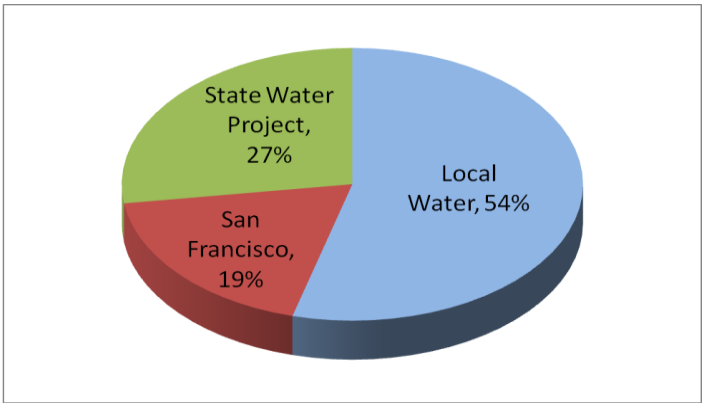
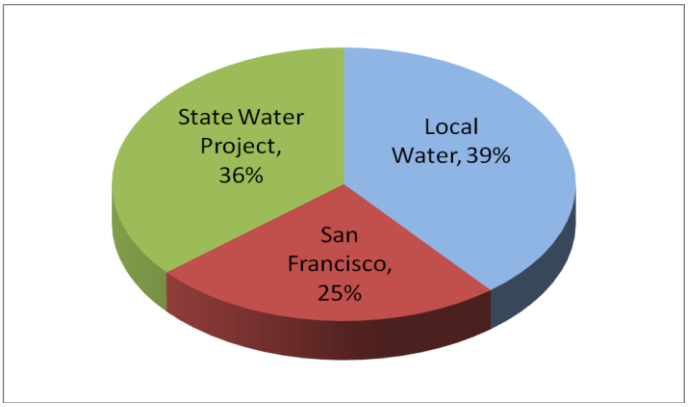


Figure 3-3
Average Sources of Supply (FY99/00-09/10)
Distribution System Demands Only



Each of the District's water supply sources is discussed in greater detail below. Table 3-2 provides a summary of the estimated availability of each of these supplies. Tables 3-3 and 3-4 provide a summary of the availability of wholesale water supplies from the SWP and San Francisco Regional System.

Table 3-1
Historical Water Supply Utilization by ACWD (AF/Yr)

FISCAL YEAR	SWP supplies used at ACWD facilities	Del Valle	San Francisco Regional Water	Newark Desal Facility[2]	Net Local Groundwater Recharge[3]	Recovered from Semitropic GW bank	Total In-District Water Supply	SWP Supply delivered to Semitropic GW bank
93-94	21,600	5,000	12,200	0	28,500	0	67,300	0
94-95	16,100	4,200	13,000	0	35,900	0	69,200	0
95-96	18,600	5,300	12,200	0	27,600	0	63,700	0
96-97	7,700	15,900	14,700	0	25,300	0	63,600	6,200
97-98	12,900	10,600	13,700	0	58,000	0	95,200	10,000
98-99	20,800	5,300	13,600	0	33,200	0	72,900	18,780
99-00	25,200	3,800	13,800	0	26,900	0	69,700	7,230
00-01	26,400	200	13,000	0	31,000	0	70,600	7,250
01-02	21,900	4,600	13,500	0	32,100	0	72,100	83
02-03	17,600	7,400	14,000	0	31,400	0	70,400	20,800
03-04	18,500	6,700	13,700	2,600	30,700	0	72,200	4,000
04-05	18,800	6,000	11,800	3,900	38,700	0	79,200	9,300
05-06	15,600	7,700	11,700	3,900	38,200	0	77,100	41,540
06-07	13,800	11,000	15,300	2,800	26,000	0	68,900	11,936
07-08	22,600	500	15,000	3,600	24,600	5,500	71,800	0
08-09	10,400	4,200	12,600	3,200	24,100	10,600	65,100	0
09-10	18,100	2,500	11,700	1100	30,800	0	64,200	0

Notes:
1. All values rounded to the nearest 100. Total values may not equal sum of individual components due to rounding errors.
2. Newark Desal Facility supply represents total blended flow. In 2009/10 the facility was operated for only two months due to the Phase 2 construction activities.
3. Recharge figures do not include Del Valle Reservoir or imported supplies used for recharge, and are less evaporation and other losses.

Table 3-2
Summary of Water Supply Availability for Existing Supplies (AF/Yr)

SUPPLY COMPONENT	Estimated Water Supply Availability			
	Median Year[1] (1936 Hydrologic Conditions)	Long-Term Average[2]	Maximum Availability[3]	Minimum Availability[4]
Imported Supplies				
State Water Project	27,500	25,500	42,000	4,000
San Francisco Regional	15,400	15,000	15,400	8,500
Local Supplies				
Groundwater Recharge[5]	24,500	23,300	44,400	7,500
Groundwater Storage	N/A	N/A	10,000	0
Del Valle	5,800	7,100	18,500	0
Desalination[6]	5,100	5,100	5,600	5,100
Banking/Transfers				
Semitropic Banking[7]	N/A	N/A	33,500	13,500
TOTAL SUPPLY	***78,300***	***76,000***	***N/A***	***N/A***

Notes:
1. Median Year values represent the median projected supply availability considering the sum of all of ACWD existing supplies and are based on the 1922-2003 historical hydrologic conditions (assuming 2010 operating conditions). The water supply availability under the year 1936 hydrologic conditions is utilized for the Median Year. Local Groundwater Storage and Semitropic Banking are not included in the Median Year because these supply components are used solely for dry year supplies and not under Median Year conditions.
2. Long-term Average values represent the average water supply availability based on the 1922-2003 historical hydrologic conditions. Local Groundwater Storage and Semitropic Banking are not included in the Long-term Average because these supply components only provide dry year supplies and are based on a balanced "put" and "take" over the long-term.
3. Maximum Availability represents the maximum quantity of supply from each supply component. For the imported supplies, these quantities represent the maximum contractual amount that ACWD can receive from these sources. For local supplies, the maximum quantities represent the maximum amount projected to be available based on the 1922-2003 historical hydrologic conditions. For Groundwater Storage, the maximum assumes that the groundwater basin is within normal operating levels in the beginning of the year. For Semitropic Banking, the maximum amount is based on maximum contractual return capacity to ACWD assuming 100% SWP allocation. The Maximum supply quantities listed above are not additive because the availability of these individual supplies may not occur under the same year/hydrologic condition.
4. Minimum Availability represents the minimum quantity of supply from each supply component. These quantities represent the minimum projected supply availability based on the 1922-2003 historical hydrologic conditions. San Francisco Regional minimum estimated by ACWD based on Tier Two drought allocation formula and SFPUC reliability data. For Groundwater Storage, the minimum quantity assumes that the groundwater basin was at the minimum operating groundwater elevation in the beginning of the year and there is no usable groundwater storage available. For Semitropic Banking, the minimum quantity assumes that only Semitropic "pumpback" capacity is available to return banked water to ACWD. The Minimum Availability quantities are not additive because the availability of these individual supplies may not occur under the same year/hydrologic condition.
5. Groundwater Recharge is calculated as recharge from deep percolation of rainfall and applied water plus recharge at ACWD's groundwater percolation facilities (with local runoff from the Alameda Creek Watershed) less "Other Outflows" (as described in ACWD's annual Groundwater Survey Reports). Groundwater Recharge values in Table 3-1 do not include recharge from State Water Project or Del Valle Reservoir supplies.
6. Maximum Availability of Desalination based on 5 mgd annual average permeate production capacity. Peak month permeate capacity may be up to 10 mgd. Median Year availability is based on 10% outage. Minimum Availability based on modeling analyses with 2010 supply/demand conditions and long-term hydrologic conditions (1922-2003).
7. Mitigation Measure CUM PU-1 of the Patterson Ranch Planned District Final EIR, requires the project proponent to secure up to 300 AF of additional recovery capacity from the Semitropic Groundwater Banking (or equivalent mitigation measure). As of March 2011 this additional recovery capacity has not been secured. Because of uncertainties regarding timing of this mitigation (or potential implementation of an alternate equivalent mitigation measure), this additional recovery capacity is not included in this UWMP.

Table 3-3
ACWD Supply Request and Projected Availability of SWP Supplies (AF/Yr)

Supply Request and Projected Availability	Year					
	2010	2015	2020	2025	2030	2035
ACWD Forecast Delivery Request	42,000	42,000	42,000	42,000	42,000	42,000
DWR Projected Supply Availability						
Maximum Contractual Amount	42,000	42,000	42,000	42,000	42,000	42,000
Median Value	26,700	26,700	26,700	26,700	26,700	26,700
Single Dry Year	4,000	4,000	4,000	4,000	4,000	4,000
Multiple Dry Year						
-Year 1	11,000	11,000	11,000	11,000	11,000	11,000
-Year 2	12,400	12,400	12,400	12,400	12,400	12,400
-Year 3	24,900	24,900	24,900	24,900	24,900	24,900
-Year 4	8,200	8,200	8,200	8,200	8,200	8,200
-Year 5	11,800	11,800	11,800	11,800	11,800	11,800

Source: California Department of Water Resources, 2009 Final State Water Project Reliability Report

Notes:
1. SWP availability assumptions are based on DWR's 2029 Scenario in the 2009 Final State Water Project Reliability Report

Table 3-4
ACWD Supply Request and Projected Availability of San Francisco Regional Supplies (AF/Yr)

Supply Request and Projected Availability	Year					
	2010	2015	2020	2025	2030	2035
ACWD Forecast Delivery Request	15,400	15,400	15,400	15,400	15,400	15,400
SFPUC Projected Supply Availability						
Maximum	15,400	15,400	15,400	15,400	15,400	15,400
Median Value	15,400	15,400	15,400	15,400	15,400	15,400
Single Dry Year	8,500	8,500	8,500	8,500	8,500	8,500
Multiple Dry Year						
-Year 1	14,100	14,100	14,300	14,600	14,900	15,100
-Year 2	11,100	13,400	13,300	13,200	13,100	13,000
-Year 3	8,500	8,500	9,200	9,800	10,500	11,100
-Year 4	8,500	8,500	8,900	9,200	9,600	9,900
-Year 5	8,500	8,500	9,000	9,500	10,000	10,600

Source: San Francisco Public Utilities Commission, Transmittal to BAWSCA, March 31, 2011 (with application of Tier 2 drought allocation formula)

State Water Project

In 1961, the District signed a contract with the State Department of Water Resources (DWR) for a maximum annual amount of 42,000 acre-feet from the State Water Project (SWP). The SWP, managed by the DWR, is the largest state-built, multi-purpose water project in the country. The SWP facilities include 28 dams and reservoirs, 26 pumping and generating plants, and approximately 660 miles of aqueducts. The water stored in the SWP storage facilities originates from rainfall and snowmelt runoff in Northern and Central California watersheds. The SWP's primary storage facility is Lake Oroville in the Feather River Watershed. Releases from Lake Oroville flow down the Feather River to the Sacramento River, which subsequently flows to the Sacramento-San Joaquin Delta. The SWP diverts water from the Delta through the Banks Pumping Plant which lifts water from the Clifton Court Forebay (in the Delta) to the California Aqueduct and Bethany Reservoir. From Bethany Reservoir, the South Bay Pumping Plant lifts water into the South Bay Aqueduct, which delivers State Water Project supplies to ACWD and other Bay Area water agencies in Alameda and Santa Clara Counties.

State Water Project Availability

In September 2010, DWR released its Final 2009 SWP Delivery Reliability Report. In this biennial report DWR provides two reliability analyses, one assuming the current year's level of demand (2009) and one twenty years in the future (2029). The future scenario conservatively assumes full demand of State water resources by all contracting agencies. ACWD elects to assume the more conservative 2029 projection for all years as it better reflects the full stress on the SWP. According to the DWR, the long-term average delivery of contractual SWP supply ("Table A") is projected to be 60 percent of full contract, ranging from a minimum of 10 percent (single dry year) to 100 percent (single wet year). Contractual amounts are projected to range from 19 to 59 percent during multiple-dry year periods, and from 68 to 100 percent during multiple-wet year periods.

To ensure a conservative analysis, the 2009 SWP Delivery Reliability Report expressly assumes and accounts for the institutional, environmental, regulatory, and legal factors affecting SWP supplies, including but not limited to: water quality constraints, fishery protections, and other operational requirements imposed by regulatory agencies. The report also considers the potential effects of Delta levee failures and other seismic or flood events. Notably, the report assumes that all of these restrictions and limitations will remain in place over the next 20-year period and that no actions to improve the Delta will occur, even though numerous legal challenges, various Delta restoration processes, and new legal requirements for Delta improvements are currently underway (i.e., Bay Delta Conservation Plan, Delta Vision, Delta Plan, etc.). Finally, DWR's long-term SWP delivery reliability analyses incorporate assumptions intended to account for potential supply shortfalls related to global climate change.

A summary of the projected SWP supply availability is provided in Table 3-3.

In order to assist the DWR in its water supply planning, on an annual basis ACWD submits its forecasted use (through the year 2035) of its SWP supplies to the DWR. For planning purposes, ACWD requests the full delivery of its maximum contractual amount of 42,000 acre-feet. Currently, SWP water that is not directly used by ACWD within the service area (to meet distribution and/or groundwater system demands) is stored within the local groundwater basin or at the Semitropic Groundwater Bank for later dry year use (see discussion below). Alternatively, ACWD's SWP water may also be stored as carryover water at the SWP's San Luis Reservoir.

Semitropic Banking of ACWD's SWP Supplies

Because of the variability in the SWP supply availability, ACWD's 1995 IRP identified the need to secure storage to improve the dry year reliability of the District's SWP supplies. Based on this IRP recommendation, ACWD has contracted with Semitropic Water Storage District for participation in the Semitropic Groundwater Banking Program. ACWD has secured 150,000 AF of groundwater storage capacity at Semitropic under this program. In wet years, ACWD delivers its unused (excess) SWP supplies to Semitropic for storage in their groundwater basin. In dry years, ACWD can recover these supplies through: (1) an "in-lieu" exchange whereby ACWD will

receive a portion of Semitropic's SWP supplies (and Semitropic will utilize groundwater previously stored by ACWD in its basin); and (2) a "pumpback" program where Semitropic directly pumps stored groundwater into the California Aqueduct. As with local groundwater storage in the Niles Cone Groundwater Basin, the Semitropic Groundwater Banking Program does not provide a new source of supply for the District. Rather, it provides a means to store the District's unused SWP supplies in wet years for use during dry years when the delivery of SWP supplies may be significantly curtailed.

San Francisco's Regional Water System

ACWD receives water from the City and County of San Francisco's Regional Water System (RWS), operated by the San Francisco Public Utilities Commission (SFPUC). This supply is predominantly from the Sierra Nevada, delivered through the Hetch Hetchy aqueducts, but also includes treated water produced by the SFPUC from its local watersheds and facilities in Alameda and San Mateo Counties. The amount of imported water available to the SFPUC's retail and wholesale customers is constrained by hydrology, physical facilities, and the institutional parameters that allocate the water supply of the Tuolumne River. Due to these constraints, the SFPUC is very dependent on reservoir storage to firm-up its water supplies.

In order to enhance the ability of the SFPUC water supply system to meet identified service goals for water quality, seismic reliability, delivery reliability, and water supply, the SFPUC has undertaken the Water System Improvement Program (WSIP), approved October 31, 2008. The WSIP will deliver capital improvements aimed at enhancing the SFPUC's ability to meet its water service mission of providing high quality water to customers in a reliable, affordable and environmentally sustainable manner. Many of the water supply and reliability projects evaluated in the WSIP were originally put forth in the SFPUC's Water Supply Master Plan (2000).

A Program Environmental Impact Report (PEIR) was prepared in accordance with the California Environmental Quality Act for the WSIP. The PEIR, certified in 2008, analyzed the broad environmental effects of the projects in the WSIP at a program level and the water supply impacts of various alternative supplies at a project level. Individual WSIP projects are also undergoing individual project specific environmental review as required.

In approving the WSIP, the Commission adopted a Phased WSIP Variant for water supply that was analyzed in the PEIR. This Phased WSIP Variant established a mid-term water supply planning milestone in 2018 when the Commission would reevaluate water demands through 2030. At the same meeting, the Commission also imposed the Interim Supply Limitation which limits the volume of water that the member agencies and San Francisco can collectively purchase from RWS to 265 million gallons per day (mgd) until at least 2018. Although the Phased WSIP Variant included a mid-term water supply planning milestone, it did include full implementation of all proposed WSIP facility improvement projects to insure that the public health, seismic safety, and delivery reliability goals were achieved as soon as possible. As of July 1, 2010, the WSIP was 27% complete overall and is scheduled to be completed in December 2015.

San Francisco Regional Water Supply Availability

Water supplies from the San Francisco Regional Water System are subject to variability depending on hydrologic conditions and other factors. A summary of the projected availability of supplies from this source is provided in Table 3-4. The following provides a description of ACWD's contractual supply for San Francisco Regional Water supplies, and how this supply would be allocated among San Francisco and its wholesale customers in the event of a water supply shortage.

2009 Water Supply Agreement The business relationship between San Francisco and its wholesale customers is largely defined by the "Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County and Santa Clara County" entered into in July 2009 (WSA). The new WSA replaced the Settlement Agreement and Master Water Sales Contract that expired June 2009. The WSA addresses the rate-making methodology used by the City in setting wholesale water rates for its wholesale customers in addition to addressing water supply and water shortages for the RWS. The WSA has a 25 year term.

In terms of water supply, the WSA provides for a 184 mgd (expressed on an annual average basis) "Supply Assurance" to the SFPUC's wholesale customers, subject to reduction, to the extent and for the period made necessary by reason of water shortage, due to drought, emergencies, or by malfunctioning or rehabilitation of the regional water system. The WSA does not guarantee that San Francisco will meet peak daily or hourly customer demands when their annual usage exceeds the Supply Assurance. The SFPUC's wholesale customers have agreed to the allocation of the 184 mgd Supply Assurance among themselves, with each entity's share of the Supply Assurance set forth on Attachment C to the WSA. The Supply Assurance survives termination or expiration of the WSA and this agency's Individual Water Sales Contract with San Francisco.

The Water Shortage Allocation Plan between the SFPUC and its wholesale customers, adopted as part of the WSA in July 2009, addresses shortages of up to 20% of system-wide use. The Tier 1 Shortage Plan allocates water from the RWS between San Francisco Retail and the wholesale customers during system-wide shortages of 20% or less. The WSA also anticipated a Tier 2 Shortage Plan adopted by the wholesale customers which would allocate the available water from the RWS among the wholesale customers.

Individual Supply Guarantee In 2009, ACWD, along with 25 other Bay Area water suppliers signed a Water Supply Agreement (WSA) with San Francisco, supplemented by an individual Water Supply Contract. These contracts, which expire in 25 years, provide for a 184 mgd Supply Assurance to the SFPUC's wholesale customers collectively. ACWD's Individual Supply Guarantee (ISG) is 13.76 mgd (or approximately 15,410 acre feet per year). Although the WSA and accompanying Water Supply Contract expire in 2034, the Supply Assurance (which quantifies San Francisco's obligation to supply water to its individual wholesale customers) survives their expiration and continues indefinitely.

Tier One Drought Allocations In July 2009, in connection with the WSA, the wholesale customers and San Francisco adopted a Water Shortage Allocation Plan (WSAP) to allocate water from the regional water system to retail and wholesale customers during system-wide shortages of 20% or less (the "Tier One Plan"). The Tier One Plan replaced the prior Interim Water Shortage Allocation Plan, adopted in 2000, which also allocated water for shortages up to 20%. The Tier One Plan also allows for voluntary transfers of shortage allocations between the SFPUC and any wholesale customer and between wholesale customers themselves. In addition, water "banked" by a wholesale customer, through reductions in usage greater than required, may also be transferred.

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

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

The Tier One Plan will expire at the end of the term of the Water Supply Agreement, unless extended by San Francisco and the wholesale customers.

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

wholesale customer into account, including: 1) the Individual Supply Guarantee; 2) seasonal use of all available water supplies; and 3) residential per capita use.

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

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

The Tier Two Plan requires that the Allocation Factors be calculated by BAWSCA each year in preparation for a potential water shortage emergency. As the wholesale customers change their water use characteristics (e.g., increases or decreases in SFPUC purchases and use of other water sources, changes in monthly water use patterns, or changes in residential per capita water use), the Allocation Factor for each wholesale customer will also change. However, for long-term planning purposes, each wholesale customer shall use as its Allocation Factor, the value identified in the Tier Two Plan when adopted. The Tier Two Plan will expire in 2018 unless extended by the wholesale customers.

2018 Interim Supply Limitation As part of its adoption of the Water System Improvement Program (WSIP) in October 2008, discussed separately herein, the Commission adopted a water supply element, the Interim Supply Limitation (ISL), to limit sales from San Francisco Regional Water System (RWS) watersheds to an average annual amount of 265 million gallons per day (mgd) through 2018. The wholesale customers' collective allocation under the ISL is 184 mgd and San Francisco's is 81 mgd. Although the wholesale customers did not agree to the ISL, the WSA provides a framework for administering the ISL.

Interim Supply Allocations The Interim Supply Allocations (ISAs) refers to each individual wholesale customer's share of the Interim Supply Limitation (ISL). On December 14, 2010, the Commission established each agency's ISA through 2018. In general, the Commission based the allocations on the lesser of the projected fiscal year 2017-18 purchase projections or Individual Supply Guarantees. The ISAs are effective only until December 31, 2018 and do not affect the Supply Assurance or the Individual Supply Guarantees, both discussed separately herein. San Francisco's Interim Supply Allocation is 81 mgd. ACWD's ISA is 13.76 mgd, the same as the Individual Supply Guarantee.

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

Environmental Enhancement Surcharge The Commission plans to establish the Environmental Enhancement Surcharge concurrently with the budget-coordinated rate process. This surcharge will be unilaterally imposed by SFPUC on individual wholesale customers, and SFPUC retail customers, when each agency's use exceeds their Interim Supply Allocation and when sales of water to the wholesale customers and San Francisco retail customers, collectively, exceeds the Interim Supply Limitation of 265 mgd.

The SFPUC anticipates that the Environmental Enhancement Surcharge program will become effective beginning FY 2011/12.

Local Sources

As described above, ACWD's local sources include fresh groundwater from the Niles Cone Groundwater Basin, brackish groundwater desalination, and surface water supplies from the Del Valle Reservoir. Each of these supplies is described in greater detail below.

Niles Cone Groundwater Basin: The principal source of local supply for the District is the local aquifer system known as the Niles Cone Groundwater Basin. The primary source of recharge for the Niles Cone Groundwater Basin is local runoff from the Alameda Creek Watershed, which is captured, diverted and recharged at the District's groundwater recharge facilities. Alameda Creek annual runoff at the USGS Alameda Creek near Niles stream gage (located near ACWD's recharge facilities) has varied from a recorded minimum of 650 AF/Yr in 1960-1961, to a recorded maximum in 1982-1983 of 360,000 AF/Yr. Typically, ACWD diverts only a small portion of the local runoff flowing in Alameda Creek. The majority of local runoff flows downstream through the Alameda Creek Flood Control Channel to San Francisco Bay. To a lesser extent, infiltration of rainfall and applied water also provide a local source of recharge for the groundwater basin. ACWD also uses a portion of its imported State Water Project supplies for groundwater recharge.

The water quality in the groundwater system is characterized by fresh groundwater in the eastern portion of the groundwater basin transitioning into brackish groundwater in the western portion of the basin. The brackish groundwater is a result of historical seawater intrusion from the adjacent San Francisco Bay. Since the 1960's ACWD has managed the groundwater basin to prevent any additional seawater intrusion and has pumped the trapped brackish groundwater back to San Francisco Bay through the District's Aquifer Reclamation Program.

The Niles Cone Groundwater Basin has capacity to store water from year to year ("local groundwater storage"). However, the usable storage capacity of the groundwater basin is significantly limited by the potential for seawater intrusion if groundwater levels are maintained too low. Although local groundwater storage (i.e. groundwater supplies in excess of recharge) provides a short term source of supply during dry years, it is not a supply that is available every year because the groundwater system will require replenishment from freshwater sources, without which seawater intrusion would occur.

Brackish Groundwater Desalination: In 2003, ACWD commissioned the Newark Desalination Facility, with a capacity of 5 mgd (permeate, or treated water, production capacity). In 2010, ACWD expanded this capacity to 10 mgd. This facility utilizes the reverse osmosis process to remove salts and other impurities from the brackish groundwater pumped at ACWD's Aquifer Reclamation Program wells. Treated water (permeate) from the Newark Desalination Facility is blended with local groundwater and provides a supply for the distribution system demands. Chapter 6 provides additional information on ACWD's desalination program.

Del Valle Reservoir: The District and Zone 7 Water Agency of the Alameda County Flood Control and Water Conservation District (hereafter referred to as "Zone 7"), have equal rights on Arroyo Del Valle to divert water to storage. When the California Department of Water Resources (DWR) constructed Del Valle Dam in the upper Alameda Creek Watershed, those rights were recognized in an agreement between DWR, the District, and Zone 7. Consequently, DWR typically makes a total of 15,000 AF of storage available annually in Del Valle Reservoir for use by ACWD and Zone 7. ACWD and Zone 7 equally share this storage capacity, thereby providing up to 7,500 AF of storage capacity annually to ACWD.

Local Water Supply Availability

A summary of the estimated water supply availability from ACWD's local supplies is provided in Table 3-2. As indicated in these tables, the amount of local water supplies available to ACWD from Del Valle Reservoir and fresh groundwater sources varies widely from year to year, depending primarily on hydrologic conditions and availability of local runoff. In general, desalination of brackish groundwater provides a more reliable water source than other local supplies. However, there may be limitations to this source if groundwater levels are lowered to the extent that a reduction in Aquifer Reclamation Program pumping is required to prevent new

seawater intrusion.

In addition, ACWD has initiated informal discussions with the National Marine Fisheries Service (NMFS) and California Department of Fish and Game (DFG) regarding the permitting for fish passage facilities at ACWD's inflatable rubber dams in the Alameda Creek Flood Control Channel. A key element of these discussions has been the minimum bypass flows needed at these facilities to support steelhead migration through the Flood Control Channel. As of March 2011, ACWD, NMFS and DFG have developed a preliminary agreement on a minimum bypass flow schedule and it is anticipated that this bypass flow schedule will be incorporated into the permitting for this project. Therefore, for the purpose of this UWMP, the March 2011 bypass flow schedule has been incorporated into the modeling analyses of local water supply availability.

3.2 WATER SUPPLY UNCERTAINTIES

The purpose of this section is to identify factors which may impact current planning assumptions, the significance and magnitude of which are currently unknown. As described below, the potential impacts of global warming are a key uncertainty which may impact all of ACWD supplies. In addition, each of ACWD's supplies face uncertainties which may be unique to the source of supply. A summary of water supply uncertainties facing ACWD's supplies is provided in Table 3-5 and discussed in greater detail below. This includes a discussion of how climate change may impact ACWD's supplies, followed by a discussion of additional sources of uncertainty for each source of supply.

Climate Change

Climate change may result in a long term trend characterized by less snowfall, more local rainfall and rising sea-levels. Under current conditions, much of ACWD's imported water supplies is held in "storage" in winter and spring snowpack in the Sierra Nevada Mountains. With a diminished snowpack, the yield of the State Water Project and San Francisco Regional System may be significantly impacted. The magnitude of the impact of climate change on water supplies is not known. However, the following provides an overview of recent studies that have evaluated potential impacts on surface water and groundwater supplies in California.

State Water Project: In 2006 DWR's Climate Action Team (CAT) released a report on climate change and its potential impact on California's water resources. Entitled *Progress on Incorporating Climate Change into Management of California's Water Resources* (*2006 Climate Change Repor*t), the report summarizes recent research into change in precipitation, air temperatures, snow levels, and snowmelt runoff. The report also evaluates possible future impact on California water supply through model simulations reflecting multiple climate change scenarios, weather conditions and geopolitical conditions.

The main results of the *2006 Climate Change Report* related to climate change's estimated impacts on the State Water Project around the year 2050:

- Estimated changes in annual average SWP south-of-Delta Table A deliveries range from a slight increase of about 1 percent for a wetter scenario to about a 10 percent reduction for one of the drier climate change scenarios.

Table 3-5
Summary of Potential Future Factors that may Influence ACWD Water Supply Reliability

SUPPLY	Factor		
	Legal & Environmental	Water Quality	Climatic
Imported Supplies			
- State Water Project	ESA* requirements may constrain Delta pumping	Potential seawater intrusion impacts if Delta Levees fail.	Supply is dependent on hydrologic conditions
- San Francisco Regional Supply	ESA and other permitting requirements may require additional reservoir releases	None anticipated	Supply is dependent on hydrologic conditions
Local Supplies			
- Groundwater Recharge	ESA requirements may impact groundwater recharge operations Upstream water management activities and/or agreements with upstream agencies may impact supply availability	Upstream water management activities and/or land use activities may impact water quality	Supply is dependent on hydrologic conditions
- Groundwater Storage	None anticipated	None anticipated	Supply is dependent on availability of water to store in wet years
- Del Valle	ESA requirements may require downstream flow releases	None anticipated	Supply is dependent on hydrologic conditions
- Desalination	None anticipated	None anticipated	Supply is dependent on local groundwater conditions
- Recycled Water	None anticipated	None anticipated	None anticipated
Banking/Transfers			
- Semitropic Banking	Delta pumping constraints may impact ability to recover water through SWP exchanges	Banked groundwater may require treatment	Supply is dependent on availability of water to store in wet years

* Endangered Species Act

- Estimated increased winter runoff and lower Table A allocations resulting in slightly higher average annual Article 21 deliveries in the three drier climate change scenarios[1]. However, the increases in Article 21 deliveries do not offset the losses to Table A. The wetter scenario with higher Table A allocations results in fewer Article 21 delivery opportunities and slightly lower annual Article 21 deliveries.

- Estimated SWP carryover storage is reduced in the drier climate change scenario and is somewhat increased in the wetter climate change scenario.

The 2009 Biennial Report of the CAT includes updates to the findings of the 2006 study. The update expands the number of future climate scenarios, methods for estimating sea-level rise, estimates for irrigation demands, reservoir inflows, and restrictions in Delta operations anticipated with sea-level rise and resultant salt-intrusion. The updated study qualitatively reports that SWP reliability will be further diminished from previous findings, however, as determined in 2006, those impacts do not become significant until the latter half of the 21st century. Therefore, while included in this analysis, the water supply impacts anticipated from climate change are minimal during the 20-year purview of the UWMP. The 2009 SWP Delivery Reliability Report includes these revised climate change assumptions, the impacts of which are reflected in the reliability data used in this UWMP.

San Francisco Regional Supplies: The issue of climate change has become an important factor in water resources planning in the State, and is frequently being considered in urban water management planning purposes, though the extent and precise effects of climate change remain uncertain. As described by the SFPUC in its Final Water Supply Availability Study for the City and County of San Francisco, dated October 2009, there is evidence that increasing concentrations of greenhouse gasses have caused and will continue to cause a rise in temperatures around the world, which will result in a wide range of changes in climate patterns. Moreover, there is evidence that a warming trend occurred during the latter part of the 20th century and will likely continue through the 21st century. These changes will have a direct effect on water resources in California, and numerous studies have been conducted to determine the potential impacts to water resources. Based on these studies, climate change could result in the following types of water resource impacts, including impacts on the watersheds in the Bay Area:

- Reductions in the average annual snowpack due to a rise in the snowline and a shallower snowpack in the low and medium elevation zones, such as in the Tuolumne River basin, and a shift in snowmelt runoff to earlier in the year;
- Changes in the timing, intensity and variability of precipitation, and an increased amount of precipitation falling as rain instead of as snow;
- Long-term changes in watershed vegetation and increased incidence of wildfires that could affect water quality;
- Sea level rise and an increase in saltwater intrusion;
- Increased water temperatures with accompanying potential adverse effects on some fisheries and water quality;
- Increases in evaporation and concomitant increased irrigation need; and
- Changes in urban and agricultural water demand.

[1] Article 21 deliveries refer to Article 21 of the SWP contracts which allows for contractors to receive additional water deliveries only under specific conditions. These conditions include: 1) Article 21 water is available only when excess water is available in the Delta, and 2) Article 21water is available only when conveyance capacity through the SWP facilities is available. Due to the uncertainties regarding the availability of Article 21 water, ACWD does not include this supply in its water supply planning and Urban Water Management Plan.

According to the SFPUC (2009), other than the general trends listed above, there is no clear scientific consensus on exactly how climate change will quantitatively affect the state's water supplies, and current models of water systems in California generally do not reflect the potential effects of climate change.

Initial climate change modeling completed by the SFPUC indicates that about seven percent of runoff currently draining into Hetch Hetchy Reservoir will shift from the spring and summer seasons to the fall and winter seasons in the Hetch Hetchy basin by 2025. This percentage is within the current interannual variation in runoff and is within the range accounted for during normal runoff forecasting and existing reservoir management practices. The predicted shift in runoff timing is similar to the results found by other researchers modeling water resource impacts in the Sierra Nevada due to warming trends associated with climate change.

The SFPUC has stated that based on this preliminary analysis, the potential impacts of climate change are not expected to affect the water supply available from the San Francisco Regional Water System (RWS) or the overall operation of the RWS through 2030.

The SFPUC views assessment of the effects of climate change as an ongoing project requiring regular updating to reflect improvements in climate science, atmospheric/ocean modeling, and human response to the threat of greenhouse gas emissions. To refine its climate change analysis and expand the range of climate parameters being evaluated, as well as expand the timeframes being considered, the SFPUC is currently undertaking two additional studies. The first utilizes a newly calibrated hydrologic model of the Hetch Hetchy watershed to explore sensitivities of inflow to different climate change scenarios involving changes in air temperature and precipitation. The second study will seek to utilize state-of-the-art climate modeling techniques in conjunction with water system modeling tools to more fully explore potential effects of climate change on the SFPUC water system as a whole. Both analyses will consider potential effects through the year 2100.

Groundwater: In 2003, and then again in an update prepared in August of 2005, the Pacific Institute for Studies in Development, Environment and Security prepared a literature search report for DWR, which summarized recommendations for coping with and adapting to climate change from key peer-reviewed publications and specifically considered the potential impacts of climate change on groundwater. The Pacific Institute's report is entitled, *Climate Change and California Water Resources: A Survey and Summary of the Literature,* by Michael Diparsky and Peter H. Gleick, Pacific Institute (*Climate Change and Water Resources*).

Climate Change and Water Resources found that little work has been done on the impacts of climate change for specific groundwater basins, or for general groundwater recharge characteristics or water quality. As the following conclusions from the report illustrate, the potential impacts of climate change on groundwater resources are divided, with some potentially resulting in increased availability of groundwater and others potentially resulting in less.

- Changes in recharge will result from change in effective rainfall as well as a change in the timing of the recharge season. Increased winter rainfall could lead to increased groundwater recharge.

- Higher evaporation or shorter rainfall seasons could mean that soil deficits persist for longer periods of time, shortening recharge seasons.

- Because a significant portion of winter recharge comes from deep percolation of precipitation below the rooting zone, warmer winter temperatures between storms would be expected to increase and dry out the soil between storms. A greater amount of rain in subsequent storms would then be required to wet the root zone and provide water for deep percolation.

- Sea-level rise could affect coastal aquifers through saltwater intrusion.

- Warmer, wetter winters would increase the amount of runoff available for groundwater recharge. However this additional runoff would be occurring at a time when some basins are either being recharged at their maximum capacity or are already full.

- Reductions in spring runoff and higher evapotranspiration because of higher temperatures could reduce the amount of water available for recharge.

State Water Project Supplies

The reliability of ACWD's State Water Project supplies will continue to remain uncertain due to the on-going concerns regarding the sustainability of the Delta. These concerns include the Delta ecosystem and potential future environmental regulations, levee stability and the potential for catastrophic failure of these levees, urban encroachment within the Delta, and water quality within the Delta due to urban and agricultural discharges.

Most notably, successive actions to protect endangered species within the Delta have resulted in reductions in long term reliability from 69% to 60% of Maximum Table A allocation over the past four years. Beginning in December of 2007, Federal District Court Judge Oliver Wanger issued a final court order ("Wanger Decision") which put into place an operational plan requiring the State Water Project and Central Valley Project (CVP) to reduce Delta export pumping operations in order to protect the Delta smelt. This court action was replaced by a biological opinion in December of 2008, which largely upheld the operating restrictions imposed by the Wanger Decision. In June of 2009 a revised biological opinion for salmonids was published which further restricted the State's ability to deliver supplies presently and for the foreseeable future.

On July 20, 2010, the State Water Resources Control Board (State Water Board) released a report titled "Draft Report on the Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem". Development of these criteria was required under SBX7 1, passed in November of 2009, which sought to protect the public trust resources of the Delta ecosystem. The purpose for developing the criteria is to inform planning decisions for the Delta Plan and the Bay Delta Conservation Plan (BDCP), a multiagency effort with the goal of providing long-term Federal and State Endangered Species Act compliance for Delta export operations. At this point, the extent to which these criteria will be implemented and what effect they may have on the State's ability to deliver water supplies is as of yet unknown.

Additional information on potential factors affecting SWP reliability is provided in Appendix B.

Semitropic Banking Program

ACWD faces several uncertainties with regard to recovery of water from the Semitropic Banking Program. These uncertainties include: 1) water quality concerns with regard to groundwater from Semitropic that is pumped back into the California Aqueduct; and 2) the ability to make the upstream exchanges needed to deliver the recovered water to the ACWD service area. With regards to the water quality issues, Semitropic has initiated a pilot water treatment plant which has treated the groundwater to meet the required criteria for pumping this water into the California Aqueduct. Semitropic has indicated that this pilot treatment plant may form the basis for a future permanent treatment facility. With regards to the exchange capacity needed to recover dry year supplies from Semitropic, ACWD has coordinated with Semitropic, DWR, and other Semitropic Banking partners to ensure coordination of the planned use of the Semitropic recovery capacity and the needed exchanges. However, the risk remains that under certain critical dry year conditions ACWD may not be able to recover 100% of the District's contractual recovery capacity from Semitropic. Potential mitigation measures to minimize the risk associated with the constraints in Semitropic dry year recovery. These measures may include: 1) re-operation of local and other storage available to ACWD (i.e. Niles Cone Groundwater Basin, Del Valle Reservoir, San Luis Reservoir) in coordination with recovery from Semitropic and/or: 2) alternative dry year supply programs.

San Francisco Regional Water System

In order to enhance the ability of the SFPUC water supply system to meet identified service goals for water quality, seismic reliability, delivery reliability, and water supply, the SFPUC is undertaking a Water System Improvement Program (WSIP). Completion of the projects in the WSIP is critical to ensuring the reliability of the San Francisco Regional supplies. However, it is currently uncertain if the SFPUC will be successful in fully implementing this program, and if it will be accomplished in a timely manner. Other factors that may impact the reliability of San Francisco Regional supplies include environmental regulations and permitting requirements for its Hetch-Hetchy and local watershed facilities and operations.

Additional information on potential factors affecting San Francisco Regional Water System reliability is provided in Appendix B.

Local Supplies

In addition to potential climate change impacts, the availability of ACWD's local supplies may be influenced by a variety of other factors including additional operational and facility modifications to accommodate on-going Alameda Creek fishery restoration efforts (beyond those included in the March 2011 preliminary agreement with NMFS/DFG). Upstream land use, flood control and water supply projects in the Alameda Creek Watershed may also impact the supply and quality of water available at ACWD's groundwater recharge facilities. There also may be uncertainties regarding future releases from the major reservoirs in the Alameda Creek Watershed, including Calaveras and San Antonio Reservoirs (SFPUC) and Del Valle Reservoir (DWR), as required for environmental purposes and/or operational agreements. This includes a previous agreement between ACWD and the SFPUC to provide water to ACWD for groundwater recharge during a period when the Niles Cone Groundwater Basin was in overdraft condition and threatened by seawater intrusion. Similarly, efforts to develop groundwater supplies by entities in the South East Bay Plain (north of ACWD) may also impact ACWD's groundwater supply availability. ACWD is currently working to address these items. However, it is not clear whether or not these issues will ultimately impact ACWD's local supplies.

3.3 MANAGEMENT AND DISTRIBUTION OF WATER SUPPLIES

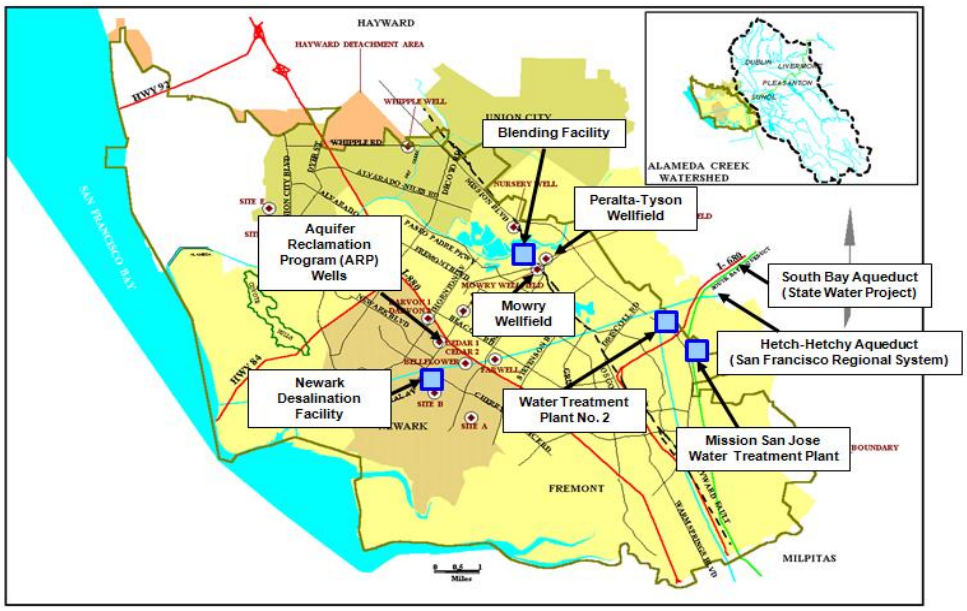
With local water and two sources of imported water, the District has the flexibility to change the timing and use of supplies to best meet its water management objectives, which include:

- Maximizing total usable supply
- Maximizing water quality/providing uniform water quality
- Protecting groundwater resources from degradation due to previously intruded seawater
- Protecting groundwater resources from further seawater intrusion

District customers receive water from one or more production sources: the San Francisco Regional Water System, the District's Mission San Jose Water Treatment Plant (MSWTP), the District's Water Treatment Plant Number 2 (WTP 2), the District's Blending Facility which blends local groundwater (from the Mowry and Peralta-Tyson Wellfields) with San Francisco Regional supplies, and the Newark Desalination Facility (see Figure 3-4).

Flow from the SBA and releases from Del Valle Reservoir may be diverted into either of the two treatment plants, diverted into Alameda Creek, or both. Depending on the water quality and flow in Alameda Creek, water can also be diverted into percolation ponds for groundwater recharge. San Francisco Regional Water System supplies are either routed to the Blending Facility for blending with local groundwater supplies or, under certain conditions, directly supplied to users.

Figure 3-4 ACWD Water Supply Sources and Production Facilities



Groundwater Management and Protection

Groundwater is an important component of the District's supply, as demonstrated in Tables 3-1 and 3-2. ACWD has had a Groundwater Management Policy in place since 1989. This management policy outlines the District's protection and management activities for the Niles Cone Groundwater Basin to ensure a reliable supply of high quality water that satisfies current and future water needs in the ACWD service area. Chapter 4 in this UWMP describes the District's groundwater management and protection policy in more detail.

Groundwater Recharge

During wet periods, local runoff from the Alameda Creek Watershed is diverted into the groundwater percolation ponds. When local runoff is not available, water may be released from either Del Valle Reservoir or from the SBA for groundwater recharge. Currently, the District operates two inflatable dams to capture and divert Alameda Creek flow into the percolation ponds. The dams are deflated for protection from debris when creek flow is above 700 cfs and no off-stream diversions occur during these high flow conditions.

Del Valle Supplies

Typically, ACWD's water stored at Del Valle is used by the fall to maximize the capture of local runoff during the winter and spring seasons. In decreasing order of priority, Del Valle water is delivered to ACWD:

- Via the SBA to the District's treatment facilities (MSJWTP and WTP2).
- Via the SBA and released into Alameda Creek at Vallecitos Takeoff for groundwater recharge.
- Into Arroyo Del Valle Creek, where it flows to Arroyo de la Laguna and eventually into Alameda Creek for groundwater recharge.

State Water Project Water

Water from the SWP (delivered via the SBA) can either be taken at Vallecitos Takeoff and discharged to Alameda Creek for groundwater basin recharge or taken at the Alameda-Bayside Takeoffs for delivery to the treatment plants. By October 1 of every year, the District must submit its anticipated requests for monthly water deliveries for the upcoming year. The State confirms the District's request or provides the District with the anticipated percentage allocation by December 1. The estimated percentage delivery is then adjusted during the spring based on estimated runoff.

Blending of San Francisco Regional System Water with Groundwater

San Francisco Regional Water System supplies can be taken at any of nine takeoffs throughout the District's distribution system. This water supply is significantly lower in hardness than ACWD's local groundwater supplies. The District blends the San Francisco Regional water with higher hardness groundwater at ACWD's Blending Facility with the objective of providing a uniform water quality with hardness levels similar to those of other sources of supply. Since the Blending Facility has come on-line, most of the San Francisco Regional System water has been taken at the Fremont connection for direct delivery to the Blending Facility.

3.4 SOURCE WATER QUALITY

As required by law, Drinking Water Source Assessments are conducted to determine the vulnerability of ACWD's drinking water sources to contamination. As described below, assessments have been completed for all of ACWD's water sources:

- The San Francisco Public Utilities Commission, which administers the San Francisco Regional Water System, completed its assessment in 2000. It was found that the SFPUC's watersheds are vulnerable to contaminants associated with wildlife and, to a limited extent, human recreational activity. Historically, the levels of contamination have been very low in the watersheds.

- The South Bay Aqueduct Source Assessment was completed in 2002 to evaluate potential vulnerabilities to ACWD's State Water Project supplies. This source is most vulnerable to agricultural drainage, wastewater treatment plant discharges, urban runoff, recreational usage of the water, and cattle grazing. In addition, seawater intrusion in the Delta contributes salt and bromide to the water supply.

- ACWD's assessment of local groundwater sources was also completed in 2002. This assessment concluded that local groundwater is most vulnerable to gas stations, known contaminant plumes, confirmed leaking underground storage tanks, dry cleaners, metal plate/finishing/fabricating, and sewer collection. The potential for saltwater intrusion into the aquifer system is also of concern to ACWD.

Although ACWD raw water sources are vulnerable to potentially contaminating activities, ACWD treatment and blending facilities ensure that all potable water delivered by ACWD meets the strict standards set by state and federal regulatory agencies. In addition, ACWD's groundwater management program (see Chapter 4) has been developed to protect the local groundwater supplies from contamination. As such, under most future scenarios, it is not anticipated that future changes to source water quality will adversely impact the long-term availability or reliability of these supplies. However, catastrophic events (i.e., levee failures in the Delta resulting in seawater intrusion impacts on Delta supplies) or other unforeseen circumstances may impact ACWD supplies and their reliability, resulting in water supply shortages. Chapter 10 (Water Shortage Contingency Plan) addresses potential future shortages.

CHAPTER 4
GROUNDWATER

This chapter describes the Niles Cone Groundwater Basin, the District's reliance on it as a source of water supply and the District's policy and activities for managing it.

4.1 BACKGROUND

As described in Chapter 3 (Sources of Supply), the Niles Cone Groundwater Basin provides a significant source of water supply for the ACWD service area. ACWD manages the basin both in conjunctive use mode (most recharge of surface water occurs in the wet season, with most groundwater extraction occurring during the dry season) as well as in a groundwater banking mode (excess water is stored in the basin during wet years for recovery during dry years when local and imported supplies may be significantly cut back). Because of its importance as a local supply, the protection of this valuable local resource has long been a high priority for ACWD. The Niles Cone Groundwater Basin is not an adjudicated basin, and is not considered to be in "overdraft" or "potentially overdraft" condition by the DWR (source: DWR Bulletin 118- Update 2003).

Niles Cone Groundwater Basin Hydrogeology

The Niles Cone Groundwater Basin, as delineated by the Department of Water Resources (DWR), exists almost exclusively within the District's boundaries. The groundwater basin is an alluvial aquifer system consisting of unconsolidated gravel, and, silt, and clay. The groundwater basin is divided by the Hayward Fault which is an active fault with low permeability that impedes the lateral flow of groundwater. Large differences in water levels on either side of the fault demonstrate the relatively impermeable nature of the fault. ACWD manages both the Above Hayward Fault (AHF) and the Below Hayward Fault (BHF) sub-basins. The AHF sub-basin on the east side of the Hayward Fault is composed of highly permeable sediments referred to as the AHF Aquifer. The BHF sub-basin is composed of a series of relatively flat lying aquifers separated by extensive clay aquitards. The location of the Hayward Fault is shown in Figure 4-1. Figure 4-2 provides a cross-section based on a DWR conceptual figure (DWR, 1968).

Figure 4-1
ACWD Groundwater Management Facilities

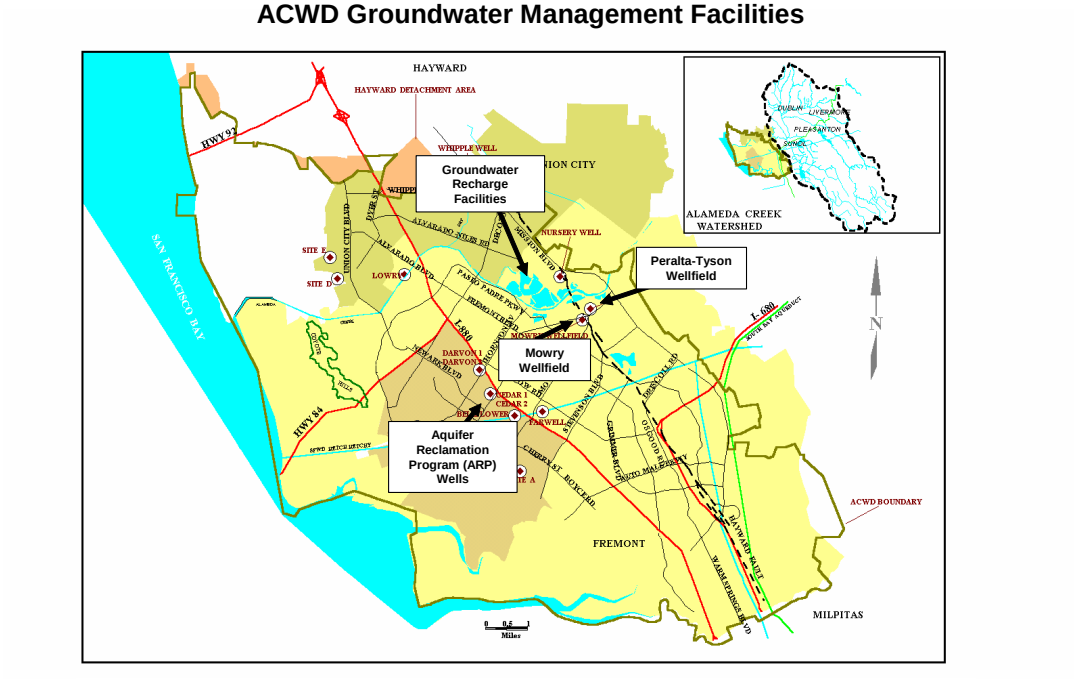
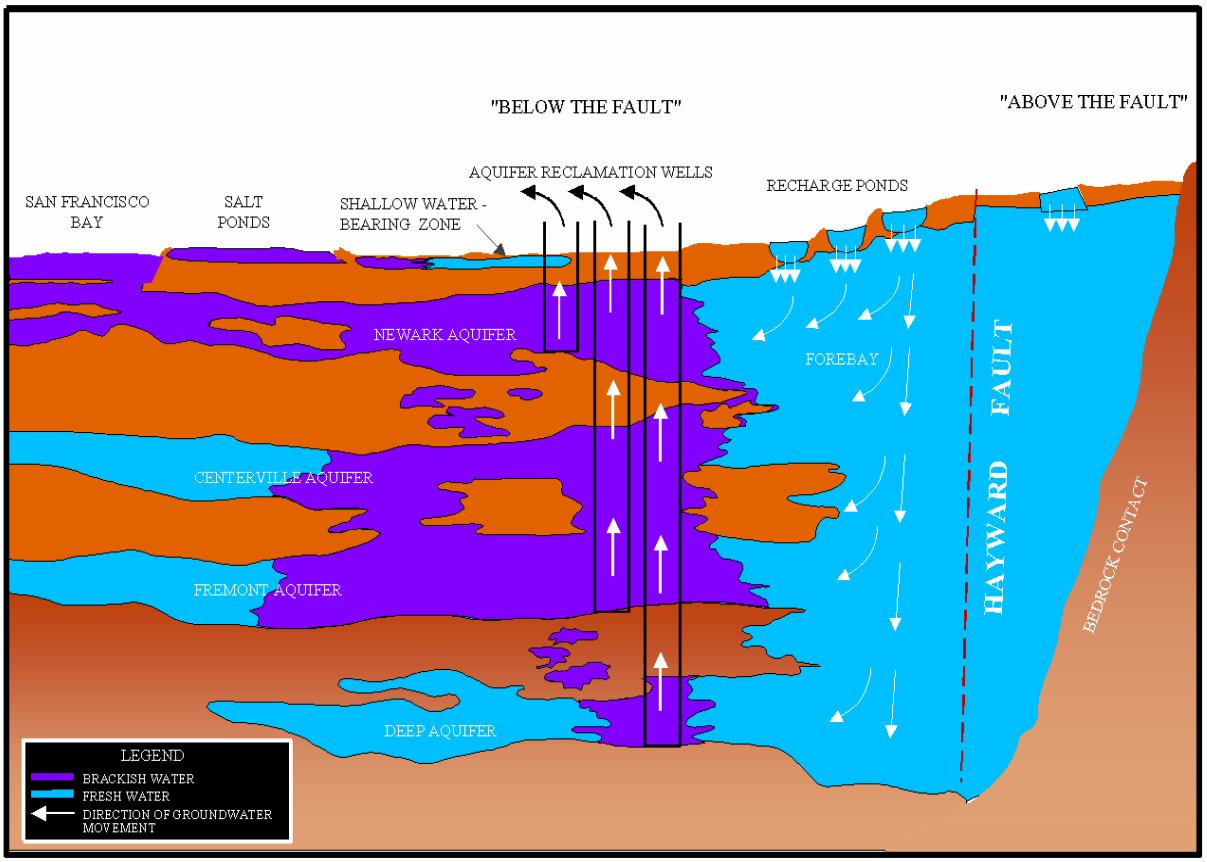


Figure 4-2
Niles Cone Groundwater Basin Schematic



The shallowest regional aquifer in the BHF sub-basin, the Newark Aquifer, is an extensive permeable gravel and sand layer between 40 and 140 feet below ground surface (bgs), except in the forebay (inland) area where it begins at the surface. The thickness of the Newark Aquifer ranges from less than 20 feet at the western edge of the basin to more than 140 feet at the Hayward Fault (DWR, 1968). The Newark Aquifer is overlain in most of the sub-basin by a thick layer of silt and clay called the Newark Aquiclude (DWR, 1968). The Newark Aquiclude is absent in the forebay area, allowing direct recharge to the Newark Aquifer from Alameda Creek and the recharge ponds. Within the Newark Aquiclude, discontinuous layers of sand and silt comprise a non-regional hydrogeologic unit known commonly as the shallow water-bearing zone.

An extensive thick clay aquitard separates the Newark Aquifer from the Centerville Aquifer. The Centerville Aquifer, the top of which lies at an average depth of 180 to 200 feet bgs, overlies a thick clay aquitard, which in turn overlies the Fremont Aquifer which exists in the interval of 300 to 390 feet bgs. The Centerville and Fremont Aquifers are considered as one combined aquifer (Centerville-Fremont Aquifer) in some parts of the basin based on lithology and water level data that indicate that they are in good hydrogeologic connection. However, water level and water chemistry results from recently installed wells indicate that, in some areas of the basin, these two aquifers are isolated from each other.

The deepest water-bearing units, referred to collectively as the Deep Aquifers, are present at approximately 400 and 500 feet bgs (and possibly deeper) and are separated from the overlying Fremont Aquifer by a competent regional aquitard. Also, based on ACWD's lithologic data and DWR (1967), these

deep aquifers are both hydraulically separated and connected by the presence or absence of intervening clays dependent on the location in the basin, and extend beyond the limits of the Niles Cone Groundwater Basin to act as conductive layers for the migration of groundwater out of the basin.

Groundwater Quality

Groundwater quality in the AHF Aquifer is acceptable for potable use; however, groundwater quality in certain areas of the BHF aquifers has been degraded by salt water intrusion. The salt water intrusion was first noticed in the 1920's and occurred due to historical pumping from the basin that was in excess of recharge (i.e., overdraft). Many years of this chronic overdraft caused the groundwater levels in the Newark Aquifer to drop below sea level. This relative elevation difference between the groundwater in the basin and the saline water from San Francisco Bay caused a landward direction of groundwater flow through the Newark Aquifer and intrusion of salt water into the groundwater basin. Several decades of salt water intrusion occurred and saline water migrated as far as the Forebay area. The piezometric heads in the deeper aquifers are generally lower than that of the Newark Aquifer, and the aquitards separating the aquifers are thin to absent in the Forebay area. As a result, saline water in the forebay area migrated downward from the Newark Aquifer and into the lower aquifers. Also, saline water may have migrated downward from the Newark Aquifer to the deeper aquifers through abandoned and improperly sealed water wells.

Since 1962, ACWD has purchased State Water Project water supplies to supplement local recharge and raise groundwater levels. This has resulted in bringing the water table above sea level and returning the hydraulic gradient to its natural bayward direction in the Newark Aquifer. Although there has been substantial improvement in the basin, a considerable volume of saline water still remains in the aquifers. As described below, ACWD has also implemented an Aquifer Reclamation Program (ARP) to pump out brackish groundwater from the impacted areas of the aquifer system. Historically, this brackish water has been discharged back to San Francisco Bay through local flood control channels. However, most of it is now treated at the Newark Desalination Facility for potable use.

In order to protect the Basin from further seawater intrusion, the District's operational goals are to maintain groundwater levels above sea-level in the Newark Aquifer system. During critically dry periods the District may temporarily reduce groundwater levels slightly below sea-level (no lower than -5 feet mean sea-level), in the Newark Aquifer in the Forebay area. Groundwater modeling analysis has indicated that temporarily drawing the aquifer down in this inland area can provide additional supply in critically dry years without impacting the integrity of the Basin.

Groundwater Facilities

ACWD's groundwater management activities include groundwater recharge as well as production. As shown on Figure 4-1, ACWD groundwater facilities include production wellfields and groundwater recharge facilities. Currently, 16 wells are available for production; eight of the wells are located in the Peralta-Tyson Wellfield in the AHF sub-basin; and the remaining eight wells are located in the Mowry Wellfield in the BHF sub-basin.

The Niles Cone Groundwater Basin is recharged through (1) deep percolation of rainfall and applied water, and (2) percolation of water in Alameda Creek received at ACWD's groundwater recharge facilities. Most of the water for this artificial recharge program is from Alameda Creek Watershed runoff and the remainder is imported supplies released to tributaries of Alameda Creek. Water percolates into the groundwater basin through the stream channel bed and through the District's off-stream recharge ponds. The District utilizes inflatable rubber dams in the channel to divert water from the creek into the ponds.

As described below, ACWD's Aquifer Reclamation Program, which is designed to remove and control the

movement of intruded saline water, has been in operation since 1974. The program facilities consist of nine wells. These wells also provide the source water for the Newark Desalination Facility. This facility removes salts and other impurities from the brackish groundwater and provides the treated water as a source for the District's distribution system.

Aquifer Reclamation

High volume pumping in the 1920's through the early 1960's without adequate recharge for replenishment of the basin led to lower water levels in the Newark Aquifer and salt water intrusion. The District, concerned with this salt water intrusion, began importing water from the SWP to artificially recharge the groundwater basin. The District's aggressive artificial recharge program and its use of imported water in lieu of groundwater have caused water levels to slowly rise above sea-level. Thus, further seawater intrusion has been prevented and saline water in the Newark Aquifer is now flushed towards San Francisco Bay. However, because the Centerville-Fremont and Deep Aquifers are not in direct hydraulic connection with San Francisco Bay, saline water in those deep aquifers cannot be easily flushed back by simply raising groundwater levels. Consequently, there are trapped pockets of saline water in these deeper aquifers.

In 1974, the District initiated its Aquifer Reclamation Program (ARP) to restore water quality in the groundwater basin by removing the saline water trapped in the aquifer system. Nine wells are utilized for reclamation pumping: three in the Newark Aquifer, five in the Centerville-Fremont Aquifer, and one in the Deep Aquifer. This brackish groundwater is the source water for ACWD's Newark Desalination Facility, with any excess pumped brackish groundwater discharged to San Francisco Bay through flood control channels. The quality of groundwater in the basin is improved as recharge water replaces the pumped brackish groundwater. ARP pumping also prevents the plume of brackish water in the Centerville-Fremont and Deep Aquifers from further migrating toward ACWD's Mowry Wellfield.

Groundwater Elevations

ACWD actively manages the Niles Cone Groundwater Basin to prevent groundwater overdraft conditions that could lead to future seawater intrusion and groundwater overdraft. In order to monitor the groundwater basin conditions, since 1961 ACWD has conducted the Spring/Fall Groundwater Monitoring Program to visit wells, obtain water level measurements and collect water samples. The data collected is summarized in an annual groundwater monitoring report prepared by ACWD.

The groundwater elevations throughout the basin fluctuate seasonally due to seasonal changes in groundwater pumping and recharge. In general, the groundwater elevations are the highest in the late winter and early spring (in response to high recharge and lower groundwater pumping) and are the lowest in the fall months (in response to peak groundwater pumping during the warmer summer and fall months). However, throughout the year groundwater elevations in the Newark Aquifer are maintained above sea-level with a positive groundwater gradient from the inland area (at the recharge ponds) towards San Francisco Bay. The groundwater elevations in the Centerville/Fremont and Deep Aquifers are generally lower than that of the Newark Aquifer, thereby allowing percolation from the Newark Aquifer to these deeper aquifers. Because ACWD operates the groundwater basin in a balanced "put and take" mode, groundwater elevations over the past thirty years have remained fairly consistent (within a typical operating range), and there have been no long-term trends that suggest the basin is in overdraft condition.

4.2 GROUNDWATER MANAGEMENT AND PROTECTION POLICY

In 1989 ACWD adopted a Groundwater Management Policy to protect and manage the Niles Cone Groundwater Basin. This Groundwater Management Policy was last updated in 2001, and effectively serves as ACWD's groundwater management plan for the Niles Cone Groundwater Basin. The policy is based on the statutory authority granted to ACWD under the County Water District Law (commencing with Section 30000 of the Water Code); the Replenishment Assessment Act of the Alameda County Water District (Chapter 1942 of the Statutes of 1961, as amended in 1970 and 1973), which grants additional powers to ACWD to prevent pollution, contamination, or diminution in quality of the groundwater supply; Alameda County Water District Groundwater Protection Act (Division 12, Part 5, Chapter 1, Article 9.3 commencing with Sections 31142.20 of the California Water Code); ACWD Ordinance No. 2010-01, which regulates wells, exploratory holes and other excavations within the Cities of Fremont Newark and Union City; agreements with other agencies; and local hazardous materials ordinances.

A copy of ACWD's Groundwater Management Policy is provided in Appendix C.

Groundwater Management Policy Statement

ACWD's groundwater management policy statement is as follows:

"It is the policy of the Alameda County Water District to efficiently protect and manage the Niles Cone Groundwater Basin to ensure a reliable supply of high quality water that satisfies present and future municipal, industrial, recreational, and agricultural water needs in the ACWD service area. ACWD will develop and implement appropriate programs within the ACWD service area to protect and manage the groundwater basin as a long-term source of water supply for ACWD. ACWD will also actively protect the groundwater basin from activities outside the ACWD service area that may negatively impact the water quality and/or water supply of the basin.

This Policy is intended to serve as a guide to ACWD management in the continued development and implementation of programs to manage and protect ACWD water resources and as a nontechnical document to explain ACWD groundwater programs to members of the public. This Policy is not intended to create legal rights in any person or organization, or to impose legal obligations on ACWD. It may be amended or repealed by the Board of Directors at any time."

Policy Objectives

The purpose of the Groundwater Management Policy is to protect and improve ACWD's groundwater resources for the benefit of both ACWD's customers and private well owners by taking actions designed to meet the following objectives:

- Increase groundwater replenishment capability.

- Increase the usable storage capacity of the groundwater basin.

- Operate the basin to provide:
  - A reliable water supply to meet baseload and peak distribution system demands,
  - An emergency source of supply, and
  - Reserve storage to augment dry year supplies.

- Protect groundwater quality from degradation from any and all sources including: saline water intrusion, wastewater discharges, recycled water use, urban and agricultural runoff, or chemical contamination.

- Improve groundwater quality by:
  - Removing salts and other contaminants from affected areas of the basin, and
  - Improving the water quality of source water used for groundwater recharge.

4.3 GROUNDWATER MANAGEMENT PROGRAMS

The following eight major groundwater management programs have been developed and implemented by ACWD to achieve ACWD's Groundwater Management Policy objectives:

- Water Supply Management
- Groundwater Replenishment
- Watershed Protection and Monitoring
- Basin Monitoring
- Wellhead Protection Program
- Aquifer Reclamation Program
- Groundwater Protection Program
- Well Ordinance Administration

A brief summary of each of these programs is provided in Table 4-1. A detailed description of each program is included in the Groundwater Management Policy which is attached in Appendix C.

4.4 GROUNDWATER RECHARGE AND PRODUCTION

The primary components of the groundwater budget for the Niles Cone Groundwater Basin are: (1) pumping; (2) recharge; and (3) saline groundwater outflows. Groundwater pumping includes pumping at ACWD's Peralta-Tyson and Mowry Wellfields), private (non-District) pumping; and pumping from the District's Aquifer Reclamation Program (ARP) wells. Groundwater recharge occurs primarily through percolation at ACWD's recharge facilities and natural percolation of rainfall and applied water. Saline groundwater outflows represent the groundwater outflows from the Newark Aquifer to San Francisco Bay. As is typical in coastal groundwater basins, groundwater outflows are required to prevent seawater intrusion from occurring.

As required by the District's Replenishment Assessment Act, the District meters active wells in the District, and prepares an annual Groundwater Survey Report which summarizes the total well production, estimated recharge, and changes in groundwater storage. A summary of groundwater pumping, recharge and change in storage is provided in Table 4-2. As indicated in the table, annual groundwater supply from ACWD's production wells has ranged from 14,200 AF/Yr to 20,900 AF/Yr over the past ten years. Over the same period, aquifer reclamation pumping has ranged from 4,300 to 11,600 AF/Yr and private groundwater pumping has ranged from 1,900 to 3,800 AF/Yr. Annual groundwater recharge has ranged from 28,100 AF to 44,100 AF/Yr.

Future Use of Groundwater

As described in ACWD's Integrated Resources Planning Study, ACWD will continue to rely on the Niles Cone Groundwater Basin as a source of supply for the service area. ACWD's plans are to continue to manage the groundwater basin in a balanced "put and take" mode whereby groundwater pumping and saline outflows are balanced with groundwater recharge. Year to year variations in recharge, pumping and saline outflows will occur due to variations in local hydrologic condition and other factors. Therefore, in some years recharge may exceed the sum of pumping and saline outflows resulting in a temporary imbalance. Similarly, in some years pumping and saline outflows may exceed groundwater recharge, also resulting in a temporary imbalance. However, over the long-term, the operation of the basin will be balanced to ensure that the basin is protected from seawater intrusion and that reclamation of the basin from previous seawater intrusion continues. It is anticipated that ACWD's future groundwater pumping will continue to occur at the Mowry Wellfield, Peralta-Tyson Wellfield, and the Aquifer Reclamation Program wells. ACWD's projected future use of groundwater under normal and dry year conditions is summarized in Chapter 9 – Water Supply Strategy.

Table 4-1
Summary of ACWD Groundwater Management Programs

Groundwater Program	*Description*
Water Supply Management	Planning, managing, and optimizing ACWD's sources of supply: watershed runoff, SWP water for recharge, SWP water for treatment, SFPUC water for blending, and water banking.
Groundwater Replenishment	Operation of ACWD groundwater recharge facilities to optimize 1) capture of local runoff, 2) replacement of water extracted from production and ARP wells, and 3) maintenance of groundwater levels to prevent salt water intrusion.
Watershed Protection and Monitoring	Assisting in the protection and monitoring of the watershed to optimize the quality of runoff water available for ACWD water supply.
Basin Monitoring	Sampling and measuring wells to assess and evaluate 1) groundwater quality, 2) water pressures within the basin, and 3) the direction of groundwater flow.
Wellhead Protection Program	Identify sensitive recharge and groundwater areas, maintain an inventory of potential threats within these areas, assess the vulnerability of source water, and develop management strategies to minimize the potential for groundwater quality impacts.
Aquifer Reclamation Program	Pump brackish water from degraded aquifers in order to 1) increase useable basin storage, 2) improve overall water quality, 3) prevent movement of brackish water toward ACWD production wells, and 4) provide (future) supply augmentation through treatment to potable water standards.
Groundwater Protection Program	Maintain an active role in 1) assisting with the identification of potential groundwater contamination, 2) implementing monitoring systems at hazardous materials storage sites, and 3) providing technical oversight for investigations and cleanups at hazardous materials spill sites.
Well Ordinance Administration	As enforcing agency for ACWD Ordinance 2010-01 governing construction, repair, or destruction of wells, exploratory wells and other excavations, ACWD provides inspection services, collects fees, and performs field searches for abandoned wells which could act as a conduit for contamination of groundwater.

Table 4-2
Groundwater Budget for the Niles Cone Groundwater Basin (AF/Yr)
(Source: ACWD Annual Groundwater Survey Reports)

Groundwater Budget Item	*Fiscal Year*									
	2000/01	*2001/02*	*2002/03*	*2003/04*	*2004/05*	*2005/06*	*2006/07*	*2007/08*	*2008/09*	*2009/10*
Total Net Recharge[1]	35,200	35,200	36,900	35,900	44,100	41,500	32,400	31,600	28,500	32,400
Pumping										
Production Wells	20,800	18,200	20,900	20,100	16,500	17,500	18,500	14,800	14,200	15,300
ARP Wells	4,300	7,400	7,700	11,100	9,400	11,600	9,900	6,600	4,900	7,000
Private Wells	3,800	3,100	3,400	3,600	3,800	3,000	3,000	2,200	2,100	1,900
Total Pumping	**28,900**	**28,700**	**32,000**	**34,800**	**29,700**	**32,100**	**31,400**	**23,600**	**21,200**	**24,200**
Saline Groundwater Outflows	6,600	6,300	5,800	7,200	6,600	8,400	6,800	7,400	7,400	6,800
Change in Storage	-300	200	-900	-6,100	7,800	1,000	-5,800	600	-100	1,400

Notes:
(1) Total Net Recharge is calculated as recharge from deep percolation of rainfall and applied water plus recharge at ACWD's groundwater percolation facilities (including recharge of imported water) less the sum of evaporation losses and "Other Outflows" (as described in ACWD's annual Groundwater Survey Reports).

CHAPTER 5
DESALINATION

This chapter describes local opportunities for desalination, including ACWD's Newark Desalination Facility and its associated water supply and water quality benefits.

5.1 DESALINATION FACILITY PLANNING AND BACKGROUND

As part of the development of the District's 1995 Integrated Resources Plan, the District evaluated an extensive list of potential water supply alternatives. This included supply-side alternatives (i.e. supplemental sources, facilities, and operational modifications) and demand-side (i.e. conservation) alternatives. ACWD's goal was to end up with a manageable number of the most effective resource options. Included within the potential supply-side alternatives was brackish groundwater desalination and seawater desalination. However, because of the high costs of seawater desalination and potential issues with concentrate disposal, the seawater desalination alternative was eliminated from further consideration during the screening process of the IRP alternatives.

After careful consideration, ACWD adopted a strategy that consists of a mix of conservation, operational alternatives, new supplies and facilities. This included implementation of a Phase 1 (5 mgd of permeate, or treated water production capacity) and Phase 2 (increase to 10 mgd) desalination facility.

5.2 CURRENT DESALINATION CAPACITY AND USE

On September 19, 2003, the Alameda County Water District dedicated the first brackish water desalination facility in northern California (Figure 5-1). The Newark Desalination Facility (Desal Facility) produces potable water by removing salts and other minerals from brackish groundwater. The Newark Desalination Facility had an original permeate production capacity of 5 mgd. However, in 2010 ACWD completed the Phase 2 expansion of the Desal Facility to double the overall capacity to 10 mgd, its current capacity.

The source of water for the Newark Desalination Facility is from portions of the Niles Cone Groundwater Basin that contain brackish groundwater due to previous years of seawater intrusion (see Figure 5-2). The District operates a series of wells that remove brackish water (approximate TDS range of 1,100 to 2,400 mg/l from the groundwater basin).

This program, called the Aquifer Reclamation Program (ARP), was developed to stop the spread of saltwater already in the groundwater basin and to reclaim the aquifers of the basin for future potable use. Brackish water from some of these wells is treated at the Newark Desalination Facility rather than being allowed to flow back into San Francisco Bay. The Newark Desalination Facility utilizes reverse osmosis to convert brackish water to potable water.

The soft water produced by the Desalination Facility is blended with the harder groundwater to maintain a more uniform water hardness. Therefore, in addition to being a relatively new local source of water, the Desalination Facility improves both the quality and reliability of the ACWD water supply.

Figure 5-1
Newark Desalination Facility and Associated Facilities

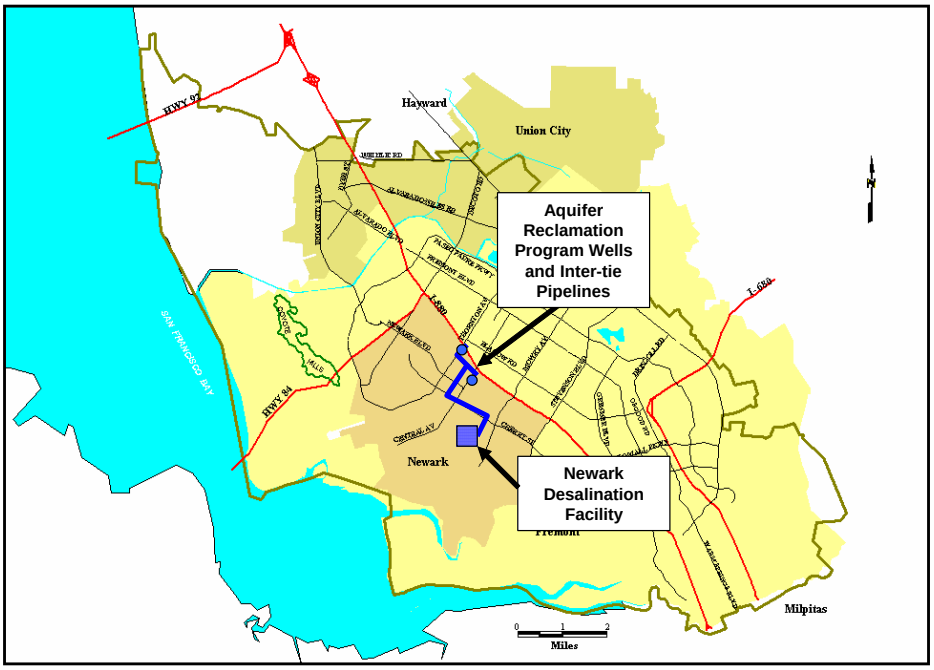
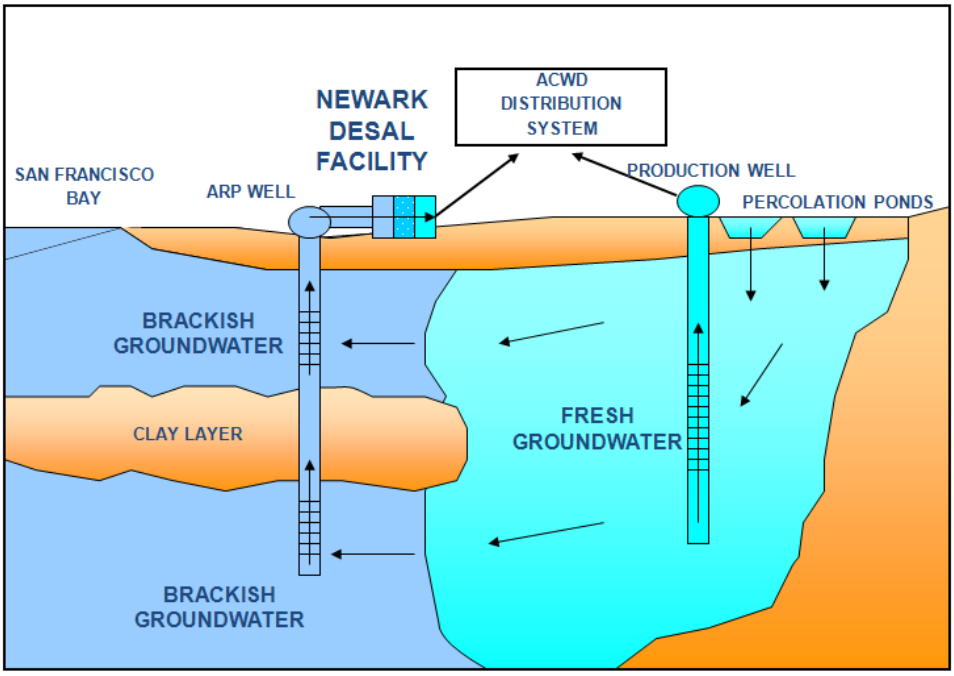


Figure 5-2
Newark Desalination Facility and Aquifer Reclamation Program Schematic



The Newark Desalination Facility provides the following water supply and water quality benefits:

- **Improved dry year water supply reliability:** The District's IRP identified potential dry year water supply shortages of up to 50% in 2030 without further action. To improve dry year supply reliability, the District-adopted water management strategy includes conservation, reclamation, off-site groundwater banking and desalination. The desalination facility improves ACWD's dry year supply reliability by providing a new source of potable supply for the service area.

- **Improved water system reliability and security:** The Newark Desalination Facility improves the overall reliability and security of the District's supplies by providing a source of supply west of the Hayward Fault and Calaveras Fault. ACWD's imported water supplies are conveyed via aqueducts (South Bay Aqueduct and Hetch-Hetchy Aqueduct) that are susceptible to failure due to earthquakes along these faults. The Newark Desalination Facility provides ACWD with increased local production capacity, which is key for the District in the event of temporary loss of imported water supplies or production facilities east of the Hayward Fault due to a seismic event.

- **Increased water production capacity:** In addition to the District's dry year reliability needs, the District's IRP also identified the need for additional water production capacity to meet peak summer demands. Although water conservation (targeting outdoor use) and recycled water programs identified in the IRP will help to reduce some of the additional peak demands, additional production capacity in the service area is also needed. The Newark Desalination Facility helps meet the existing and future peak summer demands by providing additional production capacity.

- **Improved water quality:** Because the District's existing potable groundwater supplies are relatively high in hardness, the District blends these groundwater supplies with San Francisco Regional Water System supplies to reduce the overall hardness and improve water quality. Implementation of the desalination facility has allowed the District to further improve water quality for its customers.

- **Reduced future reliance on imported supplies:** The Newark Desalination Facility allows ACWD to reclaim local, brackish groundwater for potable use, reducing the District's need for additional reliance on imported water supplies from the Delta to meet increasing demands in the service area.

- **Groundwater basin protection and reclamation:** The source of the brackish groundwater comes from ACWD's Aquifer Reclamation Program (ARP) in the local Niles Cone Groundwater Basin. The ARP program is an on-going program in which ACWD has been reclaiming to freshwater conditions the portions of the local groundwater basin that have previously been impacted by seawater intrusion from San Francisco Bay. Historically, ACWD has pumped the brackish groundwater out of the basin and disposed of it back to San Francisco Bay. However, the desalination facility now treats this brackish water and allows it to be used as a potable supply.

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CHAPTER 6
WATER RECYCLING

This chapter describes the Union Sanitary District's wastewater system (which serves the ACWD's service area), and the opportunities for the use of recycled water in the ACWD service area.

6.1 AGENCY COORDINATION

As described below, Union Sanitary District (USD) provides wastewater transport, treatment and effluent disposal for the Cities of Fremont, Newark and Union City (encompassing the ACWD service area). In 1993 ACWD coordinated with USD in the development of a recycled water master plan (1993 Master Plan) which served as the basis for ACWD's recycled water use planning, as outlined in the District's Integrated Resources Plan. Since 1993, ACWD and USD have jointly updated the master plan, most recently in 2010 with the ACWD/USD Recycled Water Feasibility Study Update (2010 Feasibility Study).

6.2 WASTEWATER SYSTEM DESCRIPTION

The following provides a description of USD's facilities and operations, as previously summarized in USD's District-Wide Master Plan.

Wastewater Transport

Wastewater generated within the USD service area is collected and conveyed by gravity sewers to three major pump stations. The Irvington Pump Station serves the southern portion of the service area, the Newark Pump Station serves the central portion and the Alvarado Pump Station serves the northern portion. Wastewater collected in the southern and central areas is transported to the Alvarado Wastewater Treatment Plant (Alvarado WWTP) in Union City via dual 33-inch and 39-inch force mains. The northern drainage area wastewater is pumped directly to the WWTP headworks from the Alvarado Pump Station.

Wastewater Treatment

The Alvarado WWTP uses activated sludge as the biological liquid treatment process to meet the National Pollutant Discharge Elimination System (NPDES) permit requirements for secondary treatment. Additional treatment processes include primary and secondary clarification, and chlorination. The capacity of the WWTP is 33 mgd.

Solids handling at the WWTP includes: sludge thickening, digestion and dewatering. Sludge thickening is accomplished by gravity thickeners that are equipped with odor scrubbers. After thickening, the sludge is stabilized by anaerobic digestion and dewatered to about 20 percent solids using belt filter presses. Dewatered sludge is then transported by truck to approved agricultural fields in Sacramento County, (also Solano and Alameda Counties) where biosolids are surface applied and incorporated into the soil.

Effluent Disposal

All wastewater generated within the USD service area, including peak wet weather flows, receives full secondary treatment and is discharged to the East Bay Dischargers Authority's (EBDA) system for disposal in San Francisco Bay. Currently, there are no wet weather bypasses or overflows from the USD's facilities. The EBDA system conveys treated effluent for discharge to the Bay from several local agencies. The facilities consist of approximately 58,000 feet of pipeline ranging in diameter from 60 inches, where USD discharges into the system, to 96 inches at the outfall. USD's contractual discharge capacity is about 43 mgd.

A portion of the USD's effluent is diverted from the EBDA pipeline to supply fresh water to the Hayward Marsh, a constructed wetland located just north of the San Mateo Bridge. In 1991, USD assumed responsibility for the Hayward Marsh Project. Located just north of the San Mateo Bridge, the marsh consists of 145 acres of fresh and brackish wetland, with wide-ranging environmental benefits. Before the marsh was restored from abandoned salt ponds, there was no wildlife habitat at the site. Now the marsh is a popular stop for migratory waterfowl and includes a preserve for the endangered Salt Marsh Harvest Mouse. High quality treated effluent supplied by USD is the fresh water source for this marsh ecosystem.

Existing and Projected Dry Weather Flows

The average dry weather flow treated at the Alvarado WWTP in 2009 was approximately 24.49 mgd. As part of its 1993 District-Wide Master Plan, USD developed dry weather flow projections of 31.8 mgd, 33.1mgd, 34.3 mgd and 35.6 mgd for the years 2010, 2015, 2020 and 2025, respectively. These dry weather flow projections were based on a review of existing and planned growth in the service area (based on the cities' General Plans) and were used for the sizing and phasing of future planned wastewater conveyance and treatment facilities.

6.3 CURRENT USES OF RECYCLED WATER

As described above, as part of USD's effluent disposal program, a portion of USD's effluent is provided to the Hayward Marsh Project (located within the ACWD service area) as a fresh water source for the marsh ecosystem. Approximately 3.5 mgd (approximately 3,900 AF/Yr) of high quality, treated effluent are provided to the marsh annually from USD's Alvarado WWTP. However, currently there are no uses of recycled water in the ACWD service area that are off-setting potable water demands.

6.4 FUTURE RECYCLED WATER OPPORTUNITIES

The use of recycled water to offset the distribution system demand is included as part of ACWD's long-term water supply strategy in the District's Integrated Resources Plan. Recycled water in the service area is planned solely for non-potable use, primarily for landscape irrigation and industrial use. The District is not considering the use of recycled water as a potable water supply.

ACWD and USD have evaluated several opportunities for recycled water use as a non-potable water supply in the service area. Potential sources of recycled water include treated wastewater from: the USD Alvarado Wastewater Treatment Plant; from a satellite treatment facility located in the southern service area; or from the purchase of recycled water from the South Bay Water Recycling Program. Each of these opportunities is described in greater detail below.

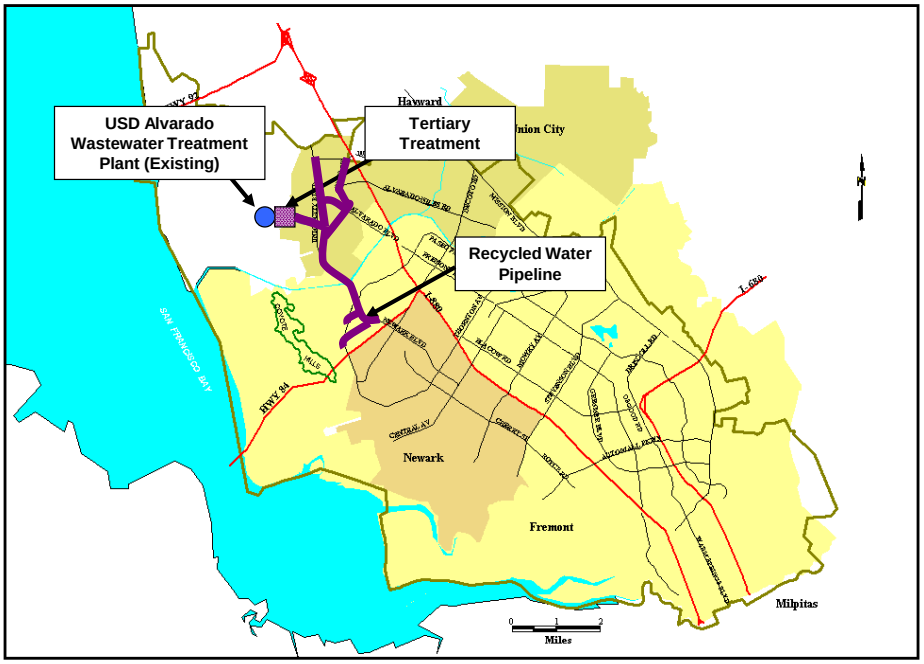
Recycled Water Treatment at USD's Alvarado Waste Water Treatment Plant

This alternative is based on providing a recycled water source from a new tertiary treatment facility at USD's existing Alvarado WWTP in Union City. The 1993 Master Plan recommended a three phase implementation plan which allows for the most cost-effective users (i.e. those in the northern service and central service areas, known as the Phase 1 and Phase 2 service areas, respectively) to be connected to the system first.

Since 1993, a number of changes have occurred which prompted updates to the 1993 Master Plan, including potential new demands and new regulatory requirements. The 2010 Feasibility Study identified potential demands of approximately 550 AF/Yr. Because of the large landscape irrigation component, the demand peaks during the summer irrigation season and is minimal during the winter. The maximum day demand during the summer (peak month) is projected to be 1.08 mgd with a peak hour demand of approximately 3.21 mgd.

The recycled water would originate at the Alvarado WWTP, located at the north end of the service area (Figure 6-1). For a system such as that proposed for ACWD and USD, the recycled water must be suitable for application on unrestricted use sites such as schoolyards, parks, playgrounds and food crops. This requires a high level of treatment that Title 22 designates as "disinfected tertiary recycled water." Following secondary treatment of the wastewater, this treatment level requires chemical addition, flocculation/coagulation, filtration and disinfection. Alternatively, membrane technology could be utilized to provide tertiary treatment.

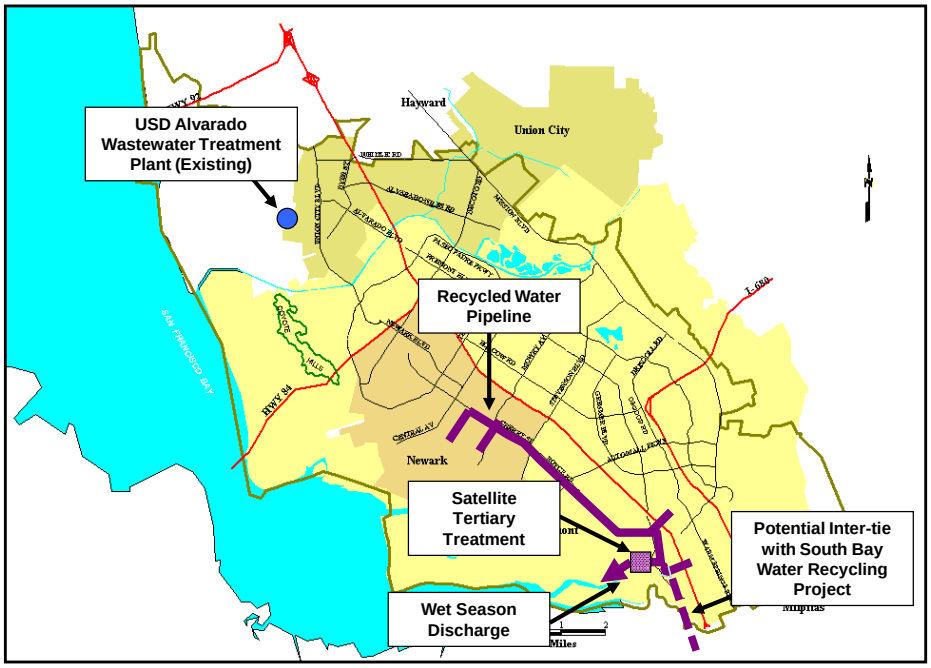
Figure 6-1
2010 Recycled Water Feasibility Study Update: Alvarado Wastewater Treatment Plant Alternative



Recycled Water Treatment at a Satellite Treatment Facility

As an alternative to constructing a recycled water treatment facility at the Alvarado WWTP, in 2003 ACWD and USD completed an evaluation of the feasibility of constructing a satellite recycled water treatment facility in southern Fremont at USD's Irvington Pump Station (Figure 6-2). This alternative was further evaluated in the 2010 Feasibility Study. This satellite facility would benefit ACWD by providing a recycled water source for customers in southern and central Fremont, and would potentially benefit USD by providing advanced treatment for a potential new wet-season outfall. The 2010 Feasibility Study Update identified a potential future recycled water demand of approximately 1,500 AF/Yr in ACWD's southern service area. However, much of this projected demand is for a planned golf course (Newark Area 3 and 4), which has not yet been constructed.

Figure 6-2
2010 Recycled Water Feasibility Study Update: Satellite Treatment Plant Alternative



South Bay Water Recycling Program Alternative

This alternative would involve connecting to the South Bay Water Recycling (SBWR) Project in northern Milpitas (Santa Clara County) to serve customers in the southern portion of the ACWD service area (see Figure 6-2). As identified in the 2010 Recycled Water Feasibility Study, the total potential recycled water demand for this alternative is approximately 250 AF/Yr. It is likely that a purchase agreement for recycled water from SBWR would also require approval from the Santa Clara Valley Water District. In addition, because of concerns regarding water transfers across county boundaries, such an agreement would likely be for a limited duration. Therefore, the 2010 Feasibility Study identified this alternative as an interim source of supply, until a long term supply at the satellite treatment plant (as described above) becomes available.

6.5 OPTIMIZATION OF RECYCLED WATER SUPPLIES

As described above, ACWD's IRP strategy includes provisions for a potential future recycled water project. The planned implementation of a recycled water project in the ACWD service area is still at least ten years away. However, as part of the Water Supply Assessments for new developments in the potential recycled water service area, ACWD has required that these developments: 1) install separate distribution systems for the use of recycled water for landscape irrigation purposes; and 2) accept recycled water (when it becomes available) for landscape irrigation in-lieu of potable water.

Future updates to this Urban Water Management Plan will update the documentation of the optimization plan as the recycled water project planning continues. However, potential actions that might be taken by ACWD and USD to encourage customers to accept the use of recycled water include the following:

- Financial Incentives: This would provide an incentive by offering customers a lower rate for recycled water than for potable supplies from the distribution system. Other financial incentives might include reduced connection charges and service charges.

- Guarantee of Firm Supply: This would provide an incentive for recycled water use by guaranteeing that the recycled water supplies would not be subject to voluntary or mandatory cutbacks during droughts and/or water supply shortages.

The actions described above have not been formally adopted by ACWD or USD but represent potential actions that might be taken in the future as recycled water becomes available. In addition, projections of the quantities of recycled water that might be utilized as a result of these potential actions have not yet been developed. These projections will be developed as recycled water planning in the service area progresses and will be included in future updates to this Urban Water Management Plan. However, based on discussion with many of the potential recycled water customers there is a high degree of acceptance for the use of recycled water in the service area, and no significant obstacles to the full utilization of the planned recycled water quantities is anticipated.

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CHAPTER 7
DEMAND MANAGEMENT

Demand management is an integral part of ACWD's long term water management strategy. As part of ACWD's IRP process, potential demand management programs were evaluated at the same level of detail as other supply-side options. In some instances, it may be more cost-effective to implement demand management programs than it would be to secure additional supplies and production/treatment facilities to meet existing and growing demands. A discussion of the District's water supply strategy and how demand management plays a key role in this strategy is provided in Chapter 9.

In addition to implementing demand management measures as part of its IRP program, ACWD is a signatory to the Memorandum of Understanding (MOU) on Urban Water Conservation, and is committed to implementing those water conservation Best Management Practices (BMPs) which are cost effective for the District. As a signatory to the MOU, ACWD is also committed to providing bi-annual reports to the California Urban Water Conservation Council (CUWCC) on the status of the District's BMP implementation. Copies of the most recent annual reports (2009-2010) are provided in Appendix D.

The first section (7.1) of this chapter summarizes ACWD's demand management strategy developed as part of the District's IRP process. Section 7.2 provides detailed information about the implementation status of the District's demand management program.

7.1 ACWD DEMAND MANAGEMENT STRATEGY

As is the case with supply-side options, a systematic approach was applied to develop the conservation options as part of the District's IRP process. The conservation analysis included the following steps:

- Disaggregate demand data to determine water-use patterns in the District;
- Carefully screen conservation measures to determine the ones that are appropriate for use in the District;
- Target specific water uses with cost effective conservation measures;
- Design appropriate delivery mechanisms, including incentives and marketing approaches;
- Characterize the programs, including participation levels, program costs, water savings, revenue impacts, demand hardening impacts (a term used to describe the diminished ability or willingness of customers to reduce demand during a supply shortage), and staffing requirements; and
- Package conservation programs into logical groups for integration with supply options.

The IRP recommended a water conservation program that focuses on reducing seasonal (outdoor) demands (thereby reducing the need for additional production and storage facilities to meet peak summer demands) while still addressing indoor water demands. Specific conservation programs included under the recommended conservation program include: residential audits and incentives, conservation kit distribution, business/industrial audits and incentives, water efficiency workshops, and large landscape audits and incentives.

7.2 IMPLEMENTATION STATUS OF DEMAND MANAGEMENT PROGRAM

Based on IRP recommendations and commitments to implementing BMPs, ACWD has a multi-faceted demand management program that includes a variety of activities that reach out to residential, business, industrial and landscape customers. In this section, ACWD's MOU compliance status, key water conservation activities, and implementation status are described. A summary of the BMP requirements and ACWD's progress in meeting our commitments to the MOU is also provided in Table 7-2; water conservation activities are also summarized in Table 7-3. The District is on track in meeting both our IRP demand management recommendations and CUWCC BMP implementation commitments.

Demand Management Measures and CUWCC MOU Compliance

Water Code Section 10631 (f) requires a water supplier to provide a description, within their Urban Water Management Plan, of each demand management measure (DMM) implemented and scheduled for implementation; Section 10631(g) requires that, for those DMMs listed in section 10631(f) that are not being implemented and/or scheduled for implementation, the water supplier provide an evaluation of that measure to demonstrate why it is not being implemented. However, under section 10631 (j) a water supplier will be "deemed in compliance with the requirements of subdivisions (f) and (g) by complying with all the provisions of the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated December 10, 2008, as it may be amended, and by submitting the annual reports required by Section 6.2 of that Memorandum." Furthermore, the UWMP Guidebook states that:

> *"CUWCC members have the option of submitting their 2009–2010 BMP annual reports in lieu of describing the DMMs in their UWMP if the supplier is in full compliance with the CUWCC's Memorandum of Understanding Regarding Urban Water Conservation in California (the CUWCC MOU). The submitted reports should have documentation from the CUWCC that supplier is in full compliance with the MOU.*

ACWD has submitted the required annual reports for 2009-2010 to the CUWCC to comply with the MOU under the Gallons Per Capita Per Day (GPCD) implementation method, and the CUWCC has verified that ACWD is in full compliance with the BMPs (Appendix D). Under the GPCD implementation method, ACWD determined its baseline GPCD (average annual Potable Water GPCD for 1997 through 2006) of 165 GPCD (See Chapter 8, Table 8-1 for analysis) and targets (see Table 7-1 below) as prescribed in the CUWCC MOU.

Table 7-1
GPCD Compliance

Year	*Target (% Baseline)*	*Highest Acceptable Bound (% Baseline)*	*ACWD Forecast GPCD (see Figure 8-2, Chapter 8)*
2010	159.1 (96.4%)	165 (100%)	127.5 (Actual)
2012	153.1 (92.8%)	159.1 (96.4%)	127.4
2014	147.2 (89.2%)	153.1 (92.8%)	128.2
2016	141.2 (85.6%)	147.2 (89.2%)	129.2
2018	135.3 (82%)	135.3 (82%)	128.6

In addition to fulfilling the requirements under Water Code Sections 10631(f) and (g) through submission of data documenting full compliance with the CUWCC MOU under GPCD implementation, ACWD has also included detailed information about all of its demand management measures in this section of the UWMP.

Partnerships

ACWD has developed numerous partnerships over the years to help maximize implementation of its demand management program. Partnerships provide financial, marketing and program administration benefits and include coordination with water agencies, cities, schools and other organizations. The District is always looking for additional partnerships opportunities. The District's current partnership programs are summarized below; additional information about these programs is provided within the program description section.

Local Cites: The District coordinates with Fremont, Newark and Union City on several programs as well as customer outreach. The District works closely with each service area city to ensure that its programs are consistent with city ordinances and policies.

Local School Districts and Community Colleges: The District has worked closely with the local school districts and community colleges to promote water use efficiency at their facilities. Most recently ACWD provided incentives to change out urinals for all Fremont Unified School District schools and provided a grant to help establish a water efficient landscape at Ohlone Community College's "Green" Campus In Newark.

Union Sanitary District (USD): The District participates in several cost share programs with Union Sanitary District including providing residential and commercial high efficiency clothes washer rebates and commercial high efficiency toilet rebates.

Bay Area Water Supply and Conservation Agency (BAWSCA): The District is a member of BAWSCA and participates in several BAWSCA programs including the residential and commercial turf replacement program, residential landscape class program and the development of the water wise gardening tool.

California Youth Energy services (CYES): Since 2009 the District has partnered with the California Youth Energy Services to implement a residential water and energy use survey program, which combines green job training and energy and water savings assistance to the community. The city of Fremont, Union City, Pacific Gas & Electric and the California Public Utilities Commission are also partners in this effort.

StopWaste/Bay-Friendly: A regular fall workshop series for service area residents is offered through a partnership with Alameda County Waste Management Authorities' StopWaste Program and the Bay-Friendly Gardening Program. ACWD's Drought Tolerant Garden is a Bay-Friendly certified garden, a designation given to gardens that employ the seven Bay-Friendly Gardening Principles, which include: landscape locally, landscape for less to the landfill, nurture the soil, conserve water and energy, protect water and air quality, and create wildlife habitat, and as such is a lecture stop on a tour of Bay Area residential landscape gardens that meet and exceed Bay-Friendly Gardening standards. The District has also signed a pledge to employ these principles for all landscaping the District maintains. The District is also working with these agencies on a public outreach campaign to educate the public about environmentally sound landscaping practices, which include water efficient landscaping.

Alameda County Green Business Program: The Alameda County Water District works with businesses who would like to be certified as a green business through the Alameda County's Green Business Program. The District uses this as an opportunity to conduct Water Use Efficiency Surveys for businesses.

Table 7-2
Summary of District Water Conservation BMP Implementation

	BMP Category	BMP #	BMP	District Progress	Meets BMP Requirements
Foundational	Operations Practices	1.1.1	Conservation Coordinator	· Conservation Coordinator position is staffed	*Yes*
		1.1.2	Water Waste Prevention	· Water Waste Prevention Ordinance in effect at all times (addressing new development and existing users) · Drought Ordinance implemented during water shortage	*Yes*
		1.1.3	Wholesale Agency Assistance Programs	- Not applicable, ACWD is a retail water agency	*Yes*
		1.2	Water Loss Control	· Annual system audit conducted using AWWA water auditing tool · Component analysis conducted every four years · Water Audit Data Validity score over 66 · On average, over 100 miles of ACWD's distribution system is checked for leaks annually · Leak Detection and notification program	*Yes*
		1.3	Metering with Commodity Rates	· All accounts are metered and customers charged by volume of use · Program to test, repair and replace meters · Feasibility study conducted to separate landscape use from mixed use meters	*Yes*
		1.4	Retail Conservation Pricing	· Currently using uniform rate structure where revenue from volumetric charge is > 70% of total revenue · Alternative conservation rate structures being evaluated · Implemented inverted block rate structure during drought	*Yes*
	Education Programs	2.1	Public Information Programs	· Program includes newsletters, bill messages, new customer packets, brochures, newspaper ads, postcard reminders, press releases, website, and speaking and participation at community events.	*Yes*
		2.2	School Education Programs	· Program includes classroom presentations, assemblies, free resource material, teacher training/workshops, grants, poster/slogan contest and field trips.	*Yes*

Table 7-2 (continued)
Summary of District Water Conservation BMP Implementation

	BMP Category	BMP #	BMP	District Progress	Meets BMP Requirements
Programmatic	Residential	3.1	**Residential Assistance Program**	· Surveys covering more than 10,000 residential units completed since 1994 · Distributed over 22,500 kits to residential units since 1991 · SFR High Water Use Notification program · Leak Detection and notification program · CYES summer survey program	**Yes, ACWD meets the requirements for these BMPs through the GPCD compliance approach**
		3.2	**Landscape Water Survey**	· SFR High Water Use Notification program · Turf replacement incentive program · Landscape classes/workshops · Seasonal irrigation reminders	
		3.3	**High Efficiency Clothes Washing Machine Rebates**	· Over 20,900 rebates provided since 1996	
		3.4	**WaterSense Specification (WSS) toilets**	· Program in place for low-income multi-family	
	CII	4	**Commercial, Industrial, Institutional Programs**	· Over 600 surveys conducted since 1998 · Commercial HET and washing machine rebate programs offered in conjunction with Union Sanitary District · Pre-rinse spray nozzle replacement program with over 570 nozzles replaced at local restaurants	
	Landscape	5	**Large Landscape Programs**	· Landscape water budget program implemented for dedicated landscape accounts · Landscape survey program for all large landscape accounts (DL and mixed use) · WBIC and turf replacement incentives · Recognition awards for businesses demonstrating landscape water use efficiency	

Table 7-3
Summary of District Water Conservation Programs

Program Name	*Program Description*
Residential Programs	
Water Conservation Kit/Device Distribution Program	Distribute water efficient plumbing fixtures to SF/MF residents whose homes were built prior to 1992. Over 22,500 kits have been distributed.
CYES Residential Survey Program	ACWD partners with CYES to conduct water and energy audits throughout its service area. The audits are conducted by trained youth ages 15-22. During each audit the auditors collect information about water and energy consumption, and provide residents with tips and tools for improving water and energy use efficiency. During the survey the auditors replace inefficient devices when possible. This program started in 2009, with over 450 audits performed to date.
High Efficiency Clothes Washer Rebate Program	Provide a rebate to customers who install a qualifying High Efficiency clothes washer in ACWD's service area. Over 3000 rebates are issued annually.
Seasonal Irrigation Reminder Program	Irrigation reminders are sent on a seasonal basis to SF residents to update them on current landscape irrigation requirements. Reminders are sent via postcards and/or with the bills to all SF residents, three times a year since 1998.
Residential Leak Detection Program	Customer Service notifies customers of non-typical water usage at their address with suggested remedies for the problem. Follow up is conducted until the issue is resolved. Approximately 1,200 customers are contacted annually.
Residential High Water Use Notification Program	Letters are sent to residences in the service area where water consumption is significantly higher than average compared to others in their area with similar lot sizes. GIS is used to perform the analysis. Letters are mailed out once per year, surveys are conducted as necessary. Approximately 1,000 customers are contacted annually.
Residential Landscape Workshops	Partner with Bay Area Water Supply and Conservation Agency (BAWSCA) and Bay-Friendly Gardening to provide workshops to residential customers on efficient water use in the landscape throughout the Spring and Fall. Topics include efficient irrigation, water efficient design elements, low water use plants and lawn alternatives.
"Water-Wise Gardening in the Bay Area" CD-ROM	Distribute a CD that contains images of gardens around the Bay Area that are employing water efficient landscaping techniques and links to plants adapted to the Bay Area climate. It includes a searchable plant database and information about gardening techniques, irrigation scheduling and maintenance. The information on the CD is also available to customers online. Over 495 CDs have been distributed to ACWD customers.
Turf Replacement Program	Pilot Program that launched in February 2011. Incentives are offered to customers who replace turf with low water use plants. Rebate is available to SFR customers and is equal to 50 cents per square foot of turf replaced up to a maximum $500.
Bay Friendly Garden Tour	ACWD's Drought Tolerant Garden is a lecture stop on a tour of Bay Area residential landscape gardens that meet and exceed Bay-Friendly Gardening standards. During the tour conservation staff spends time discussing water conservation and the use of drought tolerant plants with visitors.

Table 7-3 (continued)
Summary of District Water Conservation Programs

Commercial, Industrial, Institutional (CII) Programs	
CII Water Use Efficiency Survey Program	Conduct on-site visits to service area businesses to evaluate water use practices and fixtures. A written report of findings and recommendations is sent out to the customer after the site visit. Over 600 surveys have been conducted to date.
CII/MFR HET/HEU Rebate Program	Provide rebates to CII and low-income MFR customers who install qualifying High Efficiency Toilets (HETs) and Urinals (HEUs). Currently a $150 rebate is being offered in partnership with USD. Over 570 rebates have been issued.
School Waterless Urinals Incentives	Provide incentives for service area schools to replace standard urinals with waterless urinals. USD cost-shares in this effort. Over 370 standard urinals have been replaced with waterless urinals through this program.
CII High Efficiency Clothes Washer Rebate Program	Provide rebates to CII and MFR customers who install qualifying high efficiency commercial (coin-op) clothes washing machines Currently a $300 rebate is being offered in partnership with USD. Over 278 rebates have been issued.
Alameda County Green Business Program	Partner with Alameda County, Bay Area utilities, government agencies and non-profit organizations to conduct CII surveys that qualify service area businesses as 'green' or environmentally friendly. ACWD uses these survey opportunities to conduct more comprehensive CII water use efficiency surveys.
Spray and Rinse Valve Installation Program	Partnered with water agencies and energy providers (i.e. PG&E) through a statewide grant program to install water and energy efficient spray valve nozzles in service area restaurants. Spray valves are water and energy efficient and were installed at no cost to the restaurant. This program was co-funded by the California Public Utilities Commission and local water agencies. Over 570 nozzles have been installed at restaurants throughout ACWD's service area.
Large Landscape Programs	
Dedicated Landscape Partnership (DLP)	A large landscape survey and water budget program offered to CII and MFR/HOA customers with dedicated landscape accounts. Through a site survey or GIS analysis turf and non-turf areas are measured to establish an irrigation budget based on square footage and climate conditions. Water use reports are issued to customer and their landscape contractor three times per year. About 560 sites are participating in the program, including the city parks.
City Parks Budget Reports	Irrigation water use at large city parks is tracked through this program. Through a site survey or GIS analysis turf and non-turf areas are measured to establish an irrigation budget based on square footage and climate conditions. Water use reports are issued twice a year.
Turf Replacement Program	Pilot Program that launched in February 2011. Incentives are offered to customers who replace turf with low water use plants. Rebate is available to MFR and CII customers and is equal to 50 cents per square foot of turf replaced up to a maximum $3000.
"Smart" Irrigation Controller Rebate Program	Provide rebates to CII and other large landscape customers that replace their existing conventional irrigation controller with a "smart" irrigation controller. "Smart" Irrigation Controllers use weather data and site information to adjust watering times and frequency. Over 120 conventional controllers have been replaced.
Irrigation System Audits	Irrigation audits are provided as a component of the DLP. DLP participants that are over-budget are provided with an irrigation system walk-through to determine the efficiency of the system. Recommendations to improve system efficiency and a suggested irrigation schedule are provided to the customer at the end of the audit. Surveys covering more than 420 accounts have been conducted.

Table 7-3 (continued)
Summary of District Water Conservation Programs

Large Landscape Programs (continued)	
Landscape Contractor Irrigation Classes	Partner with BAWSCA, Irrigation supply manufacturers/distributors, and other interested organizations to provide landscape water use efficiency training in the service area.
Alameda County Stop Waste (Bay-friendly Gardening) Program	Partner with Alameda County, Bay Area utilities, government agencies and non-profit organizations to promote resource conservation for landscaping through workshops/classes, trainings, garden tours, and program co-branding/marketing. Sponsored by the Alameda County Waste Management Authority.
CIMIS Weather Station	Partner with DWR and Union City to host a CIMIS station at a park in Union City. The station provides climate data that is used for programs such as the DLP's water budgets. ACWD maintains the station on a monthly basis.
Public Information & School Education Programs	
Avenues for Public Outreach	ACWD website, Aqueduct newsletter, bill messages, new customer packets, postcards, brochures, newspaper advertisements, press releases, public appearances, and participation at community events.
School Education Programs	Program to work with children in the service area to better equip them for understanding and practicing water conservation techniques. Program includes classroom programs, assembly programs, poster/slogan contest, special activities (see below). ACWD's classroom programs reach over 7,000 students annually, and the ACWD sponsored assembly program reaches approximately 17,000 students annually.
Drought Tolerant Demonstration Garden and Employee Composting Program	Maintain a drought resistant demonstration garden and provides brochures of the garden and irrigation system for customers. The garden includes a composting demonstration where green waste from the employee lunchroom is collected and placed in a compost bin, the compost is then used to maintain healthy soil in the demonstration garden. ACWD's demonstration garden is also a Bay-friendly certified garden.
Student Leak Check Postcard Program	Provided students (15,000) in grades K-6th a toilet leak detection kit. The kit contained leak detection tablets, instructions for testing for a leak, and a postage paid response card to notify ACWD of the results of the test. Students who reported a leaking toilet were sent a replacement toilet flapper.
Student Short Shower Pledge Program	Provide students (15,000) in grades K-6th the opportunity to sign a "Shorter Shower Pledge" and display a shorter shower sticker in their bathrooms. Those who participated in the program and notified us of participation received a free electronic 5-minute shower timer.
Customer Service and Conservation Material Distribution	Address customer questions about water conservation whether in person, via phone or email. Mail out print materials to assist customers in achieving conservation goals.
Other Conservation Activities at ACWD	
System Leak Detection and Repair	Evaluate the distribution system for leaks and make necessary repairs to the system. On average, ACWD surveys over 100 miles of pipeline annually.
Metering	All ACWD accounts are metered.
Billing	All ACWD accounts are billed based on the amount of water used.

RESIDENTIAL PROGRAMS

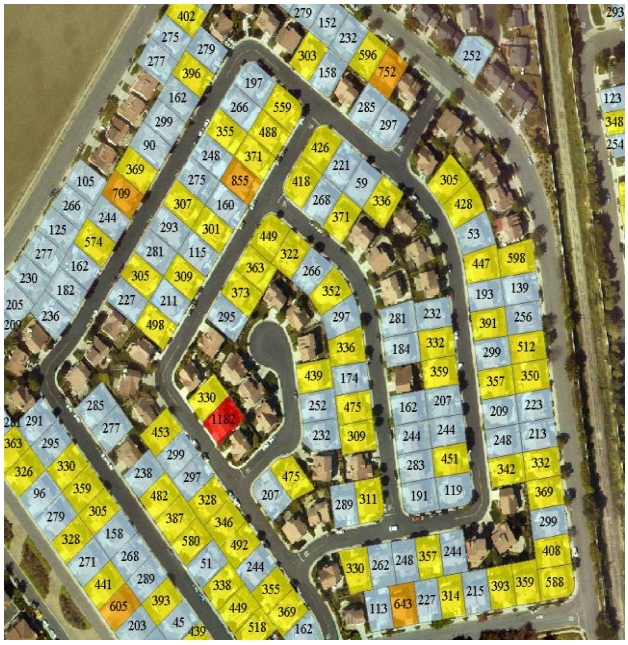
The District has a variety of residential demand management programs that target both indoor and outdoor residential water use. Each program is initially and continually evaluated for cost effectiveness. Programs include providing customers with free devices/tools, incentives, education, technical information and support.

Residential Clothes Washer Rebate Program

The District has been offering rebates for high efficiency clothes washers since 1997; currently the most water and energy efficient clothes washers on the market are eligible for a rebate. These water conserving washers are estimated to save over 7,000 gallons per year, compared with non-conserving washers. The purpose of the program is both to encourage customers to purchase high efficiency clothes washers, as well as encourage manufacturers to develop and market these washers. ACWD partners with other water agencies, Union Sanitary District and Pacific Gas & Electric Company to offer these rebates. Over 20,900 rebates have been issued to District residential customers who purchased new water efficient washers.

Single-Family High Water Use Notification

Utilizing GIS data linked with our customer service database, customer water use is compared to similar households' water use (based on parcel size). Those customers in the top 2% for water consumption are sent high water use alert letters. A list of possible reasons for their much higher than average water use are suggested, along with conservation tips, and they are encouraged to call to discuss their water use practices with a conservation staff member. On-site surveys are also offered to customers through this program. The District runs the program every year (since 2004), currently reaching about 1,000 customers each time. Issues identified through this program are over-irrigation (~50%) and leaks (~15%). Large families (~25%) provide opportunities to maximize low flow device installation. Consumption is monitored annually to confirm program effectiveness.



Aerial photo showing water use at single family homes, in gallons per day

Residential Conservation Kit Distribution Program

In 1997, the District initiated an aggressive program to market and distribute free water conservation kits to its residential customers in pre-1992 homes (i.e., homes built prior to the implementation of laws requiring the use of low flow plumbing fixtures). Free conservation kits (including high quality low-flow showerheads) are offered through the District's newsletter, website, flyers, direct mailings and events. Over 22,500 conservation kits have been provided to residential customers. In addition, free water conserving fixtures have also been provided to qualifying multi-family complexes that have participated in the District's survey program. The District has provided over 3,400 showerheads and over 3,250 faucet aerators to 28 apartment complexes. ACWD has also developed a program to market and distribute free water conservation kits to townhouse and condominium owners in the Tri-Cities area. Over 2,700 kits have been distributed through this program.

Turf Replacement Incentive Program

The District, in partnership with BAWSCA, launched a pilot turf replacement incentive program, called Lawn Be Gone!, in early 2011. The purpose of the program is to permanently reduce landscape water use in ACWD's service area by providing an incentive to encourage customers to convert water-thirsty lawns to water thrifty landscapes. Landscape water use accounts for about 40% of total water use and turf has one of the highest water requirements of any landscape plants. Lower water use plants thrive on a fraction of the water (about 30% less). Some of the turf surrounding CII buildings, home owner associations and apartment complexes in the District's service area is non-functional and demands a lot of water, especially during the summer. It has been demonstrated that significant water savings can be achieved by replacing large non-functional turf areas with low water use plants. Customers renovating non-functional turf areas will receive a rebate based on the square footage of turf removed and replaced with low water use landscaping. The program is available to SFR, MFR and CII customers. SFR customers are eligible for a rebate of up to $500.


Photos courtesy of BAWSCA

“Water-Wise Gardening in the Bay Area” CD-ROM

In partnership with BAWSCA and other water agencies, ACWD helped develop a CD which contains images of gardens around the Bay Area that are employing water efficient landscaping techniques and links to plants adapted to the Bay Area climate. It includes a searchable plant database and information about gardening techniques, irrigation scheduling and maintenance. The information on the CD is also available to customers online. To date, approximately 500 CDs have been distributed to ACWD customers.

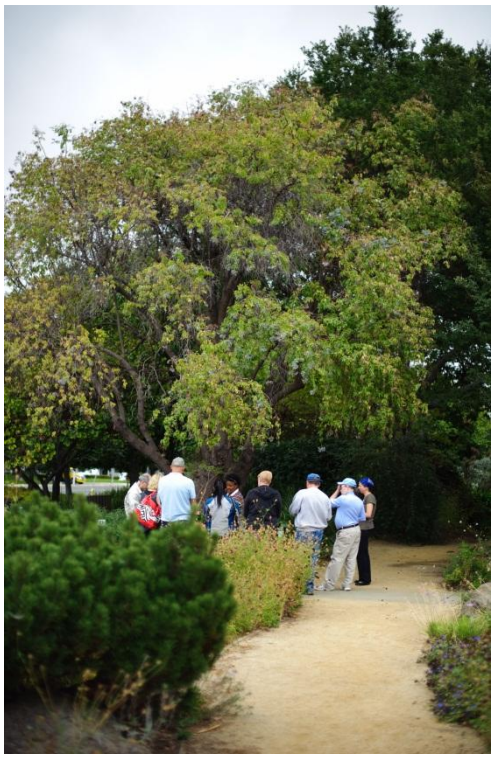
Photos from the "Water-wise Gardening in the Bay Area" CD-ROM

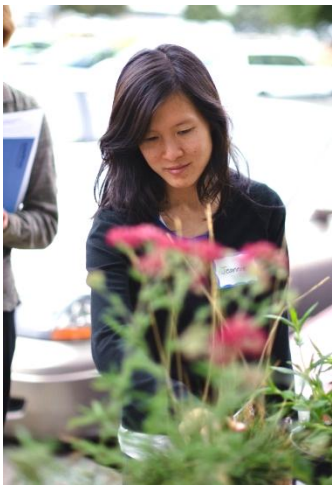
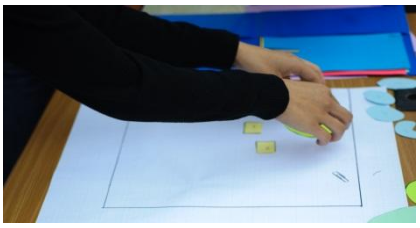
Residential Seasonal Landscape Irrigation Reminders

Residential landscape irrigation represents one of the single largest uses of water in the District’s service area, and also provides an opportunity for one of the largest sources of water savings through improved efficiency. In 1998, the District implemented a program to provide residential customers with landscape irrigation guidelines. As part of this program, the District provides seasonal notices through postcards, newsletters and/or our web site for adjusting irrigation rates depending on the season. These seasonal notices are provided in the fall (to indicate that watering times should be reduced to 50% of their summer schedule), in the winter (to indicate that sprinkler systems should be turned off) and in the spring (to provide maintenance and efficient watering tips).

Residential Landscape Workshops

ACWD regularly hosts and co-sponsors garden tours and residential landscape workshops/classes. A fall workshop series for service area residents is offered through a partnership with Alameda County Waste Management Authorities’ StopWaste Program and the Bay-Friendly Gardening Program. ACWD's Drought Tolerant Garden is a lecture stop on tour of Bay Area residential landscape gardens that meet and exceed Bay-Friendly Gardening standards, which include water use efficiency. During the tour, conservation staff spends time discussing water conservation and the use of drought tolerant plants with visitors. ACWD also partners with Bay Area Water Supply and Conservation Agency (BAWSCA) to offer several residential landscape classes each fall and spring. Topics have included efficient irrigation, water efficient design elements, low water use plants and lawn alternatives.

Residential Surveys

The District initiated a pilot residential survey program in 1995. Trained water auditors conduct onsite reviews of water use practices and fixtures, check for leaks, and provide recommendations for improving water efficiency (both indoor and outdoor). The District has conducted surveys for over 1,275 single-family residences (SFR) and 58 multi-family (MFR) apartment complexes (representing over 8,750 apartment units). Free water conservation kits and/or individual devices are provided on an as-needed basis. In 1997 the District evaluated the cost-effectiveness of continuing a large-scale SFR survey program and determined that, based on actual water savings and costs of the program, it was not cost-effective so it was discontinued. However, the District continues to offer audits and/or leak assistance to customers targeted through its high water use notification program described on page 7-9, the "Stop that Running Toilet" and the CYES programs (described below), and the turf replacement program described on page 7-10 (outdoor only). The MFR survey program was cost-effective and was continued.

***"Stop that Running Toilet" Program*:** In 2008-2009 over 15,000 students in grades K-6th were given a toilet leak detection kit. The kit contained leak detection tables, instructions for testing for a leak, and a postage paid response card. Students who returned their postcard with the results of their leak test received a free gift. If the student responded that their toilet leaked they received a toilet flapper valve. A total of 2,406 postcards were returned to the District, a 16% response rate. Of those returning postcards 607 or 25.2% reported that they had a leaky toilet. Of these, 150 customers installed new flapper valves before receiving one from ACWD and the remainder were sent replacement flapper valves. Assuming a leaky toilet wastes 60 gallons of water per day, and assuming all 607 leaky toilets were repaired with the replacement flapper, an estimated 13 million gallons of water will be saved each year. ACWD received the Clair A. Hill Award for excellence in water management and innovation from the Association of California Water Agencies in 2010 for this program.

Partnership with California Youth Energy Services (CYES): Beginning in 2009, ACWD partnered with CYES to hire youth/students to conduct water and energy audits within its service district each summer. The initial program was set up in cooperation with the City of Fremont, but audits were conducted in the surrounding communities of Union City and Newark. In 2011 Union City will begin officially participation in this program. The audits are conducted by youth/students ages 15-22. During each audit the auditors collect information about water and energy consumption, and provide residents with tips and tools for improving water use efficiency. Inefficient devices are replaced where possible. Over 450 surveys have been conducted with over 650 efficient-flow devices (including showerheads, bathroom sink aerators and kitchen sink aerators) installed.

RISING SUN ENERGY CENTER
CALIFORNIA YOUTH ENERGY SERVICES

Residential Ultra Low Flow Toilet Replacement

Legislation enacted in 1992 required that all new toilets sold or installed in California be Ultra Low Flush Toilets (ULFTs) using no more than an average of 1.6 gallons per flush (gpf) and new State legislation (AB 715), effective January 1, 2014, will require that all new toilets sold or installed in California be High Efficiency Toilets (HETs), with a maximum flush volume of 1.28 gpf. Additional legislation enacted in 2009 (SB 407), mandates that all buildings in California come up to current State plumbing fixture standards by 2019. Enforcement is through the permitting process for alterations/improvements to a property, beginning in 2014 for all properties and through property sales and transfers as part of the disclosure process starting in 2017 for single-family residential properties, and beginning in 2019 for multi-family residential and commercial properties. As such, the expectation is for natural turnover/replacement to ultimately lead to the replacement of all toilets (and urinals) throughout the State over the next decade.

Based on a saturation study conducted in 2000, the District's current (2010) analysis estimates that approximately 51% of the pre-1992 toilets in single-family residential dwellings have been replaced (38% multi-family), and continue to be replaced at a rate of approximately 4.1% per year (SFR) and 2.8% per year MFR. The legislation mentioned above will accelerate this rate of replacement, and the District agrees with the State's expectation that most of the pre-1992 high water consumption toilets in the service area will be replaced within the next 6-8 years. The District has implemented a multi-family residential HET rebate program to accelerate the change out for low income multi-family residential properties.

Residential Leak Detection and Notification Program

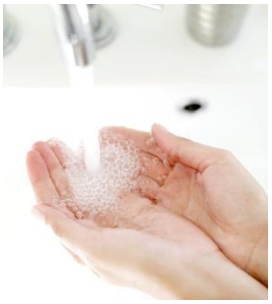
Leak detection is an on-going part of ACWD's bi-monthly meter reading program. If an abnormally high water consumption is detected, the meter reader is alerted (through their handheld devices) to check for a leak. The meter reader looks at the meter to see if the instruments are spinning. If they are, the meter reader will knock on the door to check if anyone is home. If no one answers they leave a door hanger that states there might be a leak and the customer should contact customer service with any questions. If someone is home they have them turn off all water in the house, look at the meter again, and if it is still moving they inform the owner in person that they most likely have a leak. Meter readers carry conservation devices and leak detection dye tablets, which are provided to the customers that are home, along with instructions for identifying leaks. For billing purposes, the meter reader enters a leak report code indicating whether or not the abnormal read may be the result of a leak at the residence. Two weeks later a re-check is performed. If there is still an indication of a leak, a letter notifying the customer of a potential leak is sent to the customer. Another check is performed two weeks later, followed by a second letter, if necessary. About 1,200 customers are contacted annually through this program.

BUSINESS PROGRAMS

A significant part of the District's conservation effort is directed at the business community. Commercial, Industrial and Institutional (CII) customers present important opportunities for conservation-directed programming. CII programs include incentives for installing water efficient fixtures and landscaping, as well as a water use efficiency survey program.

Commercial Clothes Washer Rebate Program

ACWD provides rebates for qualifying commercial clothes washing machines of up to $300 per washer, which includes matching funds from Union Sanitary District. Over 270 rebates have been approved since program inception. Participants include laundromats and apartment complexes with on-site laundry facilities**.**



Commercial High Efficiency Toilet / Urinal Rebate Program

In 2000 ACWD, together with Union Sanitary District, initiated a program to provide rebates of up to $150 to commercial, industrial and institutional customers and low-income multi-family homes for the replacement of non-conserving toilets with water conserving toilets and urinals. The purpose of this program is to target District customers that have the highest potential water savings when their older, non-conserving toilets are replaced with conserving models. Analysis by the CUWCC and others has indicated that commercial customers such as restaurants and gas stations, as well as multi-family residential units have the highest potential water savings. Over 570 non-conserving toilets have been replaced with water conserving toilets, WSS (WaterSense Specification) HETs starting in 2007, within the ACWD service area. The program is marketed through the CII survey program, the Green Business Certification program, other CII programs and various other means.

Waterless Urinal Installation at Local Schools

In 2008, ACWD partnered with USD and the Fremont Unified School District (FUSD) to replace all urinals throughout FUSD's schools (36 schools and facilities) with waterless urinals. In 2009, ACWD worked with another area school, Fremont Christian School, to replace all of their standard urinals with waterless models, again with USD's cost-share assistance. ACWD and USD offered a combined rebate of $150 per urinal. Over 370 standard water-using urinals have been replaced with waterless urinals through this program.

Spray Valve Replacement Program

ACWD participated in a statewide grant program that partnered with water agencies and their energy providers (i.e. PG&E) to install water and energy efficient spray valve nozzles in service area restaurants. These spray valves are water and energy efficient and were installed at no cost to the restaurants. This program was co-funded by the California Public Utilities Commission and local water agencies. To date Over 570 nozzles have been installed at restaurants throughout ACWD's service area.

Commercial, Industrial, and Institutional Surveys

The District's commercial, industrial and institutional (CII) survey program is tailored to meet the specific needs of our customers. The survey program is targeted at hotels, restaurants and other commercial, industrial and institutional facilities with high indoor water use (e.g., restrooms, laundry, food preparation/clean up, cooling systems, water purification systems, and other industrial processes). Some of the surveys are coordinated through a partnership with the Alameda County Green Business Certification program and, in the past, through the statewide Rinse & Save spray valve replacement program. Over 600 CII surveys have been conducted to date. In-house water conservation staff conducts most surveys, while larger commercial and industrial surveys have been conducted by consultants. On-site surveys include a comprehensive review of existing water use, identification of areas for improvement, and water use efficiency recommendations outlined in a report provided to the customer. These recommendations include an analysis of potential water and cost savings, as well as a payback analysis. Free conservation devices and follow-up assistance are offered to participating CII customers.

LANDSCAPE PROGRAMS

Landscape water use accounts for as much as 40% of the total water use in the service area. The District has developed programs that promote efficient landscape water use including incentives, landscape budgets and surveys.

Weather Based Irrigation Controller Program

The District provides rebates to large landscape customers (CII, HOAs and MFR) toward the purchase of "smart" irrigation controllers. Weather Based Irrigation Controllers or "Smart" Controllers (WBICs) are effective tools for reducing landscape water use. They use weather data and site information to adjust watering times and frequency. More efficient watering means less waste, reduced run-off and healthier plants. A pilot program started in 2006 as part of a statewide grant funded program. Results from the initial program indicated that savings were close to 20% for controllers installed in ACWD's service area. The District's current program began in 2010. Program implementation was modeled after the initial program but improved based on lessons learned. While the initial program included single-family residential customers, the current program focuses on CII, HOA and MFR customers. Over 120 WBICs have been installed on both commercial and residential landscapes in ACWD's service area.

Turf Replacement Incentive Program

As described under the Residential Programs section, the District, in partnership with BAWSCA, is launching a pilot turf replacement incentive program, called "Lawn Be Gone!", in early 2011. The program is available to SFR, MFR and CII customers. Customers renovating non-functional turf areas will receive a rebate based on the square footage of turf removed and replaced with low water use landscaping. CII and MRF customers are eligible for a maximum rebate of $3,000.

Dedicated Landscape Partnership (DLP) Program

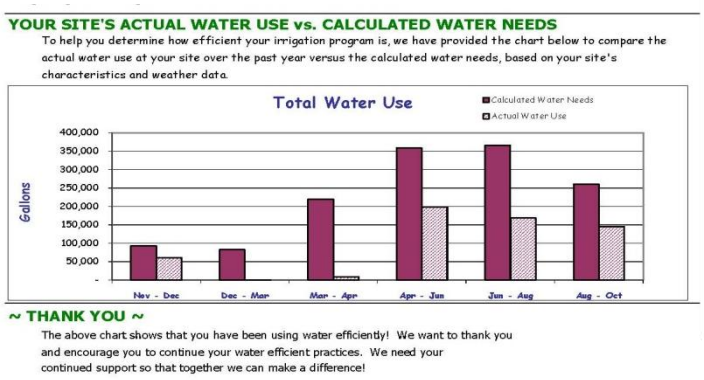
ACWD has over 2,100 dedicated irrigation accounts at multi-family, commercial, industrial and institutional sites. In order to ensure that these sites are being irrigated efficiently, the District initiated a water budget and survey program in 1999.

Water Budget Reports: In 1999/2000 the District ranked customers with dedicated landscape (DL) accounts according to use, those accounts with the highest consumption were offered a free landscape survey to determine landscaped areas (turf and non-turf). Information from these surveys was entered into an application that created individual reports comparing actual water use with calculated landscape water needs at each site. In 2001/2002 ACWD expanded the program using GIS to identify turf and non-turf areas to add more DL accounts and to match parcels to meter numbers for large municipal parks in the service area. About 560 large landscape sites are participating and almost 90% of the DL consumption is captured in the water budget report program. Reports are issued every four months to customers and their landscape contractors.

Landscape Surveys: Through the water budget program, sites that are consistently over budget are identified and offered onsite landscape water use efficiency surveys. Surveys include an evaluation of current and past usage, a review of landscape area measurements, a walkthrough of the irrigation system to identify maintenance issues and inefficiencies, and an assessment of landscape characteristics. Findings and recommendations are provided at the end of the survey, followed by a report that summarizes this information. Recommendations may include participation in the District's other landscape programs such the "smart" controller program or the turf replacement program. Landscape surveys covering more than 420 accounts have been conducted.

Business of the Year Awards: ACWD also recognizes those Dedicated Landscape Partners that remain within their annual water budget through a "Water Conservation Business of the Year" awards program. In 2009, 242 DLP participants qualified to receive the award. These recipients were listed in a Sunday edition of the local newspaper during May, Water Awareness Month.

Future plans for the DLP program include expanding it to all large landscape customers and continuing to offer detailed irrigation surveys to over-budget participants.



Workshops and Trainings for Landscape Contractors

ACWD partners with various organizations including BAWSCA, Bay-Friendly, irrigation supply manufacturers/distributors and other interested parties to provide landscape water use efficiency training geared toward landscape contractors. These workshops and/or training sessions are held at least once per year.

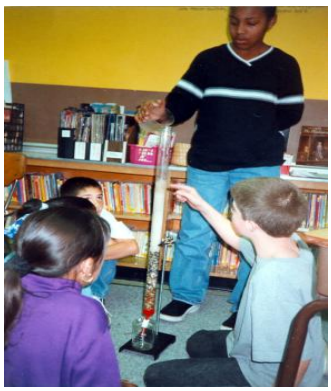
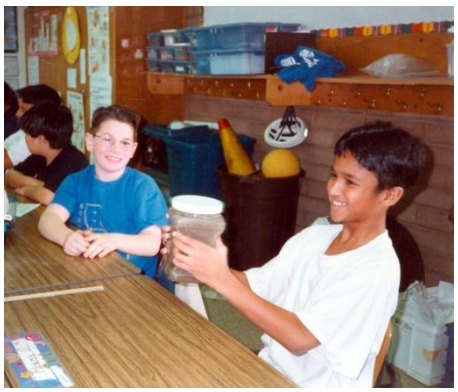
California Irrigation Management Information System (CIMIS)

The California Irrigation Management Information System (CIMIS), operational since 1982, is a repository of climate data collected from more than 100 computerized weather stations located throughout California. CIMIS helps agricultural growers and turf managers administering parks, golf courses and other landscapes to develop water budgets for determining when to irrigate and how much water to apply. Providing information for improving water and energy management through efficient irrigation practices is the primary use of the CIMIS system. CIMIS was developed by the California Department of Water Resources and the University of California at Davis. Access to CIMIS is free and the system operates 24 hours a day, every day of the year except during maintenance hours. There has been a CIMIS station in the ACWD service area for over 10 years. ACWD, the Department of Water Resources and Union City joined forces to open a station at Town Estates Park in Union City. Union City CIMIS Station #171 meets all the conditions needed to provide accurate weather information. This station provides the weather data ACWD uses to develop its dedicated landscape water budget report.

SCHOOL EDUCATION PROGRAMS

ACWD's school education program is a Clair A. Hill award winning program reaching over 17,000 students each year though innovative, hands-on programs such as the student take home leak detection kit and the shower timer programs, classroom presentations and assemblies. It was established prior to 1991 and has been used as a model by other water agencies. The school education program includes the following:

Classroom Instruction: ACWD provides trained staff to conduct water supply and conservation programs at public and private schools in ACWD's service area. Programs are available for kindergarten through 12th grade and are aligned with California education content standards. They are taught as special classes (in which an ACWD instructor substitutes for the regular teacher) and are activity-based. ACWD provides all of the necessary resource materials required for these programs (see below for description). Each year, ACWD reaches approximately 7,000 students through these classroom presentations.


"Stop that Running Toilet" Program: In 2008-2009 over 15,000 students in grades K-6th were given a toilet leak detection kit after attending a water conservation presentation. The kit contained leak detection tablets, instructions for testing for a leak, and a postage paid response card. Students who returned their postcard with the results of their leak test received a free gift. If the student responded that their toilet leaked they received a toilet flapper valve.

"You have the Power to Take a Short Shower" Program: In 2009-2010 nearly 15,000 students in grades K-6th were given the opportunity to sign a "Shorter Shower Pledge" and display a shorter shower sticker in their bathrooms. Those who participated in the program and notified us of this fact via postcard received a free electronic 5-minute shower timer.

"Saving Blue" Program: During the 2010-2011 school year, *ZunZun*, a musical duo specializing in water conservation school assemblies, performed 64 shows at ACWD service area schools. As part of the assembly, entitled, "Saving Blue," classrooms were given the opportunity to participate in a contest for a chance to perform on a special CD being produced by *ZunZun*. Classes were asked to write a verse for a new *ZunZun* water conservation song. The three winning classes were recorded singing their verses and these recordings were included on the CD. The recording sessions were also videotaped and the video was posted on ACWD's website and ACWD's YouTube channel. The video may also be used as a public service announcement on local television stations. All classrooms participating in the contest received a free copy of the CD.

School Assembly Program: Each year, ACWD sponsors a water conservation school assembly program for 38 schools in its service area. The program stresses the various facets of water conservation through the use of music, storytelling, and drama and is appropriate for kindergarten through 6th grade. The school assembly program reaches approximately 17,000 students each year.

Educational Resource Materials: ACWD provides resource materials for teachers to use in teaching about water supply and water conservation. These materials include workbooks, lesson plans, curriculum guides, brochures, pamphlets, videos, posters, maps, games, stickers, pencils, rulers, and magnets. All materials are provided to schools and teachers upon request. Each year, approximately 70,000 pieces of material are distributed to local schools.

Tours: ACWD offers tours of the District's facilities to local schools. These tours include visits to our water treatment and groundwater recharge facilities. All tours are led by District staff.

Water Conservation Poster and Slogan Contest: Each year, ACWD sponsors its extremely popular Water Conservation Poster and Slogan Contest. First through 6th grade students are invited to enter posters and slogans that encourage water conservation. Winning entries are included in a Water Conservation Calendar that is distributed to the over 1,200 teachers in the District's service area. Approximately 1,500 students enter the contest each year.

Other: Students who participate in ACWD sponsored activities are encouraged to visit our home page (http://www.acwd.org), which includes educational material and water conservation material. In addition, ACWD participates in Water Awareness Month by providing teachers with free water conservation lesson plans developed by the California Water Awareness Campaign. ACWD also sponsors a mini-grant program for local teachers and conducts free educational workshops (Project WET, etc.).

PUBLIC INFORMATION PROGRAMS

ACWD's public information program was also established prior to 1991. The public information program includes the following:

***Demonstration garden*:** ACWD maintains a drought resistant demonstration garden and provides brochures of the garden and irrigation system for our customers. The garden includes a composting demonstration where green waste from the employee lunchroom is collected and placed in a compost bin, the compost is then used to maintain healthy soil in the demonstration garden. ACWD's demonstration garden is also a Bay-friendly certified garden, a designation given to gardens that employ the seven Bay-friendly Gardening Principles, which include: landscape locally, landscape for less to the landfill, nurture the soil, conserve water and energy, protect water and air quality, and create wildlife habitat. ACWD has also assisted Union City with the development of a demonstration garden at their City offices and provided a grant to help establish a water efficient landscape at Ohlone College's "Green" Newark Campus.





***Bill inserts*:** Bill inserts for ACWD customers are provided throughout the year. These inserts include information about water conservation, leak detection, water quality, water rates and other District related information. Water conservation messaging is also included with every bill the District sends out.

***New customer packet*:** All new ACWD customers receive a packet from ACWD that includes information on water conservation and leak detection.

Brochures: ACWD has a wide variety of water conservation brochures on such topics as leak detection, water conservation devices and measures, irrigation guidelines and drought resistant landscaping

***Previous use shown on bill*:** The customer's consumption from the previous year is provided on all customer billing statements.

***Community Events*:** ACWD routinely participates in a wide variety of community events and other local events.

***Internet home page*:** ACWD maintains a home page on the Internet (http://www.acwd.org), which provides a wide variety of information on water conservation measures such as leak detection, water saving fixtures and drought resistant landscaping.

CONSERVATION ACCOMPLISHMENTS AND FUTURE PLANS

ACWD has successfully worked with other water agencies on large scale conservation programs and has actively pursued conservation grant opportunities. The District has developed the in-house capacity to conduct commercial and landscape water use efficiency surveys and has creatively utilized new technologies, such as GIS, to advance conservation programming.

In 2010 ACWD received the Clair A. Hill Award for excellence in water management and innovation from the Association of California Water Agencies. As the honored recipient, ACWD is privileged to administer the Clair A. Hill Scholarship for the 2011-2012 academic year. Offered in the name of water leader Clair A. Hill, this $5,000 scholarship was awarded to a qualified student in a water resources-related field of study.

In 2010, ACWD hired a consultant to evaluate alternatives to its uniform rate structure, including tiered rates and budget-based rates. The study is expected to be completed in June of 2011 and, if the Board selects a new rate structure based on that study, it may be implemented as early as February of 2012.

In addition to the programs detailed above, ACWD conservation staff will continue to seek grant funding to maintain, identify, develop and implement projects that contribute toward meeting the District's demand management goals. ACWD will continue to creatively use new technologies to maximize program effectiveness (e.g. installation of weather-based irrigation controllers, the use of GIS and other applications, higher efficiency appliances), work with other agencies and participate in regional and statewide conservation programming.

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CHAPTER 8
WATER CONSERVATION BILL OF 2009 (SBX7-7)

The Water Conservation Bill of 2009 (SBX7-7), requires a statewide 20% reduction in urban per capita water use by 2020. It requires that urban water retail suppliers determine baseline water use and set reduction targets according to specified requirements, and requires agricultural water suppliers to prepare plans and implement efficient water management practices.

On June 9, 2011 ACWD held a public hearing to consider and adopt the method for determining ACWD's water use targets under SBX7-7, including obtaining community input regarding ACWD's implementation plan and considering the economic impacts, if any, for implementing that plan.

As part of SBX7-7, the Department of Water Resources (DWR) is required to adopt an alternative method for setting targets through a public process. DWR, in consultation with the California Urban Water Conservation Council (CUWCC), is also required to develop standardized technical methodologies and criteria for calculating per capita water use, baseline use, population and other analytical metrics. DWR is also directed to convene a representative Commercial, Industrial and Institutional (CII) Task Force to develop standard metrics and best management practices (BMPs) for CII water use.

As required under SBX7-7, urban retail water suppliers, including ACWD, must determine their base per capita water use and develop water use reduction targets using one of four specified methods:

- Option 1: 80% of baseline per capita daily water use
- Option 2: Sum of specified performance standards
- Option 3: 95% of DWR Hydrologic Region target
- Option 4: A flexible alternative designed to adjust to local circumstances

The purpose of this chapter is to document ACWD's approach for complying with SBX7-7, including baseline water use, target determination, and proposed methods to ensure compliance with the 2015 interim and 2020 per capita water use targets (i.e. water use reduction plan).

8.1 BASELINE AND TARGET DETERMINATION

Beginning with this 2010 UWMP, SBX7-7 (CWC §10608.20 (e)) requires each urban retail water supplier to include the following in its UWMP.

- Baseline daily per capita water use - how much water is used within an urban water supplier's distribution system area on a per capita basis. It is determined using water use and population estimates from a defined range of years.

- Urban water use target - the planned daily per capita water use in 2020 within an urban water supplier's distribution system area, taking into account water conservation practices that currently are and plan to be implemented.

- Interim urban water use target - the planned daily per capita water use in 2015, a value halfway between the baseline daily per capita water use and the urban water use target.

In 2015 and 2020, each water supplier will also determine the compliance daily per capita water use to assess progress toward meeting interim and 2020 urban water use targets. Determining and tracking use levels and targets will support the goal of reducing the state's per capita urban water consumption by 20 percent. This section provides documentation on ACWD's determination of these numbers and the supporting information that they are based on.

Process Overview

The Water Conservation Bill of 2009 describes the overall process by which a water supplier complies with the requirements. It specifically identifies three of the four methods for establishing urban water use target and requires DWR to develop a fourth target method. Additionally, it requires DWR to develop technical methodologies for consistent implementation of the Water Conservation Bill of 2009 requirements. These technical methodologies and the fourth target method were developed in close consultation with the Urban Stakeholders Committee (USC) during spring and summer 2010. Target methods are the four options an urban water supplier has to determine its urban water use target. They are referred to as Target Method 1, Target Method 2, etc. These methods identify specific steps water suppliers will follow to establish targets. Each urban water supplier (or regional alliance) must use one of the four target methods to perform the required calculations. Technical methodologies are procedures and guidance for conducting some of the specific steps identified in the target methods. There are nine technical methodologies. Multiple methodologies may be needed for completion of a target method calculation.

The Water Conservation Bill of 2009 provides flexibility in how an urban water supplier determines the baseline and target numbers for its water service area. It also indicates that water suppliers can cooperatively determine and report progress toward achieving these targets through a regional alliance. A water supplier may determine the targets on a fiscal year or calendar year basis, but must clearly state in its UWMP the basis for its reporting.

Although the legislation provides flexibility in how an individual or group of water suppliers approaches baseline and target compliance, it also requires method and methodology consistency over time. So, technical methods and methodologies used by a water supplier to determine use levels and develop targets in 2010 are to be the same as those used in 2015 and 2020. A water supplier may select a different Target Method in its 2015 UWMP, but not in any amended 2015 UWMPs or in the 2020 UWMP. A water supplier has the opportunity to modify its target method during the implementation period, but any changes must be retroactive, as described in Technical Methodology 9: Regional Compliance.

Baseline Periods

Two baseline periods are to be determined during the calculation of the base daily per capita water use. The legislation provides some flexibility in what actual periods of time are used to establish these baselines. This accounts for short-term water demand variations resulting from weather influences, as well as acknowledging the advances of water suppliers that have already begun using recycled water to reduce potable demands. The two baseline periods are:

- 10- to 15-year base period: This is a 10-year or 15-year continuous period used to calculate baseline per capita water use.

- 5-year base period: This is a continuous 5-year period used to determine whether the 2020 per capita water use target meets the legislation's minimum water use reduction requirements of at least a 5 percent reduction per capita water use.

If the urban retail water supplier's base daily per capita water use calculated using the 5-year base period is 100 gallons per capita per day (GPCD) or less, then the urban water supplier is exempt from the 5 percent minimum required reduction. It must document in subsequent UWMPs in 2015 and 2020 that it has maintained the 100 GPCD compliance level of water use.

Meeting Water Conservation Bill of 2009 Requirements

There are four overall steps a water supplier completes to meet the 2010 UWMP requirements indentified in the Water Conservation Bill of 2009:

- Step 1: Determine Base Daily Per Capita Water Use
- Step 2: Determine Urban Water Use Target
- Step 3: Compare Urban Water Use Target to the 5-year Baseline
- Step 4: Determine Interim Urban Water Use Target

Each of these steps and its application to the ACWD service area is described below.

Step 1: Determine Base Daily per Capita Water Use

Gross Water Use

The Water Conservation Bill of 2009 requires each urban retail water supplier to include in its UWMP an estimate of base daily per capita water use. Base daily per capita water use, measured in GPCD, is established for an initial period of time, which is referred to as the 10- to 15-year base period.

ACWD delivers water to its customers in two ways. The first is through a conventional potable distribution system. All points of entry to this distribution system are metered (Figure 3-4). The second is through recharge of the local aquifer for extraction by privately-owned groundwater wells. All private wells are individually metered and billed quarterly by District staff in accordance with the District's Replenishment Assessment Act. Gross Water Use is a combination of these two demands and is reflected in Table 8-1.

Estimating Service Area Population

As described in Chapter 1, section 1.5, the Alameda County Water District service area encompasses the Cities of Fremont, Newark and Union City (Figure 1-1). ACWD is a Category 1 Water Supplier as defined in Methodology 2 and relies on the California Department of Finance (CA DOF) for population estimates. These figures are reflected in Table 8-1.

Calculating Base Daily per Capita Water Use

ACWD does not currently have a recycled water supply that offsets potable water use; therefore the base daily per capita water use is simply an average of the annual Gross Water divided by the estimated population. ACWD has identified its base daily per capita usage, by the ten year period between January 1, 1995 and December 31, 2004 (see Table 8-1).

Step 2: Determine Urban Water Use Target

The water supplier has four different methods for determining the urban water use target. Methods 1 through 3 were established by the Legislature in the Water Conservation Bill of 2009.

Method 1: 80% of Base Daily Per Capita Water Use

Method 1 is the simplest approach and defines the water use target as 80% of the baseline value, or (0.8 x 169.2 GPCD) = 135.3 GPCD.

Table 8-1
ACWD Data for analysis and Compliance with SBX7-7

Calendar Year	Population Est. (CA DOF)	Gross Water Use (mgd)			Annual Daily per Capita Water Use (GPCD)	Base Daily per Capita Water Use (10 yr Average)	Base Daily per Capita Water Use (5 yr Average)
		ACWD Production Facilities	Private Well Pumping	Total Gross Water			
1995	278,182	42.8	4.3	47.1	169.4		
1996	280,812	46.5	4.0	50.5	180.0		
1997	286,734	49.8	4.1	53.9	188.0		
1998	295,661	46.0	2.8	48.8	165.2		
1999	304,006	48.7	2.5	51.2	168.5		
2000	312,753	49.7	3.5	53.2	170.2		
2001	317,954	49.8	2.7	52.4	164.9		
2002	322,532	49.6	3.2	52.8	163.6		
2003	323,210	48.4	3.1	51.5	159.4		
2004	322,736	49.2	3.4	52.6	163.0	**169.2**	
2005	323,465	47.1	2.9	50.1	154.8	167.8	
2006	324,390	46.9	2.5	49.4	152.4	165.0	
2007	326,616	48.7	2.3	50.9	156.0	161.8	**157.1**
2008	330,256	48.5	2.0	50.5	152.8	160.6	155.8
2009	333,881	43.8	1.9	45.7	136.8	157.4	150.6
2010	337,562	41.6	1.4	43.0	127.5	153.1	145.1

Method 2: Performance Standards

Method 2 is the most complex approach and defines the target per capita demand as the sum of defined performance standards for indoor residential, landscape and commercial, industrial, and institutional (CII) Water Use. This method accounts for local conditions through its consideration of actual local weather conditions and customer landscaping, however the data required to confirm these standards is extensive and far beyond what is typically available to water agencies. ACWD's analysis of Method 2 as a potential water use target is based mostly on available data but in some areas relies on reasonable assumptions. Data needs and assumptions are listed in Table 8-2 and results with specific performance standards are listed in table 8-3

Given the conservative assumptions made for this analysis, Method 2 target shows promise to be an achievable target for ACWD. However, the target lacks an allowance for water loss. Water loss is a typical aspect of water delivery, and an important area for scrutiny and improvement, however is not likely to be less than between 5% and 10% of total water demand for an efficient distribution system. Given the high level of data collection needed to comply with Method 2, and lack of allowance for reasonable transmission losses, ACWD will not select this method in 2010. However, ACWD will continue to gather some amount of the data needed and reevaluate the viability of this method prior to the 2015 UWMP.

Table 8-2
Method 2 Performance Standards and Requirements

Water Demand	*Performance Standard*	*Demand Based On*	*Data Required for Compliance by 2020*	*Assumptions and Data Needed for 2020 Target Est.*
Indoor Residential Use	55 gallons per capita per day	Population estimates	Department of Finance population estimates	None
Landscaped Area Water Use	Model Water Efficient Landscape Ordinance (MWELO)	Estimated landscape area for all residential customers on parcels < 24,000 ft^2	GIS- based measurements of approximately 5,000 residential customers' landscape area, needed to develop statistically viable algorithm relating parcel sizes to landscape area.	Limited sample set (850) sufficient for estimation within +/- 15%
		Individual landscape budgets for all residential accounts on parcels > 24,000 ft^2	Over 2,000 mixed use and residential accounts would require custom landscape budgets	MWELO budgets for all parcels assuming only 10,000 ft^2
		Individual landscape budgets for all dedicated landscape accounts	Over 2,000 dedicated landscape accounts would require budgets	Budgets are available for roughly half of accounts, comprising 90% of Demand. Total budget figures are estimated by scaling up existing figures to accounts for the remaining 10% of demand.
Commercial, Industrial, and Institutional Water Use (CII)	A 10% reduction in per capita CII water use from baseline.	Not applicable	Department of Finance population estimates and billed CII consumption during the required base period	None

Table 8-3
Results of ACWD Method 2 Analysis

Calendar year	*Population Estimate*	*Residential Indoor Target (GPCD)*	*CII Target (GPCD)*	*Estimated Landscape Demand (1) (GPCD)*	*Annual Target (GPCD)*
2010	337,562	62.8	37.5	50.9	151.3
2015	347,854	58.9	35.6	49.8	144.8
2020	358,408	55.0	33.8	48.7	137.3

(1) An additional 0.4 GPCD is typical used per year for fire-lines and temporary hydrant meters supporting construction activities. SBX7-7 does not stipulate that these demands can be added into the annual target and have therefore been omitted from this table.

Method 3: 95% of Regional Target

Method 3 relies on regional targets defined for specific hydrologic regions of the State of California. ACWD falls inside of the San Francisco Bay Region which has defined a baseline of 157 GPCD and 2020 target of 131 GPCD x 95% or 125 GPCD.

This target is notably lower than all other targets for ACWD. The San Francisco Bay Region (Region) on whole encompasses mostly cooler and wetter micro-climates than that of the ACWD service area, as illustrated by the Region's average annual precipitation of 21.4", 16% greater than the ACWD service area average of 18.4". This regional target does not sufficiently account for the efficient and reasonable use of water for landscape demands in the southeasterly portion of the Region (i.e. ACWD service area), and therefore is not considered by ACWD.

Method 4: DWR Methodology

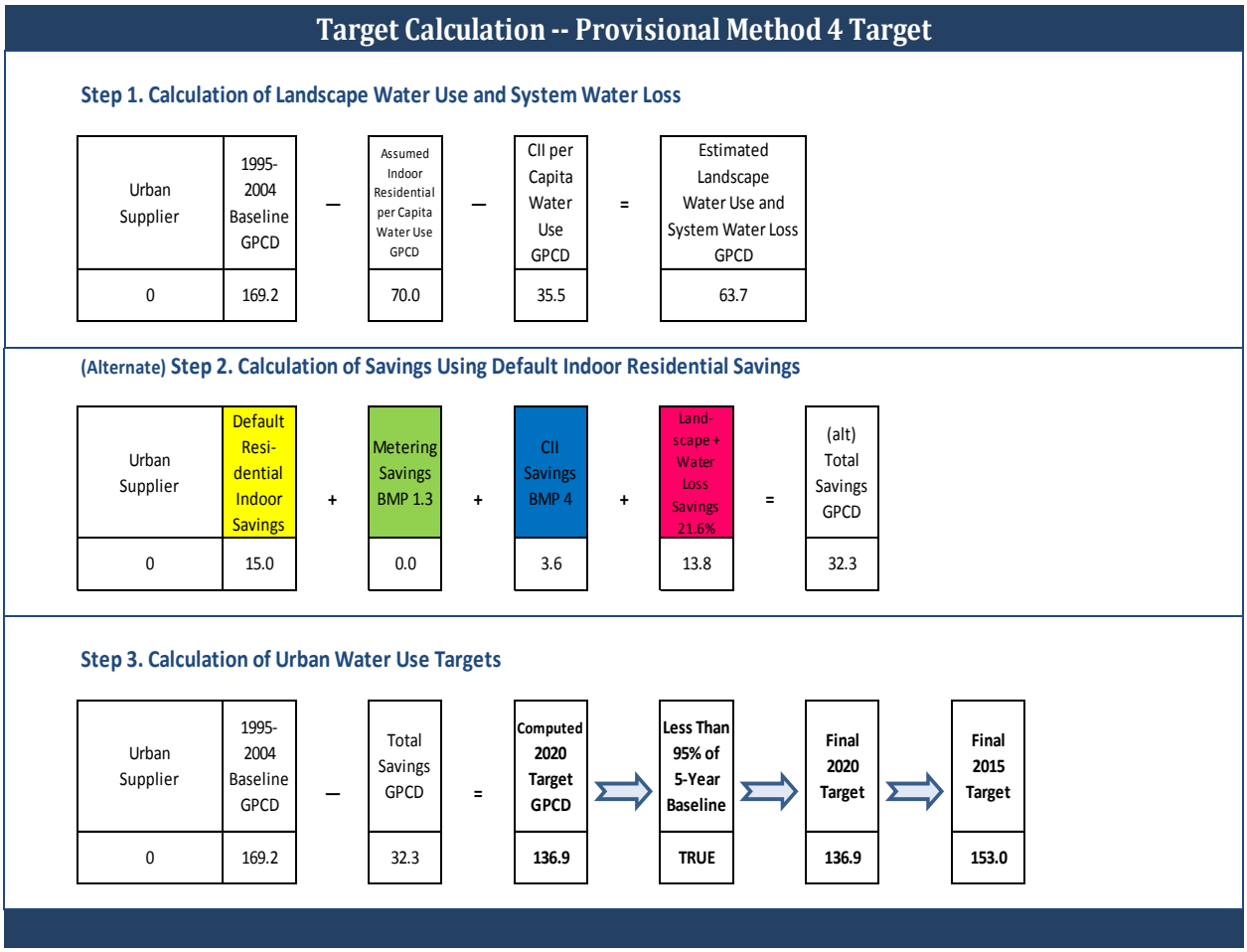
Target Method 4 was developed by DWR under direction from the State legislature. The Water Code provides that DWR will update it by December 31, 2014, but that it will be in effect until the update occurs.

Method 4 assumes savings between the baseline period and 2020 from the metering of unmetered water connections and the achievement of conservation measures in residential indoor, CII and Landscape water use, water loss and other unaccounted-for water (non-revenue water). DWR developed a spreadsheet calculator for use by individual agencies to determine their target. The calculator incorporates savings assumptions developed from a study of 52 randomly selected water suppliers in California with a variety of climatic and demographic characteristics. The calculator can either use a default savings assumption or an agency may individualize the calculation by entering past conservation activities. A summary of input data that is specific to ACWD is provided in Table 8-4.

Table 8-4
Method 4 Specific Inputs for ACWD

Input	*ACWD Selection*	*Details*
Baseline period	Jan 1, 1995 to Dec 31, 2004	ACWD selection
Midpoint of Baseline Period	1999	--
Baseline Water Use GPCD	169.2 GPCD	See Table 8-1
Population in Midpoint Year	304,006	Ca. DoF estimate, Table 8-1
CII consumption in Midpoint Year	12,097 AF/Yr	Billed CII consumption in 1999 without adjustment for water-loss
Number of unmetered Connections in Midpoint Year	0	ACWD does not have unmetered connections

Figure 8-1
Method 4 Target Calculated by DWR Spreadsheet Tool assuming Default Savings



Target Selection

The results of the four target method calculations are summarized in Table 8-5. ACWD has elected to use Target Method 4. However, ACWD will re-evaluate the target selection prior to the adoption of the District's next UWMP update in 2015.

Table 8-5
ACWD Target Compliance

	GPCD	*Assumption*
Baseline	169.2	Sec. 10608.20: Highest 10-yr average ending no earlier than Dec 31, 2004
Method 1 Target	135.4	80% of baseline
Method 2 Target	137.3	Sum of performance guidelines
Method 3 Target	124.5	95% of regional 131 GPCD
Method 4 Target *	136.9	Default Method 4 calculation provided by DWR
Alternative Minimum / 95% of 5-yr baseline	149.3	Sec. 10608.22: 95% of '03-'07 Average 157 GPCD. Selected target must be less than this figure.

**** Selected Method***

Step 3: Confirm Urban Water Use Target

In order to confirm that ACWD's selected water use target meets a minimum reduction established by statute, ACWD's selected target must be less than 95% of 5-year baseline demand ending no earlier than 12/31/2007. ACWD's selected 5-Year Base Period is CY 2003 through 2007, with a base daily per capita water use of 157 GPCD (see Table 8-1). The target minimum 95% of 157 GPCD is 149.3, which is greater than any of the Method 1 through 4 targets calculated (Table 8-5)

Step 4 – Determine Interim Water Use Target

Table 8-6 provides a summary of the baseline, 2015, and 2020 daily per capita water use targets, per the Method 4 approach, discussed above.

Table 8-6
ACWD Selected Water Use Target from Method 4

Calendar year	Population Estimate	Annual Target (GPCD)
Baseline	337,562	169.2
2015	347,854	153.0
2020	358,408	136.9

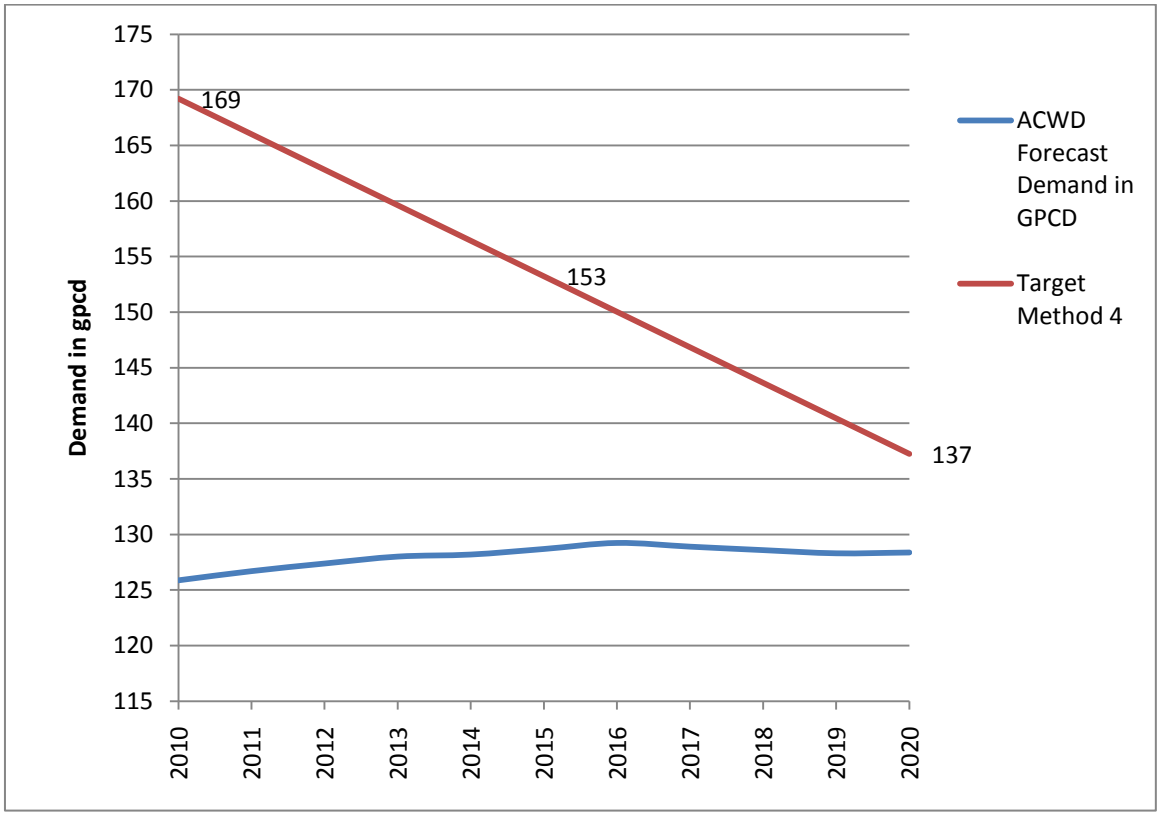
8.2 COMPLIANCE WITH SBX-7-7 WATER USE TARGETS

In 2015 and 2020, ACWD will be required to determine the compliance daily per capita water use to assess progress toward meeting interim and 2020 urban water use targets. In order to evaluate the projected future compliance with the SBX7-7 water use targets, the following provides a comparison of ACWD's water demand forecast with the water use targets. In addition, specific measures are identified to help ensure that ACWD will comply with the SBX7-7 targets.

Comparison of water use targets to projected demands

ACWD's projected water demands are provided in Chapter 2 of this UWMP Update. In order to compare the projected water demands with the SBX7-7 targets, the projected distribution system demands, combined with the private groundwater pumping demands, are divided by the population forecasts. The results of this comparison are shown on Figure 8-2. As shown on the figure, ACWD's projected per capita water use is below the SBX7-7 targets for 2015 and 2020. Therefore, based on current planning assumptions, ACWD is currently projected to be in compliance with both the 2015 and 2020 SBX7-7 water use targets.

Figure 8-2
ACWD Forecast Daily Per Capita Usage Compared to SB-7 Method 4 Thresholds



Measures for future compliance with the 2009 Water Conservation Act

A key assumption in the analysis of ACWD's compliance with the SBX7-7 water use targets is that the per capita water use in the service area will not fully rebound to pre-2007 conditions. In order to ensure that the gains in water efficiency over the past five years are not lost (and that ACWD complies with the SBX7-7 targets), ACWD is planning on the following measures:

Water use monitoring and tracking: ACWD routinely monitors water consumption, production and population in the service area. As part of this effort, on an annual basis staff will also calculate per capita water use, and compare the per capita water use with the SBX7-7 targets.

Continued implementation of water conservation programs: As described in Chapter 7, ACWD has implemented a comprehensive water conservation program. ACWD plans to continue to implement water existing water conservation measures and develop new measures, as appropriate. A key focus of ACWD conservation program will continue to target improvements in outdoor water use efficiency.

Consideration of water use efficiency rate structure: ACWD currently has a uniform water rate structure for all customer classifications. In order to further promote water use efficiency, ACWD has recently retained a consultant to evaluate alternative rate structures, including tiered-rates and budget-based rates. As of March 2010, this study is still on-going and no decisions have been made by the ACWD Board regarding changes to the rate structure. However, if the Board selects a new rate structure, it may be implemented as soon as February 2012.

Economic Impacts Analyses

Water Code Section 10608.26 requires that urban retail water suppliers consider potential economic impacts of the implementation plan for complying with SBX7-7. As described above, ACWD is currently projected to be in compliance with both the 2015 and 2020 SBX7-7 water use targets. No additional water reduction measures, beyond the water conservation programs already planned by ACWD, are anticipated to be needed to meet the District's water use targets. Therefore, the District does not anticipate that there will be additional economic impacts beyond those already contemplated as a result of the District's compliance with SBX7-7, nor will there be any disproportionate burden placed on any customer sector. In addition, compliance with SBX7-7 water use targets will not require that ACWD's existing customers undertake changes in product formulation, operations, or equipment that would reduce process water use.

CHAPTER 9
WATER SUPPLY STRATEGY

ACWD's Integrated Resources Plan recommended a water supply strategy to meet the District's planning objectives for water supply reliability, costs, water quality, environmental protection and risk. Included in the District's water supply strategy are programs for additional conservation, recycled water, brackish groundwater desalination and water banking/transfers. This chapter summarizes the planning criteria utilized by ACWD in developing the District's water supply strategy as part of the IRP process, followed by a summary of the recommended water supply strategy for the District and the implementation status of key IRP recommended programs.

9.1 PLANNING CRITERIA

The IRP utilized the following planning criteria in the formulation and evaluation of potential water supply strategies:

Costs: In addition to avoiding rate shocks, key IRP objectives related to costs are to 1) minimize resource costs, and 2) maintain low average customer bills. The District believes that keeping costs, and therefore customer bills, low is a paramount objective.

Reliability: The District intends to maintain a high level of service reliability for its current and future customers. The IRPs' primary focus was long-term water supply reliability because the District has contingency plans and internal standards (e.g., storage standards and peak-day spare capacity for pumps and tanks) to address short-term reliability issues. Through public and stakeholder input during the IRP process, the District determined that a shortage of greater than 10% in 1 out of every 30 years is unacceptable. Likewise, frequent small shortages have also been deemed unacceptable. Hence, resource strategies that result in shortages of greater than 10% or chronic shortages were not considered.

Water Quality: In addition to maximizing the health-related treated water quality, the District's IRP objectives also included avoiding sudden changes in water taste or appearance. Aesthetics, especially taste, are extremely important to District customers. Major fluctuations in aesthetics are noticeable to customers and may generate customer inquiries. One determinant of taste is hardness, expressed as mg/L, or parts per million (ppm) as $CaCO_3$. A key criterion used in the IRP process was to provide uniform hardness levels and limit the maximum monthly hardness.

Environmental Impacts: The District's planning objective was to avoid or mitigate environmental impacts. For a resource option to be considered viable, appropriate mitigation needs to be provided such that any significant environmental impacts are reduced to levels that are less than significant.

Local Control: In light of the current uncertainties associated with the District's imported supplies, the District determined that local control of future resources is desirable. Factors considered in evaluating local control include:

1. The number of entities involved in developing or acquiring the supply options;
2. The firmness of the District's water rights or contractual allocations;
3. The amount of water that the District would have to share with other contractors; and
4. Whether state or federal agencies are involved in allocating water deliveries.

Risk: The last key planning objective was to minimize risks due to future uncertainty. These risks include:

- ***Financial risk:*** The likelihood of spending more money than expected or spending money unnecessarily. This rating is affected by factors such as the ratio of fixed to variable cost, construction and permitting lead times and resource size. For example, resources with high capital cost are more financially risky than resources characterized by variable costs.

- ***Water quality regulatory risk:*** The likelihood of being unable to comply with future health-related water quality regulations. Even though the cost of treatment needed to comply with current standards is included for all source options, some sources have an inherently higher risk of not meeting future standards with existing treatment facilities.

- ***Availability risk:*** The likelihood that a supply source is not available due to external legal or regulatory changes or uncertainties in the quantity of supply provided or saved. For example, agricultural transfers may be risky because of contractual and through-Delta delivery issues.

9.2 WATER SUPPLY STRATEGY AND IMPLEMENTATION STATUS

As part of ACWD IRP process, the District evaluated a wide range of water supply and water conservation options. These options were packaged into nine alternative water supply strategies, each of which was evaluated against the District's planning objectives (described above). The recommended water supply strategy, chosen because it best met the District's objectives, included desalination, recycled water, conservation, groundwater management and off-site banking/transfers. Table 9-1 provides a summary of the key projects incorporated in the District's water supply strategy and their current implementation status.

Table 9-1
ACWD Water Supply Strategy and Implementation Status

IRP Component	*2000*	*2010*	*2020*	*2030*	*Implementation Status*
Conservation	Package 2 (IRP)	Package 2 (IRP)	Package 2 (IRP)	Package 2 (IRP)	All cost-effective BMPs are being implemented. New programs focused on landscape irrigation in place.
Desalination (mgd)	5	10	10	10	Phase 1 Desal (5 mgd) completed and in operation in 2003. Phase 2 (10 mgd) completed and operational in 2010.
Off-Site Storage/Banking Capacity (1,000 AF)	65	95	100	140	Secured 150,000 AF of off-site banking storage capacity at Semitropic Groundwater Banking Program.
Groundwater Management (Min. Inland GW Elev., ft mean sea-level)	1	-5	-5	-5	Completed the Quarry Lakes rehabilitation project to enhance groundwater recharge capacity (1996).
Recycled Water	---	---	Phase 1, timing is dependent on project needs, future recycled water customers and funding availability.		ACWD/USD Recycled Water Feasibility Study completed in 2010.

ACWD's previous Urban Water Management Plans were based on the same IRP water supply strategy that is included in this 2010-2015 Plan. Since the 2006-2010 Plan was adopted by the ACWD Board in 2005, ACWD has made significant progress in the implementation of this strategy. This progress includes: (1) on-going implementation of the District's water conservation program; (2) completion of the Phase 2 Newark Desalination Facility for a total treatment capacity of 10 mgd (2010); and (3) completion of a joint ACWD/USD feasibility study for a recycled water project (2010).

Each of the key components of ACWD water supply strategy is discussed in greater detail below:

Desalination

As described in Chapter 5, the IRP recommended developing a brackish groundwater desalination facility which would provide a new production facility to maximize use of local water supply by removing salts and other minerals from brackish (slightly salty) groundwater in the western portion of the groundwater basin.

ACWD completed construction of the first phase (5 mgd permeate production capacity) of the Newark Desalination Facility in 2003. In 2010 the Phase 2 expansion of the Newark Desalination Facility was completed, providing a total treatment capacity of 10 mgd. ACWD was awarded a $2.8 million grant from the California Department of Water Resources for this expansion. The Newark Desalination Facility utilizes state-of-the-art reverse osmosis technology to convert brackish water to potable water. This process forces water under pressure across a semi-permeable membrane. The membrane allows water molecules to pass through but stops dissolved minerals such as salts and iron. The soft water produced by the Desalination Facility is blended with the harder groundwater to provide a supply with lower overall hardness.

The source water for the desalination facility comes from a series of wells that remove brackish water from the western portion of the Niles Cone Groundwater Basin. This program, called the Aquifer Reclamation Program, was developed to stop the spread of brackish water already in the groundwater basin and to reclaim the aquifers of the basin for future potable use. With the start-up of the Newark Desalination Facility in 2003, a portion of the brackish groundwater pumped from these wells has been treated for subsequent potable use rather than being allowed to flow to San Francisco Bay. This represents a new source of supply to the extent that this brackish groundwater would be pumped regardless (through the District's Aquifer Reclamation Program) in order to improve water quality in the basin and to protect the District's Mowry Wellfield.

Recycled Water

The District's long-term supply strategy includes a potential recycled water program, which will provide up to 1,600 AF/yr of non-potable supply (e.g. landscape irrigation and industrial process water). As described in Chapter 6 of this report, the source of recycled water will likely be from a joint project with ACWD and Union Sanitary District (USD). As an interim supply, another potential source is the purchase of recycled water from the South Bay Water Recycling Program. Recycled water distribution pipelines will be separate from the District's existing potable distribution system and, therefore, would not adversely affect existing potable supply operations. The volume of recycled water produced would be the same in drought years as in normal years, thus providing a firm source of supply. Demand for recycled water for irrigation purposes is highest in the summer months. Therefore, in addition to increasing water supply, use of reclaimed water would help meet peak monthly and daily production capacity needs.

In 2010 ACWD and USD completed the ACWD/USD Recycled Water Feasibility Study Update. This study identified two potential recycled water projects with a potential combined supply of up to 2,500 AF/Yr. However, a significant portion of this supply would be to meet future demands from land use projects (including a golf course) that, as of 2011, have not yet been developed and are in various stages of the planning process. In addition, because of economic conditions, the 2007-09 drought, and other factors, the existing and projected water demands in the ACWD service area are significantly lower than previous forecasts. Based on discussions with representatives from the Fremont, Union City and Newark, it is also likely that many of the planned development projects (including potential future recycled water customers) will be significantly delayed until economic conditions are more favorable.

Because of the lower projected water demands over the UWMP planning horizon coupled with uncertainties regarding the timing of future developments, recycled water is not included in the 25-year planning horizon of the water supply-demand comparisons provided in this UWMP. However, recycled water is still considered a potential future source of supply for ACWD, especially in light of uncertainties with the reliability of ACWD's existing supplies, and a potential rebound of water demands in the service area – both of which could accelerate the need for a recycled water project. As part of the 2011 update to the District's Integrated Resources Planning Study, ACWD will continue to evaluate the potential timing for a future recycled water project in the service area.

Demand Management

As discussed in Chapter 7, demand management is a key component of ACWD's long-term water supply and management strategy. The IRP recommended program ("Package 2") includes components to reduce both indoor and outdoor use for all customer groups within the District's service area. However, the focus of the recommended program is to reduce peak summer demands in order to reduce the need for additional production and storage facilities. In addition, in order to meet SBX7-7 water use targets, and as a signatory to the MOU on Urban Water Conservation, ACWD is committed to implementing locally cost-effective water conservation best management practices ("BMPs"), as developed by the California Urban Water Conservation Council (CUWCC). A summary of ACWD's water conservation program is presented in Chapter 7 and Appendix D (BMP Implementation Report), and ACWD's target water use and SBX7-7 compliance strategy is provided in Chapter 8.

As part of the IRP process, the District estimated that the total long-term savings from District sponsored conservation measures would range from approximately 1,600 AF/Yr to 4,900 AF/Yr. A range in potential savings was developed due to the uncertainties in actual savings associated with water conservation programs. For planning purposes, an average annual projected savings of 2,900 AF/Yr between the years 2000 and 2020 was utilized in ACWD's previous UWMP (an increase in conservation of approximately 730 AF/Yr every five years). Therefore, this 2010-2015 UWMP assumes that, of the 2,900 AF/Yr estimated total savings, approximately 1,500 AF/Yr of savings has already been achieved due to conservation program implementation between the years 2000 and 2010. This existing level of conservation savings (or "baseline" conservation) of 1,500 AF/Yr is already accounted for in the demand projections. Therefore, this 2010-2015 Urban Water Management Plan assumes that the remaining balance of 1,400 AF/Yr savings (or 2,900 AF/Yr minus 1,500 AF/Yr) will be achieved by the year 2020.

Groundwater Management

As stipulated in the District's Groundwater Management Policy (adopted on January 26, 1989, and amended on March 22, 2001), it is the policy of the District to efficiently protect and manage the Niles Cone Groundwater Basin to ensure a reliable supply of high quality water that satisfies present and future municipal, industrial, recreational and agricultural water needs in the ACWD service area (see Chapter 4 for a more detailed discussion of local groundwater management). In order to protect the Basin from seawater intrusion, the District's operational goals are to maintain groundwater levels above sea-level in the Newark Aquifer system (the upper aquifer which is hydraulically connected to San Francisco Bay). However, during critically dry periods the District may temporarily reduce groundwater levels slightly below sea-level (-5 feet mean sea-level minimum level), in the Newark Aquifer in the Forebay (inland) area. Detailed modeling analysis has indicated that temporarily drawing the aquifer down in this inland area could provide additional supply in critically dry years without impacting the integrity of the Basin. This analysis assumes that (1) there are no new parties pumping from the Basin, and (2) that groundwater outflows from the Basin are not increased due to increased pumping in adjacent groundwater basins that are hydraulically connected with the Niles Cone Groundwater Basin.

A key component of ACWD's management of the Niles Cone Groundwater Basin is the capability to recharge the groundwater system through the District's groundwater percolation ponds. In order to maintain the recharge capacity at these ponds, the District completed a rehabilitation of these percolation ponds in 1997. Under an agreement with the East Bay Regional Park District, the Quarry Lakes rehabilitation project also allowed for joint use of these percolation ponds for recreation and wildlife purposes.

Off-Site Banking and Transfers/Exchanges

Even with new programs for water conservation, recycled water and desalination, the District identified the need for additional supplies during dry and critically dry years. In 1999, the District completed an evaluation of a wide-range of alternatives to meet our dry year water needs. The report identified the potential methods to secure dry year supplies through both off-site banking and transfers/exchanges.

Off-site storage involves storing excess ACWD SWP supplies during wet and above normal years, for use during dry years. Because ACWD has limited local storage in the Niles Cone Groundwater Basin, storage needs to take place at off-site surface reservoirs or groundwater basins. The IRP shows a total need of 100,000 AF of off-site storage capacity by the year 2020, and 140,000 AF by the year 2030. To meet these goals, in 1997 ACWD secured 50,000 AF of storage capacity at the Semitropic Groundwater Banking Program and in 2001 secured an additional 100,000 AF, for a total combined storage capacity of 150,000 AF. As of March 2011, ACWD has approximately 110,000 AF of water in storage at the Semitropic Groundwater Bank

A key limitation to the Semitropic Banking Program is the capacity to return water to ACWD during dry years. Under ACWD's water banking agreements with Semitropic, the amount of return (or "take" capacity) from the program is based on the total amount of storage capacity. Because of this limitation, the amount of storage capacity ACWD has secured at Semitropic has exceeded the IRP recommended quantity. ACWD water supply analyses has indicated that in most dry years this groundwater banking capacity, in combination with the District's other water supplies, will be sufficient to meet the District's water needs. However, because of potential limitations on Semitropic recovery capacity due to Delta pumping restrictions and other factors, during the most critical droughts (e.g. 1977 conditions), ACWD may still not have adequate take capacity from the Semitropic Banking Program to meet all in-District water demands.

Another option to meet dry year water supply needs is for ACWD to enter into exchange agreements for dry year supplies or to purchase raw water supplies in dry years. Typically, these options would involve purchasing Delta water supplies from an entity which could temporarily use a local groundwater supply in-lieu of surface water supplies provided to ACWD. ACWD currently participates with the Department of Water Resources and State Water Contractors on an annual basis to evaluate potential water transfer opportunities.

9.3 WATER SUPPLY AND DEMAND COMPARISONS

A key recommendation in the District's 1995 Integrated Resources Planning Study was that the implementation status and planning assumptions be reviewed every ten years. In 2006, the District completed the 2006 IRP Update Review, which confirmed the overall water supply strategy recommended in the 1995 IRP. However, because of changes in water supply and demand assumptions since 2006, ACWD is in the process of conducting a second IRP review. As part of the review process, ACWD has completed its analysis of the projected water supply availability and demands under average year, single dry year, and multiple dry year conditions. These analyses are based on the most recent water supply availability projections (as described in Chapter 3) provided by the DWR and the SFPUC for ACWD's imported water supplies. Projections of local water supply reliability are based on modeling analyses under long-term local hydrologic conditions (1922-2003 historical rainfall and runoff in the Alameda Creek Watershed), and include assumptions for bypass flows at ACWD's recharge facilities in Alameda Creek (based on March 2011 preliminary agreements with National Marine Fisheries Service and California Department of Fish and Game).

The results of these analyses are presented in Table 9-2 and indicate that under normal year water supply conditions (representing median-year water supply availability based on 1922-2003 historical hydrologic conditions) ACWD will have sufficient supplies to meet projected future water demands, as adjusted for estimated future water conservation savings. As indicated in Table 9-2, this analysis also indicates that during these hydrologic conditions, ACWD would have sufficient supplies available (in excess of the projected demands) for placing into groundwater storage (locally or at the off-site Semitropic Groundwater Bank) for later use in the service area in dry years. However, as demand in the ACWD service area continues to grow through the year 2035, the amount of projected supply available for dry year banking (or to provide a buffer for future water supply uncertainties) will be reduced.

Table 9-2
Projected Normal Year Water Supply and Demand Comparison (AF/Yr)

SUPPLY/DEMAND	Year				
	2015	2020	2025	2030	2035
SUPPLY COMPONENT					
Imported Supplies					
-State Water Project	27,500	27,500	27,500	27,500	27,500
- San Francisco Regional	15,400	15,400	15,400	15,400	15,400
Total Imported Supplies	**42,900**	**42,900**	**42,900**	**42,900**	**42,900**
Local Supplies					
- Groundwater Recharge	24,500	24,500	24,500	24,500	24,500
- Groundwater Storage	0	0	0	0	0
- Del Valle	5,800	5,800	5,800	5,800	5,800
- Desalination	5,100	5,100	5,100	5,100	5,100
- Recycled Water	0	0	0	0	0
Total Local Supplies	**35,400**	**35,400**	**35,400**	**35,400**	**35,400**
Banking/Transfers					
- Semitropic Banking	**0**	**0**	**0**	**0**	**0**
TOTAL SUPPLY	***78,300***	***78,300***	***78,300***	***78,300***	***78,300***
DEMAND COMPONENT					
- Distribution System Demand	50,900	53,000	54,800	57,000	58,000
- Additional Conservation Savings	(800)	(1,400)	(1,400)	(1,400)	(1,400)
- Groundwater System Demands	16,200	16,200	16,200	16,200	16,200
TOTAL DEMAND	***66,300***	***67,800***	***69,600***	***71,800***	***72,800***
SUPPLY & DEMAND COMPARISON					
- Supply Totals	78,300	78,300	78,300	78,300	78,300
- Demand Totals	66,300	67,800	69,600	71,800	72,800
- Difference	12,000	10,500	8,700	6,500	5,500
- Difference as % of Supply	15%	13%	11%	8%	7%
- Difference as % of Demand	18%	15%	13%	9%	8%

Notes:
1. Normal Year conditions are based on the median supply availability based on a review of 1922-2003 historical hydrologic conditions. The year 1936 was selected as it is the closest year to the statistical median for each individual water supply source.
2. Groundwater System Demands include: (1) ARP groundwater production, (2) private groundwater pumping, and (3) saline groundwater outflows.
3. ACWD expanded the Newark Desalination Facility from 5 mgd to 10 mgd in the year 2010. Depending on groundwater conditions, the expanded desalination facility may provide up to 11,200 AF/Yr of production in a given year.
4. Under Normal Year conditions, ACWD does not anticipate utilizing Groundwater Storage (groundwater use in excess of recharge) or Semitropic Groundwater Banking. These supplies would be used under dry year conditions when imported and local supply availability would be reduced.
5. As documented in ACWD's 2001-2005 UWMP, ACWD's long-term planning is based on conservation savings of 2,900 AF/Yr to be achieved by the year 2020. Of the 2,900 AF/Yr estimated savings, it is estimated that 1,500 AF/Yr of savings has already been achieved due to conservation program implementation between the years 2000 and 2010. This existing level of conservation savings (1,500 AF/Yr) is already accounted for in the demand projections. Therefore, this 2011-2015 Urban Water Management Plan assumes that the remaining balance of 1,400 AF/Yr savings (or 2,900 AF/Yr minus 1,500 AF/Yr) will be achieved by the year 2020.

Table 9-3 provides a summary of the supply availability under the most severe single-year drought on record (1977). This drought year represents the projected minimum water supply availability considering all of ACWD's water supplies (i.e. State Water Project, San Francisco Regional and local supplies). Under this dry year scenario, ACWD's SWP supplies would be cut back by approximately 90%, and ACWD would need to rely on local and off-site groundwater storage to help make up for this shortfall. However, ACWD would still incur a shortage of up to 10% under this scenario. In the event that there is insufficient local groundwater storage, or ACWD is unable to recover its full contractual amount from the Semitropic Groundwater Banking Program, ACWD would look to secure additional supplies through a DWR drought water bank or similar water purchase/transfer program. In addition, ACWD would also likely implement the drought contingency plan described in Chapter 10 of this Plan.

Tables 9-4 through 9-8 provide summaries of the projected supply availabilities under a long-term (5 year) drought for 2011-2015, 2016-2020, 2021-2025, 2026-2030, and 2031-2035 demand conditions. This multiple year drought sequence is based on the 1987-1991 historical hydrologic conditions, which represents the most severe 5-year drought on record (based on projected availability of ACWD's supplies over the 1922-03 hydrologic period). The results from these analyses indicate that ACWD will have sufficient supplies to withstand a similar long-term drought. The maximum shortage projected (5% in the fourth year of the drought sequence 2031-2035) is well within the District's reliability goals of no more than a 10% shortage on a one in thirty year basis. As with the single dry year condition, both local groundwater storage and off-site groundwater storage in Semitropic will play key roles in offsetting shortfalls in the District's other local and imported supplies.

Table 9-3
Projected Single Dry Year Water Supply and Demand Comparison (AF/Yr)

SUPPLY/DEMAND	Year				
	2015	2020	2025	2030	2035
SUPPLY COMPONENT					
Imported Supplies					
-State Water Project	4,000	4,000	4,000	4,000	4,000
- San Francisco Regional	13,400	13,400	13,400	13,500	13,500
Total Imported Supplies	**17,400**	**17,400**	**17,400**	**17,500**	**17,500**
Local Supplies					
- Groundwater Recharge	15,600	15,400	15,100	14,900	14,600
- Groundwater Storage	10,000	10,000	10,000	10,000	10,000
- Del Valle	100	100	100	100	100
- Desalination	5,100	5,100	5,100	5,100	5,100
- Recycled Water	0	0	0	0	0
Total Local Supplies	**30,800**	**30,600**	**30,300**	**30,100**	**29,800**
Banking/Transfers					
- Semitropic Banking	**13,500**	**13,500**	**13,500**	**13,500**	**13,500**
TOTAL SUPPLY	***61,700***	***61,500***	***61,200***	***61,100***	***60,800***
DEMAND COMPONENT					
- Distribution System Demand	50,900	53,000	54,800	57,000	58,000
- Additional Conservation Savings	(800)	(1,400)	(1,400)	(1,400)	(1,400)
- Groundwater System Demands	13,100	13,100	13,100	13,100	13,100
TOTAL DEMAND	***63,200***	***64,700***	***66,500***	***68,700***	***69,700***
SUPPLY & DEMAND COMPARISON					
- Supply Totals	61,700	61,500	61,300	61,100	60,800
- Demand Totals	64,200	64,600	65,500	66,700	66,800
- Difference	(2,500)	(3,100)	(4,200)	(5,600)	(6,000)
- Difference as % of Supply	-4%	-5%	-7%	-9%	-10%
- Difference as % of Demand	-4%	-5%	-6%	-8%	-9%

Notes:
1. Single Dry Year conditions are based on the projected supply availability under 1977 drought conditions.
2. Groundwater system demands include: (1) ARP groundwater production, (2) private groundwater pumping, and (3) saline groundwater outflows. Under dry year conditions ACWD's groundwater system demands may be reduced from Normal Year conditions due to a reduction in saline groundwater outflows as local groundwater elevations are temporarily lowered.
3. ACWD expanded the Newark Desalination Facility from 5 mgd to 10 mgd in the year 2010. Depending on groundwater conditions, the expanded desalination facility may provide up to 11,200 AF/Yr of production in a given year.
4. As documented in ACWD's 2001-2005 UWMP, ACWD's long-term planning is based on conservation savings of 2,900 AF/Yr to be achieved by the year 2020. Of the 2,900 AF/Yr estimated savings, it is estimated that 1,500 AF/Yr of savings has already been achieved due to conservation program implementation between the years 2000 and 2010. This existing level of conservation savings (1,500 AF/Yr) is already accounted for in the demand projections. Therefore, this 2011-2015 Urban Water Management Plan assumes that the remaining balance of 1,400 AF/Yr savings (or 2,900 AF/Yr minus 1,500 AF/Yr) will be achieved by the year 2020.

Table 9-4
Projected Multiple Dry Year Period Water Supply and Demand Comparison for 2011-2015 (AF/Yr)

SUPPLY/DEMAND	Year				
	2011	2012	2013	2014	2015
SUPPLY COMPONENT					
Imported Supplies					
-State Water Project	11,000	12,400	24,900	8,200	11,800
- San Francisco Regional	14,100	13,400	8,500	8,500	8,500
Total Imported Supplies	**25,100**	**25,800**	**33,400**	**16,700**	**20,300**
Local Supplies					
- Groundwater Recharge	14,300	14,300	16,800	14,700	13,500
- Groundwater Storage	5,200	3,500	1,900	9,900	0
- Del Valle	1,500	800	800	400	4,900
- Desalination	5,100	5,100	5,100	5,100	5,100
- Recycled Water	0	0	0	0	0
Total Local Supplies	**26,100**	**23,700**	**24,600**	**30,100**	**23,500**
Banking/Transfers					
- Semitropic Banking	**12,800**	**13,200**	**4,300**	**14,100**	**16,400**
TOTAL SUPPLY	***64,000***	***62,700***	***62,300***	***60,900***	***60,200***
DEMAND COMPONENT					
- Distribution System Demand	48,400	49,100	49,800	50,300	50,900
- Additional Conservation Savings	(300)	(400)	(500)	(700)	(800)
- Groundwater System Demands	14,200	13,100	11,600	10,200	9,200
TOTAL DEMAND	***62,300***	***61,800***	***60,900***	***59,800***	***59,300***
SUPPLY & DEMAND COMPARISON					
- Supply Totals	64,000	62,700	62,300	60,900	60,200
- Demand Totals	62,300	61,800	60,900	59,800	59,300
- Difference	1,700	900	1,400	1,100	900
- Difference as % of Supply	3%	1%	2%	2%	1%
- Difference as % of Demand	3%	1%	2%	2%	2%

Notes:
1. Multiple Dry Year conditions are based on the projected supply availability under 1987-91 drought conditions.
2. Groundwater system demands include: (1) ARP groundwater production, (2) private groundwater pumping, and (3) saline groundwater outflows. Under dry year conditions ACWD's groundwater system demands may be reduced from Normal Year conditions due to a reduction in saline groundwater outflows as local groundwater elevations are temporarily lowered.
3. ACWD expanded the Newark Desalination Facility from 5 mgd to 10 mgd in the year 2010. Depending on groundwater conditions, the expanded desalination facility may provide up to 11,200 AF/Yr of production in a given year.
4. As documented in ACWD's 2001-2005 UWMP, ACWD's long-term planning is based on conservation savings of 2,900 AF/Yr to be achieved by the year 2020. Of the 2,900 AF/Yr estimated savings, it is estimated that 1,500 AF/Yr of savings has already been achieved due to conservation program implementation between the years 2000 and 2010. This existing level of conservation savings (1,500 AF/Yr) is already accounted for in the demand projections. Therefore, this 2011-2015 Urban Water Management Plan assumes that the remaining balance of 1,400 AF/Yr savings (or 2,900 AF/Yr minus 1,500 AF/Yr) will be achieved by the year 2020.

Table 9-5
Projected Multiple Dry Year Period Water Supply and Demand Comparison for 2016-2020 (AF/Yr)

SUPPLY/DEMAND	Year				
	2016	2017	2018	2019	2020
SUPPLY COMPONENT					
Imported Supplies					
-State Water Project	11,000	12,400	24,900	8,200	11,800
- San Francisco Regional	14,300	13,300	9,200	8,900	9,000
Total Imported Supplies	**25,300**	**25,700**	**34,100**	**17,100**	**20,800**
Local Supplies					
- Groundwater Recharge	14,400	14,500	16,100	15,100	13,600
- Groundwater Storage	5,300	3,800	1,400	10,000	600
- Del Valle	1,500	800	800	400	4,900
- Desalination	5,100	5,100	5,100	5,100	5,100
- Recycled Water	0	0	0	0	0
Total Local Supplies	**26,300**	**24,200**	**23,400**	**30,600**	**24,200**
Banking/Transfers					
- Semitropic Banking	**13,600**	**14,100**	**6,100**	**14,100**	**16,400**
TOTAL SUPPLY	***65,200***	***64,000***	***63,600***	***61,800***	***61,400***
DEMAND COMPONENT					
- Distribution System Demand	51,600	51,900	52,200	52,500	53,000
- Additional Conservation Savings	(900)	(1,100)	(1,200)	(1,300)	(1,400)
- Groundwater System Demands	14,000	12,700	11,400	10,300	9,300
TOTAL DEMAND	***64,700***	***63,500***	***62,400***	***61,500***	***60,900***
SUPPLY & DEMAND COMPARISON					
- Supply Totals	65,200	64,000	63,600	61,800	61,400
- Demand Totals	64,700	63,500	62,400	61,500	60,900
- Difference	500	500	1,200	300	500
- Difference as % of Supply	1%	1%	2%	0%	1%
- Difference as % of Demand	1%	1%	2%	0%	1%

Notes:
1. Multiple Dry Year conditions are based on the projected supply availability under 1987-91 drought conditions.
2. Groundwater system demands include: (1) ARP groundwater production, (2) private groundwater pumping, and (3) saline groundwater outflows. Under dry year conditions ACWD's groundwater system demands may be reduced from Normal Year conditions due to a reduction in saline groundwater outflows as local groundwater elevations are temporarily lowered.
3. ACWD expanded the Newark Desalination Facility from 5 mgd to 10 mgd in the year 2010. Depending on groundwater conditions, the expanded desalination facility may provide up to 11,200 AF/Yr of production in a given year.
4. As documented in ACWD's 2001-2005 UWMP, ACWD's long-term planning is based on conservation savings of 2,900 AF/Yr to be achieved by the year 2020. Of the 2,900 AF/Yr estimated savings, it is estimated that 1,500 AF/Yr of savings has already been achieved due to conservation program implementation between the years 2000 and 2010. This existing level of conservation savings (1,500 AF/Yr) is already accounted for in the demand projections. Therefore, this 2011-2015 Urban Water Management Plan assumes that the remaining balance of 1,400 AF/Yr savings (or 2,900 AF/Yr minus 1,500 AF/Yr) will be achieved by the year 2020.

Table 9-6
Projected Multiple Dry Year Period Water Supply and Demand Comparison for 2021-2025 (AF/Yr)

SUPPLY/DEMAND	Year				
	2021	2022	2023	2024	2025
SUPPLY COMPONENT					
Imported Supplies					
-State Water Project	11,000	12,400	24,900	8,200	11,800
- San Francisco Regional	14,600	13,200	9,800	9,200	9,500
Total Imported Supplies	**25,600**	**25,600**	**34,700**	**17,400**	**21,300**
Local Supplies					
- Groundwater Recharge	14,600	14,700	15,400	15,400	13,600
- Groundwater Storage	5,400	4,100	900	10,000	1,300
- Del Valle	1,500	800	800	400	4,900
- Desalination	5,100	5,100	5,100	5,100	5,100
- Recycled Water	0	0	0	0	0
Total Local Supplies	**26,600**	**24,700**	**22,200**	**30,900**	**24,900**
Banking/Transfers					
- Semitropic Banking	**14,400**	**15,000**	**7,900**	**14,000**	**16,400**
TOTAL SUPPLY	***66,600***	***65,300***	***64,800***	***62,300***	***62,600***
DEMAND COMPONENT					
- Distribution System Demand	53,300	53,700	54,100	54,400	54,800
- Additional Conservation Savings	(1,400)	(1,400)	(1,400)	(1,400)	(1,400)
- Groundwater System Demands	13,800	12,300	11,300	10,400	9,400
TOTAL DEMAND	***65,700***	***64,600***	***64,000***	***63,400***	***62,800***
SUPPLY & DEMAND COMPARISON					
- Supply Totals	66,600	65,300	64,800	62,300	62,600
- Demand Totals	65,700	64,600	64,000	63,400	62,800
- Difference	900	700	800	(1,100)	(200)
- Difference as % of Supply	1%	1%	1%	-2%	0%
- Difference as % of Demand	1%	1%	1%	-2%	0%

Notes:
1. Multiple Dry Year conditions are based on the projected supply availability under 1987-91 drought conditions.
2. Groundwater system demands include: (1) ARP groundwater production, (2) private groundwater pumping, and (3) saline groundwater outflows. Under dry year conditions ACWD's groundwater system demands may be reduced from Normal Year conditions due to a reduction in saline groundwater outflows as local groundwater elevations are temporarily lowered.
3. ACWD expanded the Newark Desalination Facility from 5 mgd to 10 mgd in the year 2010. Depending on groundwater conditions, the expanded desalination facility may provide up to 11,200 AF/Yr of production in a given year.
4. As documented in ACWD's 2001-2005 UWMP, ACWD's long-term planning is based on conservation savings of 2,900 AF/Yr to be achieved by the year 2020. Of the 2,900 AF/Yr estimated savings, it is estimated that 1,500 AF/Yr of savings has already been achieved due to conservation program implementation between the years 2000 and 2010. This existing level of conservation savings (1,500 AF/Yr) is already accounted for in the demand projections. Therefore, this 2011-2015 Urban Water Management Plan assumes that the remaining balance of 1,400 AF/Yr savings (or 2,900 AF/Yr minus 1,500 AF/Yr) will be achieved by the year 2020.

Table 9-7
Projected Multiple Dry Year Period Water Supply and Demand Comparison for 2026-2030 (AF/Yr)

SUPPLY/DEMAND	Year				
	2026	2027	2028	2029	2030
SUPPLY COMPONENT					
Imported Supplies					
-State Water Project	11,000	12,400	24,900	8,200	11,800
- San Francisco Regional	14,900	13,100	10,500	9,600	10,000
Total Imported Supplies	**25,900**	**25,500**	**35,400**	**17,800**	**21,800**
Local Supplies					
- Groundwater Recharge	14,700	14,900	14,700	15,700	13,700
- Groundwater Storage	5,600	4,400	500	10,000	1,900
- Del Valle	1,500	800	800	400	4,900
- Desalination	5,100	5,100	5,100	5,100	5,100
- Recycled Water	0	0	0	0	0
Total Local Supplies	**26,900**	**25,200**	**21,100**	**31,200**	**25,600**
Banking/Transfers					
- Semitropic Banking	**15,200**	**15,900**	**9,700**	**14,000**	**16,400**
TOTAL SUPPLY	***68,000***	***66,600***	***66,200***	***63,000***	***63,800***
DEMAND COMPONENT					
- Distribution System Demand	55,200	55,500	55,900	56,500	57,000
- Additional Conservation Savings	(1,400)	(1,400)	(1,400)	(1,400)	(1,400)
- Groundwater System Demands	13,600	11,900	11,100	10,500	9,400
TOTAL DEMAND	***67,400***	***66,000***	***65,600***	***65,600***	***65,000***
SUPPLY & DEMAND COMPARISON					
- Supply Totals	68,000	66,600	66,200	63,000	63,800
- Demand Totals	67,400	66,000	65,600	65,600	65,000
- Difference	600	600	600	(2,600)	(1,200)
- Difference as % of Supply	1%	1%	1%	-4%	-2%
- Difference as % of Demand	1%	1%	1%	-4%	-2%

Notes:
1. Multiple Dry Year conditions are based on the projected supply availability under 1987-91 drought conditions.
2. Groundwater system demands include: (1) ARP groundwater production, (2) private groundwater pumping, and (3) saline groundwater outflows. Under dry year conditions ACWD's groundwater system demands may be reduced from Normal Year conditions due to a reduction in saline groundwater outflows as local groundwater elevations are temporarily lowered.
3. ACWD expanded the Newark Desalination Facility from 5 mgd to 10 mgd in the year 2010. Depending on groundwater conditions, the expanded desalination facility may provide up to 11,200 AF/Yr of supply in a given year.
4. As documented in ACWD's 2001-2005 UWMP, ACWD's long-term planning is based on conservation savings of 2,900 AF/Yr to be achieved by the year 2020. Of the 2,900 AF/Yr estimated savings, it is estimated that 1,500 AF/Yr of savings has already been achieved due to conservation program implementation between the years 2000 and 2010. This existing level of conservation savings (1,500 AF/Yr) is already accounted for in the demand projections. Therefore, this 2011-2015 Urban Water Management Plan assumes that the remaining balance of 1,400 AF/Yr savings (or 2,900 AF/Yr minus 1,500 AF/Yr) will be achieved by the year 2020.

Table 9-8
Projected Multiple Dry Year Period Water Supply and Demand Comparison for 2031-2035 (AF/Yr)

SUPPLY/DEMAND	Year				
	2031	2032	2033	2034	2035
SUPPLY COMPONENT					
Imported Supplies					
-State Water Project	11,000	12,400	24,900	8,200	11,800
- San Francisco Regional	15,100	13,000	11,100	9,900	10,600
Total Imported Supplies	**26,100**	**25,400**	**36,000**	**18,100**	**22,400**
Local Supplies					
- Groundwater Recharge	14,800	15,100	13,900	16,100	13,700
- Groundwater Storage	5,700	4,800	0	10,000	2,500
- Del Valle	1,500	800	800	400	4,900
- Desalination	5,100	5,100	5,100	5,100	5,100
- Recycled Water	0	0	0	0	0
Total Local Supplies	**27,100**	**25,800**	**19,800**	**31,600**	**26,200**
Banking/Transfers					
- Semitropic Banking	**15,900**	**16,700**	**11,500**	**14,000**	**16,400**
TOTAL SUPPLY	***69,100***	***67,900***	***67,300***	***63,700***	***65,000***
DEMAND COMPONENT					
- Distribution System Demand	57,300	57,400	57,600	57,700	58,000
- Additional Conservation Savings	(1,400)	(1,400)	(1,400)	(1,400)	(1,400)
- Groundwater System Demands	13,400	11,500	11,000	10,600	9,500
TOTAL DEMAND	***69,300***	***67,500***	***67,200***	***66,900***	***66,100***
SUPPLY & DEMAND COMPARISON					
- Supply Totals	69,100	67,900	67,300	63,700	65,000
- Demand Totals	69,300	67,500	67,200	66,900	66,100
- Difference	(200)	400	100	(3,200)	(1,100)
- Difference as % of Supply	0%	1%	0%	-5%	-2%
- Difference as % of Demand	0%	1%	0%	-5%	-2%

Notes:
1. Multiple Dry Year conditions are based on the projected supply availability under 1987-91 drought conditions.
2. Groundwater system demands include: (1) ARP groundwater production, (2) private groundwater pumping, and (3) saline groundwater outflows. Under dry year conditions ACWD's groundwater system demands may be reduced from Normal Year conditions due to a reduction in saline groundwater outflows as local groundwater elevations are temporarily lowered.
3. ACWD expanded the Newark Desalination Facility from 5 mgd to 10 mgd in the year 2010. Depending on groundwater conditions, the expanded desalination facility may provide up to 11,200 AF/Yr of supply in a given year.
4. As documented in ACWD's 2001-2005 UWMP, ACWD's long-term planning is based on conservation savings of 2,900 AF/Yr to be achieved by the year 2020. Of the 2,900 AF/Yr estimated savings, it is estimated that 1,500 AF/Yr of savings has already been achieved due to conservation program implementation between the years 2000 and 2010. This existing level of conservation savings (1,500 AF/Yr) is already accounted for in the demand projections. Therefore, this 2011-2015 Urban Water Management Plan assumes that the remaining balance of 1,400 AF/Yr savings (or 2,900 AF/Yr minus 1,500 AF/Yr) will be achieved by the year 2020.

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CHAPTER 10
WATER SHORTAGE CONTINGENCY PLAN

This chapter provides the District's water shortage contingency plan, as required under the Urban Water Management Planning Act. Although it is the District's water supply reliability goal to sustain a shortage of no more than 10% during dry and critically dry conditions, the potential exists for interruptions to either imported or local water supplies (due to earthquakes, etc.) that may result in significantly greater shortages. As such, this contingency plan includes scenarios for shortages of up to 50%.

10.1 CONTINGENCY PLAN OVERVIEW

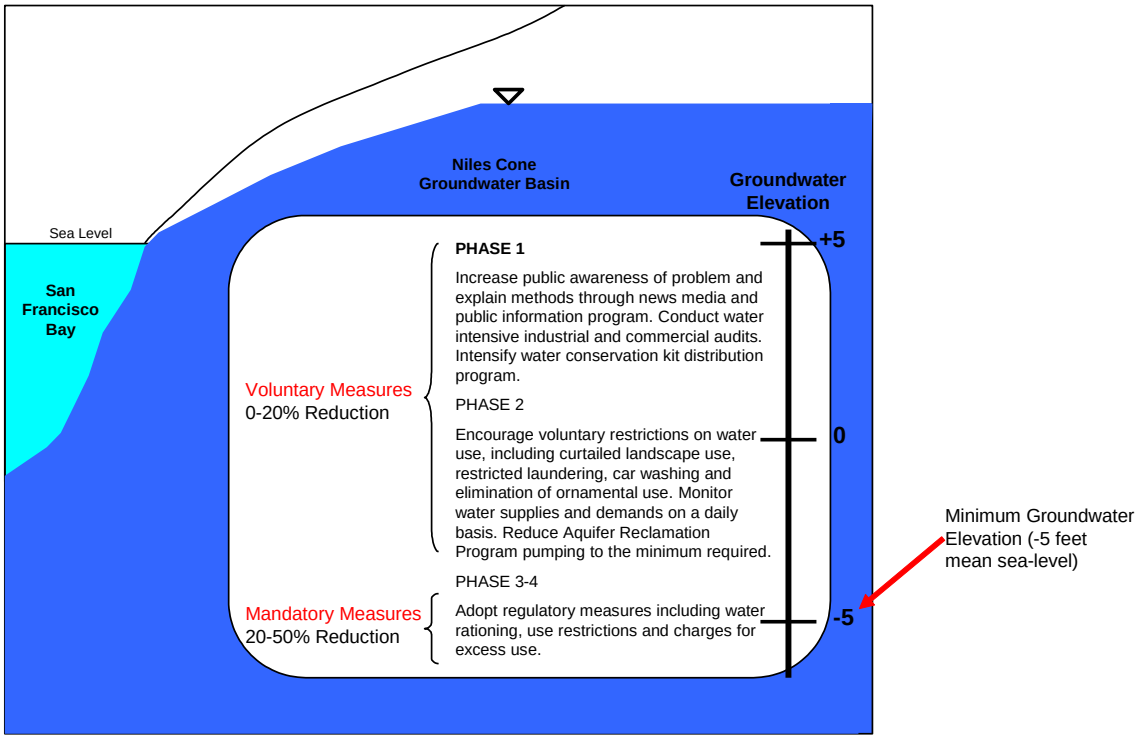
The District has sufficient water supplies to meet demands in most years, but deficiencies (shortages) can occur as a result of dry winter weather or through extended interruption of imported supplies. Under normal circumstances the Niles Cone Groundwater Basin provides the storage capacity needed to protect against short-term water supply deficiencies or disruptions. ACWD will also utilize off-site storage at the Semitropic Water Storage District's Groundwater Banking Program to help meet dry year water supply needs. However, in severe droughts or other water supply emergencies, potential future shortfalls (the difference between available water supply, including water available for recovery at Semitropic, and demand) will eventually appear in the form of lower water levels in the upper aquifer (Newark Aquifer) of the Niles Cone Groundwater Basin. That is, ACWD may need to draw on water stored in the Niles Cone Groundwater Basin such that groundwater levels in the Newark Aquifer drop below normal operating conditions.

The Newark Aquifer is subject to saltwater intrusion particularly if inland groundwater levels remain at or below sea-level for a protracted period of time. For this reason the District has been operating the basin to maintain a water level in the Newark Aquifer of at least five feet above sea level. ACWD has an ongoing program to assess water supply and demand imbalances. Each year during the months of December, January and February, the impacts of demand and supply balance are assessed, including the effects of potential reductions in imported San Francisco Regional supplies and State Water Project supplies, (*Annual Survey Report on Groundwater Conditions*). On the basis of this assessment, the groundwater levels in the Niles Cone Groundwater Basin for the following September can be estimated. These September levels are generally the lowest of the year due to high summer consumption and low rainfall. As such, they are key indicators of the presence of potential shortage. A change in the water level of five feet represents about 5,000 acre-feet of water or roughly one average month of District water supplies at current consumption levels. Figure 10-1 summarizes the management measures that go into effect at the various levels of projected reduction. Based on the anticipated September groundwater levels, Figure 10-2 summarizes the steps the District would take to implement a Water Deficiency Action Plan in response to determining that a water supply shortfall exists.

10.2 THREE YEAR DROUGHT ANALYSIS

An estimate of the minimum water supply available to ACWD over the next three years (2011-2013) was developed based on the driest three year sequence that is incorporated in ACWD's planning model, and is summarized in Table 10-1. The planning model utilizes the 81-year historical hydrologic conditions of 1922-03 for projections of local and imported supply availability. A review of the projected local and imported supply availability over the 81-year planning period indicates that the minimum cumulative imported and local water supply available to ACWD over a three-year sequence occurs under the 1931-1933 hydrologic conditions. Modeling analysis indicates that this three year drought, if it occurred in the next three years would not result in significant shortages to ACWD. ACWD's ability to withstand a severe, three year drought without shortages is a result of: (1) the completion of the Newark Desalination Facility; (2) the investment in off-site groundwater banking at Semitropic; and (3) the use of local groundwater storage in the Niles Cone Groundwater Basin.

Figure 10-1
District Water Deficiency Response



10.3 WATER SHORTAGE MITIGATION OPTIONS

The following is a discussion of options that ACWD can utilize to offset the impacts of water supply shortages:

Augmentation of Supply

In any given year ACWD strives to achieve a balance between basin supply and overall demand requirements. The goal of this effort is to maintain a basin level that is either at or above sea level, to prevent overdraft and/or saltwater intrusion. In order to meet ACWD's water supply reliability goals, the District's water supply strategy includes desalination, off-site groundwater banking and the potential development of a recycled water supply. In addition, the temporary drawdown of the groundwater basin to below sea-level (-5 feet, minimum level) may be allowed to meet short-term demands. All aspects of supply management are discussed in Chapter 9.

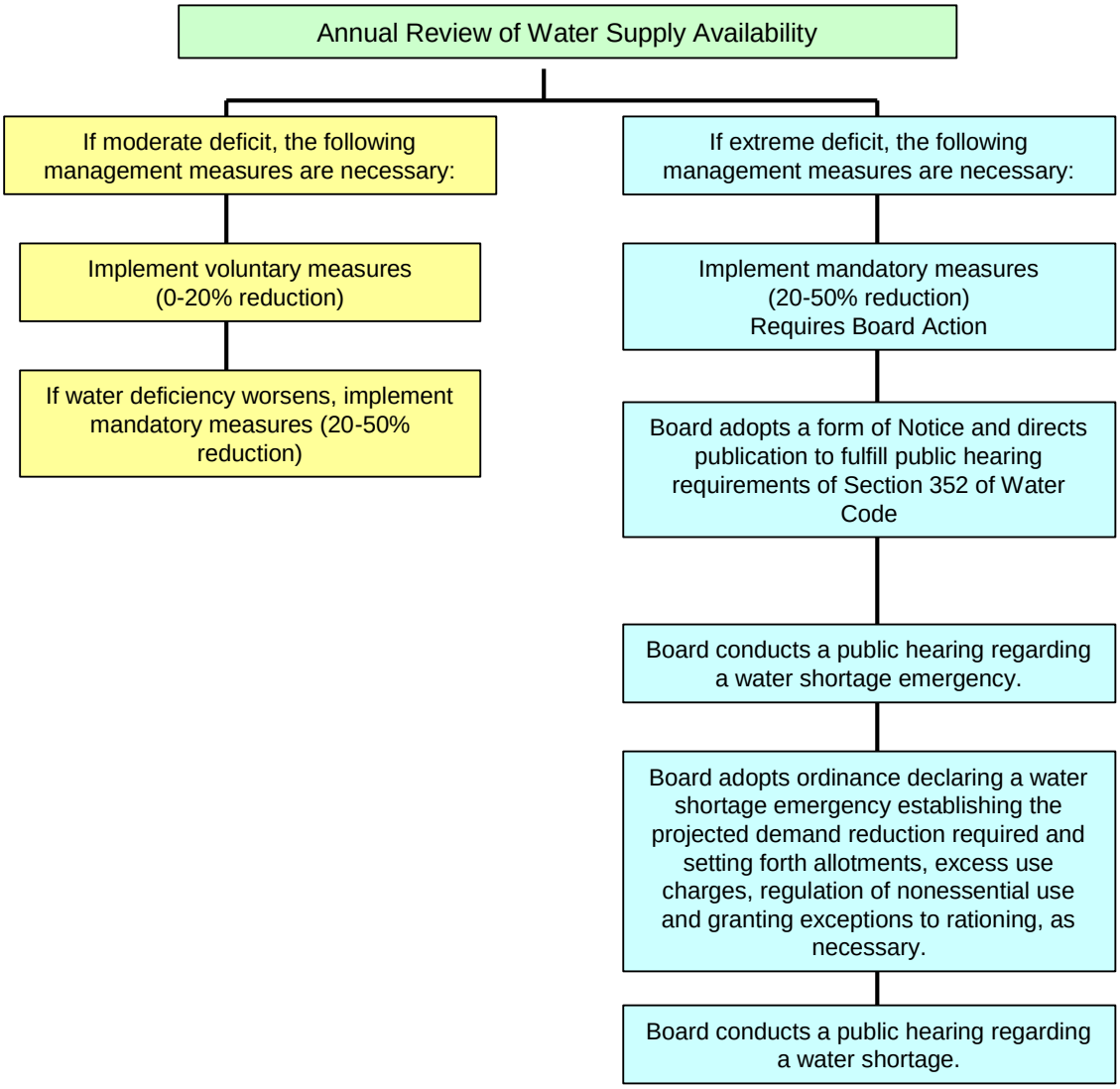
Evaporation

All District distribution reservoirs are covered to minimize evaporation while protecting the water from contamination.

Percolation

ACWD has percolation ponds which are necessary for the replenishment of its groundwater supply. Since the District's service area covers roughly the same area as the Niles Cone Groundwater Basin, recharge through the District's percolation facilities is an important District supply.

Figure 10-2
District Water Deficiency Action Plan



System Audits

The District has conducted an annual leak detection and repair program since 1987. This program will continue as a regular part of the District's operations.

Modifications to Operations

A blending facility which blends softer San Francisco Regional Water System supplies with harder groundwater has been in operation since 1992. This facility, along with other planned facilities, will help to meet ACWD's hardness goals and to help insure an equalized level of taste and hardness for all ACWD customers. However, under severe drought or emergency situations when sufficient San Francisco supplies are not available, the hardness criteria may be relaxed and additional, higher hardness groundwater may be utilized.

Table 10-1
Estimated Worst Case Three Year Drought Scenario

SUPPLY/DEMAND	Year		
	Year 1 (2011)	Year 2 (2012)	Year 3 (2013)
SUPPLY COMPONENT			
Imported Supplies			
-State Water Project	12,400	24,900	8,200
-Hetch-Hetchy	13,400	8,500	8,500
Local Supplies			
- Groundwater Recharge	14,300	16,800	14,700
- Groundwater Storage	10,000	1,900	9,900
- Del Valle Reservoir	800	800	400
- Desalination	5,600	5,600	5,600
- Recycled Water	-	-	-
Banking/Transfers			
- Semitropic Banking	13,200	4,300	14,100
Total Supply	**69,700**	**62,800**	**61,400**
DEMAND COMPONENT			
- Distribution System Demand	48,100	48,700	49,200
- Estimated Conservation Savings	(300)	(400)	(500)
- Groundwater System Demands	13,100	11,600	10,200
Total Demand	**60,900**	**59,900**	**58,900**
% Short to Meet Demands	**0%**	**0%**	**0%**

Notes:
Under critically dry conditions, the groundwater system demands may be reduced from Normal Year conditions, which would occur as a result of temporarily lowering groundwater levels in the Newark Aquifer (in the Forebay area) to slightly below sea-level (minimum elevation of –5 feet mean sea-level). This temporary drawdown of the Newark Aquifer may subsequently reduce the quantity of saline groundwater outflows to San Francisco Bay, thereby reducing the overall groundwater system demands.

Emergency Inter-ties

ACWD also has water distribution system pipeline interconnections with the neighboring cities of Hayward and Milpitas. These have been planned to be used during emergencies such as earthquakes. If appropriate, these interconnections could be used during a water supply emergency. In addition, as a SFPUC wholesale customer, ACWD may also receive emergency supply benefits from a recent inter-tie between the EBMUD system and the San Francisco Regional System.

Drawing from Reserve Supplies

ACWD is participating in the Semitropic Groundwater Banking Program. ACWD has 150,000 AF of storage capacity reserved at Semitropic, with over 110,000 AF currently in storage. In a drought situation, ACWD can retrieve water previously stored at Semitropic to help meet service area demands.

In addition, groundwater modeling of the Niles Cone Groundwater Basin has indicated that the basin groundwater levels may be temporarily drawn down to below sea-level without causing long-term water quality impacts to the Basin. In a severe drought or water shortage emergency, as documented in ACWD's Integrated Resources Planning Study, ACWD may allow the Basin groundwater elevation to be temporarily drawn down as low as 5 feet below sea-level.

Reduction of Demand

ACWD is committed to providing a reliable supply of water to its customers. The District strives to provide the highest standard of service possible to all customers within its service area. During a time of water supply shortage, first priority is given to meeting health, safety and human consumption requirements.

Since the options for supply augmentation are limited, the District's need to reduce demand during the drought emergency is very important. By adhering to the BMPs in the water conservation MOU, ACWD is working to reduce demand in all customer categories. Chapter 7 provides a detailed description of these programs.

It is also important that business and industry be allowed to continue to operate, therefore, some consideration is made for these customer classes when demand reduction levels are developed. These levels extend to a potential 50 percent shortfall, in compliance with the requirements of Water Code Section 10632. However, it should be noted that if this level of reduction were to actually occur, there is a potential for major economic impacts among the more water intensive industries in the District's service area. Table 10-2 shows billed water consumption by customer class for FY 2009/10. Using these figures as a base, Table 10-3 shows a typical sensitivity analysis for demand reduction by customer category.

Once the demand reduction level has been determined, ACWD will enact a program that will include actions required by each customer group. The Drought Management Action Plan for various levels of supply shortage is described in Tables 10-4a through 10-4d.

Table 10-2
FY 2009/10 Consumption by Customer Class

Customer Class	*Consumption (AF)*
Residential	29,100
Industry	2,500
Business	4,700
Institutional	1,800
Landscape	4,800
Total	***42,900***

Table 10-3
Example Sensitivity Analysis for Reduction in Levels of Consumption

Water Consumption	*No Deficiency*		*10% Deficiency*		*20% Deficiency*		*30% Deficiency*		*50% Deficiency*	
	%	*Amt. (AF)*	*%*	*Amt. (AF)*	*%*	*Amt. (AF)*	*%*	*Amt. (AF)*	*%*	*Amt. (AF)*
1. Total FY09/10 consumption(*excludes hydrants/firelines)*		42,900		42,900		42,900		42,900		42,900
2. Required net reduction	0%	-	10%	4,290	20%	8,580	30%	12,870	50%	21,450
3. Required level of consumption		42,900		38,610		34,320		30,030		21,450
4.Example level of reduced consumption:	%	Resulting Demand	%	Resulting Demand	%	Resulting Demand	%	Resulting Demand	%	Resulting Demand
Residential[1]	0%	29,100	10%	26,190	20%	23,280	30%	20,370	44%	16,296
Industrial[1]	0%	2,500	10%	2,250	15%	2,125	15%	2,125	30%	1,750
Business[1]	0%	4,700	10%	4,230	15%	3,995	15%	3,995	50%	2,350
Institutional[1]	0%	1,800	10%	1,620	15%	1,530	15%	1,530	50%	900
Landscape	0%	4,800	10%	4,320	30%	3,360	60%	1,920	100%	-
Total		**42,900**		**38,610**		**34,290**		**29,940**		**21,296**
5. Residential level of consumption	No Deficiency		10% Deficiency		20% Deficiency		30% Deficiency		50% Deficiency	
Avg. gpd per units served[2]	250		225		200		175		140	
Avg. gpd per capita[3]	78		70		62		54		44	

Notes:
1. Does not include water use for dedicated landscape accounts (i.e. residential, industrial, business and institutional landscape accounts). This water use is listed separately under the "Landscape" category.
2. Based on a total of 105,100 single-family and multi-family residential units in 2010 (source: Department of Finance, 2010).
3. Based on January 2010 Department of Finance population estimate of 338,000 for Fremont, Union City and Newark.

Table 10-4a
Drought Management Action Plan
Minimal Shortage (5-10%)

ACWD Action

- Initiate public information campaign.
- Explain drought situation to the public and governmental bodies.
- Explain other stages and forecast future actions.
- Request voluntary water conservation.
- Prepare and disseminate educational brochures, bills inserts, etc.
- Send technical information to specific customer types on ways to save water.
- Display information at Public Programs.
- Notify media.
- Begin advertising campaign.

Requested Customer Actions

Residential

- Implement voluntary water use reductions.
- Adhere to water waste ordinance.

Business/Industrial

- Research reuse options.
- Improve cooling tower efficiency.

Cities/Schools

- Request water conservation measures be instituted.

Enforcement

1. Educational letter, call or visit.
2. Educational visit and warning.

Table 10-4b
Drought Management Action Plan
Moderate Shortage (10-20%)

ACWD Actions

- Adopt ordinance banning water waste such as: hosing of paved surfaces, irrigation during daylight hours, unrepaired leaks water running into the street, fountains, except those using recirculated water.
- Set Allocations by customer type.
- Accelerate public information program.
- Disseminate technical information.
- Institute rate program to support conservation.
- Ask consumers for water use reductions at prescribed levels.
- Lobby for passage of drought ordinances by cities in service area.
- Encourage use of ET rate for landscape watering.
- Train staff for more interaction with the public especially leak detection and irrigation problems.
- Increase efficiency of ACWD operation to ensure supply.
- Increase advertising.
- Minimize hydrant flushing.
- Conduct water audit program.

Requested Customer Actions

Residential

- Adhere to water waste ordinance.
- Remain within water allocation or request an exception.
- Urge use of water saving plumbing devices in the home.

Commercial/Industrial

- Adhere to ordinance.
- Stay within allocation, or request an exception.
- Recycle wherever possible.
- Water served to restaurant customers on request only.
- Use of ET for watering of landscaping.

Cities/Schools

- Reduce landscape watering.

Enforcement

1. Educational letter, call or visit.

Table 10-4c
Drought Management Action Plan
Severe Shortage (20-30%)

ACWD Actions

- Adopt Base Consumption Allowance for each customer class and establish use charges.
- Advise area planning staffs of possible short-term inability to supply new developments/ annexations due to shortages to existing customers.
- Continue public information program at accelerated pace.
- Implement rate program to include fines for water wasters.
- Require all homes and businesses to adhere to mandatory regulations.
- Main flushing for emergencies only.
- Water audit program expanded.

Customer Actions

Residential

- Adhere to allocations, and restrictions as stated in ordinance.
- Use of ET for landscape watering needs.
- Use of greywater encouraged for landscape.

Business/Industrial

- Limit landscape watering.
- Submit audit of company water use demonstrating conservation efforts.

Cities/Schools

- Limit landscape watering.
- Cover pools.
- All fountains turned off.

Enforcement

1. Educational letter and visit. Fine for overuse/waste.
2. Final warning. Fine for overuse/waste.
3. Installation of flow restrictor. Fine for overuse/waste.
4. Shutoff, and reconnection fee.

Table 10-4d
Drought Management Action Plan
Critical Shortage (30-50%)

ACWD Actions

- All steps intensified.
- No potable water used by landscape meters.
- Reassess allocation plan for possible per capita residential allowance.

Customer Actions

Residential

- Adhere to ordinance.
- Remain within allocation.
- Car washing prohibited.
- Suggest monitoring water meter.
- Pools filled with water from tank truck services.
- Drip irrigation, greywater or reclaimed water used for landscaping.

Business/Industry

- Landscape watering limited to tank truck services or reclaimed water.
- Recycling of water required wherever feasible in process.
- Fountains turned off.

Cities/Schools

- Landscape watering limited to tank truck services or reclaimed water for playing fields.
- Pools filled with tank truck water only.
- All public water not required for health or safety prohibited, except if tank truck water can be used.

Enforcement

1. Educational letter and visit. Fine for overuse/waste.
2. Final Notice. Fine for overuse/waste.
3. Flow restrictor. Fine for overuse/waste.
4. Shutoff and reconnection fee.

10.4 ADMINISTRATION OF PROGRAM

In keeping with ACWD's Water Deficiency Action Plan, after comprehensive study the Board will enact, and staff will implement, a water demand management plan based on actual conditions. As done in 1991, a drought rate structure would be developed to augment and support the demand reduction program. Shown in Table 10-5 is an example of drought rate structures based on the four levels of supply deficit.

Table 10-5
Example Rate Structures Based on Deficit

Residential				
Cutback	***10%***	***20%***	***30%***	***50%***
Base Consumption Allowance (gpd)	N/A	300	250	200
Base Rate ("BR")	BR	Up to 300	Up to 250	Up to 200
2 x Base Rate		301 to 450	251 to 350	201 to 300
3 x Base Rate		451 to 600	351 to 500	301 to 400
4 x Base Rate		601+	501+	401+
Greater than 4 x Base Rate			*Flow restrictor Threat to shut off*	
Business/Industrial Governmental/Multi-Family Residential				
Base Consumption Allowance (BCA)			Base Rate	
20% above BCA			2x Base Rate	
30% above BCA			3x Base Rate	
40% above BCA			4x Base Rate	
Above 40%, full audit and possible flow restrictors or shut off.				

Note:
Actual rate structure and base consumption allowance to be set by ACWD Board at the time the water demand management plan is implemented.

Impacts on Revenues/Expenditures

In 1987, the District's Board of Directors established a Dry Year Contingency Reserve that was designed to minimize the impacts of future short-term demand reduction on rates. The reserve was based on the assumption that two out of every ten years could be expected to require demand reduction efforts due to drought. When fully funded, it would be able to maintain the District in a revenue-neutral position through two successive years of 25 percent reductions below normal demand levels. The reserve was applied during fiscal year 1991-92 to offset the effects of the drought emergency, and rates did not have to be raised to offset revenue losses caused by the demand reduction.

In 1996 the District replaced the Dry Year Contingency Fund with a Dry Year Water Supply component in the District's Capital Improvement Program. The purpose of this CIP component is to provide funding for the District's dry year water supply program, including the costs of the Semitropic Banking Program, and other potential programs such as purchases from a Drought Water Bank. In 2009, unused funds from this program were put into a reserve fund. This fund will help to reduce impacts on rates during dry years that occur as a result of reduced revenue due to reduced water sales, and additional costs of securing supplies during shortages.

In addition, the adoption of the District's water supply emergency plan (Ordinance #30, see below) would also include the implementation of excess use charges. The revenue from the excess use charges would help to offset impacts from reductions in revenues due to cutbacks in water supplies.

Adoption of Plan

During a water supply shortage, the ACWD Board would take action to declare a water supply emergency and enact appropriate ordinances as required by California Water Code Section 350 et seq. In May of 1991, Ordinance #30 (Appendix E) was put into effect. This Drought Emergency Ordinance delineated the elements of the mandatory conservation program for the ACWD service including waste restrictions and excess use charges. The ordinance is updated as base rates change.

Impact on the Billing System

In order to implement a comprehensive billing program that could include differing rate levels for a drought (or other water supply emergency), a new computerized system is currently being installed (scheduled completion January 2012). This system is capable of making changes in billing, and allows maximum flexibility for data retrieval.

Monitoring Use

The District monitors water use in two ways: total water production at each of the District's production facilities is monitored daily and monthly by the Operations Department, and billed consumption is monitored monthly through the Finance Department. The District reads each customer's water meter, and provides a water bill (with consumption information) on a bi-monthly basis.

Coordination with Other Agencies

ACWD serves the Cities of Fremont, Newark, and Union City. During the 1991 Drought Emergency, Union City enacted an ordinance that supported ACWD's restrictions, and the City of Fremont set forth a Resolution that supported the District's actions. During a future water emergency, ACWD will coordinate with the three cities to help resolve the situation. The District also has developed emergency inter-ties with the City of Hayward and the City of Milpitas.

Customer Notification and Assistance

ACWD has an active Public Information Program that shares information with the public in a variety of forms. The District's web-site, bill insertions, direct mailings, newspaper articles, a speaker's bureau, school materials, and purchased brochures are examples of this program. All District departments assist customers in need of help. Leak detection, service verification, bill adjustments, and engineering support are all offered to our customers at no extra charge.

10.5 CATASTROPHIC INTERRUPTION OF WATER SUPPLIES

Emergency Response Planning

In addition to preparation for water supply shortages due to droughts, ACWD's planning also includes preparation for catastrophic loss of supplies due to earthquakes, power outages, hazardous material spills, fire emergencies, water quality emergencies and malevolent acts and events. ACWD has in place an emergency response procedure that documents the responsibilities and response procedures for these types of events. These procedures are documented in detail in the District's Emergency Response Manual, and the key actions are summarized below:

- Mobilize using the Standardized Emergency Management System/Incident Command System.
- Assess damage to water system and its infrastructure.
- Evaluate damage and develop remedial action plan.
- Initiate repair and restore water service.
- Monitor progress of repairs and restoration.
- Communicate with health officials, the media, and water users on supply status.
- Coordinate with local, county and State in accordance with established emergency management guidelines.
- Document damage and repairs.

Evaluation of Catastrophic Loss of SWP Water Supplies

ACWD has conducted an analysis of the potential water supply impacts of the loss of SWP supplies due to a catastrophic failure of Delta levees. This evaluation focused on the District's SWP supplies because the SWP provides the greatest quantity of imported supplies to the District service area. The emergency supply scenario evaluated by ACWD was based on concerns surrounding the 2004 Jones Tract levee failure that threatened use of the Harvey O. Banks Pumping Plant to provide SWP supplies. Under the scenario evaluated, it is assumed the South Bay Aqueduct is functional with its sole supply coming from Del Valle Reservoir (i.e. no supplies from the Delta are available). Thus, the analysis evaluated ACWD's ability to provide water to its customers considering no State Water Project or Semitropic/transfer water supply available and all applicable production and hydraulic constraints. The analysis assumes the 2005 distribution system demands (approximately 10% higher than 2010 demands) and no emergency conservation benefit.

The analysis assumed conditions from May 2004, specifically average groundwater levels, median SFPUC allocation, and 6,000 AF of emergency storage from Del Valle with no additional ACWD storage. The following rain year replenishment of local supplies assumed average hydrologic conditions (i.e. 2003 conditions) for groundwater and available diversions as well as 3,000 AF of inflow to Del Valle with no additional emergency storage. Median SFPUC supply is assumed for the following year as well.

Findings from the analysis show that, under the assumptions described above, ACWD would have sufficient supplies to provide full water deliveries to its customers for over 12 months, including the projected annual increase in water demand, before supply and production constraints limit further deliveries. ACWD's estimates of its ability to withstand an extended outage of its SWP supplies is attributed to the projected availability of its local supplies (groundwater, desalination), emergency storage from Del Valle Reservoir in the Alameda Creek Watershed, and continued purchases of San Francisco Regional Water System supplies.

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APPENDIX A
Water Supply Contracts

APPENDIX A-1
State Water Project Contract

APPENDIX B-2
San Francisco Regional Water Supply Contract

(note: Complete State Water Project Supply Contract is available on DWR website:
http://www.swpao.water.ca.gov/wsc/index.cfm)

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STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

WATER SUPPLY CONTRACT
BETWEEN

THE STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

AND

ALAMEDA COUNTY WATER DISTRICT

Disclaimer: This document integrates Alameda County Water District's State Water Project water supply contract with the many amendments to the contract entered into since 1961. It is intended only to provide a convenient reference source, and the Department of Water Resources is unable to provide assurances that this integrated version accurately represents the original documents. For legal purposes, or when precise accuracy is required, users should direct their attention to original source documents rather than this integrated version.

(as of May 28, 2003)

IN WITNESS WHEREOF, the parties hereto have executed this contract on the date first above written.

Approved as to legal form
and sufficiency:

Chief Counsel (Acting)
Department of Water Resources

STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

By B. Abbott Goldberg
Acting Director

ALAMEDA COUNTY WATER DISTRICT

By Manuel J. Bernardo
Manuel J. Bernardo, President

Phyllis J. Kettering
Countersigned:
Phyllis J. Kettering, Secretary

APPROVED AS TO TERMS
AND CONDITIONS:

M. P. Whitfield, General
Manager and Chief Engineer
Alameda County Water District

APPROVED AS TO FORM:

Morris Hyman, Attorney
Alameda County Water District

APPENDIX A

TABLE A

AS SHOWN IN THE CONTRACT
BETWEEN
THE STATE OF CALIFORNIA
THE DEPARTMENT OF WATER RESOURCES AND
ALAMEDA COUNTY WATER DISTRICT
AND
AMENDMENT NO. 20

TABLE A
ANNUAL AMOUNTS OF WATER TO BE MADE AVAILABLE FOR DELIVERY TO ALAMEDA COUNTY WATER DISTRICT

<As shown in the original Contract>

Year	Total Annual Amount In Acre-feet
1	16,900
2	17,600
3	18,100
4	18,800
5	19,400
6	14,300
7	15,000
8	15,500
9	16,200
10	17,000
11	17,900
12	18,800
13	19,600
14	20,500
15	21,300
16	22,200
17	23,100
18	23,900
19	24,800
20	26,000
21	27,200
22	28,400
23	29,600
24	30,800
25	32,100
26	33,300
27	34,500
28	35,700
29	36,900
30	38,400
31	39,900
32	41,400
33	42,000
and each succeeding year thereafter, for the term of this contract:	42,000

TABLE A
ANNUAL AMOUNTS OF WATER TO BE
MADE AVAILABLE FOR DELIVERY TO
ALAMEDA COUNTY WATER DISTRICT DISTRICT

<As shown in Amendment No. 20>

Year	Total Annual Amount In Acre-feet
1962	16,900
1963	17,600
1964	18,100
1965	18,800
1966	19,400
1967	14,300
1968	15,000
1969	15,500
1970	16,200
1971	17,000
1972	17,900
1973	18,800
1974	19,600
1975	20,500
1976	21,300
1977	22,200
1978	23,100
1979	23,900
1980	24,800
1981	26,000
1982	27,200
1983	28,400
1984	29,600
1985	30,800
1986	32,100
1987	33,300
1988	34,500
1989	35,700
1990	36,900
1991	38,400
1992	39,900
1993	41,400
1994	42,000
and each succeeding year thereafter, for the term of this contract:	42,000

In any year, the amounts designated in this Table A shall not be interpreted to mean that the State is able to deliver those amounts in all years. Article 58 describes the State's process for providing current information for project delivery capability.

WATER SALES CONTRACT

This Contract dated as of July 1, 2009, is entered into by and between the City and County of San Francisco ("San Francisco") and Alameda County Water District ("Customer')

RECITALS

San Francisco and the Customer have entered into a Water Supply Agreement (WSA'), which sets forth the terms and conditions under which San Francisco will continue to furnish water for domestic and other municipal purposes to Customer and to other Wholesale Customers The WSA contemplates that San Francisco and each individual Wholesale Customer will enter into an individual contract describing the location or locations at which water will be delivered to each customer by the San Francisco Public Utilities Commission ("SFPUC"), the customer's service area within which water so delivered is to be sold, and other provisions unique to the individual purchaser This Water Sales Contract is the individual contract contemplated by the WSA

AGREEMENTS OF THE PARTIES

1 Incorporation of the WSA

The terms and conditions of the WSA are incorporated into this Contract as if set forth in full herein

2 Term

Unless explicitly provided to the contrary in Article 9 of the WSA, the term of this Contract shall be identical to that provided in Section 2 01 of the WSA

3 Service Area

Water delivered by San Francisco to the Customer may be used or sold within the service area shown on the map designated Exhibit A attached hereto Except as provided in Section 3 03 of the WSA, Customer shall not deliver or sell any water provided by San Francisco outside of this area without the prior written consent of the General Manager of the SFPUC

4 Location and Description of Service Connections

Sale and delivery of water to Customer will be made through a connection or connections to the SFPUC Regional Water System at the location or locations listed, with the applicable present account number, service location, service size, and meter size shown on Exhibit B attached hereto

5 Interties With Other Systems

Customer maintains interties with neighboring water systems at the location or locations and with the connection size(s) as shown on Exhibit C attached hereto

6 Billing and Payment

San Francisco shall compute the amounts of water delivered and bill Customer therefor on a monthly basis The bill shall show the separate components of the charge (e g , service, consumption demand) Customer shall pay the amount due within thirty (30) days after receipt of the bill

If Customer disputes the accuracy of any portion of the water bill it shall (a) notify the General Manager of the SFPUC in writing of the specific nature of the dispute and (b) pay the undisputed portion of the bill within thirty (30) days after receipt Customer shall meet with the General Manager of the SFPUC or a delegate to discuss the disputed portion of the bill

7 Minimum Water Delivery Levels

San Francisco will deliver and Customer will pay for a minimum annual supply of 7 648 MGD

IN WITNESS WHEREOF, the parties hereto have executed this Contract, to become effective upon the effectiveness of the WSA, by their duly authorized representatives.

CITY AND COUNTY OF SAN FRANCISCO
Acting by and through its Public Utilities Commission

By: _____
Edward Harrington
General Manager

Date: June 24, 2009

Approved by Commission Resolution No. 09-0069, adopted April 28, 2009

_____
Michael Housh
Secretary to Commission

Approved as to form:

DENNIS J. HERRERA
City Attorney

By: _____
Joshua D. Milstein
Deputy City Attorney

ALAMEDA COUNTY WATER DISTRICT

By: _____
Name: Paul Piraino
Title: General Manager

Date: June 11, 2009

Approved by Resolution No. 09-033, adopted June 11, 2009

ATTEST:

_____
Secretary

APPROVED AS TO FORM:

_____
Legal Counsel

APPENDIX B
Water Supply Uncertainty: Supplemental Information

APPENDIX B-1
RECENT FACTORS AFFECTING SWP SUPPLIES

APPENDIX B-2
FACTORS AFFECTING THE RELIABILITY OF THE SAN FRANCISCO REGIONAL WATER SYSTEM

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APPENDIX B-1
RECENT FACTORS AFFECTING SWP SUPPLIES
(source: State Water Project Contractors, January 2011)

Since the last round of Urban Water Management Plans (UWMPs) were prepared in 2005, the California Department of Water Resources (DWR) has twice updated its State Water Project (SWP) Delivery Reliability Report. In each of its updates, DWR has projected further reductions in average SWP water deliveries than were projected in 2005. The 2009 Report is the most recent update, and identifies several emerging factors that have the potential to affect the availability and reliability of SWP supplies. Although the 2009 Report presents an extremely conservative projection of SWP delivery reliability, particularly in light of events occurring since its release, it remains the best available information concerning the SWP. Following is information and a brief summary of several factors identified in the 2009 Report having the potential to affect the availability and reliability of SWP supplies.

A. FWS and NMFS Biological Opinions

In December 2008 and June 2009, respectively, the United States Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) issued biological opinions (B.O.s) setting forth each agency's conclusions regarding the effects that the proposed long-term coordinated operations of the SWP and Central Valley Project (CVP) would have on threatened and endangered fish species in the Delta.[1] Both B.O.s concluded that the operation of the Projects as proposed by DWR and the Bureau of Reclamation would jeopardize the continued existence of the protected species. Because FWS and NMFS reached "jeopardy" conclusions, each was required by the ESA to develop a Reasonable and Prudent Alternative (RPA) to the proposed Project, and to include that RPA in its respective B.O. According to their terms, the RPAs developed and adopted by FWS and NMFS impose many new restrictions and requirements on Project operations. If the RPA terms are fully implemented, however, the resulting Project operations are deemed to be in compliance with the ESA.

Of particular importance to the operation of the SWP and to the SWP Contractors, the RPAs included in the new B.O.s are expected to result in substantially reduced water exports from the Delta. Preliminary estimates prepared by DWR indicate that in comparison to the level of SWP exports from the Delta previously authorized under State Board Decision 1641 (D-1641),[2] the FWS B.O. could reduce those deliveries by 18 to 29 percent during average and dry conditions, respectively, and the NMFS B.O. could reduce SWP deliveries by an additional 10 percent (for an aggregate reduction of 28 to 39 percent). These estimates remain preliminary, as the operating restrictions imposed under the FWS and NMFS RPAs are dependent upon highly variable factors such as hydrologic conditions affecting Delta water supplies, flow conditions in the Delta, migratory and reproductive patterns of the protected species, and numerous other non-Project factors that impact the health and abundance of the species and their habitats. Moreover, and as further discussed below, legal challenges have been filed against the FWS and NMFS B.O.s, and should a court conclude the RPA restrictions are invalid, SWP exports could return to higher levels.

1. FWS B.O. Litigation

In early 2009, the State Water Contractors, the San Luis Delta-Mendota Water Authority, and several individual State and Federal contractor water agencies filed legal challenges against the FWS delta smelt B.O. (*The Consolidated Delta Smelt Cases*, E.D. Cal. 1:09-CV-00407-OWW-GSA.) In November 2009, the court granted summary judgment on the claim made by several plaintiffs that the federal defendants violated the National Environmental Policy Act (NEPA) by failing to perform NEPA analysis prior to provisionally adopting and implementing the FWS B.O. and RPA. Further, in May 2010, the court issued Findings of Fact and Conclusions of Law on a motion for preliminary injunction, which not

[1] The December 15, 2008 FWS B.O. evaluated impacts to the delta smelt. The June 4, 2009 NMFS B.O. evaluated impacts to winter-run and spring-run Chinook salmon, steelhead, green sturgeon, and resident killer whales.
[2] See Appendix A for a description of SWP exports as authorized under D-1641, and reductions in D-1641 exports as ordered by the "Interim Remedies" decision in *NRDC v. Kempthorne* (E.D. Cal. 05-CV-1207-OWW).

only confirmed the court's prior NEPA ruling, but also determined that plaintiffs are likely to prevail on their claims that FWS violated the ESA and the Administrative Procedure Act (APA) in adopting the B.O.'s RPA. Thereafter, the parties filed motions for summary judgment to obtain a final ruling in the cases, and those motions were argued in early July 2010. In December 2010, the court issued a memorandum decision that invalidated the B.O. and RPA in several respects and remanded the matter to FWS. Further proceedings are expected to address interim operations of the SWP and CVP

2. NMFS B.O. Litigation

After issuance of the NMFS B.O. in June 2009, the State Water Contractors and other water agencies filed legal challenges against the NMFS salmonid B.O. (*The Consolidated Salmon Cases*, E.D. Cal. 1:09-CV-1053-OWW-DLB.) In May 2010, the court ruled that the federal defendants violated NEPA by failing to analyze the impact of the B.O. and RPA on humans and the human environment. The court also ruled that plaintiffs are likely to prevail on their claims that NMFS violated the ESA and the APA in adopting the RPA, and authorized the Projects to operate in accordance with D-1641 during a short period (until the end of June 2010) unless there was a showing of jeopardy to the species or adverse modification of its critical habitat. As with the delta smelt litigation, the parties also filed motions for summary judgment to obtain a final ruling in the cases. Those motions were heard in mid-December 2010 and a decision is expected in 2011.

B. Consistency Determination Litigation

Because the delta smelt and salmon species are also protected under California's ESA, the SWP and CVP are required to obtain take authorization for Project operations from the California Department of Fish and Game (DFG). In July 2009 and September 2009, respectively, DFG issued "consistency determinations" pursuant to CESA and determined that Project operations do not violate that statute to the extent the operations are in compliance with the RPAs set forth in the FWS and NMFS B.O.s Because the consistency determinations pose a risk that the SWP could remain bound to the terms of the RPAs even if the B.O.s are overturned by a federal court, DFG's decisions were challenged in state court by the State Water Contractors and the Kern County Water Agency. The cases are currently stayed pending the outcome of *The Consolidated Delta Smelt Cases* and *The Consolidated Salmon Cases* (above).[3]

C. Longfin Smelt Protections

Regulatory actions related to longfin smelt also have the potential to affect the availability and reliability of SWP supplies. In February 2008, longfin smelt were listed as a "candidate" species under CESA, and DFG imposed certain interim restrictions on the SWP for protection of the longfin smelt and its critical habitat. In February 2009, shortly before longfin smelt were officially listed as a "threatened" species under CESA, DFG issued Incidental Take Permit No. 2081-2009-001-03 (the Permit) to DWR, which imposes terms and conditions on the ongoing and long-term operations of SWP facilities in the Delta. The operating restrictions under the Permit are based in large part on the restrictions imposed on the SWP by the new FWS B.O. for delta smelt (see above). The resulting water supply reductions under the Permit depend on several variable factors, such as Delta hydrology, migratory and reproductive patters of longfin smelt, and other factors affecting species abundance in the Delta. Notably, DWR has not indicated whether any particular reductions in SWP exports are likely to result from the Permit. In March 2009, a legal challenge was filed against the Permit.[4] Although that litigation is currently stayed pursuant to a stipulation of the parties, the challenge puts DFG's ability to enforce the Permit into question.

[3] *See*, *e.g.*, *State Water Contractors v. Cal. Dept. of Fish and Game*, Sac. Sup. Ct. Case No. 34-2010-80000552; *State Water Contractors v. Cal. Dept. of Fish and Game*, Sac. Sup. Ct. Case No. 34-2010-80000560.
[4] *See State Water Contractors v. California Dept. of Fish and Game, et al.*, Sac. Sup. Ct. Case No. 34-2009-80000203.

D. Development of Delta Plan and Delta Flow Criteria Pursuant to New State Laws

In November 2009, the California Legislature enacted SBX7-1 as part of a multi-pronged water package related to water supply reliability, ecosystem health, and the Delta.[5] Among other things, SBX7 1 creates the Delta Stewardship Council (Council) and directs the Council to develop a comprehensive management plan for the Delta by January 1, 2012 (the Delta Plan). In addition, the State Board was directed to develop flow criteria for the Delta to protect public trust resources, including fish, wildlife, recreation and scenic enjoyment, and DFG was required to identify quantifiable biological objectives and flow criteria for species of concern in the Delta.

In August 2010, the State Board adopted Resolution No. 2010-0039 approving its report entitled "Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem" (Flow Criteria). The State Board report concludes that substantially higher flows are needed through the Delta than in have occurred in previous decades in order to benefit zooplankton and various fish species.[6] Separately, in September 2010, DFG issued a draft report entitled "Quantifiable Biological Objectives and Flow Criteria for Aquatic and Terrestrial Species of Concern Dependent on the Delta" (DFG Report). The DFG Report is based on similar biological objectives and recommends Delta flows similar to those set forth in the State Board's Flow Criteria.[7] Notably, both the State Board and DFG recognize that their recommended flow criteria for the Delta do *not* balance the public interest or the need to provide an adequate and reliable water supply.[8] Also of importance, both the State Board and DFG acknowledge that their recommended flow criteria do not have any regulatory or adjudicatory effect; however, they may be used to inform the Council as it prepares the Delta Plan, and may be considered as the Bay Delta Conservation Plan (BDCP) process moves forward.[9]

E. DWR Final 2009 SWP Delivery Reliability Report

DWR continues to evaluate the issues affecting SWP exports from the Delta and how those issues may affect the long-term availability and reliability of SWP deliveries to the SWP Contractors. In September 2010, DWR released its Final 2009 SWP Delivery Reliability Report (DWR Report), which forecasts additional reductions in annual SWP deliveries on average in comparison to the 2007 Report. According to DWR, the long-term average delivery of contractual SWP Table A supply is projected to be 60 percent under current and future conditions over the 20-year projection.[10] Within that long-term average, SWP Table A deliveries can range from 7 percent (single dry year) to 68 percent (single wet year) of contractual amounts under current conditions, and from 11 percent (single dry year) to 97 percent (single wet year) under future conditions.[11] Contractual amounts are projected to range from 32 to 38 percent during multiple-dry year periods, and from 79 to 93 percent during multiple wet periods.[12]

To ensure a conservative analysis, the DWR Report expressly assumes and accounts for the institutional, environmental, regulatory, and legal factors affecting SWP supplies, including but not limited to: water quality constraints, fishery protections, other D-1641 requirements, and the operational limitations imposed by the FWS and NMFS B.O.s that are discussed above. The DWR Report also considers the potential effects of Delta levee failures and other seismic or flood events.[13] Notably, the DWR Report assumes that all of these restrictions and limitations will remain in place over the next 20-year period and that no actions to improve the Delta will occur, even though numerous legal challenges, various Delta restoration processes, and new legal requirements for Delta improvements are currently underway (i.e., BDCP, Delta Vision, Delta Plan, etc.). Finally, DWR's long-term SWP delivery reliability analyses incorporate assumptions intended to account for potential supply shortfalls related to global

[5] SBX7-1 became effective February 3, 2010 and adds Division 35 to the California Water Code (commencing with Section 85300). Division 35 is referred to as the Sacramento-San Joaquin Delta Reform Act of 2009.
[6] (Flow Criteria at 5-8.)
[7] (DFG Report at 13.)
[8] (Flow Criteria at 4; DFG Report at 16.)
[9] (Flow Criteria at 3, 10; DFG Report at ES-4.)
[10] (DWR Report at 43, 48, Tables 6.3 and 6.12.)
[11] (DWR Report at 43-44, 49, Tables 6.4, 6.5, 6.13 and 6.14.)
[12] (DWR Report at 49, Tables 6.13 and 6.14.)
[13] (*See*, *e.g.*, DWR Report at 19-24, 25-28, 29-35, Appendices A, A-1, A-2, B.)

climate change.[14] These and other factors result in DWR presenting an extremely conservative projection of SWP delivery reliability in its 2009 Report.

F. Conclusion

DWR's most recently published SWP Delivery Reliability Report (September 2010) demonstrates that the projected long-term average delivery amounts of contractual SWP Table A supplies have decreased in comparison to previous estimates. However, as noted, the projections developed by DWR are predicated on extremely conservative assumptions, which make the projections useful from a long-range urban water supply planning perspective.[15] Indeed, recent rulings in various legal actions and other factors described above and in Appendix A, among others, support higher estimates of average annual SWP deliveries than projected in DWR's 2009 Report. While this may lead DWR to increase its projections in its next scheduled Report, the 2009 Report remains the best available information concerning the long-term delivery reliability of SWP supplies.

[14] (*See*, *e.g.*, DWR Report at 19, 29-30, Appendices A-B.)

[15] *See*, *e.g.*, *Sonoma County Water Coalition v. Sonoma County Water Agency* (2010) 189 Cal.App.4th 33; *Watsonville Pilots Association v. City of Watsonville* (2010) 183 Cal.App.4th 1059; *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova* (2007) 40 Cal.4th 412.

APPENDIX B-2
FACTORS AFFECTING THE RELIABILITY OF THE REGIONAL WATER SYSTEM
(source: Bay Area Water Supply and Conservation Agency, March 2011)

The SFPUC's Water System Improvement Program (WSIP) provides goals and objectives to improve the delivery reliability of the Regional Water System (RWS) including water supply reliability. The goals and objectives of the WSIP related to water supply are:

Program Goal	System Performance Objective
Water Supply – *meet customer water needs in non-drought and drought periods*	• Meet average annual water demand of 265 million gallons per day (mgd) from the SFPUC watersheds for retail and wholesale customers during non-drought years for system demands through 2018. • Meet dry-year delivery needs through 2018 while limiting rationing to a maximum 20 percent system-wide reduction in water service during extended droughts. • Diversify water supply options during non-drought and drought periods. • Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers.

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

Water Supply – All Year Types

The SFPUC historically has met demand in its service area in all year types from its watersheds. They are the:

- Tuolumne River watershed
- Alameda Creek watershed
- San Mateo County watersheds

In general, 85 percent of the supply comes from the Tuolumne River through Hetch Hetchy Reservoir and the remaining 15 percent comes from the local watersheds through the San Antonio, Calaveras, Crystal Springs, Pilarcitos and San Andreas Reservoirs. The adopted WSIP retains this mix of water supply for all year types.

Water Supply – Dry-Year Types

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

- Restoration of Calaveras Reservoir capacity
- Restoration of Crystal Springs Reservoir capacity
- Westside Basin Groundwater Conjunctive Use
- Water Transfer with Modesto Irrigation District (MID) / Turlock Irrigation District (TID)

In order to achieve its target of meeting at least 80 percent of its customer demand during droughts, the SFPUC must successfully implement the dry-year water supply projects included in the WSIP.

Projected SFPUC System Supply Reliability

The SFPUC has provided the attached table [*Table 3: Projected System Supply Reliability Based on Historical Hydrologic Period from 3/31/11 letter from P. Kehoe*] presenting the projected RWS supply reliability. This table assumes that the wholesale customers purchase 184 mgd from the RWS through 2030 and the implementation of the dry-water water supply projects included in the WSIP. The numbers represent the wholesale share of available supply during historical year types per the Tier One Water Shortage Allocation Plan. This table does not reflect any potential impact to RWS yield from the additional fishery flows required as part of Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements Project.

Impact of Recent SFPUC Actions on Dry Year Reliability of SFPUC Supplies

In adopting the Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements Project, the SFPUC committed to providing fishery flows below Calaveras Dam and Lower Crystal Springs Dam as well as bypass flows below Alameda Creek Diversion Dam. The fishery flow schedules for Alameda Creek and San Mateo Creek represent a potential decrease in available water supply of an average annual 3.9 mgd and 3.5 mgd, respectively with a total of 7.4 mgd average annually. These fishery flows could potentially create a shortfall in meeting the SFPUC demands of 265 mgd and slightly increase the SFPUC's dry-year water supply needs. If a shortfall occurs, it is anticipated at the completion of construction of both the Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements project in approximately 2015 and 2013, respectively when the SFPUC will be required to provide the fishery flows.

The adopted WSIP water supply objectives include (1) meeting a target delivery of 265 mgd through 2018 and (2) rationing at no greater than 20 percent system-wide in any one year of a drought. As a result of the fishery flows, the SFPUC may not be able to meet these objectives between 2013 and 2018 without (1) a reduction in demand, (2) an increase in rationing, or (3) a supplemental supply. The following describes these actions.

Reduction in Demand

The current projections for purchase requests through 2018 remain at 265 mgd. However, in the last few years, SFPUC deliveries have been below this level, as illustrated below. If this trend continues, the SFPUC may not need 265 mgd from its watersheds to meet purchase requests through 2018. As a result, the need for supplemental supplies of 3.5 mgd starting in 2013 and increasing to 7.4 mgd in 2015 to offset the water supply loss associated with fish releases may be less than anticipated.

Water Deliveries in SFPUC Service Area[1]

	FY2006	FY 2007	FY 2008	FY 2009	FY 2010
Total Deliveries (mgd)	247.5	257	254.1	243.4	225.2

Increase in Rationing

The adopted WSIP provides for a dry year water supply program that, when implemented, would result in system-wide rationing of no more than 20 percent. The PEIR identified the following drought shortages during the design drought; 3.5 out of 8.5 years at 10 percent rationing and 3 out of 8.5 years at 20 percent. If the SFPUC did not develop a supplemental water supply in dry years to offset the effects of the fishery flows on water supply, rationing would increase during dry years. If the SFPUC experiences a

[1] Reference: SFPUC FY09-10 J-Table Line 9 "Total System Usage" plus 0.7 mgd for Lawrence Livermore National Laboratory use and 0.4 mgd for Groveland. No groundwater use is included in this number. Unaccounted-for-Water is included.

drought between 2013 and 2018 in which rationing would need to be imposed, rationing would increase by approximately 1 percent in shortage years. Rationing during the design drought would increase by approximately 1 percent in rationing years.

Supplemental Supply

The SFPUC may be able to manage the water supply loss associated with the fishery flows through the following actions and considerations:

- Development of additional conservation and recycling
- Development of additional groundwater supply
- Water transfer from MID and/or TID
- Increase in Tuolumne River supply
- Revising the Upper Alameda Creek Filter Gallery Project capacity[2]
- Development of a desalination project

Meeting the Level of Service Goal for Delivery Reliability

The SFPUC has stated a commitment to meeting its contractual obligation to its wholesale customers of 184 mgd and its delivery reliability goal of 265 mgd with no greater than 20 percent rationing in any one year of a drought. In Resolution No. 10-0175 adopted by the Commission on October 15, 2010, the Commission directed staff to provide information to the Commission and the public by March 31, 2011 on how the SFPUC has the capability to attain its water supply levels of service and contractual obligations. This directive was in response to concerns expressed by the Commission and the Wholesale Customers regarding the effect on water supply of the instream flow releases required as a result of the Lower Crystal Springs Dam Improvement Project and the Calaveras Dam Replacement Project. In summary, the SFPUC has a projected shortfall of available water supply to meet its LOS goals and contractual obligations. The SFPUC has stated that current decreased levels of demand keep this from being an immediate problem, but that in the near future, the SFPUC must resolve these issues. Various activities are underway by the SFPUC to resolve the shortfall problem. SFPUC staff will report back to the Commission by August 31, 2011 to provide further information on actions to resolve the shortfall problem.

[2] The adopted WSIP included the Alameda Creek Fishery Enhancement project, since renamed the Upper Alameda Creek Filter Gallery (UACFG) project, which had the stated purpose of recapturing downstream flows released under a 1997 California Department of Fish and Game MOU. Implementation of the UACFG project was intended to provide for no net loss of water supply as a result of the fishery flows bypassed from ACDD and/or released from Calaveras Dam. At the time the PEIR was prepared, the UACFG was described in the context of recapturing up to 6300 AF per year. The UACFG will undergo a separate CEQA process in which all impacts associated with the project will be analyzed fully.

SAN FRANCISCO PUBLIC UTILITIES COMMISSION

1145 Market St , 4th Floor, San Francisco. CA 94103 • Tel. (415) 554-3271 • Fax (415) 554-3161 • TTY (415) 934-5770

March 31, 2011

Nicole Sandkulla
Senior Water Resources Engineer
Bay Area Water Supply and Conservation Agency
155 Bovet Road, Suite 302
San Mateo, CA 94402

Dear Nicole,

Attached please find additional information through 2035 on the Regional Water System's supply reliability for use in the Wholesale Customer's 2010 Urban Water Management Plan updates. The SFPUC has assessed the water supply reliability under the following planning scenarios:

- Projected Single dry-year supply for 2010
- Projected Multiple dry-year supply beginning 2010; and
- Projected supply reliability for years 2010-2035.

Table 1 summarizes deliveries to the Wholesale Customers for projected single dry-year supply for 2010 and projected multiple dry-year supply beginning 2010.

With regards to future demands, the SFPUC proposes to expand their water supply portfolio by increasing the types of water supply resources. Table 2 summarizes the water supply resources assumed to be available by 2035.

Concerning allocation of supply during dry years, the Water Shortage Allocation Plan ("Plan") was utilized to allocate shortages between the SFPUC and the Wholesale Customers collectively. The Plan implements a method for allocating water among the individual Wholesale Customers which has been adopted by the Wholesale Customers. The Plan was adopted pursuant to Section 7.03(a) of the 1984 Settlement Agreement and Master Water Sales Contract and has been updated to correspond to the terminology used in the June 2009 Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County and Santa Clara County.

Finally, the SFPUC estimated the frequency and severity of anticipated shortages for the period 2010 though 2035. For this analysis, we assumed that the historical hydrologic period is indicative of future events and evaluated the supply reliability assuming a repeat of the actual historic hydrologic period 1920 through 2002. The results of this analysis are summarized in Table 3.

It is our understanding that you will pass this information on to the Wholesale Customers. If you have any questions or need additional information, please do not hesitate to contact me at (415) 554-0792.

Sincerely,

Paula Kehoe

Paula Kehoe
Director of Water Resources

Table 1
Projected Deliveries for Three Multiple Dry Years

	2010	One Critical Dry Year	Deliveries during Multiple Dry Years in mgd		
			Year 1	Year 2	Year 3
System-Wide Shortage in Percent	0%	10%	10%	20%	20%
Wholesale Allocation (mgd)	184.0	152.6	152.6	132.5	132.5

Table 2

UWMP Studies: Water Supply Reliability
Water Supply Options for Years 2010 through 2030

	2010	2015	2020	2025	2030	2035
Crystal Springs Reservoir (20.28bg)		x	x	x	x	x
Westside Basin Groundwater afa		8,100	8,100	8,100	8,100	8,100
Calaveras Reservoir Recovery (31.5 bg)		x	x	x	x	x
Districts' Transfer afa		2240	2240	2240	2240	2240

Table 3: Projected System Supply Reliability Based on Historical Hydrologic Period

Allocation by Year	Wholesale Demand in mgd					
	184.0	184.0	184.0	184.0	184.0	184.0
	Projected Wholesale Allocation in mgd					
Delivery for Fiscal Year	2010	2015	2020	2025	2030	2035
1920	184.0	184.0	184.0	184.0	184.0	184.0
1921	184.0	184.0	184.0	184.0	184.0	184.0
1922	184.0	184.0	184.0	184.0	184.0	184.0
1923	184.0	184.0	184.0	184.0	184.0	184.0
1924	184.0	184.0	184.0	184.0	184.0	184.0
1925	154.6	184.0	184.0	184.0	184.0	184.0
1926	184.0	184.0	184.0	184.0	184.0	184.0
1927	184.0	184.0	184.0	184.0	184.0	184.0
1928	184.0	184.0	184.0	184.0	184.0	184.0
1929	184.0	184.0	184.0	184.0	184.0	184.0
1930	184.0	184.0	184.0	184.0	184.0	184.0
1931	184.0	184.0	184.0	184.0	184.0	184.0
1932	132.5	152.6	152.6	152.6	152.6	152.6
1933	184.0	184.0	184.0	184.0	184.0	184.0
1934	184.0	184.0	184.0	184.0	184.0	184.0
1935	154.6	184.0	184.0	184.0	184.0	184.0
1936	184.0	184.0	184.0	184.0	184.0	184.0
1937	184.0	184.0	184.0	184.0	184.0	184.0
1938	184.0	184.0	184.0	184.0	184.0	184.0
1939	184.0	184.0	184.0	184.0	184.0	184.0
1940	184.0	184.0	184.0	184.0	184.0	184.0
1941	184.0	184.0	184.0	184.0	184.0	184.0
1942	184.0	184.0	184.0	184.0	184.0	184.0
1943	184.0	184.0	184.0	184.0	184.0	184.0
1944	184.0	184.0	184.0	184.0	184.0	184.0
1945	184.0	184.0	184.0	184.0	184.0	184.0
1946	184.0	184.0	184.0	184.0	184.0	184.0
1947	184.0	184.0	184.0	184.0	184.0	184.0
1948	184.0	184.0	184.0	184.0	184.0	184.0
1949	184.0	184.0	184.0	184.0	184.0	184.0
1950	184.0	184.0	184.0	184.0	184.0	184.0
1951	184.0	184.0	184.0	184.0	184.0	184.0
1952	184.0	184.0	184.0	184.0	184.0	184.0
1953	184.0	184.0	184.0	184.0	184.0	184.0
1954	184.0	184.0	184.0	184.0	184.0	184.0
1955	184.0	184.0	184.0	184.0	184.0	184.0
1956	184.0	184.0	184.0	184.0	184.0	184.0
1957	184.0	184.0	184.0	184.0	184.0	184.0
1958	184.0	184.0	184.0	184.0	184.0	184.0
1959	184.0	184.0	184.0	184.0	184.0	184.0

Delivery for Fiscal Year	2010	2015	2020	2025	2030	2035
1960	184.0	184.0	184.0	184.0	184.0	184.0
1961	152.6	184.0	184.0	184.0	184.0	184.0
1962	132.5	152.6	152.6	152.6	152.6	152.6
1963	184.0	184.0	184.0	184.0	184.0	184.0
1964	184.0	184.0	184.0	184.0	184.0	184.0
1965	184.0	184.0	184.0	184.0	184.0	184.0
1966	184.0	184.0	184.0	184.0	184.0	184.0
1967	184.0	184.0	184.0	184.0	184.0	184.0
1968	184.0	184.0	184.0	184.0	184.0	184.0
1969	184.0	184.0	184.0	184.0	184.0	184.0
1970	184.0	184.0	184.0	184.0	184.0	184.0
1971	184.0	184.0	184.0	184.0	184.0	184.0
1972	184.0	184.0	184.0	184.0	184.0	184.0
1973	184.0	184.0	184.0	184.0	184.0	184.0
1974	184.0	184.0	184.0	184.0	184.0	184.0
1975	184.0	184.0	184.0	184.0	184.0	184.0
1976	184.0	184.0	184.0	184.0	184.0	184.0
1977	152.6	184.0	184.0	184.0	184.0	184.0
1978	136.2	152.6	152.6	152.6	152.6	152.6
1979	184.0	184.0	184.0	184.0	184.0	184.0
1980	184.0	184.0	184.0	184.0	184.0	184.0
1981	184.0	184.0	184.0	184.0	184.0	184.0
1982	184.0	184.0	184.0	184.0	184.0	184.0
1983	184.0	184.0	184.0	184.0	184.0	184.0
1984	184.0	184.0	184.0	184.0	184.0	184.0
1985	184.0	184.0	184.0	184.0	184.0	184.0
1986	184.0	184.0	184.0	184.0	184.0	184.0
1987	184.0	184.0	184.0	184.0	184.0	184.0
1988	152.6	184.0	184.0	184.0	184.0	184.0
1989	132.5	152.6	152.6	152.6	152.6	152.6
1990	132.5	152.6	152.6	152.6	152.6	152.6
1991	132.5	132.5	132.5	132.5	132.5	132.5
1992	132.5	152.6	152.6	152.6	152.6	152.6
1993	136.2	132.5	132.5	132.5	132.5	132.5
1994	184.0	184.0	184.0	184.0	184.0	184.0
1995	154.6	184.0	184.0	184.0	184.0	184.0
1996	184.0	184.0	184.0	184.0	184.0	184.0
1997	184.0	184.0	184.0	184.0	184.0	184.0
1998	184.0	184.0	184.0	184.0	184.0	184.0
1999	184.0	184.0	184.0	184.0	184.0	184.0
2000	184.0	184.0	184.0	184.0	184.0	184.0
2001	184.0	184.0	184.0	184.0	184.0	184.0
2002	184.0	184.0	184.0	184.0	184.0	184.0

APPENDIX C
ACWD Groundwater Management Policy

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ALAMEDA COUNTY WATER DISTRICT

GROUNDWATER MANAGEMENT POLICY

(Adopted January 26, 1989)
(Amended March 22, 2001)

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TABLE OF CONTENTS

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GROUNDWATER MANAGEMENT POLICY
ADOPTED JANUARY 26, 1989
Amended March 22, 2001

BACKGROUND

The Alameda County Water District (ACWD) was created by a vote of area residents in December 1913, thereby becoming the first water district in California to be formed under the County Water District Act enacted earlier that year. It is governed by a five-member board of directors, elected at large.

In the years preceding the vote, local farmers and residents had become concerned about water companies and agencies exporting water from both Alameda Creek and local groundwater to nearby communities such as Oakland and San Francisco. The result of these exports was that the groundwater table was falling at a rapid rate. The voters hoped, in establishing ACWD, to regain control over local water supplies, to protect the underground water in the Niles Cone Groundwater Basin, and to conserve the waters of Alameda Creek.

ACWD now has several sources of supply, including water purchased from the State Water Project (via the South Bay Aqueduct) and the San Francisco Public Utilities Commission (via the Hetch Hetchy aqueduct system). But groundwater remains an important component of its supply, currently furnishing 35% of the water ACWD distributes. In dry years, groundwater has contributed over 60% of the supply. Thus, conservation and preservation of the groundwater basin continues to be a vitally important program for ACWD.

AUTHORIZATION

This Groundwater Management Policy is based on the statutory authority granted to ACWD under the County Water District Law (commencing with Section 30000 of the Water Code); the Replenishment Assessment Act of the Alameda County Water District (Section 4, Chapter 1942

of the Statutes of 1961, as amended in 1970 and 1973), which grants additional powers to ACWD to prevent pollution, contamination, or diminution in quality of the groundwater supply; local well ordinances (Fremont No. 950, as amended; Newark No. 136; and Union City No. 109-73); agreements with other agencies; and local hazardous materials ordinances.

POLICY STATEMENT

It is the policy of the Alameda County Water District to efficiently protect and manage the Niles Cone Groundwater Basin to ensure a reliable supply of high quality water that satisfies present and future municipal, industrial, recreational, and agricultural water needs in the ACWD service area. ACWD will develop and implement appropriate programs within the ACWD service area to protect and manage the groundwater basin as a long-term source of water supply for ACWD. ACWD will also actively protect the groundwater basin from activities outside the ACWD service area that may negatively impact the water quality and/or water supply of the basin.

OBJECTIVES

The purpose of this policy is to protect and improve ACWD's groundwater resources for the benefit of both ACWD's customers and private well owners by taking actions designed to meet the following objectives:

- Increase groundwater replenishment capability.
- Increase the usable storage capacity of the groundwater basin.
- Operate the basin to provide: (1) a reliable water supply to meet baseload and peak distribution system demands, (2) an emergency source of supply, and (3) reserve storage to augment dry year supplies.
- Protect groundwater quality from degradation from any and all sources including: saline

water intrusion, wastewater discharges, recycled water use, urban and agricultural runoff, or chemical contamination.

- Improve groundwater quality by (1) removing salts and other contaminants from affected areas of the basin, and (2) improving the water quality of source water used for groundwater recharge.

The specific groundwater management programs that have been developed and implemented by ACWD to achieve these policy objectives are listed in Table 1and are described in greater detail in Attachment 1 to this Policy.

This Policy is intended to serve as a guide to ACWD management in the continued development and implementation of programs to manage and protect ACWD water resources and as a nontechnical document to explain ACWD groundwater programs to members of the public. This Policy is not intended to create legal rights in any person or organization, or to impose legal obligations on ACWD. It may be amended or repealed by the Board of Directors at any time.

TABLE 1 - SUMMARY OF ACWD GROUNDWATER MANAGEMENT PROGRAMS

Groundwater Program	Description
Water Supply Management	Planning, managing, and optimizing ACWD's sources of supply: watershed runoff, SWP water for recharge, SWP water for treatment, SFPUC water for blending, and water banking.
Groundwater Replenishment	Operation of ACWD groundwater recharge facilities to optimize 1) capture of local runoff, 2) replacement of water extracted from production and ARP wells, and 3) maintenance of groundwater levels to prevent salt water intrusion.
Watershed Protection and Monitoring	Assisting in the protection and monitoring of the watershed to optimize the quality of runoff water available for ACWD water supply.
Basin Monitoring	Sampling and measuring wells to assess and evaluate 1) groundwater quality, 2) water pressures within the basin, and 3) the direction of groundwater flow.
Wellhead Protection Program	Identify sensitive recharge and groundwater areas, maintain an inventory of potential threats within these areas, assess the vulnerability of source water, and develop management strategies to minimize the potential for groundwater quality impacts.
Aquifer Reclamation Program	Pump brackish water from degraded aquifers in order to 1) increase useable basin storage, 2) improve overall water quality, 3) prevent movement of brackish water toward ACWD production wells, and 4) provide (future) supply augmentation through treatment to potable water standards.
Groundwater Protection Program	Maintain an active role in 1) assisting with the identification of potential groundwater contamination, 2) implementing monitoring systems at hazardous materials storage sites, and 3) providing technical oversight for investigations and cleanups at hazardous materials spill sites.
Well Ordinance Administration	As enforcing agency for municipal ordinances governing construction, repair, or destruction of wells, ACWD provides inspection services, collects fees, and performs field searches for abandoned wells which could act as a conduit for contamination of groundwater.

ATTACHMENT 1

ACWD GROUNDWATER MANAGEMENT PROGRAMS

(March 22, 2001)

Eight major groundwater management programs have been developed and implemented by ACWD to achieve the objectives identified in ACWD's Groundwater Management Policy:

- Water Supply Management
- Groundwater Replenishment
- Watershed Protection and Monitoring
- Basin Monitoring
- Wellhead Protection Program
- Aquifer Reclamation Program
- Groundwater Protection Program
- Well Ordinance Administration

Water Supply Management

ACWD has three primary sources of water: (1) runoff from the Alameda Creek Watershed, (2) treated surface water purchased from the San Francisco Public Utilities Commission (SFPUC) and delivered through the Hetch Hetchy aqueduct system, and (3) untreated surface water purchased from the State Water Project (SWP) and delivered through the South Bay Aqueduct. Alameda Creek watershed runoff and imported water from the State Water Project are used for replenishment of the Niles Cone Groundwater Basin.

The groundwater basin is used conjunctively with surface water supplies. Generally, surface water production facilities are operated throughout the year to meet distribution system demands. Groundwater production facilities are operated to meet a portion of the base load demand and to meet peak and emergency demands. A desalination facility is planned to be operational in 2002 to treat some of the brackish groundwater currently being discharged to the San Francisco Bay from the Aquifer Reclamation Program wells (see Aquifer Reclamation Program section) and produce a new source of high quality water.

ACWD conducts an annual survey of groundwater conditions to determine the amount of imported water needed to maintain groundwater levels within an acceptable range and to determine a replenishment assessment rate. Groundwater levels are also used to trigger dry year water management response programs, including additional water conservation and utilization of off-site water banking and/or exchange programs.

Owners of wells who pump water from the groundwater basin are required to pay a replenishment assessment to reimburse ACWD for a portion of the cost of imported water used to recharge the depleted groundwater basin and to help offset ACWD's groundwater basin operations and management costs. Currently, the owners or operators of 234 wells receive annual registration forms as part of the replenishment assessment program.

Reclaimed wastewater is a potential alternative source of supply for ACWD. ACWD will cooperate with the Union Sanitary District to explore appropriate and beneficial uses of reclaimed wastewater within ACWD's service area in locations where there is very little risk of percolation into the aquifers used for potable water production.

Groundwater Replenishment

ACWD utilizes sections of the Alameda Creek Flood Control Channel behind three inflatable rubber dams and recharge ponds (abandoned quarry pits) to store and percolate

water into the aquifers of the Niles Cone Groundwater Basin. The groundwater replenishment program serves two major roles:

(1) Replenishment of groundwater extracted to meet local demands and to replace brackish water extracted as part of the Aquifer Reclamation Program.

(2) Maintenance of groundwater flow toward San Francisco Bay, in order to prevent future saline water intrusion from the bay and to displace brackish water remaining from historic saline water intrusion.

Through ACWD's long range Capital Improvement Program, a major portion of the recharge ponds below (i.e., west of) the Hayward Fault were rehabilitated in 1997 and 1998 and resulted in greater storage capacity within the ponds and increased the rate at which water is recharged to replace water pumped from the groundwater basin.

Recharge facilities are operated to maximize the capture of local runoff. The operating criteria for the recharge facilities and the groundwater basin are continuously evaluated to optimize the use of these resources.

Watershed Protection and Monitoring

ACWD plays a major role in coordinating and communicating with other state and local agencies to influence policy decisions related to activities within the watershed of Alameda Creek which could have a negative effect on ACWD water supplies and the groundwater basin. This includes review of environmental impact reports, technical evaluation of National Pollutant Discharge Elimination System (NPDES) permits, emergency response to surface spills, participation in watershed planning and technical committees, and participation in planning studies for expansion of wastewater export facilities in the Livermore-Amador Valley.

As part of ACWD's watershed protection program, ACWD will require (to the extent

ACWD has legal authority to do so) and in all cases will request that lead agencies for future development projects within the Upper Alameda Creek Watershed that may affect water quality in Alameda Creek determine the extent and significance of those impacts, and will request such lead agencies to require adequate mitigation of any significant impacts to Alameda Creek and ACWD. Specific mitigation measures will depend on the particular features of individual projects including their location, size, volume of water applied and/or discharged, and the physical/chemical/biological composition of such water. Mitigation may include either or both implementation of on-site source control measures or contributions to off-site mitigation projects, such as reimbursement of a portion of ACWD's cost of constructing and operating a demineralization facility. The goal of whatever mitigation measures are employed is to prevent individual project or cumulative effects of development (or other projects within the Alameda Creek Watershed) from adversely changing the quality of groundwater in the Niles Cone Groundwater Basin.

ACWD is working in coordination with other agencies to implement a watershed monitoring program consisting of sampling surface water, measuring water quality parameters, and estimating water flow rates at key locations in the watershed. ACWD also patrols Alameda Creek performing visual inspections and collecting samples for water quality analysis. ACWD has constructed and maintains an automated monitoring station located adjacent to Alameda Creek at the west end of Niles Canyon which provides continuous information and signals an alarm to ACWD when there are significant changes in water flow or quality that may affect the operation of ACWD's recharge facilities.

Basin Monitoring

The District performs weekly water level measurements of representative wells in each major aquifer to monitor changes in groundwater levels. A more comprehensive

monitoring program consisting of sampling and measuring water levels is performed in the spring and fall of each year to assess the groundwater quality, water pressures within the basin, and direction of groundwater flow. Production wells are monitored regularly for a wide variety of water quality parameters specified by state and federal regulations. The groundwater recharge area is monitored daily for water level fluctuations to track percolation rates and to schedule water imports.

Because of development, many privately owned water wells that ACWD has utilized in the past for monitoring basin water levels and saline water intrusion have been destroyed. Since these wells are critical to the management of ACWD's groundwater basin, replacement monitoring wells have been included in the Capital Improvement Program. From 1997 through 1999, 32 monitoring wells have been installed as part of the Monitoring Well Construction Project. A total of approximately 60 wells are expected to be installed by 2007 to provide additional geologic information, to replace destroyed wells, and to improve water sample and water level data acquisition through efficiently located and appropriately designed wells.

Wellhead Protection Program

The 1986 Amendments to the Safe Drinking Water Act require each state to establish a Wellhead Protection Program which "protects the wellhead areas of all public water systems from contaminants that may have adverse human health effects." California is relying on local agencies to plan and implement this program. ACWD has initiated the identification of surface and recharge areas vulnerable to contamination for the protection of ACWD's groundwater facilities. The program also includes the identification of potential contaminant sources, development of management practices to reduce the contamination risk, identification of areas to be monitored, and preparation of a contingency/emergency

response plan in the event of a contamination incident. As an example of a management practice, ACWD has worked with the City of Fremont to require a "Do Not Pollute" decal at each storm drain inlet within a development adjacent to the recharge facilities and has mailed a stormwater runoff public education brochure to all houses on streets with storm drains that discharge directly into a recharge pond.

The groundwater portion of the Source Water Assessment Program (SWAP) that is now being required by the California Department of Health Services (DHS) has a similar focus to that of the Wellhead Protection Program. SWAP requires the identification of sensitive surface water and groundwater areas, an inventory of potential threats within those areas, and an assessment of source vulnerability. The primary difference between the programs is that the Wellhead Protection Program additionally identifies management strategies to minimize the potential for groundwater quality impacts. Because of the overlap between these programs, development of the programs will be closely coordinated. Since DHS is requiring a SWAP for all new sources of water, a "pilot" SWAP is currently being prepared for Aquifer Reclamation Program wells that will serve as supply wells for ACWD's future desalination facility. This pilot SWAP will serve as a model for developing a SWAP for all ACWD facilities in the future.

Both of these programs are expected to benefit from the results of the American Water Works Association Research Foundation project being jointly conducted by ACWD and the Lawrence Livermore National Laboratory. The project, titled "Predicting Water Quality Changes from Artificial Recharge Sources to Nearby Wellfields," began in the spring of 1997 and is expected to be completed in 2001. The scope of work includes the characterization and evaluation of groundwater flowing between the percolation ponds and ACWD's production wells using isotopic tracers, age-dating techniques, and production and monitoring well sampling. A major objective of the study is determining groundwater and

chemical travel times within the fastest flow paths between the recharge facilities and the production wells.

ACWD's efforts in developing a Wellhead Protection Program and maintaining a strong public education program have been recognized as a Groundwater Guardian Affiliate by the Groundwater Foundation, a private non-profit educational organization that is dedicated to educating the public about the conservation and protection of groundwater. The Groundwater Guardian Affiliate designation is awarded to entities at the regional level that work to promote shared responsibility for groundwater protection.

Aquifer Reclamation Program

The goal of this program is to remove entrapped saline water from degraded portions of aquifers in the Niles Cone Groundwater Basin in order to increase usable basin storage, to improve overall water quality, and to prevent the movement of this saline water toward production wells. Pumped water from a combination of nine Aquifer Reclamation Program (ARP) wells is discharged to flood control channels in accordance with a NPDES permit issued by the Regional Water Quality Control Board. Operation of this program depends on the annual availability of water supplies to replace the water that is pumped out of the aquifers. In the future, some of the wells used in this program will be converted to supply water to the brackish groundwater desalination facility planned for Newark to supplement ACWD's drinking water supply.

Five other wells are being evaluated as possible additions to the Aquifer Reclamation Program. These wells are former Salinity Barrier Project wells. The Salinity Barrier Project (SBP) was initiated in the late 1970's by ACWD in cooperation with the Department of Water Resources. The plan was to install 14 extraction wells strategically located to create an alignment just inland of the salt evaporator ponds, running parallel

along the entire stretch of ACWD's shoreline. Simultaneous pumping of the wells would create a trough along the alignment to prevent inland migration of saline water originating from the bay and evaporator ponds during drought periods. In addition to preventing new sea water intrusion, SBP operation was planned as a potential augmentation of the Aquifer Reclamation Program during non-drought periods for mitigating historic sea water intrusion in the interior part of the basin. By the late 1980's, five of the fourteen wells were constructed. However, the project was postponed pending further evaluation.

In the course of comprehensive water supply and facilities planning in the 1990's, ACWD determined that operation of the basin below sea level during drought periods is no longer a necessary or desirable strategy relative to other water supply options that have since become available to ACWD. Because the basin is not likely to be operated significantly below sea level during drought periods, SBP is not needed to prevent new sea water intrusion. Although ACWD's groundwater basin strategy no longer includes a salt water barrier, groundwater modeling indicates that pumping these wells may help to improve water quality in the inland portions of the groundwater basin (which is the goal of the Aquifer Reclamation Program), especially if they are pumped during wet periods with high piezometric head. More groundwater modeling work is needed to determine whether their contribution to water quality improvement would justify their activation.

Groundwater Protection Program

ACWD takes an active role in (1) assisting regulatory agencies and industry in identifying sources of potential groundwater contamination, (2) implementing monitoring systems at hazardous materials storage sites, and (3) providing technical oversight for the investigation and cleanup operations at Leaking Underground Fuel Tank (LUFT) and Spills, Leaks, Investigation, and Cleanup (SLIC) sites to assure the protection of the groundwater

basin. Coordination with federal, state, county, and city agencies similarly involved is a key to the success of this program. This program's objectives are to protect the basin from future water quality degradation by ensuring that existing tanks have not leaked and that future chemical releases are quickly identified and controlled.

Since 1988, ACWD informally provided assistance to the California Regional Water Quality Control Board - San Francisco Bay Region (Regional Board) in overseeing the investigation and remediation at LUFT and SLIC sites. In order to memorialize the terms of this participation and to further strengthen the coordination between the Regional Board and ACWD, the agencies entered into a Cooperative Agreement on June 27, 1996. ACWD entered into similar Cooperative Agreements with the Cities of Fremont, Newark, and Union City on March 25, 1997, June 26, 1997, and August 12, 1997 to further strengthen the interagency coordination and cost-effective implementation of groundwater protection within the cities. ACWD also entered into an agreement with the City of Hayward on July 27, 2000 to work cooperatively on sites which threaten or affect water quality in the portion of the City of Hayward that is within ACWD's service area (Hayward Detachment areas).

Well Ordinance Administration

Ordinances to regulate the construction, repair, reconstruction, destruction or abandonment of wells with the boundaries of the Cities of Fremont, Newark, and Union City were adopted by each city (City of Fremont Ordinance No. 950 on June 26, 1973, as amended by Ordinance No. 963 on October 16, 1973; City of Newark Ordinance No. 136 on July 12, 1973; and City of Union City Ordinance No. 109-73 on June 18, 1973). The purpose of the ordinances is:

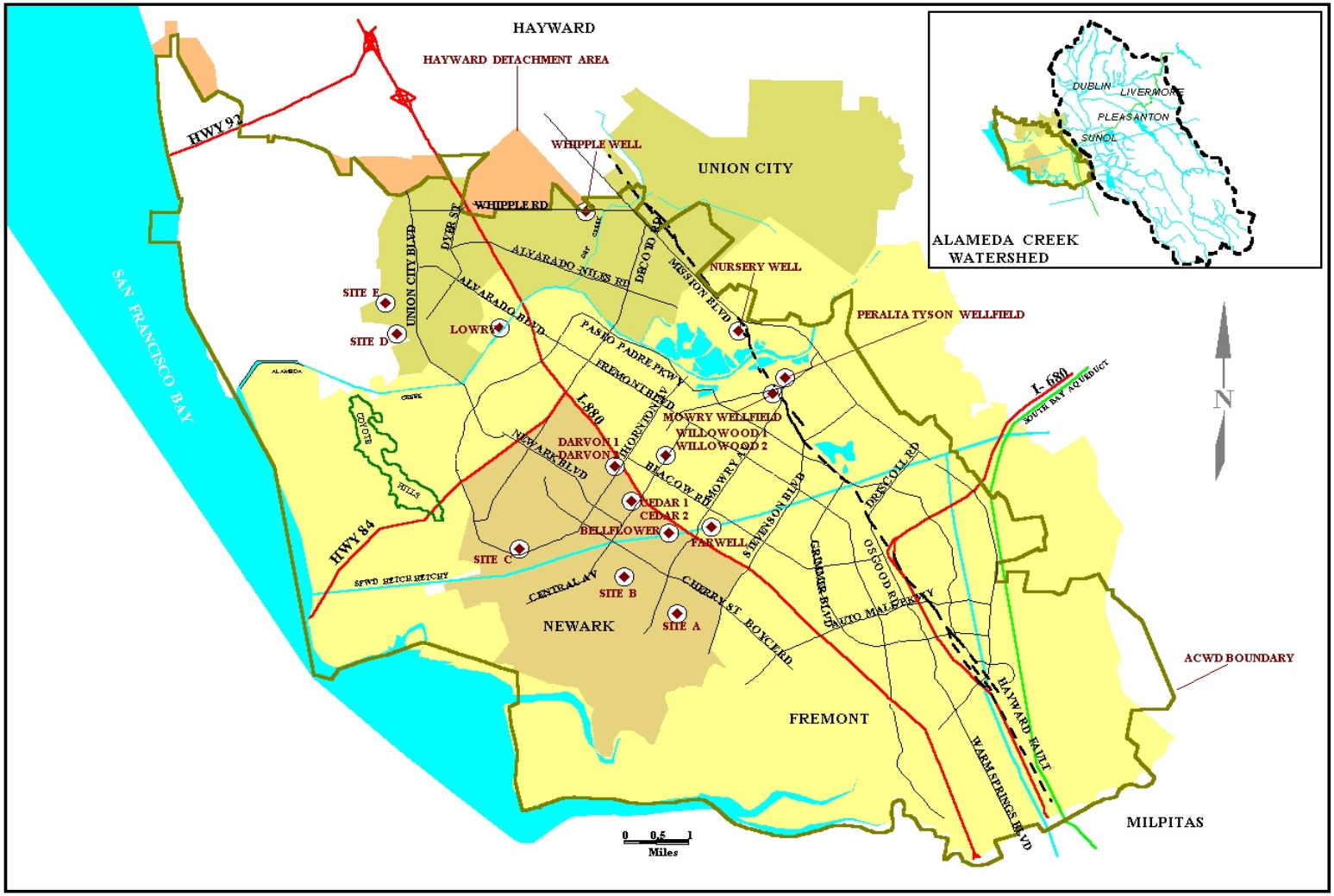
> "to provide for the construction, repair, reconstruction, and destruction of wells, including cathodic protection wells and exploratory holes, to the end

> that the groundwater found wholly or partially within the area of the [cities] will not be polluted or contaminated and that water obtained from water wells will be suitable for the beneficial uses intended and will not jeopardize the health, safety or welfare of the people of the said city, and for the destruction of abandoned wells or wells found to be public nuisances, including cathodic protection wells and exploratory holes, to the end that such wells will not cause pollution or contamination of groundwater or otherwise jeopardize the health, safety or welfare of the people of the said city."

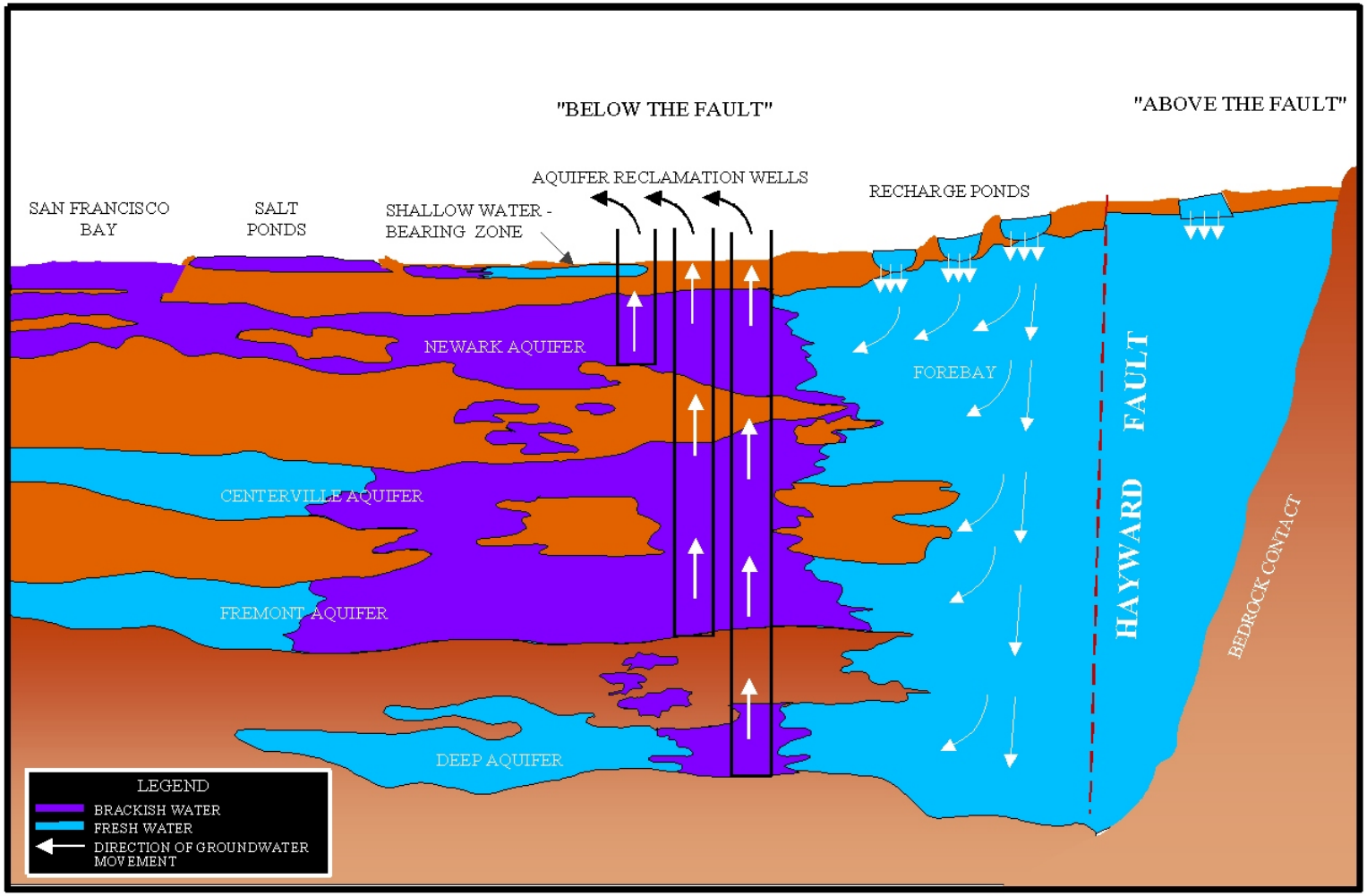
Each of the ordinances designates ACWD as the enforcing agency as defined by the Department of Water Resources and requires that a written permit be obtained from ACWD prior to conducting any of the work described above in each of the cities. By separate resolutions on January 10, 1974, ACWD agreed to implement the city ordinances and authorized the collection of fees to defray the expenses of enforcing them (Resolution No. 74-002 to implement Ordinance No. 950 as amended by Ordinance No. 963 of the City of Fremont; Resolution No. 74-003 to implement Ordinance No. 136 of the City of Newark; Resolution No. 74-004 to implement Ordinance No. 109-73 of the City of Newark). ACWD has also worked with the City of Hayward to amend the City Well Ordinance to require ACWD's approval prior to the construction, operation, or destruction of wells in Hayward Detachment areas.

ACWD has developed a well destruction program in cooperation with the cities. When land use changes are proposed, the cities require the property owners or developers to obtain a letter from ACWD indicating whether wells are located within the boundaries of the development. This process gives ACWD the opportunity to conduct a record and field search for wells before development occurs. If wells are located within the development,

the city and appropriate parties are notified. The destruction of abandoned wells then become a condition for approval of the proposed development or land use change by the city building or planning departments. ACWD also maintains a process to insure that abandoned wells are properly destroyed before water service improvements are accepted.



ATTACHMENT 2 - ALAMEDA COUNTY WATER DISTRICT GROUNDWATER FACILITIES



ATTACHMENT 3 - NILES CONE GROUNDWATER BASIN SCHEMATIC

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APPENDIX D
CUWCC Best Management Practices Annual Reporting

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California Urban Water Conservation Council Annual Reports

CUWCC BMP Retail Coverage Report 2009-2010

GPCD Compliance

GPCD Worksheet

Base Year Data 2008

Reporting Year 2009

Water Sources and Usage

Water Usage

Water Sources

BMP 1 Operations Practices

1.1 Conservation Coordinator and Water Waste Prevention

1.2 Water Loss Control

1.3 Metering with Commodity Rates

1.4 Retail Conservation Pricing

BMP 2 Education Programs

2.1 Public Outreach

2.2 School Education Programs

Reporting Year 2010

Water Sources and Usage

Water Usage

Water Sources

BMP 1 Operations Practices

1.1 Conservation Coordinator and Water Waste Prevention

1.2 Water Loss Control

1.3 Metering with Commodity Rates

1.4 Retail Conservation Pricing

BMP 2 Education Programs

2.1 Public Outreach

2.2 School Education Programs

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CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

Agency: Alameda County Water District **District Name:** Alameda County Water District **CUWCC Unit #:** 7
Retail

Primary Contact Stephanie Nevins **Telephone** 510.668.4207 **Email:** stephanie.nevins@acwd.com

Compliance Option Chosen By Reporting Agency:
(Traditional, Flex Track or GPCD)
GPCD if used:

GPCD in 2010	**128**
GPCD Target for 2018	135

Year	Report	Target		Highest Acceptable Bound	
		% Base	GPCD	% Base	GPCD
2010	1	96.4%	159	100%	165
2012	2	92.8%	153	96%	159
2014	3	89.2%	147	93%	153
2016	4	85.6%	141	89%	147
2018	5	82.0%	135	82%	135

Not on Track if 2010 GPCD is > than target

GPCD in 2010	128
Highest Acceptable GPCD for 2010	165

On Track

Agency: **Alameda County Water District** District Name: **Alameda County Water District** CUWCC Unit #: **7**
Retail

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

Foundational BMPs

BMP 1.1 Operational Practices

Conservation Coordinator provided with necessary resources to implement BMPs?

		2009	2010
1.Conservation Coordinator provided with necessary resources to implement BMPs?	Name	Stephanie Nevins	Stephanie Nevins
	Title	Water Conservation Administrator	Water Conservation Administrator
	Email		stephanie.nevins(
		On Track	On Track

On Track if any one of the 6 ordinance actions done, plus documentation or links provided

2. Water waste prevention documentation		
	Descriptive File	Alameda County WD_Alameda
	Descriptive File 2010	Alameda County WD_Alameda County WD_7_2010_operations practices_BMP1-1_Ordinance Prohibiting Wasteful Use of Water.pdf
	URL	0
	URL 2010	0
	Describe Ordinance Terms	0
	Describe Ordinance Terms 2010	0
		On Track / On Track

Agency: Alameda County Water District **District Name:** Alameda County Water District **CUWCC Unit #:** 7
Retail

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

BMP 1.2 Water Loss Control

		2009		
Compile Standard Water Audit using AWWA Software?		Yes	On Track	On Track if Yes, Not on Track if No
AWWA file provided to CUWCC?		72	On Track	On Track if Yes, Not on Track if No
AWWA Water Audit Validity Score?		yes		Info only until 2012
Completed Training in AWWA Audit Method?		Yes		
Completed Training in Component Analysis Process?		No		Info only until 2012
Complete Component Analysis?		will be completed in 2012-2013		Info only until 2012
Repaired all leaks and breaks to the extent cost effective?		Yes	On Track	On Track if Yes, Not on Track if No
Locate and repair unreported leaks to the extent cost effective.	ACWD activites include distribution system leak detection and repair of reported and unreported leaks and a residential leak detection program where meter readers assess for leaks when a reading is unusually high.		On Track	On Track if Yes, Not on Track if No
Maintain a record-keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair.				Info only until 2012

Provided 7 types of Water Loss Control Info

Leaks Repaired	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost of Interventions	Water Saved
0	$ -	$ -	0	Off	$ -	0

Info only until 2012

Agency: Alameda County Water District **District Name:** Alameda County Water District **CUWCC Unit #:** 7
Retail

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

		2010		
Compile Standard Water Audit using AWWA Software?		Yes	On Track	On Track if Yes, Not on Track if No
AWWA file provided to CUWCC?	Alameda County WD_Alameda County WD_7_2010_Water		On Track	On Track if Yes, Not on Track if No
AWWA Water Audit Validity Score?		71		Info only until 2012
Completed Training in AWWA Audit Method?		yes		
Completed Training in Component Analysis Process?		Yes		Info only until 2012
Complete Component Analysis?		No		Info only until 2012
Repaired all leaks and breaks to the extent cost effective?		Yes	On Track	On Track if Yes, Not on Track if No
Locate and repair unreported leaks to the extent cost effective.		Yes	On Track	On Track if Yes, Not on Track if No
Maintain a record-keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair.				Info only until 2012
Provided 7 types of Water Loss Control Info				Info only until 2012

Leaks Repaired	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost of Interventions	Water Saved
391	$ 2,364,018	$ 1,506,426	0	Off	$ 3,649,581	0

Agency: **Alameda County Water District** District Name: **Alameda County Water District** CUWCC Unit #: **7**
Retail

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

1.3 METERING WITH COMMODITY RATES FOR ALL NEW CONNECTIONS AND RETROFIT OF EXISTING CONNECTIONS

If signed MOU prior to 31 Dec 1997, On Track if all connections metered; If signed after 31 Dec 1997, complete meter installations by 1 July 2012 or within 6 yrs of signing and 20% biannual reduction of unmetered connections.

		2009		2010		
Exemption or 'At least as Effective As' accepted by CUWCC						
Numbered Unmetered Accounts	**2008**	0	**On Track**	0	**On Track**	On Track if no unmetered accounts
Metered Accounts billed by volume of use		Yes	**On Track**	Yes	**On Track**	Volumetric billing required for all connections on same schedule as metering
Number of CII accounts with Mixed Use meters		4,280		4,281		Info only
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?		Yes	**On Track**	Yes	**On Track**	On Track if Yes, Not on Track if No
Feasibility Study provided to CUWCC?		Yes	**On Track**	Yes	**On Track**	On Track if Yes, Not on Track if No
Completed a written plan, policy or program to test, repair and replace meters		Yes	**On Track**	Yes	**On Track**	On Track if Yes, Not on Track if No

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

Agency: **Alameda County Water District** **District Name:** **Alameda County Water District** **CUWCC Unit #:** **7**
Retail

Primary Contact Stephanie Nevins **Email:** stephanie.nevins@acwd.com

1.4 Retail Conservation Pricing

On Track if: Increasing Block, Uniform, Allocation, Standby Service; Not on Track if otherwise

Metered Water Rate Structure

Customer Class	2009 Rate Type	Conserving Rate?	Customer Class	2010 Rate Type	Conserving Rate?
Single-Family	Uniform	Yes	Single-Family	Uniform	Yes
Multi-Family	Uniform	Yes	Multi-Family	Uniform	Yes
Commercial	Uniform	Yes	Commercial	Uniform	Yes
Industrial	Uniform	Yes	Industrial	Uniform	Yes
Institutional	Uniform	Yes	Institutional	Uniform	Yes
Dedicated Irrigation	Uniform	Yes	Dedicated Irrigation	Uniform	Yes
Other	Uniform	Yes	Other	Uniform	Yes
	On Track			On Track	

Year Volumetric Rates began for Agencies with some Unmetered Accounts

Info only

Agencies with Partially Metered Service Areas: If signed MOU prior to 31 Dec. 1997, implementation starts no later than 1July 2010. If signed MOU after 31 Dec. 1997, implementation starts no later than 1July 2013, or within seven years of signing the MOU,

Agency: Alameda County Water District **District Name:** Alameda County Water District **CUWCC Unit #:** 7
Retail

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

Adequacy of Volumetric Rates) for Agencies with No Unmetered Accounts

Customer Class	2009 Rate Type	2009 Volumetric Revenues $1000s	2010 Rate Type	2010 Volumetric Revenues $1000s
Single-Family	Uniform	$ 25,524	Single-Family	$ 24,343
Multi-Family	Uniform	$ 8,571	Multi-Family	$ 8,654
Commercial	Uniform	$ 5,354	Commercial	$ 5,353
Industrial	Uniform	$ 3,276	Industrial	$ 3,182
Institutional	Uniform	$ 2,223	Institutional	$ 2,036
Dedicated Irrigation	Uniform	$ 5,917	Dedicated Irrigation	$ 5,349
Other	Uniform	$ 168	Other	$ 107
Total Revenue Commodity Charges (V):		$ 51,033		$ 49,024
Total Revenue Fixed Charges (M):		$ 6,263		$ 6,701
Calculate: V / (V + M):		89%		88%
		On Track		On Track

Agency Choices for rates:

A) Agencies signing MOU prior to 13 June2007, implementation starts 1 July2007: On Track if (V / (V + M) ≥ 70% x .8 = **56% for 2009** and 70%x0.90 = **63% for 2010**; Not on track if (V / (V + M)) < 70%;

B) Use Canadian model. Agencies signing MOU after 13June2007, implementation starts July 1 of year following signing.

Canadian Water & Wastewater Rate Design Model Used and Provided to CUWCC	**No**	**No**
	On Track	On Track
If Canadian Model is used, was 1 year or 3 year period applied?		

Wastewater Rates

	2009		2010
Does Agency Provide Sewer Service?	**No**	If 'No', then wastewater rate info not required.	**No**

Customer Class	2009 Rate Type	Conserving Rate?	Customer Class	2010 Rate Type	Conserving Rate?
		Yes			Yes
		Yes			Yes
		Yes			Yes
		Yes			Yes
		Yes			Yes
		Yes			Yes
		Yes			Yes
		On Track			On Track

On Track if: 'Increasing Block', 'Uniform', 'based on long term marginal cost' or 'next unit of capacity'

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

Agency: Alameda County Water District **District Name:** Alameda County Water District **CUWCC Unit #:** 7

Primary Contact Stephanie Nevins **Telephone** #N/A **Email:** stephanie.nevins@acwd.com

BMP 2. EDUCATION PROGRAMS

BMP 2.1 Public Outreach Actions Implemented and Reported to CUWCC

	2009	2010
1) Contacts with the public (minimum = 4 times per year)	3,049	3,048
2) Water supplier contacts with media (minimum = 4 times per year, i.e., at least quarterly).	18	20
3) An actively maintained website that is updated regularly (minimum = 4 times per year, i.e., at least quarterly).	Yes	yes
4) Description of materials used to meet minimum requirement.	Newsletter articles on conservation Website General water conservation information Email Messages Articles or stories resulting from outreach News releases Newspaper contacts Radio contacts	Newsletter articles on conservation Website General water conservation information Email Messages Articles or stories resulting from outreach News releases Newspaper contacts Radio contacts
	Description is too large for text area. Data will be stored in the BMP Reporting database when online.	
5) Annual budget for public outreach program.	$ 178,579	$ 193,309
6) Description of all other outreach programs	Description is too large for text area. Data will be stored in the BMP Reporting database when online.	Description is too large for text area. Data will be stored in the BMP Reporting database when online.
	OnTrackfor 6 Actions	**OnTrackfor 6 Actions**

All 6 action types implemented and reported to CUWCC to be 'On Track')

Agency: Alameda County Water District **District Name:** Alameda County Water District **CUWCC Unit #:** 7

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

2.2 School Education Programs Implemented and Reported to CUWCC

	2009	2010	
Does a wholesale agency implement School Education Programs for this unility's benefit?	No	No	
Name of Wholesale Supplier?	0	0	
1) Curriculum materials developed and/or provided by agency	ACWD provides resource materials to teachers about water supply and water conservation. Materials include workbooks, lesson plans, curriculum guides, brochures, videos, posters, maps, games, stickers, pencils, rulers, and magnets. Each year, approximately 70,000 pieces of material are distributed.	ACWD provides resource materials to teachers about water supply and water conservation. Materials include workbooks, lesson plans, curriculum guides, brochures, videos, posters, maps, games, stickers, pencils, rulers, and magnets. Each year, approximately 70,000 pieces of material are distributed. Project WET	Yes/ No
2) Materials meet state education framework requirements and are grade-level appropriate?	Yes	Yes	All 5 actions types implemented and reported to CUWCC to be 'On Track'
3) Materials Distributed to K-6?	yes	Yes	
Describe K-6 Materials	ACWD provides workbooks, lesson plans, curriculum guides, brochures, videos, posters, maps, stickers.	ACWD provides workbooks, lesson plans, curriculum guides, brochures, videos, posters, maps, stickers.	Describe materials to meet minimum requirements
Materials distributed to 7-12 students?	Yes	Yes	Info Only
4) Annual budget for school education program.	$107,837	$ 110,461	
5) Description of all other water supplier education programs	ACWD's school education program includes classroom instruction, a water conservation school assembly program, distribution of educational resource materials, tours, a mini-grant program for local teachers, teacher workshops (Project WET, etc.) and educational material available on ACWD's homepage www.acwd.org.	ACWD's school education program includes classroom instruction, a water conservation school assembly program, distribution of educational resource materials, tours, a mini-grant program for local teachers, teacher workshops (Project WET, etc.) and educational material available on ACWD's homepage www.acwd.org.	
	1 **On Track**	1 **On Track**	

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California Urban Water Conservation Council

TARGETS / COMPLIANCE
(CUWCC MOU)

Baseline / Initial GPCD
(Use option buttons to select)

GPCD in 2006 ○	152.4
Baseline GPCD (1997 to 2006) ◉	165.0
GPCD in 2010	127.5
GPCD Target for 2018	135.3

Potable Water GPCD for each Year in the Baseline Period

Year	GPCD
2006	152.4
2005	154.9
2004	163.0
2003	159.5
2002	163.6
2001	164.9
2000	170.2
1999	168.5
1998	165.2
1997	188.0

Biennial GPCD Compliance Table

Year	Report	Target		Highest Acceptable Bound	
		% Base	GPCD	% Base	GPCD
2010	1	96.4%	159.1	100%	165.0
2012	2	92.8%	153.1	96.4%	159.1
2014	3	89.2%	147.2	92.8%	153.1
2016	4	85.6%	141.3	89.2%	147.2
2018	5	82.0%	135.3	82.0%	135.3

Monthly GPCD Data for Weather Normalization

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2010	93.5	79.6	97.5	101.6	132.0	163.9	183.8	178.0	166.0	140.8	103.4	90.2
Baseline avg*	111.5	102.7	125.1	151.1	186.8	211.7	234.2	228.4	207.2	175.9	129.6	116.2

* The average for each month is based on the baseline period 1997 to 2006

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Agency name: Alameda County Water District

Reporting unit name (District name): Alameda County Water District

Reporting unit number: 7

Primary contact:

First name: Stephanie

Last name: Nevins

Email: stephanie.nevins@acwd.com

You must enter the re... w... agency. Click here to open a table to obtain this number.

Submit Form

Base Year Data

Link to FAQs

Reporting Unit Base Year

Base Year: 2008

What is your reporting period? Fiscal

BMP 1.3 Metering

Number of unmetered accounts in Base Year: 0

BMP 3.1 & BMP 3.2 & BMP 3.3 Residential Programs

Number of Single Family Customers in Base Year: 70,857

Number of Multi Family Units in Base Year: 33,600

BMP 3.4 WaterSense Specification (WSS) Toilets

Number of Single Family Housing Units constructed prior to 1992: 61,769

Number of Multi Family Units prior to 1992: 29,769

Average number of toilets per single family household: 2

Average number of toilets per multi family household: 1

Five year average resale rate of single family households: 5.7%

Five-year average resale rate of multi family households: 9.7%

Average number of persons per single family household: 3

Average number of persons per multi family household: 2

BMP 4.0 & BMP 5.0 CII & Landscape

Total water use (in Acre Feet) by CII accounts: 10,381

Number of accounts with dedicated irrigation meters: 2,086

Number of CII accounts without meters or with Mixed Use Meters: 4,260

Number of CII accounts: 4,260

Comments: Five Year average resale rate of SF/MF households: This information came from Zillow.com. Weighted average of Fremont, Newark, Union City based on 2000 census data. Number of CII accts with Mixed Use Meters: The no. of CII accts with mixed use meters is assumed to be the no. of CII accts due to the difficulty in identifying mixed use accts among all CII accts. The actual number is likely to be substantially less. A new customer information system to be launched in early 2012, and will allow us to get a better estimate.

version 1.0

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The fields in red are required.

Agency name: Alameda County Water District

Division name (Reporting unit): Alameda County Water District

Reporting unit number: 7

Primary contact:

First name: Stephanie

Last name: Nevins

Email: stephanie.nevins@acwd.com

Submit Form

Water Uses

2009

Potable Water Billed

Make sure to enter numbers in AF/Year.

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
Single-Family	71,085.00	24,064.00	0.00	0.00	
Multi-Family	2,061.00	8,091.00	0.00	0.00	
Commercial	2,726.00	5,064.00	0.00	0.00	
Industrial	846.00	2,829.00	0.00	0.00	
Institutional	708.00	2,095.00	0.00	0.00	
Dedicated Irrigation	2,105.00	5,625.00	0.00	0.00	
Fire Lines	2,145.00	157.00	0.00	0.00	Fire/Hydrant
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					

Potable Water Un-Billed

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					

The fields in red are required.

Agency name: Alameda County Water District

Division name (Reporting unit): Alameda County Water District

Reporting unit number: 7

Primary contact:

First name: Stephanie

Last name: Nevins

Email: stephanie.nevins@acwd.com

Submit Form

Water Uses

2009

Non-Potable Billed

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					

Non-Potable Un-Billed

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					

The fields in red are required.

Agency name: Alameda County Water District

Division name (Reporting unit): Alameda County Water District

Reporting unit number: 7

Primary contact:

First name: Stephanie

Last name: Nevins

Email: stephanie.nevins@acwd.com

Submit Form

WATER SOURCES

2009

Service Area Population: 333,881

Potable Water

Own Supply Source Name	AF/YEAR	Water Supply Type	Water Supply Description
Del Valle	4,200.00	Surface	Del Valle Treated at Surface Water
ACWD Groundwater	13,000.00	Groundwater	Wells + Desal - Imported Recharge
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	

Imported Supply Source Name	AF/YEAR	Water Supply Type	Water Supply Description
SFPUC	12,600.00	Surface	SFPUC Surface Water
Statewater	16,600.00	Surface	Statewater Treated at Surface Water
Statewater/Groundwater	4,400.00	Groundwater	Statewater Recharged and Pumped
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	

Exported Water Name	AF/YEAR	Where Exported?
None	0.00	

The fields in red are required.

Agency name: Alameda County Water District

Division name (Reporting unit): Alameda County Water District

Reporting unit number: 7

Primary contact:

First name: Stephanie

Last name: Nevins

Email: stephanie.nevins@acwd.com

Submit Form

2009

Service Area Population: 333881

Non- Potable Water

Own Supply Source Name	AF/YEAR	Water Supply Type	If you select Other for type, enter Water Supply Description
None	0.00	Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	

Imported Supply Source Name	AF/YEAR	Water Supply Type	Water Supply Description
None	0.00	Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	

Exported Water Name	AF/YEAR	Where Exported? such as groundwater recharge, retail,
None	0.00	

The fields in red are required.

Agency name: Alameda County Water District

Reporting unit name (District name): Alameda County Water District

Reporting unit number: 7

Primary contact:

First name: Stephanie

Last name: Nevins

Email: stephanie.nevins@acwd.com

You must enter the reporting unit numbe we have on record fo agency. Click here to open a table to obtain this number.

Submit Form

Link to FAQs

2009

BMP 1.1 Operations Practices

Comments:

See the complete MOU: View MOU

See the coverage requirements for this BMP:

Conservation Coordinator

Conservation Coordinator (•) Yes ( ) No

Contact Information

First Name	Stephanie
Last Name	Nevins
Title	Water Conservation Administrator
Phone	510.668.4207
Email	stephanie.nevins@acwd.com

Note that the contact information may be the same as the primary contact information at the top of the page. If this is your case, excuse the inconvenience but please enter the information again.

Water Waste Prevention

Water Agency shall do one or more of the following:

a. Enact and enforce an ordinance or establish terms of service that prohibit water waste
b. Enact and enforce an ordinance or establish terms of service for water efficient design in new development
c. Support legislation or regulations that prohibit water waste
d. Enact an ordinance or establish terms of service to facilitate implementation of water shortage response measures
e. Support local ordinances that prohibit water waste
f. Support local ordinances that establish permits requirements for water efficient design in new

To document this BMP, provide the following:

a. A description of, or electronic link to, any ordinances or terms of service
b. A description of, or electronic link to, any ordinances or requirements adopted by local jurisdictions or regulatory agencies with the water agency's service area.
c. A description of any water agency efforts to cooperate with other entities in the adoption or enforcement of local requirement
d. description of agency support positions with respect to adoption of legislation or regulations

You can show your documentation by providing files, links (web addresses), and/or entering a description.

File name(s): Email files to natalie@cuwcc.org Alameda County WD_Alameda County WD_7_2009_operations practices_BMP1-1_Ordinance Prohibiti

Web address(s) URL: comma-separated list

Enter a description:

ORDINANCE NO. 2008-01

AN ORDINANCE OF THE BOARD OF DIRECTORS OF ALAMEDA COUNTY WATER DISTRICT PROHIBITING WASTEFUL USE OF WATER, PURSUANT TO WATER CODE SECTION 375

A. REGULATIONS AND RESTRICTIONS ON WATER USE

It is hereby declared by the Board of Directors that, in order to conserve the District's water supply for the greatest public benefit, reduce the quantity of water used by the District's customers, and maintain the District's commitment to implementing cost effective Best Management Practices (BMPs) as a signatory to the Memorandum of Understanding (MOU) on Urban Water Conservation, it is necessary that wasteful use of water be eliminated. Customers of the District shall observe the following regulations and restrictions on water use:

1. Residential customers shall not:

    a. Use water for lawn or garden watering, or any other irrigation, in a manner which results in excessive flooding or excessive runoff in gutters or other waterways, patios, driveways, walks or streets;

    b. Use water for washing sidewalks, walkways, driveways, patios, parking lots, tennis courts or other hard-surfaced areas in a manner which results in excessive runoff or waste;

    c. Use water for washing cars, boats, trailers or other vehicles and machinery in a manner which results in excessive runoff or waste. Hoses should be equipped with shutoff nozzles.

2. Nonresidential customers shall not:

    a. Use single pass cooling systems in new connections;

    b. Use non-recirculating systems in new conveyer car wash and commercial laundry systems;

    c. Use non-recycling decorative water fountains;

    d. Use water for lawn or garden watering, or any other irrigation, in a manner which results in excessive flooding or runoff in gutters or other waterways, patios, driveways, walks or streets;

e. Use water for washing sidewalks, walkways, driveways, patios, parking lots, tennis courts or other hard-surfaced areas in a manner which results in excessive runoff or waste.

3. All Customers Shall:

a. Reduce other interior or exterior water uses to minimize or eliminate excessive runoffs or waste; and

b. Repair leaks as soon as practicable.

B. EXCEPTIONS

Consideration of written applications for exceptions regarding regulations and restrictions on water use set forth in this Ordinance shall be as follows:

1. Written applications for exceptions shall be accepted, and may be granted, by the Manager of Customer Service or designee.

2. Denials of applications may be appealed in writing to the General Manager;

3. Grounds for granting such exceptions are:

a. Failure to do so would cause an unnecessary and undue hardship to the Applicant, including but not limited to, adverse economic impacts, such as loss of production or jobs; or

b. Failure to do so would cause a condition affecting the health, sanitation, fire protection or safety of the Applicant or the public.

C. ENFORCEMENT

1. If the District determines that a customer is using water in violation of this Ordinance, the District will send a written warning to the customer that identifies the wasteful use of water, requests that the customer stop such wasteful use, informs the customer about the process for applying for an exception from the requirements of this Ordinance, and informs the customer that failure to comply with this Ordinance may result in the termination of service.

2. The District may, after issuing a written warning, and if the customer does not request an exception, conduct a follow-up visit in order to ascertain whether wasteful use of water is still occurring. In the event that continued waste of water is observed, and no exception has been granted, the District will issue a second written warning by on-site notification of wasteful water use and the

customer will be charged for the follow-up visit consistent with the field service visit charge in the District's Rate and Fee Schedule, Section 3A.

3. In the event that District personnel observe excessive water use occurring at a customer's premises in violation of the regulations and restrictions on water use set forth in this Ordinance more than 48 hours after the on-site notification, the General Manager may authorize termination of water service.

4. The charge for restoring service shall be consistent with the reconnection charge in District's Rate and Fee Schedule, Section 3E. The customer must have stopped the wasteful use of water and have paid all charges owed to the District under this Ordinance before the District will restore water service.

This Ordinance shall become effective and be enforced as of June 6, 2008.

The District Secretary shall cause a copy of this ordinance to be published in a newspaper of general circulation in the District.

PASSED AND ADOPTED THIS 5th day of June, 2008, by the following vote:

AYES: Directors Huang, Koller, Lampert, and Weed

NOES: None

ABSENT: Director Gunther

/s/ JOHN H. WEED
John H. Weed, President
Board of Directors
Alameda County Water District

ATTEST:

/s/ GINA MARKOU
Gina Markou, District Secretary
Alameda County Water District

APPROVED AS TO FORM:

/s/ RAY MCDEVITT
Ray McDevitt, Attorney
Alameda County Water District

The fields in red are required.

Agency name: Alameda County Water District

Reporting unit name (District name): Alameda County Water District

Reporting unit number: 7

Primary contact:

First name: Stephanie

Last name: Nevins

Email: stephanie.nevins@acwd.com

You must enter the r... agency. Click here to open a table to obtain this number.

Submit Form

Link to FAQs

2009 BMP 1.2 Water Loss Control

View MOU

AWWA Water Audit

Agency to complete a Water Audit & Balance Using The AWWA Software (●) Yes ( ) No

Email to natalie@cuwcc.org - Worksheets (AWWA Water Audit). Enter the name of the file below:

Alameda County WD_Alameda County WD_7_2009_Water Loss Control_BMP1-2-B_AWW

Water Audit Validity Score from AWWA spreadsheet: 72

Agency Completed Training In The AWWA Water Audit Method (●) Yes ( ) No

Agency Completed Training In The Component Analysis Process (●) Yes ( ) No

Completed/Updated the Component Analysis (at least every 4 years)? ( ) Yes (●) No

Component Analysis Completed/Updated Date: will be completed in 2012-2013

Water Loss Performance

Agency Repaired All Reported Leaks & Breaks To The Extent Cost Effective (●) Yes ( ) No

Recording Keeping Requirements:

Date/Time Leak Reported	Leak Location
Type of Leaking Pipe Segment or Fitting	Leak Running Time From Report to Repair
Leak Volume Estimate	Cost of Repair

Agency Located and Repaired Unreported Leaks to the Extent Cost Effective (●) Yes ( ) No

Type of Program Activities Used to Detect Unreported Leaks

ACWD activites include distribution system leak detection and repair of reported and unreported leaks and a residential leak detection program where meter readers assess for leaks when a reading is unusually high.

Annual Summary Information

Complete the following table with annual summary information (required for reporting years 2-5 only)

Total Leaks Repaired	Economic Value Of Real Loss	Economic Value Of Apparent Loss	Miles Of System Surveyed For Leaks	Pressure Reduction Undertaken for loss reduction	Cost Of Interventions	Water Saved (AF/Year)

Comments:

AWWA WLCC Free Water Audit Software: Reporting Worksheet

WAS v4.2

Back to Instructions

? Click to access definition

Water Audit Report for: Alameda County Water District
Reporting Year: 2009 (7/2008 - 6/2009)

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: MILLION GALLONS (US) PER YEAR

WATER SUPPLIED

<< Enter grading in column 'E'

Volume from own sources:	?	7	12,453.200	Million gallons (US)/yr (MG/Yr)
Master meter error adjustment (enter positive value):	?	5	0.000	MG/Yr
Water imported:	?	8	4,097.400	MG/Yr
Water exported:	?	7	0.000	MG/Yr
WATER SUPPLIED:			16,550.600	MG/Yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

					Pcnt:	Value:
Billed metered:	?	7	15,819.000	MG/Yr		
Billed unmetered:	?	7	0.000	MG/Yr		
Unbilled metered:	?	8	7.197	MG/Yr		
Unbilled unmetered:	?	5	26.600	MG/Yr		26.600
AUTHORIZED CONSUMPTION:	?		15,852.797	MG/Yr		

Use buttons to select percentage of water supplied **OR** value

WATER LOSSES (Water Supplied - Authorized Consumption)

697.803 MG/Yr

Apparent Losses

					Pcnt:	Value:
Unauthorized consumption:	?		41.377	MG/Yr	0.25%	
Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed						
Customer metering inaccuracies:	?	7	439.165	MG/Yr	2.70%	
Systematic data handling errors:	?	5	0.100	MG/Yr		
Apparent Losses:	?		480.641			

? Choose this option to enter a percentage of billed metered consumption. This is NOT a default value

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses:	?		217.162	MG/Yr
WATER LOSSES:			697.803	MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER:	?		731.600	MG/Yr

= Total Water Loss + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	?	8	874.1	miles	
Number of active AND inactive service connections:	?	8	79,787		
Connection density:			91	conn./mile main	
Average length of customer service line:	?	10	0.0	ft	(pipe length between curbstop and customer meter or property boundary)
Average operating pressure:	?	4	70.0	psi	

COST DATA

Total annual cost of operating water system:	?	8	$65,763,100	$/Year
Customer retail unit cost (applied to Apparent Losses):	?	9	$2.53	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	?	7	$2,791.42	$/Million gallons

PERFORMANCE INDICATORS

Financial Indicators

Non-revenue water as percent by volume of Water Supplied:	4.4%
Non-revenue water as percent by cost of operating system:	3.5%
Annual cost of Apparent Losses:	$1,626,228
Annual cost of Real Losses:	$606,190

Operational Efficiency Indicators

Apparent Losses per service connection per day:	16.50	gallons/connection/day
Real Losses per service connection per day*:	7.46	gallons/connection/day
Real Losses per length of main per day*:	N/A	
Real Losses per service connection per day per psi pressure:	0.11	gallons/connection/day/psi
? Unavoidable Annual Real Losses (UARL):	426.60	million gallons/year
From Above, Real Losses = Current Annual Real Losses (CARL):	217.16	million gallons/year
? Infrastructure Leakage Index (ILI) [CARL/UARL]:	0.51	

* only the most applicable of these two indicators will be calculated

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 72 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Billed metered
3: Unauthorized consumption

For more information, click here to see the Grading Matrix worksheet

The fields in red are required.

Agency name: Alameda County Water District

Reporting unit name (District name): Alameda County Water District

Reporting unit number: 7

Primary contact:

First name: Stephanie

Last name: Nevins

Email: stephanie.nevins@acwd.com

You must enter the reporting unit number

Submit Form

agency. Click here to open a table to obtain this number.

BMP 1.3 Metering with Commodity

Link to FAQs

See the complete MOU: View MOU

See the coverage requirements for this BMP:

Implementation

Does your agency have any unmetered service connections? ○ Yes ◉ No

If YES, has your agency completed a meter retrofit plan? ○ Yes ○ No

Enter the number of previously unmetered accounts fitted with meters during reporting year:

Are all new service connections being metered? ◉ Yes ○ No

Are all new service connections being billed volumetrically? ◉ Yes ○ No

Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters? ◉ Yes ○ No

Please Fill Out The Following Matrix

Account Type	# Metered Accounts	# Metered Accounts Read	# Metered Accounts Billed by Volume	Billing Frequency Per Year	# of estimated bills/yr
Single-Family	71,085	71,085	71,085	Bi-monthly	668
Multi-Family	2,061	2,061	2,061	Bi-monthly	54
Commericial	2,726	2,726	2,726	Bi-monthly	106
Industrial	846	846	846	Bi-monthly	49
Institutional	708	708	708	Bi-monthly	28
Dedicated Irrigatio	2,105	2,105	2,105	Bi-monthly	61
Other	2,145	2,145	2,145	Bi-monthly	0
Other				Other	
Other				Other	
Other				Other	

Number of CII Accounts with Mixed-use Meters: 4,280

Number of CII Accounts with Mixed-use Meters Retrofitted with Dedicated Irrigation Meters during Reporting Period: 0

Feasibility Study

Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? ◉ Yes ○ No

If YES, please fill in the following information:

A. When was the Feasiblity Study conducted: 06/01/2006

B. Email or provide a link to the feasibility study (or description of):

File name(s): Email files to natalie@cuwcc.org: Alameda County WD_Alameda County WD_7_2009_Meterin

Web address(s) URL: comma-separated list:

General Comments about BMP 1.3: Number of CII accts with Mixed Use Meters: The no. of CII accts with mixed use mete

The fields in red are required.

Agency name: Alameda County Water District

Reporting unit name (District name): Alameda County Water District

Reporting unit number: 7

Primary contact:

First name: Stephanie

Last name: Nevins

Email: stephanie.nevins@acwd.com

You must enter the reporting unit number agency. Click here to open a table to obtain this number.

Submit Form

CUWCC

2009

Link to FAQs

View MOU

BMP 1.4 Retail Conservation Pricing

If you are reporting more rate structures than this form allows, add the structures to a spreadsheet and send the file to natalie@cuwcc.org.

Implementation (Water Rate Structure)

Enter the Water Rate Structures that are assigned to the majority of your customers, by customer class

Rate Structure	Customer Class	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed Charges)
Uniform	Single-Family	25,524,165.00	4,659,777.00
Uniform	Multi-Family	8,570,617.00	507,908.00
Uniform	Commercial	5,353,747.00	393,798.00
Uniform	Industrial	3,275,831.00	203,251.00
Uniform	Institutional	2,223,280.00	171,887.00
Uniform	Dedicated Irrigation	5,916,977.00	235,159.00
Uniform	Other	168,393.00	91,347.00

Implementation Option (Conservation Pricing Option)

(•) Use Annual Revenue As Reported

( ) Use Canadian Water & Wastewater Association Rate Design Model

If CWWA is select, enter the file name and email the spreadsheet to natalie@cuwcc.org

Retail Waste Water (Sewer) Rate Structure by Customer Class

Agency Provide Sewer Service ( ) Yes (•) No

Select the Retail Waste Water(Sewer) Rate Structure assigned to the majority of your customers within a specific customer class.

Rate Structure	Customer Class	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed Charges)
Select a Rate Struc	Other		
Select a Rate Struc	Other		
Select a Rate Struc	Other		
Select a Rate Struc	Other		
Select a Rate Struc	Other		
Select a Rate Struc	Other		
Select a Rate Struc	Other		

Comments:

Union Sanitary District provides Waste Water Service for ACWD's entire service area

The fields in red are required.

Agency name: Alameda County Water District

Reporting unit name (District name): Alameda County Water District

Reporting unit number: 7

Primary contact:

First name: Stephanie

Last name: Nevins

Email: stephanie.nevins@acwd.com

Click here to open a table that displays your agency name, reporting unit name and reporting unit number. Please ensure that you enter the correct information.

Submit Form

Link to FAQs

2009

BMP 2.1 Public Outreach - Retail Reporting

View MOU

Is a Wholesale Agency Performing Public Outreach?

Are there one or more wholesale agencies performing public outreach which can be counted to help your agency comply with the BMP? ○ Yes ◉ No

Enter the name(s) of the wholesale agency (comma delimited)

Is your agency performing public outreach?

Report a minimum of 4 water conservation related contacts your agency had with the public during the year.

Public Information Programs List

Did at least one contact take place during each quarter of the reporting year? ✓

Number of Public Contacts	Public Information Programs
12	Newsletter articles on conservation
516	Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets
12	Website
509	General water conservation information
2,000	Email Messages

Contact with the Media

Are there one or more wholesale agencies performing media outreach which can be counted to help your agency comply with the BMP? ○ Yes ◉ No

Enter the name(s) of the wholesale agency (comma delimited)

OR Retail Agency (Contacts with the Media)

Media Contacts List

Did at least one contact take place during each quarter of the reporting year? ✓

Number of Media Contacts	Media Contact Types
2	Articles or stories resulting from outreach
4	News releases
12	Newspaper contacts
0	Radio contacts
0	Television contacts
0	Written editorials

Is a Wholesale Agency Performing Website Updates?

Did one or more CUWCC wholesale agencies agree to assume your agency's responsibility for meeting the requirements of and for CUWCC reporting of this BMP? ○Yes ◉No

Enter the name(s) of the wholesale agency (comma delimited)

Is Your Agency Performing Website Updates?

Enter your agency's URL (website address): www.acwd.org

Describe a minimum of four water conservation related updates to your agency's website that took place during the year:

1. Residential High Efficiency Washer Program; Annual Update
2. Other residential programs; updates as needed (3-4 times per year)
3. CII and landscape programs; updates as needed (2-3 times per year)
4. Landscape Classes/Workshops (BAWSCA, Bay-friendly); updated each spring and fall
5. Garden Tours; Annual Update

Did at least one Website Update take place during each quarter of the reporting year? ◉Yes ○No

Public Outreach Annual Budget

Enter budget for public outreach programs. You may enter total budget in a single line or brake the budget into discrete categories by entering many rows. Please indicate if personnel costs are included in the entry.

Category	Amount		Personnel Costs Included? If yes, check the box.	Comments	
all	$178,579		✓	This is the entire Public Outreach Adopted Bu	

Comments:

The fields in red are required.

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Reporting unit number: 7

Primary contact:

First name: Stephanie

Last name: Nevins

Email: stephanie.nevins@acwd.com

Click here to open a table that displays your agency reporting unit name and reporting unit number. Please ensure that you enter the correct information.

Submit Form

Link to FAQs

2009

BMP 2.1 Public Outreach Cont'd

View MOU

Public Outreach Expenses

Enter expenses for public outreach programs. Please include the same kind of expenses you included in the question related to your budget (Section 2.1.7, above). For example, if you included personnel costs in the budget entered above, be sure to include them here as well.

Expense Category	Expense Amount	Personnel Costs Included?	
Public Outreach (all expenses)	$132,878	✓	If yes, check the check box.

Additional Public Information Program

Please report additional public information contacts. List these additional contacts in order of how your agency views their importance / effectiveness with respect to conserving water, with the most important/ effective listed first (where 1 = most important).

Were there additional Public Outreach efforts? (•) Yes ( ) No

Public Outreach Additional Information

Public Information Programs	Importance
Direct Mail (seasonal irrigation notices, high water use notices)	$1
Leak detection and notification program	$1
Booths at fairs/event, presentations to community organizations, demonstration garde	$1

Social Marketing Programs

Branding

Does your agency have a water conservation "brand," "theme" or mascot? ( ) Yes (•) No

Describe the brand, theme or mascot.

Market Research

Have you sponsored or participated in market research to refine your message? ( ) Yes (•) No

Market Research Topic	
Brand Message	
Brand Mission Statement	

Community Committees

Do you have a community conservation committee? ○ Yes ◉ No

Enter the names of the community committees:

Training

Training Type	# of Trainings	# of Attendees	Description of Other
Homeowners	$1	$40	Water efficient landscape workshops

Social Marketing Expenditures

Public Outreach Social Marketing Expenses

Expense Category	Expense Amount	Description
None	0	

Partnering Programs - Partners

Name	Type of Program
☑ CLCA?	Work with members/providing program information for their clients.
☑ Green Building Programs?	Work with businesses to get them certified as a green business.
☑ Master Gardeners?	Work with Bay-friendly and their trained master gardeners.
☐ Cooperative Extension?	
☑ Local Colleges?	Ohlone College, Newark Campus (provided help with landscape - ET controllers, and water use assessment)
☑ Other	Cities (Fremont, Newark, Union City), Bay Area Water Supply and Conservation Agency, California Youth Energy Services, Alameda County G

☐ Retail and wholesale outlet; name(s) and type(s) of programs:

	Work with local appliance retailers on the high efficiency clothes washer rebate program . Work with local hardware store (Dale Hardware) on pro

Partnering Programs - Newsletters

Number of newsletters per year: 1

Number of customers per year	40,000

Partnering with Other Utilities

Describe other utilities your agency partners with, including electrical utilities	Union Sanitary District, Pacific Gas & Electric Company

Conservation Gardens

Describe water conservation gardens at your agency or other high traffic areas or new	ACWD maintains a drought resistant demonstration garden and provides brochures of the garden and irrigation system for our customers. ACWD has also helped Union City with the development of a demonstration garden at their city offices.

Landscape contests or awards

Describe water wise landscape contest or awards program conducted by your agency	ACWD recognizes those Dedicated Landscape Partners that remain within their annual water budget through a "Water Conservation Business of the Year" awards program. These recipients are listed in the local newspaper during May, Water Awareness Month.

Comments:

The fields in red are required.

Agency name: Alameda County Water District

Reporting unit name (District name): Alameda County Water District

Reporting unit number: 7

Primary contact:

First name: Stephanie

Last name: Nevins

Email: stephanie.nevins@acwd.com

Click here to open a table that displays your agency n reporting unit name an reporting unit number. Please ensure that you enter the correct information.

Submit Form

Link to FAQs

2009

BMP 2.2 School Education Programs, Retail Agencies

View MOU

School Programs

Is a wholesale agency implementing school programs which can be counted to help your agency comply with this BMP? ○ Yes ◉ No

Enter Wholesaler Names, separated by commas:

☑ Materials meet state education framework requirements?

Description of Materials: ACWD provides resource materials to teachers about water supply and water conservation. Materials include workbooks, lesson plans, curriculum guides, brochures, videos, posters, maps, games, stickers, pencils, rulers, and magnets. Each year, approximately 70,000 pieces of material are distributed.

☑ Materials distributed to K-6 Students?

Description of materials distributed to K-6 Students: ACWD provides workbooks, lesson plans, curriculum guides, brochures, videos, posters, maps, stickers.

Number of students reached: 11,148

☑ Materials distributed to 7-12 Students?

Description of materials distributed to 7-12 Students: ACWD provides Lesson plans, curriculum guides, brochures, videos, posters, maps.

Number of Distribution: 4,430

Annual budget for school education program: $107,837.00

Description of all other water supplier education programs: ACWD's school education program includes classroom instruction, a water conservation school assembly program, distribution of educational resource materials, tours, a mini-grant program for local teachers, teacher workshops (Project WET, etc.) and educational material available on ACWD's homepage www.acwd.org.

School Program Activities

Classroom presentations:

Number of presentations: 262 Number of attendees: 6,600

Large group assemblies:

Number of presentations: 63 Number of attendees: 15,443

Children's water festivals or other events:

Number of presentations: 0 Number of attendees: 0

Cooperative efforts with existing science/water education programs (various workshops, science fair awards or judging) and follow-up:

Number of presentations: 10 Number of attendees: 1,000

Other methods of disseminating information (i.e. themed age-appropriate classroom loaner kits):

Description: None

Number distributed: 0

Staffing children's booths at events & festivals:

Number of booths: 0 Number of attendees: 0

Water conservation contests such as poster and photo:

Description: Each year, ACWD sponsors a Water Conservation Poster and Slogan Contest. First through 6th grade students are invited to enter posters and slogans that encourage water conservation. Winning entries are included in a Water Conservation Calendar and water conservation Pocket Folder.

Number distributed: 9,500

Offer monetary awards/funding or scholarships to students:

Number Offered: 0 Total Funding: 0

Teacher training workshops:

Number of presentations: 0 Number of attendees: 0

Fund and/or staff student field trips to treatment facilities, recycling facilities, water conservation gardens, etc.:

Number of tours or field trips: 7 Number of participants: 212

College internships in water conservation offered:

Number of internships: 1 Total funding: 40,000

Career fairs/workshops:

Number of presentations: 0 Number of attendees: 0

Additional program(s) supported by agency but not mentioned above:

Description: "Stop that Running Toilet" Program: In 2008-2009 over 15,000 students in grades K-6th were given a toilet leak detection kit. The kit contained leak detection tablets and a postage paid response card. Students who responded that their toilet leaked they received a toilet flapper valve.

Number of events (if applicable): Number of participants: 15,000

Total reporting period budget expenditures for school education programs (include all agency costs): 135,381

Comments

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The fields in red are required.

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Division name (Reporting unit): Alameda County Water District

Reporting unit number: 7

Primary contact:

First name: Stephanie

Last name: Nevins

Email: stephanie.nevins@acwd.com

Submit Form

Water Uses 2010

Potable Water Billed

Make sure to enter numbers in AF/Year.

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
Single-Family	71,394.00	21,490.00	0.00	0.00	
Multi-Family	2,063.00	7,621.00	0.00	0.00	
Commercial	2,729.00	4,732.00	0.00	0.00	
Industrial	851.00	2,526.00	0.00	0.00	
Institutional	701.00	1,800.00	0.00	0.00	
Dedicated Irrigation	2,141.00	4,778.00	0.00	0.00	
Other	2,150.00	84.00	0.00	0.00	Fire/Hydrant
Other					
Other					
Other					
Other					
Other					
Other					

Potable Water Un-Billed

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					

The fields in red are required.

Agency name: Alameda County Water District

Division name (Reporting unit): Alameda County Water District

Reporting unit number: 7

Primary contact:

First name: Stephanie

Last name: Nevins

Email: stephanie.nevins@acwd.com

Submit Form

Water Uses

2010

Non-Potable Billed

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					

Non-Potable Un-Billed

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					

The fields in red are required.

Agency name: Alameda County Water District

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Reporting unit number: 7

Primary contact:

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Email: stephanie.nevins@acwd.com

Submit Form

WATER SOURCES

2010

Service Area Population: 337,562

Potable Water

Own Supply Source Name	AF/YEAR	Water Supply Type	Water Supply Description
Del Valle	2,500.00	Surface	Del Valle Treated at Surface Water
ACWD Groundwater	14,800.00	Groundwater	Wells + Desal - Imported Recharge
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	

Imported Supply Source Name	AF/YEAR	Water Supply Type	Water Supply Description
SFPUC	11,700.00	Surface	SFPUC Surface Water
Statewater	16,500.00	Surface	Statewater Treated at Surface Wate
Statewater/Groundwater	1,600.00	Groundwater	Statewater Recharged and Pumped
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	

Exported Water Name	AF/YEAR	Where Exported?
None	0.00	NA

The fields in red are required.

Agency name: Alameda County Water District

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Reporting unit number: 7

Primary contact:

First name: Stephanie

Last name: Nevins

Email: stephanie.nevins@acwd.com

Submit Form

2010

Service Area Population: 337,562

Non- Potable Water

Own Supply Source Name	AF/YEAR	Water Supply Type	If you select Other for type, enter Water Supply Description
None	0.00	Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	

Imported Supply Source Name	AF/YEAR	Water Supply Type	Water Supply Description
None	0.00	Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	

Exported Water Name	AF/YEAR	Where Exported? such as groundwater recharge, retail,
None	0.00	

The fields in red are required.

Agency name: Alameda County Water District

Reporting unit name (District name): Alameda County Water District

Reporting unit number: 7

Primary contact:

First name: Stephanie

Last name: Nevins

Email: stephanie.nevins@acwd.com

You must enter the reporting unit numbe we have on record fo agency. Click here to open a table to obtain this number.

Submit Form

Link to FAQs

2010

BMP 1.1 Operations Practices

Comments:

See the complete MOU: View MOU

See the coverage requirements for this BMP:

Conservation Coordinator

Conservation Coordinator (•) Yes ( ) No

Contact Information

First Name	Stephanie
Last Name	Nevins
Title	Water Conservation Administrator
Phone	510.668.4207
Email	stephanie.nevins@acwd.com

Note that the contact information may be the same as the primary contact information at the top of the page. If this is your case, excuse the inconvenience but please enter the information again.

Water Waste Prevention

Water Agency shall do one or more of the following:

a. Enact and enforce an ordinance or establish terms of service that prohibit water waste
b. Enact and enforce an ordinance or establish terms of service for water efficient design in new development
c. Support legislation or regulations that prohibit water waste
d. Enact an ordinance or establish terms of service to facilitate implementation of water shortage response measures
e. Support local ordinances that prohibit water waste
f. Support local ordinances that establish permits requirements for water efficient design in new

To document this BMP, provide the following:

a. A description of, or electronic link to, any ordinances or terms of service
b. A description of, or electronic link to, any ordinances or requirements adopted by local jurisdictions or regulatory agencies with the water agency's service area.
c. A description of any water agency efforts to cooperate with other entities in the adoption or enforcement of local requirement
d. description of agency support positions with respect to adoption of legislation or regulations

You can show your documentation by providing files, links (web addresses), and/or entering a description.

File name(s): Email files to natalie@cuwcc.org Alameda County WD_Alameda County WD_7_2010_operations practices_BMP1-1_Ordinance Prohibiti

Web address(s) URL: comma-separated list

Enter a description:

The fields in red are required.

Agency name: Alameda County Water District

Reporting unit name (District name): Alameda County Water District

Reporting unit number: 7

Primary contact:

First name: Stephanie

Last name: Nevins

Email: stephanie.nevins@acwd.com

You must enter the r... agency. Click here to open a table to obtain this number.

Submit Form

Link to FAQs

2010 BMP 1.2 Water Loss Control

View MOU

AWWA Water Audit

Agency to complete a Water Audit & Balance Using The AWWA Software (●) Yes ( ) No

Email to natalie@cuwcc.org - Worksheets (AWWA Water Audit). Enter the name of the file below:

Alameda County WD_Alameda County WD_7_2010_Water Loss Control_BMP1-2_AWWA

Water Audit Validity Score from AWWA spreadsheet: 71

Agency Completed Training In The AWWA Water Audit Method (●) Yes ( ) No

Agency Completed Training In The Component Analysis Process (●) Yes ( ) No

Completed/Updated the Component Analysis (at least every 4 years)? ( ) Yes (●) No

Component Analysis Completed/Updated Date: Will be completed in 2012-2013

Water Loss Performance

Agency Repaired All Reported Leaks & Breaks To The Extent Cost Effective (●) Yes ( ) No

Recording Keeping Requirements:

Date/Time Leak Reported	Leak Location
Type of Leaking Pipe Segment or Fitting	Leak Running Time From Report to Repair
Leak Volume Estimate	Cost of Repair

Agency Located and Repaired Unreported Leaks to the Extent Cost Effective (●) Yes ( ) No

Type of Program Activities Used to Detect Unreported Leaks

ACWD activites include distribution system leak detection and repair of reported and unreported leaks and a residential leak detection program where meter readers assess for leaks when a reading is unusually high.

Annual Summary Information

Complete the following table with annual summary information (required for reporting years 2-5 only)

Total Leaks Repaired	Economic Value Of Real Loss	Economic Value Of Apparent Loss	Miles Of System Surveyed For Leaks	Pressure Reduction Undertaken for loss reduction	Cost Of Interventions	Water Saved (AF/Year)
391	$2,364,018.0	$1,506,426.00	0		$3,649,581.00	

Comments:

AWWA WLCC Free Water Audit Software: Reporting Worksheet

WAS v4.2

Back to Instructions

? Click to access definition

Water Audit Report for: Alameda County Water District
Reporting Year: 2010 (7/2009 - 6/2010)

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: MILLION GALLONS (US) PER YEAR

WATER SUPPLIED

<< Enter grading in column 'E'

Volume from own sources:	?	7	11,517.900	Million gallons (US)/yr (MG/Yr)
Master meter error adjustment (enter positive value):	?	5	0.000	MG/Yr
Water imported:	?	7	3,816.400	MG/Yr
Water exported:	?	7	0.000	MG/Yr
WATER SUPPLIED:			15,334.300	MG/Yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

					Pcnt:	Value:
Billed metered:	?	7	14,110.000	MG/Yr		
Billed unmetered:	?	7	0.000	MG/Yr		
Unbilled metered:	?	8	4.837	MG/Yr		
Unbilled unmetered:	?	5	26.600	MG/Yr		26.600
AUTHORIZED CONSUMPTION:	?		14,141.437	MG/Yr		

Use buttons to select percentage of water supplied **OR** value

WATER LOSSES (Water Supplied - Authorized Consumption)

1,192.863 MG/Yr

Apparent Losses

					Pcnt:	Value:
Unauthorized consumption:	?		38.336	MG/Yr	0.25%	
Customer metering inaccuracies:	?	7	391.676	MG/Yr	2.70%	
Systematic data handling errors:	?	5	0.100	MG/Yr		
Apparent Losses:	?		430.112			

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Choose this option to enter a percentage of billed metered consumption. This is NOT a default value

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses:	?		762.751	MG/Yr
WATER LOSSES:			1,192.863	MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER:	?		1,224.300	MG/Yr

= Total Water Loss + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	?	8	893.0	miles	
Number of active AND inactive service connections:	?	8	80,206		
Connection density:			90	conn./mile main	
Average length of customer service line:	?	10	0.0	ft	(pipe length between curbstop and customer meter or property boundary)
Average operating pressure:	?	4	70.0	psi	

COST DATA

Total annual cost of operating water system:	?	8	$68,053,900	$/Year
Customer retail unit cost (applied to Apparent Losses):	?	9	$2.62	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	?	7	$3,099.33	$/Million gallons

PERFORMANCE INDICATORS

Financial Indicators

Non-revenue water as percent by volume of Water Supplied:	8.0%
Non-revenue water as percent by cost of operating system:	5.8%
Annual cost of Apparent Losses:	$1,506,436
Annual cost of Real Losses:	$2,364,018

Operational Efficiency Indicators

Apparent Losses per service connection per day:	14.69	gallons/connection/day
Real Losses per service connection per day*:	26.05	gallons/connection/day
Real Losses per length of main per day*:	N/A	
Real Losses per service connection per day per psi pressure:	0.37	gallons/connection/day/psi
? Unavoidable Annual Real Losses (UARL):	430.82	million gallons/year
From Above, Real Losses = Current Annual Real Losses (CARL):	762.75	million gallons/year
? Infrastructure Leakage Index (ILI) [CARL/UARL]:	1.77	

* only the most applicable of these two indicators will be calculated

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 71 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Water imported
3: Billed metered

For more information, click here to see the Grading Matrix worksheet

The fields in red are required.

Agency name: Alameda County Water District

Reporting unit name (District name): Alameda County Water District

Reporting unit number: 7

Primary contact:

First name: Stephanie

Last name: Nevins

Email: stephanie.nevins@acwd.com

You must enter the reporting unit number

Submit Form

agency. Click here to open a table to obtain this number.

BMP 1.3 Metering with Commodity 2010

Link to FAQs

See the complete MOU: View MOU

See the coverage requirements for this BMP:

Implementation

Does your agency have any unmetered service connections? ○ Yes ◉ No

If YES, has your agency completed a meter retrofit plan? ○ Yes ○ No

Enter the number of previously unmetered accounts fitted with meters during reporting year:

Are all new service connections being metered? ◉ Yes ○ No

Are all new service connections being billed volumetrically? ◉ Yes ○ No

Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters? ◉ Yes ○ No

Please Fill Out The Following Matrix

Account Type	# Metered Accounts	# Metered Accounts Read	# Metered Accounts Billed by Volume	Billing Frequency Per Year	# of estimated bills/yr
Single-Family	71,394	71,394	71,394	Bi-monthly	632
Multi-Family	2,063	2,063	2,063	Bi-monthly	58
Commericial	2,729	2,729	2,729	Bi-monthly	121
Industrial	851	851	851	Bi-monthly	25
Institutional	701	701	701	Bi-monthly	23
Dedicated Irrigatio	2,141	2,141	2,141	Bi-monthly	36
Other	2,150	2,150	2,150	Bi-monthly	0
Other				Other	
Other				Other	
Other				Other	

Number of CII Accounts with Mixed-use Meters: 4,281

Number of CII Accounts with Mixed-use Meters Retrofitted with Dedicated Irrigation Meters during Reporting Period: 0

Feasibility Study

Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? ◉ Yes ○ No

If YES, please fill in the following information:

A. When was the Feasiblity Study conducted: 06/01/2006

B. Describe, upload or provide an electronic link to the Feasibility Study Upload File

File name(s): Email files to natalie@cuwcc.org: Alameda County WD_Alameda County WD_7_2010_Meterin

Web address(s) URL: comma-separated list:

Comments: Number of CII accts with Mixed Use Meters: The no. of CII accts with mixed use mete

The fields in red are required.

Agency name: Alameda County Water District

Reporting unit name (District name): Alameda County Water District

Reporting unit number: 7

Primary contact:

First name: Stephanie

Last name: Nevins

Email: stephanie.nevins@acwd.com

You must enter the reporting unit number that we have on record for your agency. Click to obtain

Submit Form

CUWCC

2010

Link to FAQs

View MOU

BMP 1.4 Retail Conservation Pricing

If you are reporting more rate structures than this form allows, add the structures to a spreadsheet and send the file to natalie@cuwcc.org.

Implementation (Water Rate Structure)

Enter the Water Rate Structures that are assigned to the majority of your customers, by customer class

Rate Structure	Customer Class	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed Charges)
Uniform	Single-Family	24,343,412.00	4,980,688.00
Uniform	Multi-Family	8,653,656.00	554,936.00
Uniform	Commercial	5,353,272.00	428,942.00
Uniform	Industrial	3,182,058.00	214,767.00
Uniform	Institutional	2,035,687.00	184,315.00
Uniform	Dedicated Irrigation	5,348,810.00	255,143.00
Uniform	Other	107,217.00	81,914.00

Implementation Option (Conservation Pricing Option)

(•) Use Annual Revenue As Reported

( ) Use Canadian Water & Wastewater Association Rate Design Model

If CWWA is select, enter the file name and email the spreadsheet to natalie@cuwcc.org

Retail Waste Water (Sewer) Rate Structure by Customer Class

Agency Provide Sewer Service ( ) Yes (•) No

Select the Retail Waste Water(Sewer) Rate Structure assigned to the majority of your customers within a specific customer class.

Rate Structure	Customer Class	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed Charges)
Select a Rate Struc	Other		
Select a Rate Struc	Other		
Select a Rate Struc	Other		
Select a Rate Struc	Other		
Select a Rate Struc	Other		
Select a Rate Struc	Other		
Select a Rate Struc	Other		

Comments:

Union Sanitary District provides Waste Water Service for ACWD's entire service

The fields in red are required.

Agency name: Alameda County Water District

Reporting unit name (District name): Alameda County Water District

Reporting unit number: 7

Primary contact:

First name: Stephanie

Last name: Nevins

Email: stephanie.nevins@acwd.com

Click here to open a table that displays your agency name, reporting unit name and reporting unit number. Please ensure that you enter the correct information.

Submit Form

Link to FAQs

2010

BMP 2.1 Public Outreach - Retail Reporting

View MOU

Is a Wholesale Agency Performing Public Outreach?

Are there one or more wholesale agencies performing public outreach which can be counted to help your agency comply with the BMP? ○ Yes ◉ No

Enter the name(s) of the wholesale agency (comma delimited)

Is your agency performing public outreach?

Report a minimum of 4 water conservation related contacts your agency had with the public during the year.

Public Information Programs List

Did at least one contact take place during each quarter of the reporting year? ✓

Number of Public Contacts	Public Information Programs
10	Newsletter articles on conservation
517	Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets
12	Website
509	General water conservation information
2,000	Email Messages

Contact with the Media

Are there one or more wholesale agencies performing media outreach which can be counted to help your agency comply with the BMP? ○ Yes ◉ No

Enter the name(s) of the wholesale agency (comma delimited)

OR Retail Agency (Contacts with the Media)

Media Contacts List

Did at least one contact take place during each quarter of the reporting year? ✓

Number of Media Contacts	Media Contact Types
4	Articles or stories resulting from outreach
6	News releases
10	Newspaper contacts
0	Radio contacts
0	Television contacts
0	Written editorials

Is a Wholesale Agency Performing Website Updates?

Did one or more CUWCC wholesale agencies agree to assume your agency's responsibility for meeting the requirements of and for CUWCC reporting of this BMP? ○Yes ◉No

Enter the name(s) of the wholesale agency (comma delimited)

Is Your Agency Performing Website Updates?

Enter your agency's URL (website address): www.acwd.org

Describe a minimum of four water conservation related updates to your agency's website that took place during the year:

1. Residential High Efficiency Washer Program; Annual Update
2. Other residential programs; updates as needed (3-4 times per year)
3. CII and landscape programs; updates as needed (2-3 times per year)
4. Landscape Classes/Workshops (BAWSCA, Bay-friendly); updated each spring and fall
5. Garden Tours; Annual Update

Did at least one Website Update take place during each quarter of the reporting year? ◉Yes ○No

Public Outreach Annual Budget

Enter budget for public outreach programs. You may enter total budget in a single line or brake the budget into discrete categories by entering many rows. Please indicate if personnel costs are included in the entry.

Category	Amount		Personnel Costs Included? If yes, check the box.	Comments	
All	$193,309		✓	This is the entire Public Outreach adopted bu	

Comments:

The fields in red are required.

Agency name: Alameda County Water District

Reporting unit name (District name): Alameda County Water District

Reporting unit number: 7

Primary contact:

First name: Stephanie

Last name: Nevins

Email: stephanie.nevins@acwd.com

Click here to open a table that displays your agency reporting unit name and reporting unit number. Please ensure that you enter the correct information.

Submit Form

Link to FAQs

2010

BMP 2.1 Public Outreach Cont'd

View MOU

Public Outreach Expenses

Enter expenses for public outreach programs. Please include the same kind of expenses you included in the question related to your budget (Section 2.1.7, above). For example, if you included personnel costs in the budget entered above, be sure to include them here as well.

Expense Category	Expense Amount	Personnel Costs Included?	
Public Outreach (all expenses)	$156,101	✓	If yes, check the check box.

Additional Public Information Program

Please report additional public information contacts. List these additional contacts in order of how your agency views their importance / effectiveness with respect to conserving water, with the most important/ effective listed first (where 1 = most important).

Were there additional Public Outreach efforts? (•) Yes ( ) No

Public Outreach Additional Information

Public Information Programs	Importance
Direct Mail (seasonal irrigation notices, high water use notices)	$1
Leak detection and notification program	$1
Booths at fairs/event, presentations to community organizations, demonstration garde	$1

Social Marketing Programs

Branding

Does your agency have a water conservation "brand," "theme" or mascot? ( ) Yes (•) No

Describe the brand, theme or mascot.

Market Research

Have you sponsored or participated in market research to refine your message? ( ) Yes (•) No

Market Research Topic	
Brand Message	
Brand Mission Statement	

Community Committees

Do you have a community conservation committee? ○ Yes ◉ No

Enter the names of the community committees:

Training

Training Type	# of Trainings	# of Attendees	Description of Other
Homeowners	$2	$40	Water efficient landscape workshops

Social Marketing Expenditures

Public Outreach Social Marketing Expenses

Expense Category	Expense Amount	Description
None	0	

Partnering Programs - Partners

	Name	Type of Program
☑ CLCA?		Work with members/providing program information for their clients.
☑ Green Building Programs?		Work with businesses to get them certified as a green business.
☑ Master Gardeners?		Work with Bay-friendly and their trained master gardeners.
☐ Cooperative Extension?		
☑ Local Colleges?		Ohlone College, Newark Campus (provided help with landscape - ET controllers, and water use assessment)
☑ Other		Cities (Fremont, Newark, Union City), Bay Area Water Supply and Conservation Agency, California Youth Energy Services, Alameda County G

☑ Retail and wholesale outlet; name(s) and type(s) of programs:

	Work with local appliance retailers on the high efficiency clothes washer rebate program . Work with local hardware store (Dale Hardware) on pro

Partnering Programs - Newsletters

Number of newsletters per year: 1

Number of customers per year: 40,000

Partnering with Other Utilities

Describe other utilities your agency partners with, including electrical utilities: Union Sanitary District, Pacific Gas & Electric Company

Conservation Gardens

Describe water conservation gardens at your agency or other high traffic areas or new: ACWD maintains a drought resistant demonstration garden and provides brochures of the garden and irrigation system for our customers. ACWD has also helped Union City with the development of a demonstration garden at their city offices.

Landscape contests or awards

Describe water wise landscape contest or awards program conducted by your agency: ACWD recognizes those Dedicated Landscape Partners that remain within their annual water budget through a "Water Conservation Business of the Year" awards program. These recipients are listed in the local newspaper during May, Water Awareness Month.

Comments:

The fields in red are required.

Agency name: Alameda County Water District

Reporting unit name (District name): Alameda County Water District

Reporting unit number: 7

Primary contact:

First name: Stephanie

Last name: Nevins

Email: stephanie.nevins@acwd.com

Click here to open a table that displays your agency n reporting unit name an reporting unit number. Please ensure that you enter the correct information.

Submit Form

Link to FAQs

2010

BMP 2.2 School Education Programs, Retail Agencies

View MOU

School Programs

Is a wholesale agency implementing school programs which can be counted to help your agency comply with this BMP? ○ Yes ◉ No

Enter Wholesaler Names, separated by commas:

☑ Materials meet state education framework requirements?

Description of Materials: ACWD provides resource materials to teachers about water supply and water conservation. Materials include workbooks, lesson plans, curriculum guides, brochures, videos, posters, maps, games, stickers, pencils, rulers, and magnets. Each year, approximately 70,000 pieces of material are distributed.

☑ Materials distributed to K-6 Students?

Description of materials distributed to K-6 Students: ACWD provides workbooks, lesson plans, curriculum guides, brochures, videos, posters, maps, stickers.

Number of students reached: 9,143

☑ Materials distributed to 7-12 Students?

Description of materials distributed to 7-12 Students: ACWD provides Lesson plans, curriculum guides, brochures, videos, posters, maps.

Number of Distribution: 3,633

Annual budget for school education program: $110,461.00

Description of all other water supplier education programs: ACWD's school education program includes classroom instruction, a water conservation school assembly program, distribution of educational resource materials, tours, a mini-grant program for local teachers, teacher workshops (Project WET, etc.) and educational material available on ACWD's homepage www.acwd.org.

School Program Activities

Classroom presentations:

Number of presentations: 239 Number of attendees: 6234

Large group assemblies:

Number of presentations: 65 Number of attendees: 14,919

Children's water festivals or other events:

Number of presentations: 0 Number of attendees: 0

Cooperative efforts with existing science/water education programs (various workshops, science fair awards or judging) and follow-up:

Number of presentations: 0 Number of attendees: 0

Other methods of disseminating information (i.e. themed age-appropriate classroom loaner kits):

Description: None

Number distributed: 0

Staffing children's booths at events & festivals:

Number of booths: 0 Number of attendees: 0

Water conservation contests such as poster and photo:

Description: Each year, ACWD sponsors a Water Conservation Poster and Slogan Contest. First through 6th grade students are invited to enter posters and slogans that encourage water conservation. Winning entries are included in a Water Conservation Calendar and water conservation Pocket Folder.

Number distributed: 9,500

Offer monetary awards/funding or scholarships to students:

Number Offered: 0 Total Funding: 0

Teacher training workshops:

Number of presentations: 0 Number of attendees: 0

Fund and/or staff student field trips to treatment facilities, recycling facilities, water conservation gardens, etc.:

Number of tours or field trips: 4 Number of participants: 124

College internships in water conservation offered:

Number of internships: 1 Total funding: 40,000

Career fairs/workshops:

Number of presentations: 0 Number of attendees: 0

Additional program(s) supported by agency but not mentioned above:

Description: "You have the Power to Take a Short Shower" Program: In 2009-2010 nearly 15,000 students in grades K-6th were given the opportunity to sign a "Shorter Shower Pledge" and a display shorter shower sticker in their bathrooms. Those who participated in the program and notified us of this fact via postcard received a free electronic 5-minute shower timer.

Number of events (if applicable): Number of participants: 15,000

Total reporting period budget expenditures for school education programs (include all agency costs): $138,040

Comments

APPENDIX E
ACWD Water Shortage Ordinance

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ORDINANCE NO. 30

AN ORDINANCE OF ALAMEDA COUNTY WATER DISTRICT REGULATING THE NONESSENTIAL USE OF WATER, AND PROVIDING FOR THE CONSERVATION OF THE WATER SUPPLY OF THE DISTRICT.

BE IT ORDAINED by the Board of Directors of ALAMEDA COUNTY WATER DISTRICT as follows:

Section 1. Declaration of a Water Shortage Emergency.

This Board of Directors does hereby find and declare as follows:

(a) Pursuant to Resolution No. 91-014, duly adopted by this Board, a public hearing was held on March 25, 1991, on the matter of whether this Board of Directors should declare a water shortage emergency condition exists within the water service area of this District.

(b) Notice of said hearing was published pursuant to law in the Argus, a newspaper of general circulation, printed and published within said water service area of the District.

(c) At said hearing all persons present were given an opportunity to be heard and all persons desiring to be heard were heard.

(d) Said hearing was called, noticed and held in all respects as required by law.

(e) This Board heard and has considered each protest against the declaration and all evidence presented at said hearing.

(f) Pursuant to Resolution No. 91-016, adopted by this Board on March 25, 1991, a water shortage emergency condition exists and prevails within the water service area of this District. Said water shortage exists by reason of the fact that the ordinary demands and requirements of the water consumers in the Alameda County Water District service area cannot be met and satisfied by the water supplies now available to this District without depleting the water supply or diminishing its quality to the extent that there would be insufficient water for human consumption, sanitation and fire protection.

Section 2. Purpose and Authority.

The purpose of this ordinance is to conserve the water supply of the District for the greatest public benefit with particular regard to public health, fire protection and domestic use; to conserve water by reducing waste; and to the extent necessary by reason of drought and the existing water shortage emergency condition, to reduce water use fairly and equitably. This ordinance is adopted pursuant to Sections 350 to 358, 31026 to 31029 and 31035 of the California Water Code.

Section 3. Effect of Ordinance.

This ordinance shall take effect May 1, 1991, shall supersede and control over any other ordinance or regulation of the District in conflict herewith, and shall remain in effect until the Board of Directors declares that the water shortage emergency has ended.

Section 4. Water Use Limitations.

(a) Restrictions on Water Use.

During the water shortage emergency condition, and to preserve the water supply for the greatest public benefit with particular regard to domestic use, sanitation, and fire protection, the following uses of water have been determined to be wasteful and are hereby prohibited:

(1) Using water in an irresponsible manner for any purpose resulting in wastage.

(2) Watering lawns or any other irrigation in a manner which results in excessive flooding or runoff into streets, gutters or other waterways.

(3) Using hoses to clean sidewalks, driveways, patios, parking lots, walkways, or other hard surface areas, except when necessary for public health or safety.

(4) Use of hoses for any purpose without a positive shutoff nozzle.

(5) Flushing sewers, hydrants or washing streets, except in cases of emergency and for essential operations.

(6) Restaurants serving water to customers unless requested.

(b) Enforcement of Restrictions.

(1) The District may, after two warnings, order that special follow-up visits be made to ascertain whether wasteful use of water is continuing to occur.

(2) In the event the District determines that water waste is still occurring at a customer's premises in violation of the restrictions on water use set forth in this ordinance, installation of a flow-restrictor, or termination of service may occur. Charges for reconnection and/or removal of flow-restrictor shall be the responsibility of the customer.

(3) The District may immediately cancel a permit to use water from a hydrant when the customer is observed using water in violation of the regulations set forth in this ordinance.

(c) Water Use Guidelines.

During the water shortage emergency condition, customers are urged to adhere to the following guidelines to conserve the limited water supply available:

(1) Utilize systems which recycle water when possible.

(2) Use water for whatever purpose in a manner which minimizes waste, ınd repair leaks as soon as possible.

(3) Avoid draining and refilling of existing swimming pools and/or spas vhere possible.

(4) Use non-potable water for construction purposes unless it is not ıppropriate and/or not available. If reclaimed water is used, the proposed conditions of ıse must meet the requirements of the San Francisco Bay Regional Water Quality Control Board.

(5) Landscape Guidelines:

Irrigate early in the morning (before 10:00 a.m.), to minimize evaporation.

Use of Evapotranspiration Rate to determine plant water needs is encouraged. The Evapotranspiration Rate is available at (510) 659-1970, ext. 200.

Installation of new landscaping should utilize best known irrigation and horticultural practices for efficient water use.

Existing systems should be evaluated and repaired to maximize efficiency.

Use of reclaimed water for landscaping is encouraged.

Use drought tolerant plant species wherever possible for replacement and at all new landscape installations.

Section 5. Customer Conservation Rate Schedules.

(a) Single-Family Detached Dwelling Units.

Single-family detached dwelling units shall receive a base consumption allocation (BCA) of 400 gallons per day. This allocation may be increased by an additional 50 gallons per day (4 ccf units bi-monthly) for each person in the household over four. For water uses at or above this level, the following rate schedule shall apply:

Billing Units	Approx. gpd Maximum	Rate $ Per Unit
0-30	400	1.008 BCA (4 persons*)
31-48	600	1.25 x base
49-64	800	1.50 x base
65-80	1000	1.75 x base
Over 80		2.00 x base

* An additional 4 units (50 gpd) is provided for each additional person over the BCA. One billing unit equals one hundred cubic feet, or approximately 748 gallons.

(b) Multi-Family Residential and Non-Residential Customers.

All master-metered multi-family residential accounts and all commercial, industrial and public agency accounts will receive a BCA of 90 percent of average 1990 use, with the following charges for use above the BCA:

Up to Baseline Consumption Allocation (BCA)	$1.008/unit base
Up to 20% above BCA	1.25 x base rate
20.01 - 40% above BCA	1.50 x base rate
40.01 - 60% above BCA	1.75 x base rate
Above 60% of BCA	2.00 x base rate

(c) Landscape Irrigation Only Accounts.

Multi-family residential, commercial, industrial or public agency/institutional accounts classified for landscape irrigation-only will receive a Base Consumption Allocation that represents 80 percent of average 1990 use, with use over this level charged pursuant to the schedule in Section 5(b) above.

New accounts with significant landscape needs with no prior history will apply for a Base Consumption Allocation based on the regional evapotranspiration rate and size of project. Use over the level provided by this allocation will be charged pursuant to the schedule in Section 5 (b) above. This formula will also be applied to those customers seeking exceptions pursuant to Section 7 below who have landscape irrigation requirements exceeding one-quarter of an acre in size.

Section 6. Water Banking.

The District will utilize water banking during the drought emergency period. This will allow customers who do not use their total base allotment of water in a given billing period to supplement their water usage up to the amount banked in a subsequent billing period. All water bank balances will be zeroed out at the end of the drought emergency program.

Section 7. Exceptions.

Pursuant to the procedures set forth in Section 8, exceptions to increase the amount of water which may be used without exceeding the basic allotments may be granted upon written request, including, but not limited to the following:

(a) Verified medical requirements.

(b) Incorrect customer classification based on predominant use. Allowance will also be made to adjust a residential BCA for home businesses for which the customer has a valid business license, (e.g., a child care provider).

(c) Accounts classified as single family which provide water for livestock.

(d) Unnecessary and undue hardship to the Applicant, including, but not limited to, adverse economic impacts, such as loss of production or jobs.

(e) Emergency conditions, such as impairment of health, sanitation, fire protection or safety of the applicant or public.

Section 8. Application Procedure for Exceptions.

Consideration of written applications for exceptions regarding restrictions on water use set forth in Section 4 or Base Consumption Allocations set forth in Section 5, shall be as follows:

(a) Written applications for exceptions shall be accepted, and may be granted by the District's Drought Management Coordinator;

(b) Denials of applications may be appealed in writing to the General Manager.

Section 9. Exemption from CEQA.

The District Board of Directors finds that this ordinance is exempt from provisions of the California Environmental Quality Act of 1970 because it is immediate action necessary to prevent or mitigate an emergency, as described in Section 15269(c) of the Guidelines promulgated under said Act.

PASSED AND ADOPTED this 23rd day of April, 1992, by the following vote:

AYES: Directors Damas, Redeker, Rollisson, Strandberg and Borghi

NOES: None

ABSENT: None

/s/ FRANK BORGHI, JR.
Frank Borghi, Jr., President
Board of Directors
Alameda County Water District

ATTEST:

/s/ RUTH R. EVANS
Ruth R. Evans, District Secretary
Board of Directors
Alameda County Water District
(SEAL)

APPROVED:

/s/ GENE RHODES
Gene Rhodes, Attorney
Alameda County Water District

CERTIFICATE

I, the undersigned Secretary of ALAMEDA COUNTY WATER DISTRICT, do hereby certify that the foregoing is a full, true and correct copy of an Ordinance of the Board of Directors of ALAMEDA COUNTY WATER DISTRICT, a political subdivision, which said Ordinance was duly adopted at a meeting of said Board regularly held on April 25, 1991 as revised by the Board at their regular meetings held on September 26, 1991, January 9, 1992, and April 23, 1992, and that a copy of said Ordinance was forthwith duly entered in the minutes of said meeting of said Board, and that the same is in full force and effect.

Dated: April 29, 1996

Marvell L. Herren, District Secretary
Alameda County Water District

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APPENDIX F
ACWD Board of Directors Resolution No. 11-037
Adopted on June 9, 2011

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RESOLUTION NO. 11-037

OF BOARD OF DIRECTORS OF ALAMEDA COUNTY WATER DISTRICT ADOPTING THE 2010-2015 URBAN WATER MANAGEMENT PLAN AND THE SBX7-7 COMPLIANCE METHOD

WHEREAS, pursuant to the Urban Water Management Planning Act, California Water Code Sections 10610 *et seq.* (Act), the Alameda County Water District (District) must prepare and adopt an Urban Water Management Plan (UWMP);

WHEREAS, beginning with the 2010-2015 UWMP, the District also must prepare and adopt a method for determining its urban water use target for compliance with the Water Conservation Bill of 2009, California Water Code Sections 10608 *et seq.* (SBX7-7);

WHEREAS, the analysis and selection of the District's SBX7-7 compliance method is set forth in its UWMP;

WHEREAS, the District met and exceeded the procedural requirements of both the Act and SBX7-7 by doing all of the following: (1) coordinated the preparation of the UWMP with other appropriate agencies in the area; (2) notified the County of Alameda and cities of Fremont, Union City, and Newark that the District will be reviewing the UWMP and considering its adoption at least 60 days prior to the public hearing; (3) distributed the draft UWMP to numerous local and regional agencies and other parties who requested a copy of the UWMP; (4) made the draft UWMP available at the local libraries and at the District headquarters; (5) posted the draft UWMP on the District's website; (6) encouraged active involvement of different elements of the population and the community; (7) reviewed and made available the draft UWMP at the regular, publicly noticed, April 12 Board meeting; (8) provided an opportunity to comment on the draft UWMP at the regular, publicly noticed, May 19 Board meeting; (9) published a notice of the June 9 public hearing in the local newspaper once a week for two successive weeks beginning at least fourteen days prior to the public hearing and posted that notice on the District's website; (10) held a public hearing inviting public input regarding the draft UWMP and the SBX7-7 compliance method, including the District's SBX7-7 implementation plan, the economic impacts of that implementation plan, and the method

selected for determining the District's urban water use target; and (11) considered all comments received during the public hearing; and

WHEREAS, the SBX7-7 compliance method recommended by staff is method four, the method developed by the California Department of Water Resources that considers local and regional factors (Method Four) and using the default indoor residential savings assumptions developed by DWR, based on an analysis of each of the four alternative methodologies as described in the UWMP.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of Alameda County Water District as follows:

1. The Board adopts Method Four for determining its urban water use target for compliance with SBX7-7.

2. The Board adopts the 2010-2015 Urban Water Management Plan as presented by staff, and authorizes staff to incorporate the public hearing comments as approved by the Board after the close of the public hearing.

3. The Board authorizes and directs the General Manager to submit copies of the final UWMP to the Department of Water Resources, the California State Library, the County of Alameda, and the cities of Fremont, Newark and Union City by July 9, 2011.

PASSED AND ADOPTED this 9th day of June, 2011, by the following vote:

AYES: Directors Weed, Koller, Sethy, and Huang

NOES: None

ABSENT: Director Gunther

Judy C. Huang, President
Board of Directors
Alameda County Water District

ATTEST:

Andrew Warren, Assistant District Secretary
Alameda County Water District
(Seal)

APPROVED AS TO FORM:

Patrick T. Miyaki, Attorney
Alameda County Water District

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