FINAL

COASTSIDE COUNTY WATER DISTRICT

2010 Urban Water Management Plan

WEST YOST ASSOCIATES

COASTSIDE COUNTY WATER DISTRICT

2010 Urban Water Management Plan

Prepared for

Coastside County Water District

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WEST YOST ASSOCIATES

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List of Acronyms

AB 797	Assembly Bill 797
ABAG	Association of Bay Area Governments
ACDD	Alameda Creek Diversion Dam
AFY	Acre Feet Per Year
AWWA	American Water Works Association
Balance	Balance Hydrologics, Inc.
BAWSCA	Bay Area Water Supply and Conservation Agency
BMPs	Best Management Practices
CA DFG	California Department of Fish and Game
CDD	City Distribution Division
CDP	Coastal Development Permit
CEQA	California Environmental Quality Act
cfs	Cubic Feet Per Second
CII	Commercial, Industrial, and Institutional
CIMIS	California Irrigation Management Information System
CIP	Capital Improvement Program
CUWCC	California Urban Water Conservation Council
CWC	California Water Code
District	Coastside County Water District
DMMs	Demand Management Measures
DOST	DWR Online Submittal Tool
DSS	Decision Support System
DWR	California Department of Water Resources
ERRP	Emergency Response and Recovery Plan
ET	Evapotranspiration
gpcd	Gallons Per Capita Per Day
gpm	Gallons Per Minute
GWMP	Groundwater Management Plan
ISG	Individual Supply Guarantee
ISL	Interim Supply Limitation
IWA	International Water Association
LCP	Local Coastal Program
LOS	Level of Service
LUST	Leaking Underground Storage Tanks
Maddaus	Maddaus Water Management

MG	Million Gallons
MG/yr, MGY	Million Gallons Per Year
MGD	Million Gallon Per Day
MID	Modesto Irrigation District
MOU	Memorandum of Understanding
MWSD	Montara Water and Sanitary District
NCCWD	North Coast County Water District
NPDES	National Pollutant Discharge Elimination System
PEIR	Program Environmental Impact Report
RWS	Regional Water System
SAM	Sewer Authority Mid-Coastside
SBx7-7	Water Conservation Act of 2009, Senate Bill x7-7
SFPUC	San Francisco Public Utilities Commission
SWRCB	State Water Resources Control Board
TID	Turlock Irrigation District
UACFG	Upper Alameda Creek Filter Gallery
UAFW	Unaccounted for water
UWMP	Urban Water Management Plan
WDR	Waste Discharge Requirement
West Yost	West Yost Associates
WQB	Water Quality Bureau
WS&TD	Water Supply and Treatment Division
WSA	Water Supply Agreement
WSAP	Water Shortage Allocation Plan
WSCP	Water Shortage Contingency Plan
WSIP	Water System Improvement Program
WSS	WaterSense Specification
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

ES.1 INTRODUCTION

This 2010 Urban Water Management Plan (UWMP) Update has been prepared for the Coastside County Water District (District) by West Yost Associates (West Yost). This 2010 UWMP for the District describes the current and future water use, sources of supply and their reliability, and existing and planned conservation measures.

This 2010 UWMP complies with the Urban Water Management Planning Act, which was originally established by Assembly Bill 797 (AB 797) on September 21, 1983. The law requires water suppliers in California providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet per year (AFY) of water to prepare and adopt an UWMP every five years.

Several changes to the Urban Water Management Planning Act have been approved in recent years. Revisions to the act include requiring a robust supply and demand comparison, as well as detailed discussion of groundwater resources, water recycling and desalination. Also, this 2010 UWMP is also required to comply with the requirements of the Water Conservation Act of 2009 (Senate Bill x7-7) which was enacted in November 2009. SBx7-7 requires urban retail water suppliers, such as the District, to develop per capita water use targets to be met by 2015 and 2020. The overall statewide objective of SBx7-7 is to reduce per capita water use by 20 percent by the year 2020.

The requirements of SBx7-7 extended the deadline for adoption of the 2010 UWMPs for urban retail water suppliers from December 31, 2010 to July 1, 2011. Similar legislation (SB 1478) was passed in September 2010 to also extend the adoption submittal deadline for urban wholesale water suppliers' UWMPs to July 1, 2011, to allow for coordination between retail and wholesale water suppliers.

ES.2 PLAN ADOPTION

The Coastside County Water District Board of Directors adopted this 2010 UWMP on June 14, 2011. A copy of the adoption resolution (Resolution No. 2011-09) is included in Appendix B.

Following plan adoption, the 2010 UWMP was submitted to the Department of Water Resources and to the California State Library. Copies of the adopted 2010 UWMP were also provided to the following agencies within 30 days of adoption:

- City of Half Moon Bay,
- County of San Mateo – Planning,
- San Francisco Public Utilities Commission (SFPUC),
- Bay Area Water Supply and Conservation Agency (BAWSCA), and
- Sewer Authority Mid-Coastside (SAM).

Within 30 days of submitting the adopted 2010 UWMP to DWR, copies of the adopted 2010 UWMP will be made available during normal business hours at the following locations:

- Coastside County Water District, 766 Main Street, Half Moon Bay, and
- Half Moon Bay Library, 620 Correas Street, Half Moon Bay.

A copy of the adopted 2010 UWMP will also be available on the District's website:

- Coastside County Water District website (http://www.coastsidewater.org)

Should this 2010 UWMP be amended or changed, copies of amendments or changes to the plan shall be submitted to DWR, the California State Library, and any city or county within which the District provides water supplies within 30 days after adoption.

ES.3 PLAN OVERVIEW

ES.3.1 Service Area

The District is a special district providing water to customers within its boundaries, which include the City of Half Moon Bay and several unincorporated communities in San Mateo County, including El Granada, Miramar and Princeton by the Sea. The District is located approximately 30 miles south of San Francisco along the Pacific Ocean and resides at 69 feet above sea level. Most of the area served by the District is located along the coastal terrace between the Pacific Ocean and the precipitous Santa Cruz Mountains. The District boundaries extend approximately 9.5 miles north to south along the coast and 1.5 miles east to west, and include approximately 14 square miles of land.

The District serves a highly desirable coastal area relatively close to major employment centers in San Mateo and San Francisco Counties. Land use planning within the District is undertaken by the City of Half Moon Bay and for the unincorporated areas, the County of San Mateo. Land use planning within the City is guided by the *Half Moon Bay Local Coastal Program and Land Use Plan (1993).* Planning in the unincorporated areas of the District, including El Granada, Granada Highlands, Clipper Ridge, Princeton and part of Miramar, is guided by the *San Mateo County Local Coastal Program (August 1992).*

Growth management provisions in the San Mateo County Local Coastal Program limit growth to 125 units/year in the County's planning area, only a portion of which is in the District service area. Furthermore, growth within the City of Half Moon Bay is limited to 1 percent per year by Measure D, a voter-adopted residential growth control ordinance adopted in 1999.

The current population served by the District is estimated (based on data from the Association of Bay Area Governments, ABAG) to be 20,216 people. At 2035, the service area population is projected to be 23,427 people.

ES.3.2 Water Demand

Unlike past UWMPs, the projected water demand in this 2010 UWMP is primarily driven by the per capita water use targets mandated by the Water Conservation Act of 2009 (enacted by Senate Bill SBx7-7 in November 2009). As part of the District's compliance with SBx7-7, the District has established its baseline per capita water use and has established and adopted a 2015 interim per capita water use target and a 2020 final per capita water use target. The development of the District's baseline and target per capita water use is described in Chapter 4 and Appendix F and are summarized as follows:

- Baseline Per Capita Water Use: 128 gallons per capita per day (gpcd)
- 2015 Interim Per Capita Water Use Target: 124 gpcd
- 2020 Final Per Capita Water Use Target: 120 gpcd

As described in Chapter 4, the District anticipates being able to meet the adopted SBx7-7 through a combination of existing water conservation programs and possibly some additional future programs. The District will closely monitor its per capita water use in the coming years to assess if additional programs will need to be implemented to meet the 2015 and 2020 per capita water use targets.

Projected water demands were determined by multiplying the per capita water use targets by the projected future service area population. Projected water demands based on Normal Year supply conditions are summarized in Table ES-1. As described below under Section ES.3.4 Projected Water Supply, under dry year conditions, customer demands will need to be reduced in accordance with the District's Water Shortage Contingency Plan.

Table ES-1. Projected Water Demand, AFY

Water Use	FY 2009/10 (actual)	2015	2020	2025	2030	2035
Total Projected Demand (including unaccounted for water[a])	2,265	2,850[b]	2,787[c]	2,822[d]	2,859[e]	3,149[f]

[a] Unaccounted for water is estimated to be 7.5 percent of total production.
[b] Consistent with District's interim gpcd target of 124 gpcd per SBx7-7 (124 gpcd x 20,515 service area population = 2,850 AFY).
[c] Consistent with District's final gpcd target of 120 gpcd per SBx7-7 (120 gpcd x 20,736 service area population = 2,787 AFY).
[d] Consistent with District's final gpcd target of 120 gpcd per SBx7-7 (120 gpcd x 20,991 service area population = 2,822 AFY).
[e] Consistent with District's final gpcd target of 120 gpcd per SBx7-7 (120 gpcd x 21,265 service area population = 2,859 AFY).
[f] Consistent with District's final gpcd target of 120 gpcd per SBx7-7 (120 gpcd x 23,427 service area population = 3,149 AFY).

ES.3.3 Projected Water Supply

The District's primary supply source is water that is purchased on a wholesale basis from the San Francisco Public Utilities Commission (SFPUC). The District's SFPUC supplies are obtained from the SFPUC's Pilarcitos Lake and the Upper Crystal Springs Reservoir. The District is a member of the Bay Area Water Supply and Conservation Agency (BAWSCA), which was created in 2003 to represent the interests of the 26 cities and water district, and two private

utilities, in Alameda, Santa Clara and San Mateo counties that purchase water on a wholesale basis from the San Francisco Regional Water System.

In addition to water purchases from the SFPUC, the District obtains water from two local sources:

- Infiltration Well water from the District's Pilarcitos well field, and
- Local surface water and groundwater from the District's Denniston Project.

The availability and reliability of each of these supply sources is described in Chapter 3. The District's current and planned uses of these water supplies based on Normal Year supply conditions are shown in Table ES-2.

Table ES-2. Current and Planned Water Supplies, AFY

Supply	FY2009/10 (actual)	2015	2020	2025	2030	2035
Water supply purchased from SFPUC	2,038	1,970	1,907	1,942	1,979	2,269
Supplier-produced groundwater (Denniston)	19	120	120	120	120	120
Supplier-produced surface water (Denniston)	72	610	610	610	610	610
Supplier-produced surface water (Pilarcitos well field)	136	150	150	150	150	150
Total	2,265	2,850	2,787	2,822	2,859	3,149

As described in Chapter 7, the District's Normal Year supplies are sufficient to meet the District's projected Normal Year demands through 2035. However, the District's water supplies (particularly its local water supplies) are subject to significantly reduced availability in dry years. Therefore, in single dry years and multiple dry years the District will need to implement its Water Shortage Contingency Plan to reduce customer water demands. With these demand reductions, and based on the anticipated reliability of the District's water supplies during normal, single dry and multiple dry years, the District anticipates that it has adequate water supplies to meet projected water demands during all hydrologic conditions through 2035.

ES.3.4 Demand Management and Water Conservation

The District's compliance with the established SBx7-7 targets will be achieved through the District's on-going implementation of the foundational and programmatic Best Management Practices (BMPs) included in the California Urban Water Conservation Council (CUWCC) Memorandum of Understanding (MOU). The District's current and proposed BMP implementation is described in Chapter 5.

In particular, the District's continued implementation of the following existing water use efficiency programs will be critical to meeting the adopted SBx7-7 targets:

- Implementation of the CUWCC BMPs,
- High efficiency toilet rebate program,
- High efficiency clothes washer rebate program,
- Indoor Water Use Efficiency Ordinance, and
- Participation in BAWSCA's residential landscape classes.

In addition, the District will consider the following future programs to enhance its water conservation program:

- Lawn replacement program, and
- Residential audits.

ES.3.5 Water Shortage Contingency Plan

In April 2011, the District Board of Directors adopted a revised Water Shortage Contingency Plan (WSCP) to address potential water shortages due to prolonged drought conditions or other water supply outages. The WSCP delineates five stages of action, triggers, prohibitions and other water consumption reduction methods and associated penalties and charges for violating the established water use restrictions. The five stages of the plan are intended to address up to a 50 percent reduction in available water supplies. The WSCP is summarized in Chapter 8 of this 2010 UWMP. A complete copy of the adopted WSCP is provided in Appendix I.

ES.4 ON-LINE SUBMITTAL TO DWR USING DOST

This 2010 UWMP will be submitted to DWR using the DWR On-line Submittal Tool (DOST), when DOST has been completed by DWR and is available for use.

ES.5 PLAN ORGANIZATION AND DEMONSTRATION OF PLAN COMPLETENESS

This 2010 UWMP is organized into the following chapters:

- Chapter 1: Introduction and Background
- Chapter 2: Supplier Service Area
- Chapter 3: Water Supply
- Chapter 4: Water Demand
- Chapter 5: Demand Management Measures
- Chapter 6: Wastewater and Recycled Water
- Chapter 7: Supply and Demand Comparison

- Chapter 8: Water Shortage Contingency Plan
- Chapter 9: Adoption and Implementation of the UWMP
- Chapter 10: References

This 2010 UWMP also contains the following appendices of supplemental information and data related to the District's 2010 UWMP:

- Appendix A: Legislative Requirements
- Appendix B: UWMP Adoption Resolution
- Appendix C: Notices
- Appendix D: SFPUC Supply Reliability Information
- Appendix E: Groundwater Information
- Appendix F: Compliance with the Water Conservation Act of 2009 (SBx7-7)
- Appendix G: CUWCC BMP Reporting and Water Conservation Materials
- Appendix H: Coastside County Water District Water Rate Schedule
- Appendix I: Water Shortage Contingency Plan
- Appendix J: DWR UWMP Checklist

This 2010 UWMP complies with the requirements of the Urban Water Management Planning Act, as amended by recently enacted legislation. DWR's Urban Water Management Plan Checklist, as provided in the 2010 UWMP Guidebook, has been completed by West Yost to demonstrate the plan's compliance with applicable requirements. A copy of the completed checklist is included in Appendix J.

Furthermore, this 2010 UWMP contains all of the data tables recommended by DWR. Table ES-3 provides a listing of the recommended DWR data tables with a cross-reference to the table locations in this 2010 UWMP.

Table ES-3. Location of DWR Recommended Data Tables		
DWR Data Table Number and Title	2010 UWMP Chapter and Table Number	
Table 1. Coordination with Appropriate Agencies	Chapter 1	Table 1-1
Table 2. Population—Current and Projected	Chapter 2	Table 2-3
Table 3. Water Deliveries—Actual, 2005	Chapter 4	Table 4-1
Table 4. Water Deliveries—Actual, 2010	Chapter 4	Table 4-2
Table 5. Water Deliveries—Projected, 2015	Chapter 4	Table 4-5
Table 6. Water Deliveries—Projected, 2020	Chapter 4	Table 4-6
Table 7. Water Deliveries—Projected, 2025, 2030 and 2035	Chapter 4	Table 4-7
Table 8. Low-Income Projected Water Demands	Chapter 4	Table 4-8
Table 9. Sales to Other Water Agencies	Chapter 4	Table 4-9
Table 10. Additional Water Uses and Losses	Chapter 4	Table 4-10
Table 11. Total Water Use	Chapter 4	Table 4-11
Table 12. Retail Agency Demand Projections Provided to Wholesale Suppliers	Chapter 4	Table 4-12
Table 13. Base Period Ranges	Chapter 4	Table 4-13
Table 14. Base Daily Per Capita Water Use—10- to 15-Year Range	Chapter 4	Table 4-14
Table 15. Base Daily Per Capita Water Use—5-Year Range	Chapter 4	Table 4-15
Table 16. Water Supplies—Current and Projected	Chapter 3	Table 3-5
Table 17. Wholesale Supplies—Existing and Planned Sources of Water	Chapter 3	Table 3-6
Table 18. Groundwater—Volume Pumped	Chapter 3	Table 3-2
Table 19. Groundwater—Volume Projected to be Pumped	Chapter 3	Table 3-3
Table 20. Transfer and Exchange Opportunities	Chapter 3	Table 3-4
Table 21. Recycled Water—Wastewater Collection and Treatment	Chapter 6	Table 6-1
Table 22. Recycled Water—Non-Recycled Wastewater Disposal	Chapter 6	Table 6-2
Table 23. Recycled Water—Potential Future Use	Chapter 6	Table 6-4
Table 24. Recycled Water—2005 UWMP Use Projection Compared to 2010 Actual	Chapter 6	Table 6-3
Table 25. Methods to Encourage Recycled Water Use	Chapter 6	Table 6-5
Table 26. Future Water Supply Projects	Chapter 3	Table 3-7
Table 27. Basis of Water Year Data	Chapter 3	Table 3-13
Table 28. Supply Reliability—Historic Conditions	Chapter 3	Table 3-14
Table 29. Factors Resulting in Inconsistency of Supply	Chapter 3	Table 3-8
Table 30. Water Quality—Current and Projected Water Supply Impacts	Chapter 3	Table 3-16
Table 31. Supply Reliability—Current Water Sources	Chapter 3	Table 3-15
Table 32. Supply and Demand Comparison—Normal Year	Chapter 7	Table 7-3
Table 33. Supply and Demand Comparison—Single Dry Year	Chapter 7	Table 7-6
Table 34. Supply and Demand Comparison—Multiple Dry Year Events	Chapter 7	Table 7-9
Table 35. Water Shortage Contingency—Rationing Stages to Address Water Supply Shortages	Chapter 8	Table 8-1
Table 36. Water Shortage Contingency—Mandatory Prohibitions	Chapter 8	Table 8-2
Table 37. Water Shortage Contingency—Consumption Reduction Methods	Chapter 8	Table 8-2
Table 38. Water Shortage Contingency—Penalties and Charges	Chapter 8	Table 8-4

CHAPTER 1
Introduction and Background

1.1 INTRODUCTION

The Urban Water Management Planning Act was originally established by Assembly Bill 797 (AB 797) on September 21, 1983. Passage of this law was recognition by state legislators that water is a limited resource and a declaration that efficient water use and conservation would be actively pursued throughout the state. The law requires water suppliers in California providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet per year (AFY) of water to prepare and adopt an Urban Water Management Plan (UWMP) every five years.

Several changes to the Urban Water Management Planning Act have been approved in recent years. Revisions to the act include requiring a robust supply and demand comparison, as well as detailed discussion of groundwater resources, water recycling and desalination. Also, this 2010 UWMP is also required to comply with the requirements of the Water Conservation Act of 2009 (Senate Bill x7-7) which was enacted in November 2009. SBx7-7 requires urban retail water suppliers, such as the Coastside County Water District (District), to develop per capita water use targets to be met by 2015 and 2020. The overall statewide objective of SBx7-7 is to reduce per capita water use by 20 percent by the year 2020.

The requirements of SBx7-7 have extended the deadline for adoption of the 2010 UWMPs for urban retail water suppliers from December 31, 2010 to July 1, 2011. Similar legislation (SB 1478) was passed in September 2010 to also extend the adoption submittal deadline for urban wholesale water suppliers' UWMPs to July 1, 2011, to allow for coordination between retail and wholesale water suppliers.

A copy of the current version of the Urban Water Management Planning Act and the Water Conservation Act of 2009 (SBx7-7) is provided in Appendix A of this document.

1.2 PLAN OVERVIEW

This 2010 UWMP for the District is the sixth plan adopted by the District's Board of Directors. Several changes have occurred since the District's first UWMP was adopted in 1985.

This 2010 UWMP for the District describes the current and future water use, sources of supply and its reliability, and existing and planned water conservation (demand management) measures. This 2010 UWMP contains the appropriate sections and tables required per California Water Code Division 6, Part 2.6 (Urban Water Management Planning Act), included in Appendix A of this document, and has been prepared based on guidance provided by the California Department of Water Resources (DWR) in their March 2011 "Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan" (DWR 2010 Guidebook).

This Coastside County Water District 2010 UWMP Update has been prepared jointly by District staff and West Yost Associates (West Yost). To demonstrate the completeness of this 2010 UWMP, the UWMP checklist provided in the DWR 2010 Guidebook has been completed and is included in Appendix J.

This 2010 UWMP was adopted by the Coastside County Water District Board of Directors on June 14, 2011. A copy of the resolution adopting the 2010 UWMP (Resolution No. 2011-09) is included in Appendix B.

1.3 BACKGROUND AND ANTICIPATED BENEFITS

The purpose of the UWMP is to provide a planning tool for the District for developing and delivering municipal water supplies to the District's water service area. Since 1947, the District has had a long history of providing clean and reliable water to its residential, business, and floriculture customers in the City of Half Moon Bay and the unincorporated areas of San Mateo County. Expanding local sources of water and finding new sources have met the needs for water in the community. In 1994, the District finalized a major pipeline project with the SFPUC (the Crystal Springs Project), which allowed the District to purchase water from Crystal Springs Reservoir. This project allowed the District to no longer be constrained by variable local supplies. To continue to meet the water needs of the community, the District carefully manages its available water resources. The District's UWMP acts as a comprehensive guide in planning for a safe and adequate water supply.

1.4 AGENCY COORDINATION, NOTIFICATION & PARTICIPATION

Water Code § 10620 (d)(1)(2)

(d) (1) An urban water supplier may satisfy the requirements of this part by participation in area-wide, regional, watershed, or basin-wide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

The District is a member of the Bay Area Water Supply and Conservation Agency (BAWSCA). BAWSCA members are all contract customers of the San Francisco Public Utilities Commission (SFPUC) for the wholesale purchase of water. Land use planning and development approvals within the District's boundaries are the responsibility of the City of Half Moon Bay and the County of San Mateo. The Sewer Authority Mid-Coastside (SAM) provides wastewater treatment and the Coastside Fire Protection District provides fire suppression services. These and other agencies, as well as the public, participated in the coordination and preparation of this 2010 UWMP, and are summarized in Table 1-1.

Table 1-1. Coordination with Appropriate Agencies (DWR Table 1)

Agency	Notified of UWMP Preparation/ Contacted for Input	Participated in UWMP Development	Notified 60 days Prior to Public Hearing	Attended Public Meetings	Sent Copy of Draft UWMP	Commented on Draft UWMP	Sent Notice of Intention to Adopt	Not Involved/ No Info.
City of Half Moon Bay	✓		✓		✓		✓	
County of San Mateo-Planning	✓		✓		✓		✓	
Sewer Authority Mid-Coastside	✓		✓		✓		✓	
Granada Sanitary District	✓		✓					
Bay Area Water Supply and Conservation Agency	✓	✓	✓					
Montara Water and Sanitary District	✓		✓					
San Francisco Public Utilities Commission	✓	✓	✓					
Half Moon Bay Coastside Chamber of Commerce	✓		✓					
San Mateo County Farm Bureau	✓		✓					
San Mateo County Harbor District	✓		✓					
The Rotary Club of Half Moon Bay	✓		✓					
Peninsula Open Space Trust (POST)	✓		✓					
Coastside Land Trust	✓		✓					
San Mateo County Resources Conservation District	✓		✓					
Coastside Fire Protection District	✓		✓					

In January 2011, at the beginning of the UWMP update process, a notice of preparation was sent to stakeholders to inform them of the UWMP update process and schedule and solicit input for the update. A copy of the notice is included in Appendix C. A notice was also placed in the February 2, 2011 edition of the local newspaper (Half Moon Bay Review) and in the District's spring newsletter to notify customers and the general public about the UWMP update.

In accordance with the requirements of SBx7-7, Water Code Section 10608.26, a public hearing was held on April 12, 2011 to discuss the City's proposed per capita water use targets for 2015 and 2020.

Following completion of the Draft UWMP, a notification of public review was placed in the local newspaper (Half Moon Bay Review) about the 2010 UWMP update process and copies of the Draft UWMP were made available at the District's offices and at the Half Moon Bay Library, with an electronic version placed on the District's website. Copies of the Draft UWMP were also sent directly to key stakeholder agencies (see Table 1-1), including the cities and communities served by the District and San Mateo County. During the public review period, local cities and communities and San Mateo County, as well as the general public, were encouraged to comment on the draft document.

A public hearing to discuss the Draft UWMP was held on June 14, 2011, in conjunction with the District's Board of Directors meeting. Noticing for the public hearing was conducted pursuant to Section 6066 of the Government Code. Also, per California Water Code Section 10621, notice regarding the public hearing was sent to the cities located in the District's service area and San Mateo County 60 days prior to the public hearing date.

Copies of the public hearing notices and notices to city and county entities served by the District are included in Appendix C.

1.5 PUBLIC PARTICIPATION

> *Water Code §10642 Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.*

The District has actively encouraged community participation in water management activities and specific water-related projects. The District's public participation program includes both active and passive means of obtaining input from the community, such as mailings, public meetings, and web-based communication. The District's website describes on-going projects and posts announcements of planned rate increases to fund these water projects.

As part of development of this 2010 UWMP update, the District allowed a public review period following noticing and prior to adoption to allow ample time for public comments to be developed and received. Public noticing, pursuant to Section 6066 of the Government Code, was

conducted prior to commencement of the public comment period. Public hearing notices are included in Appendix C of this document. During the public comment period, the Draft UWMP update was made available at the District office and at the Half Moon Bay Library, as well as on the District's website.

2.1 DISTRICT SERVICE AREA

Water Code § 10631 (a), §10620 (f)

A plan shall be adopted in accordance with this chapter and shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

§10620 (f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

The District is a special district providing water to customers within its jurisdictional boundaries, which include the City of Half Moon Bay and several unincorporated communities in San Mateo County, including El Granada, Miramar and Princeton by the Sea. The District's jurisdictional boundaries are depicted on Figure 2-1.

The District is located approximately 30 miles south of San Francisco along the Pacific Ocean and resides at 69 feet above sea level. Most of the area served by the District is located along the coastal terrace between the Pacific Ocean and the precipitous Santa Cruz Mountains. The District boundaries extend approximately 9.5 miles north to south along the coast and 1.5 miles east to west, and include approximately 14 square miles of land.

The predominant land use within the District is small residential communities surrounded by agricultural or light ranching activities. Commercial development is limited to the populated areas along State Route 1 and Highway 92 and at Pillar Point Harbor. Floriculture is the largest industry in the area.

2.2 WATER SYSTEM FACILITIES

Figure 2-2 provides an overview of the District's water system facilities. Major water system facilities are described below.

2.2.1 Water Treatment Plants

The District operates two water treatment plants: the Nunes Water Treatment Plant and the Denniston Water Treatment Plant.

The Nunes Water Treatment Plant, located on Carter Hill northeast of Half Moon Bay, began operating in 1982 with an initial treatment capacity of 2.5 million gallons per day (MGD). The Nunes WTP was expanded as part of the Crystal Springs Project and now has a treatment capacity of 4.5 MGD. The Nunes WTP treats water purchased from the SFPUC (from Pilarcitos Lake and Crystal Springs Reservoir) and the District's Pilarcitos Well Field.

The Denniston Water Treatment Plant, in operation since 1974, is located above Denniston Creek and has a treatment capacity of 1.0 MGD. It treats water from both surface and groundwater from the District's Denniston Project. The District is currently in the process of making improvements to its Denniston WTP. The improvements will not expand the existing

treatment capacity of the facilities, but will allow the District's facilities to treat water of higher turbidity, and provide a more reliable and efficient treatment of local water supplies. The District is proposing to install two contact clarifiers for raw water pretreatment; replace existing chemical feed and storage systems for caustic soda, polymer, aluminum sulfate, and sodium hypochlorite; install new raw water pumps; replace existing washwater and solids handling facilities; and make associated improvements to electrical and control systems. This maintenance, replacement, and modernization project is required to improve the treatment plant reliability by replacing systems which have reached the end of their useful life, to bring the facilities into conformance with current safety regulations for chemical containment, and to facilitate treatment of lower quality raw water. The design for the WTP improvements has been completed and the District is in the process of selecting a contractor for the project. The WTP improvements are anticipated to be complete by October 2012.

2.2.2 Pilarcitos Wells

The District owns and operates five infiltration wells in the Pilarcitos Canyon, upstream of Highway 92. The five wells (known as Wells P1 through P5) are shown on Figure 2-2. Water extracted from these wells is treated at the Nunes Water Treatment Plant. Additional discussion of these wells is provided in Chapter 3.

2.2.3 Denniston Well Field

The District owns and operates nine groundwater wells (Wells D1 through D9) located east of the Half Moon Bay Airport. The location of these wells is shown on Figure 2-2. Additional discussion of these wells is provided in Chapter 3.

2.2.4 Storage and Distribution

The District has eleven treated water storage tanks with a total storage capacity of 8.1 million gallons (MG) (see Figure 2-2).

The District's other major facilities include a network of transmission and distribution pipelines. The major transmission pipelines are shown on Figure 2-2. The 18-inch diameter transmission pipeline from Pilarcitos Lake, which is the District's largest source of supply during peak demand periods in the summer and fall, has a capacity of 1,889 gallons per minute (gpm). Treated water is distributed from the treatment plants to two major geographical zones via 8-, 10-, 12- and 16-inch transmission lines.

As pipelines age and become more susceptible to leaks, the District implements an extensive pipeline replacement program. Each year, the District implements a number of Capital Improvement Program (CIP) projects to replace aging pipelines. All old pipelines are replaced with new iron ductile pipe to reduce leaks and minimize losses within the distribution system.

2.3 CLIMATE

The District enjoys a cool climate moderated throughout the year by on-shore breezes from the Pacific Ocean. Summer fog significantly reduces landscape irrigation requirements. Temperatures are moderate with the summer highs in the mid 60's and the winter lows in the mid 50's. Average rainfall in Half Moon Bay is 26.3 inches per year.

Water use within the District's service area is dependent on various climate factors such as temperature, precipitation, and evapotranspiration (ET). Climate data, including temperature and precipitation estimates, were obtained from the Western Regional Climate Center for Half Moon Bay, California. The period of record was July 1, 1939 to September 30, 2010.

ET is a term used to describe water lost through evaporation from the soil and surface-water bodies combined with plant transpiration. In general, the reference evapotranspiration (ET_o) is given for turf grass, and then corrected for a specific crop type. Local ET_o data was obtained from the California Irrigation Management Information System (CIMIS) Station #104 (De Laveaga), located near Santa Cruz, California and operated by DWR.

Table 2-1 shows the historical climate characteristics affecting water management in the District's service area.

Table 2-1. Coastside County Water District Historical Climate Data

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Monthly Average ET_o[(a)], in	1.36	1.93	3.26	4.70	4.87	5.32	5.03	4.84	3.60	2.96	1.64	1.30	40.81
Average Total Precipitation[(b)], in	5.25	4.55	3.78	1.89	0.77	0.27	0.11	0.19	0.35	1.59	3.01	4.53	26.29
Average Max Temperature[(b)], ^oF	58.3	59.3	59.8	60.7	61.7	63.4	64.2	65.2	66.9	65.8	62.7	58.9	62.2
Average Min Temperature[(b)], ^oF	42.9	43.6	43.9	44.6	47.4	49.8	51.9	52.7	51.2	48.3	45.5	43.4	47.1

(a) Data from CIMIS Station #104 (http://wwwcimis.water.ca.gov/cimis/monthlylyEToReport). DWR requests that information be based on the last 30 years; however, the CIMIS information for this station is available only from September 1990 to the present.
(b) Data from Western Regional Climate Center (http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca5738) for Half Moon Bay, California. Period of record is 07/01/1939 to 09/30/2010.

2.4 OTHER DEMOGRAPHIC FACTORS

The District serves a highly desirable coastal area relatively close to major employment centers in San Mateo and San Francisco Counties. Land use planning within the District is undertaken by the City of Half Moon Bay, and for the unincorporated areas, the County of San Mateo. Land use planning within the City is guided by the *Half Moon Bay Local Coastal Program and Land Use Plan (1993).* Planning in the unincorporated areas of the District, including El Granada, Granada Highlands, Clipper Ridge, Princeton and part of Miramar, is guided by the *San Mateo County Local Coastal Program (August 1992).*

Growth management provisions in the San Mateo County Local Coastal Program (LCP) limit growth to 125 units/year in the County's planning area, only a portion of which is in the District service area.

As part of growth management, the City and County LCP's limit the total number of water connections that can be sold within the District's service area. The District has two types of water connections:

- Priority Connections are defined as commercial visitor serving, and includes motels, hotels, agriculture, and restaurants; and
- Non-Priority Connections include residential and non-commercial visitor serving.

Also, in 1999, voters in Half Moon Bay passed Measure D which limits residential growth within the City of Half Moon Bay to 1 percent per year.

2.5 SERVICE AREA POPULATION

2.5.1 Historical Population

The District's historical service area population has been estimated using data from the United States Census Bureau. 1990 Census data for the 94019 zip code was used to estimate the District's 1990 service area population. 2000 Census data for three Census tracts (Census tracts 6135.01, 6135.02 and 6137) was used to estimate the District's 2000 population. Projections made by the Association of Bay Area Governments (ABAG) in 2009 for those same Census tracts were then used to estimate District's population growth since 2000. The District also serves an approximately nine block area in Princeton (Census tract 6136); however, these are primarily non-residential land uses with no population associated with them. The District's historical service area population from 1990 to 2010 is summarized in Table 2-2.

Table 2-2. Coastside County Water District Historical Service Area Population	
Year	Estimated Service Area Population
1990	14,034[a]
1991	14,524[b]
1992	15,014[b]
1993	15,504[b]
1994	15,994[b]
1995	16,484[b]
1996	16,974[b]
1997	17,464[b]
1998	17,954[b]
1999	18,444[b]
2000	18,452[c]
2001	18,668[d]
2002	18,884[d]
2003	19,100[d]
2004	19,316[d]
2005	19,617[d]
2006	19,766[d]
2007	19,915[d]
2008	20,064[d]
2009	20,213[d]
2010	20,216[d]

(a) Based on 1990 Census data for zip code 94019.
(b) Interpolated between 1990 and 2000 Census data.
(c) Based on 2000 Census data for Census tracts 6135.014, 6135.02 and 6137.
(d) Population estimates for 2001 and beyond are based on ABAG 2009 population projections for Census tracts 6135.014, 6135.02 and 6137.

2.5.2 Projected Population

As discussed previously, growth and development within the District's service area are subject to City and County growth management policies. Projections of future population within the District's service area have been made by ABAG and are summarized in Table 2-3.

Table 2-3. Population Served by the Coastside County Water District – Current and Projected[a] (DWR Table 2)

Area Served	2010	2015	2020	2025	2030	2035
TOTAL	20,216	20,515	20,736	20,991	21,265	23,427

(a) Based on ABAG 2009 Projections for Census tracts 6135.014, 6135.02 and 6137

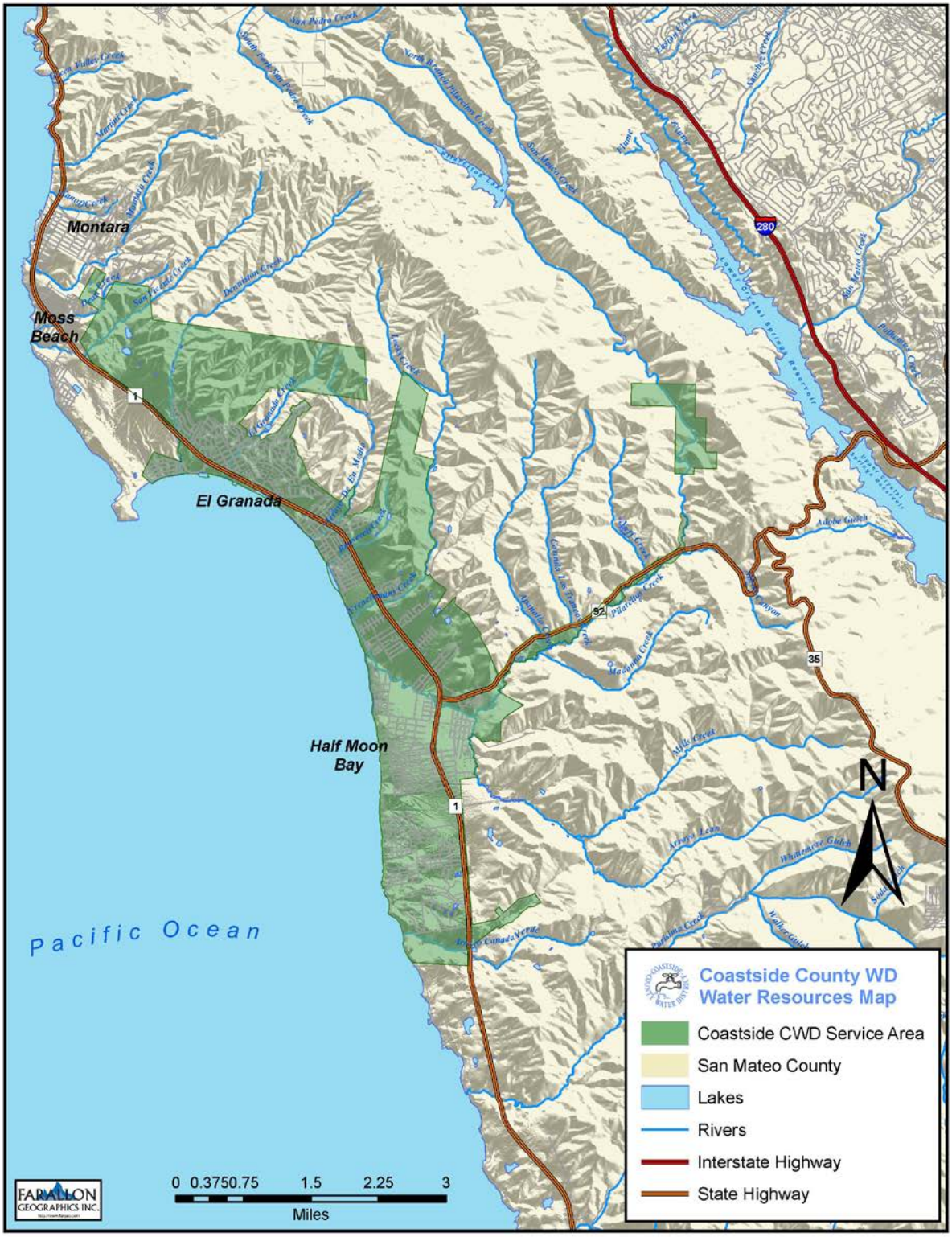


Figure 2-1. Coastside County Water District Jurisdictional Area

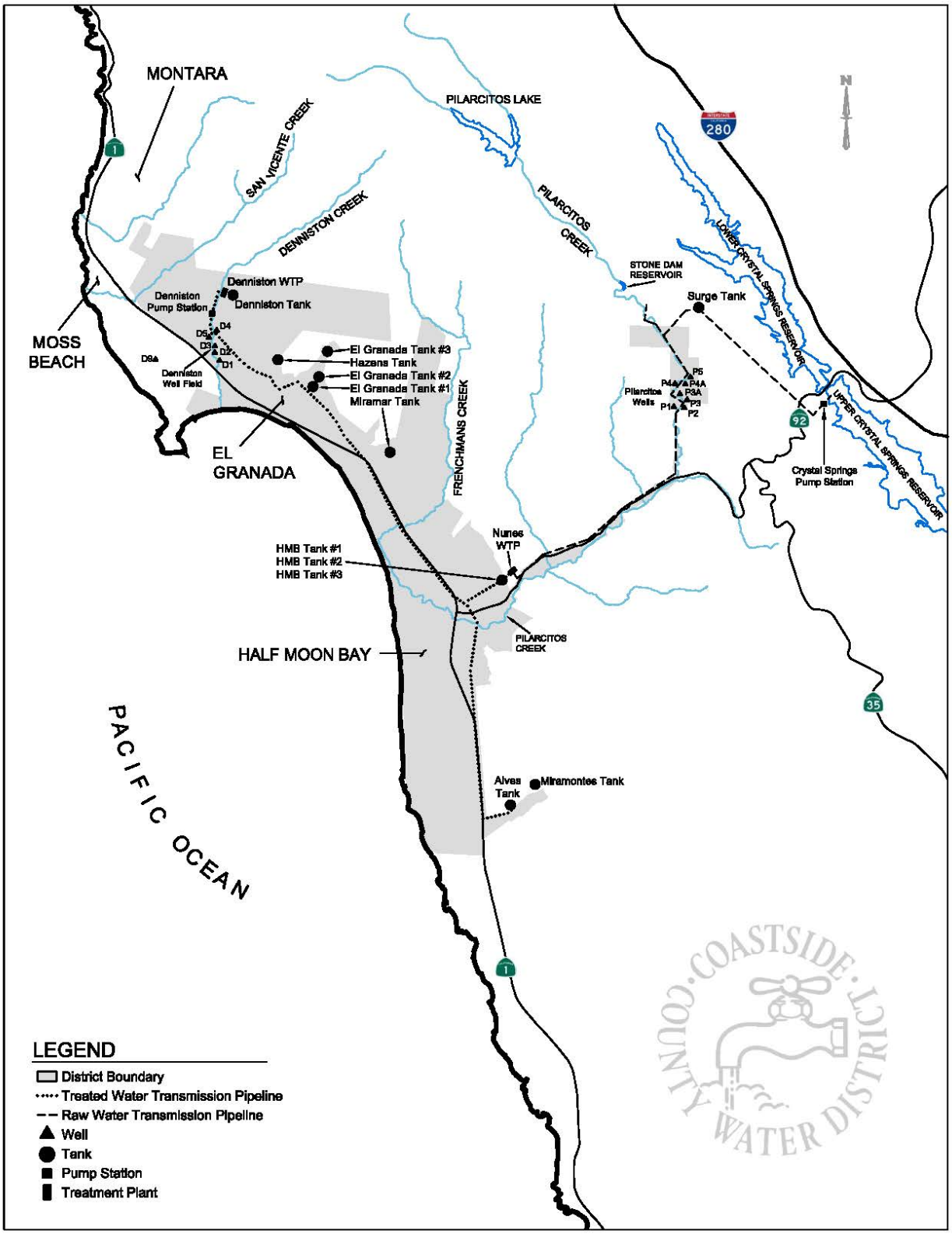


Figure 2-2. Coastside County Water District Water System Facilities

3.1 WATER SUPPLY OVERVIEW

This chapter describes the sources of water available to the District. The chapter includes a description of each water supply source, including limitations, water quality and water exchange opportunities.

The District currently obtains water from three sources:

- Purchased water from the SFPUC,
- Infiltration Well water from the District's local Pilarcitos well field, and
- Local surface water and groundwater from the District's Denniston Project.

The historical use of these water supplies by the District over the past sixteen years is shown on Figures 3-1 and 3-2. Figure 3-1 shows the total use of local supplies versus supplies purchased from the SFPUC. As shown, under pre-drought conditions (before FY2005/06) local supplies made up about 30 to 40 percent of the District's total supplies; however, in the recent drought years, local supplies have only made up about 8 to 20 percent of the District's total supplies. In FY2009/10, local supplies made up about 10 percent of the District's total supplies. Figure 3-2 illustrates the use of each of the District's specific water supply sources and shows the reduction in each of the local supplies, particularly in Denniston surface water, in recent years.

Each of the District's supplies is described below.

3.2 WATER SUPPLY PURCHASES FROM THE SAN FRANCISCO PUBLIC UTILITIES COMMISSION

The District purchases water from the SFPUC under the terms of the 2009 Water Supply Agreement between SFPUC and its wholesale customers. The District is currently entitled to purchase a maximum of approximately 800 million gallons (MG) annually (about 2.18 MGD or approximately 2,455 AFY), except in drought years when mandatory water rationing is in effect. The Water Supply Agreement stipulates that this entitlement, called the District's Individual Supply Guarantee (ISG), will not be increased before 2018. Because availability of additional water from SFPUC after 2018 is uncertain, the District assumes for planning purposes that the ISG will not be increased.

3.2.1 SFPUC Regional Water System Overview

The City and County of San Francisco's regional water system, operated by the SFPUC, is predominantly supplied from runoff and snowmelt 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.

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

3.2.2 SFPUC Water System Improvement Program

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 2000 Water Supply Master Plan. An overview of the WSIP is provided in Figure 3-3.

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 the regional water system to 265 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 percent complete overall with the planning and design work over 90 percent complete. The WSIP is scheduled to be completed in December 2015.

3.2.3 2009 Water Supply Agreement

The business relationship between San Francisco and its wholesale customers is largely defined by the "Water Supply Agreement (WSA) 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. 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 percent 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 percent 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.

3.2.4 Bay Area Water Conservation and Supply Agency

The District is a member of the BAWSCA which was created on May 27, 2003 to represent the interests of the 26 cities and water districts, and two private utilities, in Alameda, Santa Clara and San Mateo counties that purchase water on a wholesale basis from the San Francisco Regional Water System.

BAWSCA is the only entity having the authority to directly represent the needs of the cities, water districts and private utilities (wholesale customers) that depend on the regional water system. BAWSCA provides the ability for the customers of the regional system to work with San Francisco on an equal basis to ensure the water system gets fixed, and to collectively and efficiently meet local responsibilities.

BAWSCA has the authority to coordinate water conservation, supply and recycling activities for its agencies; acquire water and make it available to other agencies on a wholesale basis; finance projects, including improvements to the regional water system; and build facilities jointly with other local public agencies or on its own to carry out the agency's purposes.

3.2.5 SFPUC Supplies Purchased by the District

As described above, in 2009, the District, along with 25 other Bay Area water suppliers signed a WSA with San Francisco, supplemented by an individual Water Supply Contract. These contracts, which expire in 25 years, provide for a 184 MGD (expressed on an annual average basis) Supply Assurance to the SFPUC's wholesale customers collectively. The District's Individual Supply Guarantee (ISG) is 800 million gallons per year (MGY) (or approximately 2,455 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.

The District purchases water from two sources owned and operated by the SFPUC: Pilarcitos Lake and Upper Crystal Springs Reservoir. The transmission pipelines from each of these sources interconnect in upper Pilarcitos Canyon. Each supply source from the SFPUC is discussed below.

3.2.5.1 SFPUC Water Supplies from Pilarcitos Lake

Water supplies from Pilarcitos Lake are available to the District throughout the year. The source of the water in Pilarcitos Lake is local runoff from the surrounding watershed; no imported water from Hetch Hetchy is stored in Pilarcitos Lake. Water from this source is transported to the District's Nunes Water Treatment Plant (Nunes WTP) via gravity pipelines. The maximum rate of flow is 1,889 gpm. The District prefers to draw SFPUC water from the more local Pilarcitos Lake source because the water flows by gravity from the SFPUC service connection at Stone Dam to the District's Nunes WTP, avoiding the power costs associated with pumping water from SFPUC's Upper Crystal Springs Reservoir. When there is insufficient water stored in Pilarcitos Lake or when the District's demand exceeds the hydraulic capacity of the District-owned pipeline from Stone Dam, the District pumps SFPUC water from Upper Crystal Springs Reservoir.

3.2.5.2 Water Supplies from the Upper Crystal Springs Reservoir

The water in Upper Crystal Springs Reservoir is supplied by local runoff from the surrounding watershed and imported water supplies from Hetch Hetchy. Upper Crystal Springs Reservoir also serves as an emergency water supply for the regional water system and its customers in the event of an interruption to SFPUC's Hetch Hetchy supplies. The District pumps water from Upper Crystal Springs Reservoir through an 18-inch diameter transmission pipeline to the District's Nunes WTP. Water from the Upper Crystal Springs Reservoir source is available throughout the year. The Crystal Springs project was designed for an ultimate capacity of 12.0 MGD. The present capacity to provide water to the District is 4.5 MGD and is limited by the operational constraints of the Nunes WTP. Expansion of the project capacity would require the approval of the SFPUC and the California Coastal Commission. The Upper Crystal Springs Reservoir supply source is important to the District because Upper Crystal Springs Reservoir is intertied with SFPUC's main supply source (Hetch Hetchy). The Upper Crystal Springs Reservoir supply is more expensive than the other supply sources because of the pumping (electrical power) costs combined with the cost of purchasing the water.

3.2.6 Projected Future Purchases from the SFPUC

Water Code §10631 (k)

A plan shall be adopted in accordance with this chapter and shall do all of the following:

(k) Urban water suppliers that rely upon a wholesale agency for a source of water, shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is avail2able. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water

supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

Table 3-1 presents the District's projected future purchases from the SFPUC through 2035 assuming normal year hydrologic conditions.

Table 3-1. Demand Projections Provided to SFPUC, AFY (DWR Table 12)

Wholesaler	Contracted Volume	FY2009/10 (actual)	2015	2020	2025	2030	2035
SFPUC	2,455[(a)]	2,038	1,970[(b)]	1,907[(b)]	1,942[(b)]	1,979[(b)]	2,269[(b)]

[(a)] Based on 800 MG/year, or 2.18 MGD
[(b)] Assumes normal year availability of local supplies.

3.3 LOCAL SUPPLIES

The District has two local water supply sources: the Pilarcitos infiltration wells and the Denniston Project which provides surface and groundwater supplies.

3.3.1 Pilarcitos Infiltration Wells

The Pilarcitos Well Field is located in Pilarcitos Creek Canyon between Pilarcitos Lake and Highway 92 and it is owned and operated by the District. Operation of this well field is limited by a state-issued water rights license for the period November 1 through March 31 of each year. Also, the license limits the maximum pumping rate to 673 gpm and annual production to 117 MG (approximately 360 AFY). Because the production of these wells is dependent upon infiltration from the Pilarcitos Creek stream flow, their yield is extremely low during drought years.

Normal year supplies from the Pilarcitos Wells are anticipated to be 48 to 50 million gallons per year (MG/yr) (about 150 AFY).

3.3.2 Denniston Project

The Denniston Project is located in the vicinity of the Half Moon Bay Airport. The Denniston Project has two water supply sources:

- Denniston Creek surface water (stream diversion), and
- Denniston wells (groundwater).

The District owns and operates these water production facilities. The Denniston Water Treatment Plant (Denniston WTP) treats groundwater pumped from the Denniston wells and surface water diverted from Denniston Creek. The Denniston WTP has limited ability to treat water with high turbidity, so during episodes of high turbidity, the treatment plant is taken off-line. The Denniston wells are only operated to augment the Denniston Creek stream diversions. If stream diversions from the creek are not available, the Denniston wells are not pumped.

3.3.2.1 Denniston Surface Water Supplies

Surface water may be diverted from both Denniston and San Vicente Creeks under a water rights permit issued by the State. The diversions from Denniston Creek and San Vicente Creeks are under a State water rights permit and limit the District to no more than a total of 4 cubic feet per second (cfs) annually.

Currently, the District has no permanent facilities for the diversion of water from San Vicente Creek. The water production available from these surface water sources during the summer months is limited by the amount of flow in the creeks and diversions for agricultural irrigation under superior riparian water rights. During drought years the production from these creeks is extremely low because of the small watershed.

The intake at the Denniston stream diversion has been negatively impacted by the build-up of silt. Silt build-up and plant growth affect both the quality and the quantity of water from the Denniston stream diversion. In 2009, the District successfully dredged around the point of diversion improving the quality and quantity of water diverted into the Denniston WTP.

Normal year supplies from the District's Denniston surface water supplies are anticipated to be about 200 MG/yr (about 610 AFY).

3.3.2.2 Denniston Groundwater Supplies

Water Code §10631 (b)(1-4)

A plan shall be adopted in accordance with this chapter and shall do all of the following:

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.

For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

The District pumps groundwater from nine wells (Wells D1 through D9) in the Denniston Well Field which is located east of the Half Moon Bay Airport (see Figure 2-2). The groundwater resource is described below.

3.3.2.2.1 Groundwater Basin Description

The groundwater basin that the District utilizes is part of DWR's designated San Francisco Bay Hydrologic Region and is known as the Half Moon Bay Terrace Basin (DWR Basin Number 2-22), as described in the Department of Water Resources Bulletin 118. The Half Moon Bay Terrace Basin covers an area of 9,150 acres (see Figure 3-4).

DWR Bulletin 118 (California's Groundwater) does not contain a groundwater description for the Half Moon Bay Terrace Basin. Information regarding the groundwater basin has therefore been compiled based on information provided in available studies. The Half Moon Bay Terrace Basin is not adjudicated and DWR has not identified the basin as being in an "overdraft" condition.

The groundwater basin for the Half Moon Bay and El Granada area is located on the Coast of San Mateo County on gently sloping marine terrace benches and the adjacent lower slopes of the Santa Cruz Mountains. The Half Moon Bay Terrace Formation underlies the Half Moon Bay Airport and the agricultural fields both east and west of Highway 1. This formation consists of unconsolidated deposits of sand, silt and clay and serves as the principal water bearing zone in the Moss Beach and El Granada area. There are two bedrock units that underlie most of the general area. These bedrock formations are the Purisima Formation and the Montara Mountain Granodiorite. The unconsolidated deposits consist of marine terrace deposits and colluvium, alluvium, and residual soil deposits.

The District's Denniston Well Field is in what is referred to as the Airport Terrace Subbasin (see Figure 3-5). As shown in Figure 3-5, both the Montara Water and Sanitary District (MWSD) and the District have production wells in this subbasin. It is believed that the most significant recharge of the Airport Subbasin is infiltration recharge from Denniston Creek and groundwater inflow derived from the Denniston Creek watershed.

Other Subbasins identified in the District's service area are the El Granada Subbasin, the Arroyo de en Medio/Frenchmans Subbasin, and the Lower Pilarcitos Subbasin. As described in Section 3.3.2.2.2.2, the District has conducted a recent study of the potential for developing wells in the Lower Pilarcitos Subbasin.

3.3.2.2.2 Groundwater Studies

3.3.2.2.2.1 Midcoast Groundwater Study

San Mateo County commissioned a groundwater study for the San Mateo County "Midcoast" area extending from northern Half Moon Bay to Devils Slide along Highway 1. The County's objective was to identify the groundwater yield that may be safely taken from the Midcoast aquifers. A three-phased study has been conducted that could lead to the eventual development of a Groundwater Management Plan (GWMP).

Balance Hydrologics, Inc. (Balance) prepared a comprehensive literature and data review as a Phase I of the Midcoast Groundwater Study (Woyshner and others, April 2002). Kleinfelder subsequently prepared Phase II of the study (April 2009), which included depth-to-water measurements and pump tests in selected wells and a water balance assessment by subarea. Specific Phase II findings related to the Airport Subbasin are as follows:

- The Airport Subbasin is made up of the Airport Terrace, Denniston Upland and Denniston Stream Valley subareas. The San Vicente Upland and San Vicente Stream Valley subareas also contribute to the Airport Subbasin.
- Approximately 513 AFY of groundwater is pumped annually from the Airport Subbasin. These withdrawals consists of 169 AFY of average annual pumping by the Coastside Community Water District, 224 AFY of average annual pumping by the MWSD, about 96 AFY of extractions by approximately six agricultural wells, and approximately 24 AFY of withdrawals by about 87 domestic and other wells.
- The water table drops during dry years, but can quickly rebound during wet years.
- Based on prior studies, the 55-year precipitation record, monitoring data from two wells within the Airport subarea, and other factors, Kleinfelder estimated that the average annual inflow to the basin of 2,780 AFY equals the average annual output. As a result, the Phase II Report states that the Airport Subbasin appears to be in long-term hydrologic balance.
- The volume of Denniston Creek water that enters the Airport Terrace subarea is a significant recharge factor that is not well understood because long-term gaging data are not available. It is difficult to estimate the water balance in the Airport Terrace subarea without a better understanding of this recharge.
- A 1991 study by Earth Sciences Associates concluded that at least 45 to 87 AFY of additional groundwater could be annually pumped from the Airport Subbasin without detrimental impacts.
- The Kleinfelder study does not indicate whether or not additional groundwater is available for pumping due to significant hydrological uncertainties in the area.

In the subsequent Phase III Study prepared by Balance Hydrologics, Inc. (June 2010), the following findings were made with regard to the Airport Subbasin:

- Monitoring data indicate that groundwater storage was not as depleted as during previous droughts and storm recharge appeared normal during the 2009 dry season relative to pre-drought conditions.
- Groundwater levels were high in the Airport Aquifer when compared to the previous drought, 1987 to 1992. Static (not pumped) groundwater levels in MWSD wells were higher than pre-drought levels. Leaking underground storage tanks (LUST) site groundwater levels (in Princeton) were within a normal range.

- Previous investigations identified that baseflows in Denniston Creek provide significant recharge to the Airport Terrace through the dry season. During dry-season 2009, baseflows were gaged in Denniston Creek at two stations. The upper station was located at the canyon mouth below the reservoir, and the lower station was located below Capistrano Road at Princeton. Similar to findings during the previous drought, a net loss of flow was observed in the creek, which can be attributed to groundwater recharge and evapotranspiration. In addition, flows were compared to measurements taken in 1990, during the previous drought. Denniston Creek flowed continuously through dry-season 2009, with higher flows than were recorded during the scattered measurements made throughout the previous drought. The measurement with lowest flow was taken in June 1990; lower flows and drier conditions in general would have persisted through the dry season of 1990. This comparison of the 2009 flow data with 1990 measurements suggests that the current drought is less severe than the previous drought. Baseflows in 2009, however, were significantly lower than during 2008.
- In summary, groundwater storage was not as depleted as during previous droughts and storm recharge appeared normal during dry-season 2009 relative to pre-drought conditions.
- Groundwater recharge from Denniston Creek through the Airport Terrace is significant during the dry season. The agricultural irrigation ponds at the northeast portion of the Airport Subarea, filled from diversion of flow in San Vicente Creek, also should provide recharge to that portion of the Airport Subarea. Groundwater levels at Pillar Point Marsh support normal marsh conditions and conditions potentially allowing sea-water intrusion to occur were not observed.
- Additional analysis should include developing dry-season groundwater contour maps to compare with those reported during the 1987 to 1992 drought.
- Wells are available for continued monitoring and reported subsurface information are available for the sub-basin. A water balance model, drought analysis, and a groundwater flow model would assist groundwater management. Gaging Denniston Creek would greatly assist calibration of the models. In addition, the Airport Terrace is an ideal location for regional reference ETo monitoring. CIMIS only estimates ETo for the Midcoast and measured ETo would assist with calibration of all water balance models on the Midcoast.

Excerpts from the Phase II and Phase III Reports discussing the Airport Subbasin are provided in Appendix E for this 2010 UWMP.

3.3.2.2.2.2 Lower Pilarcitos Creek Groundwater Basin Study

In June of 2003, the District, along with Todd Engineers and Kennedy Jenks Consultants finalized a comprehensive study for developing the Lower Pilarcitos Creek Groundwater Basin. The scope of the study was to assess the feasibility of developing drinking water wells in the Lower Pilarcitos Creek Groundwater Subbasin. The study found that if a well field were fully developed in Lower Pilarcitos Creek Groundwater Basin, the District could potentially increase its local water supply by a range of 396 to 795 AFY (depending on dry or wet season). The

quality of water produced from five test wells in Lower Pilarcitos Creek Groundwater Basin found water to be suitable for potable uses when blended (ratio of 3:1) at the Nunes Water Treatment Plant with water from existing sources of supply. However, no action has been taken by the District, since the study was completed.

3.3.2.2.3 Groundwater Management Plans

As described above, currently there is no groundwater management plan for the Half Moon Bay Terrace Groundwater Basin or the Airport Subbasin.

3.3.2.2.4 Groundwater Production

A Coastal Development Permit (CDP) limits the annual total production from the District's Denniston Well Field to 130 MG/year (equivalent to 399 AFY). It is assumed that production from the Denniston Well Field may decrease substantially during drought periods, due to lowering of the water table in the groundwater basin.

Historical groundwater pumpage from FY2004/05 through FY2009/10 is shown in Table 3-2. Average groundwater pumpage over the last 16 years has been about 115 AFY; however, during the last five years, average pumping has only been about 44 AFY.

Table 3-2. Amount of Groundwater Pumped, AFY (DWR Table 18)

Basin Name	Metered or Unmetered	FY2004/05	FY2005/06	FY2006/07	FY2007/08	FY2008/09	FY2009/10
Half Moon Bay Terrace Basin (Airport Subbasin)	Each well is individually metered	133	63	41	71	27	19
Groundwater Pumped (Total)		133	63	41	71	27	19
% of Total Supply		5.0%	2.5%	1.4%	2.6%	1.1%	0.8%

Table 3-3 presents the District's current and projected future groundwater pumping.

Table 3-3. Amount of Groundwater Projected to be Pumped – Normal Average Annual Demands, AFY[(a)] (DWR Table 19)

Basin Name	FY2009/10 (actual)	2015	2020	2025	2030	2035
Half Moon Bay Terrace Basin (Airport Subbasin)	19	120	120	120	120	120
% of Total Supply	0.8%	4%	4%	4%	4%	4%

[(a)] Projected groundwater pumpage based on normal year pumpage from the Denniston Wells of 40 MG/yr.

3.4 EXCHANGE OR TRANSFER OPPORTUNITIES

Water Code §10631 (d)

A plan shall be adopted in accordance with this chapter and shall do all of the following:

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

Since completion of the Crystal Springs Project in 1994, the District has had a direct supply from the SFPUC's Hetch Hetchy system. This ended the District's exclusive dependence on only local supplies. As shown in Table 3-4, no additional water exchanges with other agencies are anticipated.

Table 3-4. Transfer and Exchange Opportunities (DWR Table 20)

Transfer Agency	Transfer or Exchange	Short term	Proposed Quantities	Long term	Proposed Quantities
None anticipated					
Total	NA	NA	NA	NA	NA
NA = not applicable					

3.5 DESALINATED WATER

Water Code §10631 (i)

A plan shall be adopted in accordance with this chapter and shall do all of the following:

(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

Desalination is a process that removes dissolved minerals from seawater, brackish water or treated wastewater. Seawater desalination may be considered a long-term option for the District, particularly if the opportunity arises to develop this resource on a regional basis. Technological advancements may make this option significantly more cost-effective in the future. However, studies performed by other nearby small coastal communities evaluating the potential for desalination have concluded that water desalination would not be cost-effective at this time[1].

[1] North Coast County Water District (NCCWD), 2006-2010 UWMP, December 2005 and MWSD, Public Works Plan Phase 1, October 2008.

3.6 SUMMARY OF CURRENT AND FUTURE WATER SUPPLIES AVAILABLE UNDER NORMAL YEAR CONDITIONS

Water Code § 10631 (b)

A plan shall be adopted in accordance with this chapter and shall do all of the following:

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.

For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

3.6.1 Current and Future Supplies

In years of normal precipitation, the District estimates that all four sources of supply will have an average yield of 1,090 MG (3,335 AFY). This assumes that up to 800 MG (2,455 AFY) is purchased from SFPUC (Pilarcitos Lake and Upper Crystal Springs Reservoir), and that 200 MG/yr (610 AFY) is available from the District's Denniston surface water, 40 MG/yr (120 AFY) from the District's Denniston groundwater and 50 MG/yr (150 AFY) from the District's Pilarcitos well field.

Table 3-5 summarizes the current and projected future water supplies for the District.

Table 3-5. Current and Planned Water Supplies, AFY (DWR Table 16)						
Supply	FY2009/10 (actual)	2015	2020	2025	2030	2035
Wholesale Water Providers (SFPUC)	2,038	1,970	1,907	1,942	1,979	2,269
Supplier-produced groundwater (Denniston)	19	120	120	120	120	120
Supplier-produced surface water (Denniston)	72	610	610	610	610	610
Supplier-produced surface water (Pilarcitos well field)	136	150	150	150	150	150
Transfers in or out	0	0	0	0	0	0
Exchanges In or out	0	0	0	0	0	0
Recycled Water (projected use)	0	0	0	0	0	0
Desalinated Water	0	0	0	0	0	0
Other	0	0	0	0	0	0
Total	2,265	2,850	2,787	2,822	2,859	3,149

Table 3-6 shows the amount of water supplies anticipated to be purchased by the District on a wholesale basis from SFPUC.

Table 3-6. Existing and Planned Wholesale Sources of Water from SFPUC, AFY (DWR Table 17)						
Supply	Contracted Volume	2015	2020	2025	2030	2035
SFPUC	2,455[a]	1,970[b]	1,907[b]	1,942[b]	1,979[b]	2,269[b]
Total	2,455	1,970	1,907	1,942	1,979	2,269

[a] Based on 800 MG/year, or 2.18 MGD
[b] Assumes normal year availability of local supplies.

3.6.2 Potential Future Water Supply Projects

The District is evaluating three potential future local water supply projects including:

- Diversions from San Vicente Creek,
- Pilarcitos Well Field improvements, and
- Potential development of Lower Pilarcitos Creek groundwater supplies.

Each of these is described below.

3.6.2.1 Diversions from San Vicente Creek

As described previously, the District currently diverts no water from San Vicente Creek. Utilization of this source of supply requires a pump station at the point of diversion, a pipeline from the pump station to the existing Denniston Pump Station, and expansion of the Denniston water treatment plant. It is estimated that 50 to 100 MG/yr (150 to 300 AFY) may be available for diversion from San Vicente Creek if the required facilities are constructed. This potential project will also require licenses from the State Water Resources Control Board (SWRCB), as well as permits from the California Department of Fish and Game (CA DFG).

3.6.2.2 Pilarcitos Well Field Improvements

As described above, the District's license for use of the Pilarcitos well field allows a maximum annual withdrawal of 117 MG/yr (359 AFY). During the 1970's and early 1980's, annual production from the wells during non-drought years was always above 60 MG, often above 80 MG, and sometimes over 100 MG. Since 2001, production has dropped below 40 MG. It is estimated that annual production from this source could be increased by 30 to 40 MG (92 to 122 AFY) by implementing a program to construct new wells to replace poorly producing wells and replace old inefficient pumps.

3.6.2.3 Lower Pilarcitos Creek Groundwater

As described previously, the District has constructed a series of test wells and completed a feasibility study for using the Lower Pilarcitos Creek groundwater basin as a source of water supply. The feasibility study report stated that the estimated annual production from the completed project would range from 129 MG/yr (396 AFY) during drought years to 259 MG/yr (795 AFY) during normal precipitation years.

These potential future water supply projects are summarized in Table 3-7.

Table 3-7. Potential Future Water Supply Projects (DWR Table 26)

Project Name	Projected Start Date	Projected Completion Date	Potential Project Constraints	Estimated Supply Quantities, AFY				
				Normal Year Supply	Single Dry Year Supply	Multiple Dry Year Supply (Year 1)	Multiple Dry Year Supply (Year 2)	Multiple Dry Year Supply (Year 3)
Diversions from San Vicente Creek	TBD	TBD	Requires license from SWRCB Requires permits from CA DFG Requires expansion of Denniston WTP, diversion facility, pipeline and pump station	300	150	150	60	0
Pilarcitos Well Field Improvements	TBD	TBD	Cost	122	61	61	0	0
Lower Pilarcitos Creek Groundwater	TBD	TBD	Cost	795	396	396	396	396

TBD = To be determined

3.7 SUPPLY RELIABILITY AND VULNERABILITY

Water Code §10631 (c)

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(1) An average water year.

(2) A single dry water year.

(3) Multiple dry water years.

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.

Table 3-8 provides a summary of the various factors which can impact the availability and reliability of the District's existing water supplies.

Table 3-8. Factors Resulting in Inconsistency of Supply (DWR Table 29)

Name of Supply	Specific Source Name, if any	Limitation Quantification	Legal	Environmental	Water Quality	Climatic	Additional Information
SFPUC Supplies	Pilarcitos Lake				✓	✓	
	Upper Crystal Springs Reservoir				✓	✓	
Pilarcitos Creek Wells						✓	
Denniston Groundwater					✓	✓	
Denniston Surface Water					✓	✓	

Each of these factors is described below.

3.7.1 SFPUC Supplies

3.7.1.1 Reliability of the SFPUC Regional Water System

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 primary water supply goal is to meet customer water needs in non-drought and drought periods. The related system performance objectives are as follows:

- Meet average annual water demand of 265 MGD from the SFPUC watersheds for retail and wholesale customers during non-drought years for system demands through 2018,
- Meet dry-year delivery needs through 2018 while limiting rationing to a maximum 20 percent system-wide reduction during extended droughts,
- Diversify water supply options during non-drought and drought periods, and.
- 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.

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, and
- 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.

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, and
- 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.

3.7.1.2 Projected SFPUC System Supply Reliability

The SFPUC has provided information on the projected SFPUC system reliability based on the historical hydrologic period (see Table 3 in Appendix D). 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.

3.7.1.3 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.

3.7.1.3.1 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 in Table 3-9. 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.

Table 3-9. Water Deliveries in SFPUC Service Area[(a)]

	FY2006	FY 2007	FY 2008	FY 2009	FY 2010
Total Deliveries, MGD	247.5	257.0	254.1	243.4	225.2

[(a)] 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.

3.7.1.3.2 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 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.

3.7.1.3.3 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], and
- Development of a desalination project.

3.7.1.3.4 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 Level of Service (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.

3.7.1.4 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 percent 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 percent. 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.

[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 Alameda Creek Diversion Dam (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/yr. The UACFG will undergo a separate California Environmental Quality Act (CEQA) process in which all impacts associated with the project will be analyzed fully.

The Tier One Plan, which allocates water between San Francisco and the wholesale customers collectively, distributes water based on the level of shortage as shown in Table 3-10.

Table 3-10. Share of Available SFPUC Supplies Under Various Shortages

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

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

3.7.1.5 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:

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

The water made available to the wholesale customers collectively will be allocated among them in proportion to each wholesale customer's Allocation Basis, expressed in 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.

3.7.1.6 Interim Supply Limitation and Allocations

As part of its adoption of the 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 of 265 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.

BAWSCA has developed a strategy to address each of its member agencies' unmet needs flowing from the ISL through its Water Conservation Implementation Plan and the Long-term Reliable Water Supply Strategy, separately addressed herein.

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. The District's ISA is 2.18 MGD

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.

3.7.1.7 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 is in the process of developing the methodology and amount of this volume-based charge. The Environmental Enhancement Surcharge will become effective beginning fiscal year 2011-12.

3.7.1.8 Projected SFPUC Supplies Under Various Hydrologic Conditions

Based on the allocations described above, the District's projected SFPUC supplies under various hydrologic conditions are summarized in Table 3-11.

Table 3-11. Projected SFPUC Supply Under Various Hydrologic Conditions

	Normal Year	Single Dry Year	Multiple Dry Years		
			Year 1	Year 2	Year 3
SFPUC RWS Shortage	0%	10%	10%	20%	20%
Wholesale Allocation, MGD	184	152.6	152.6	132.5	132.5
District's Allocation, MGD	2.18	1.82	1.82	1.58	1.58
District's Allocation, MG/year	800	662	662	575	575

3.7.2 Local Supplies

As described previously, the availability of the District's local supplies in Normal Years is as follows:

- About 48 to 50 MG/yr (150 AFY) from the District's Pilarcitos Creek wells;
- About 40 MG/yr (120 AFY) of groundwater from the District's Denniston Project; and
- About 200 MG/yr (610 AFY) of surface water from the District's Denniston Project.

In Single Dry Years, the availability of the District's local supplies is expected to decrease by about 50 percent based on decreased surface water flows in Pilarcitos Creek and Denniston Creek. Therefore, the Single Dry Year availability is anticipated to be as follows:

- About 25 MG/yr (75 AFY) from the District's Pilarcitos Creek wells (a 50 percent reduction from Normal Year supplies);
- About 20 MG/yr (60 AFY) of groundwater from the District's Denniston Project (a 50 percent reduction from Normal Year supplies); and
- About 100 MG/yr (305 AFY) of surface water from the District's Denniston Project (a 50 percent reduction from Normal Year supplies).

In Multiple Dry Years, the District's supplies are anticipated to be as follows:

- First Year
  - District supplies will be the same as the Single Dry Year supplies (see discussion above)

- Second Year
  - No supply from the District's Pilarcitos Creek wells (a 100 percent reduction from Normal Year supplies);
  - About 8 MG/yr (24 AFY) of groundwater from the District's Denniston Project (an 80 percent reduction from Normal Year supplies); and
  - About 40 MG/yr (122 AFY) of surface water from the District's Denniston Project (an 80 percent reduction from Normal Year supplies).
- Third Year
  - No supply from the District's Pilarcitos Creek wells (a 100 percent reduction from Normal Year supplies);
  - No supply of groundwater from the District's Denniston Project (a 100 percent reduction from Normal Year supplies); and
  - No supply of surface water from the District's Denniston Project (a 100 percent reduction from Normal Year supplies).

Table 3-12 provides a summary of the District's local supplies under various hydrologic conditions.

Table 3-12. Projected Local Supplies Under Various Hydrologic Conditions

	Normal Year	Single Dry Year	Multiple Dry Years		
			Year 1	Year 2	Year 3
Pilarcitos Creek Wells, MG/yr	50	25	25	0	0
Denniston Groundwater, MG/yr	40	20	20	8	0
Denniston Surface Water, MG/yr	200	100	100	40	0
Total Local Supplies, MG/yr	290	145	145	48	0

3.7.3 Summary of District Supply Reliability

The basis for the hydrologic year types for the District's supplies are summarized in Table 3-13.

Table 3-13. Basis for Water Year Data (DWR Table 27)

Water Year Type	Base Year(s)
Average/Normal Water Year	2002
Single Dry Water Year	1977
Multiple Dry Water Years	1988-1992

The District's historical supplies based on the base years shown in Table 3-12 are summarized in Table 3-14.

Table 3-14. Historical Supply Reliability, AFY (DWR Table 28)

Supply	Average/ Normal Year	Single Dry Water Year	Multiple Dry Water Years		
			Year 1	Year 2	Year 3
	2002	1977	1988	1989	1990
SFPUC Supplies	2,455	2,032	2,032	1,765	1,765
Pilarcitos Creek Wells	150	75	75	0	0
Denniston Groundwater	120	60	60	24	0
Denniston Surface Water	610	305	305	122	0
Total	3,335	2,472	2,472	1,911	1,765
Percent of Average/ Normal Year, %	100%	74%	74%	57%	53%

The District's current minimum supply for the next three years based on a multiple dry year scenario starting in 2011, and the supply reliabilities discussed above, is shown in Table 3-15.

Table 3-15. Current Supply Reliability, AFY (DWR Table 31)

Source	Average/ Normal Water Year Supply (2011)	Multiple Dry Water Year Supply		
		Year 1 (2011)	Year 2 (2012)	Year 3 (2013)
SFPUC Supplies	2,455	2,032	1,765	1,765
Pilarcitos Creek Wells	150	75	0	0
Denniston Groundwater	120	60	24	0
Denniston Surface Water	610	305	122	0
Total	3,335	2,472	1,911	1,765
Percent of Normal Year, %	100%	74%	57%	53%

3.8 WATER QUALITY IMPACTS

Water Code §10634

The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

As the District finds a need to expand its water supply and capability in the future, finding new water sources that have satisfactory water quality will be important criteria for selection. All of the District's water sources receive full treatment in accordance with Federal and State standards. The District's water quality control program collects over 11,000 test samples throughout the year to ensure water quality process control.

Each year the District reports water quality test results to its customers through the Consumer Confidence Report, also known as the Annual Water Quality Report. The report includes results of treated water tests from both the Nunes Water Treatment Plant and the Denniston Water Treatment Plant and results from raw source water tests from the Denniston Wells, Pilarcitos Wells, Pilarcitos Lake, Upper Crystal Springs Reservoir and Denniston Reservoir.

At this time, the District does not anticipate any changes in supply availability as a result of water quality. This is summarized in Table 3-16.

Table 3-16. Current and Projected Water Supply Changes due to Water Quality, AFY (DWR Table 30)

Water Source	2010	2015	2020	2025	2030	2035
SFPUC Supplies	0	0	0	0	0	0
Pilarcitos Creek Wells	0	0	0	0	0	0
Denniston Groundwater	0	0	0	0	0	0
Denniston Surface Water	0	0	0	0	0	0

3.9 CLIMATE CHANGE

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 (and those providing the District's local water supplies):

- 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.

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 RWS or the overall operation of the RWS through 2030.

The SFPUC views assessment of the effects of climate change as an on-going 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.

3.10 EFFORTS TO MINIMIZE IMPORTED WATER AND MAXIMIZE LOCAL RESOURCES

The District's local water supply is being optimized and maximized through a number of actions.

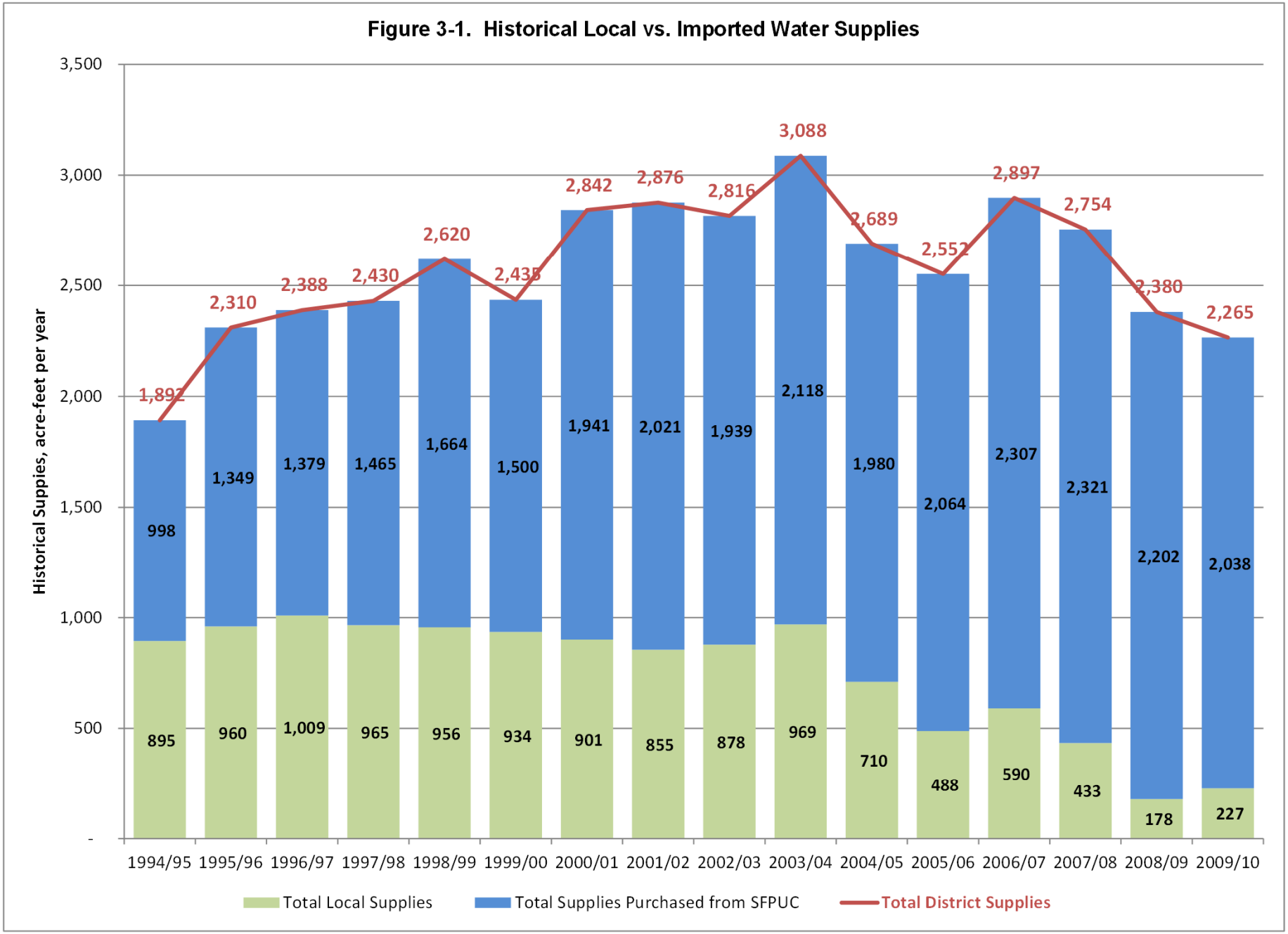
In 2009 and 2010, the District dredged Denniston Creek to remove sediment. In 2009, 800 cubic yards of sediment was removed, and, in 2010, 400 cubic yards of sediment was removed. Although dredging does not increase the quantity of water that is treated at the Denniston Water Treatment Plant, it does will significantly increase the quality of water.

Also, the District is currently in the process of making improvements to its Denniston WTP. The improvements will not expand the existing treatment capacity of the facilities, but will make the District's facilities more safe and reliable for the efficient treatment of local water supplies. The District is proposing to install two contact clarifiers for raw water pretreatment; replace existing chemical feed and storage systems for caustic soda, polymer, aluminum sulfate, and sodium hypochlorite; install new raw water pumps; replace existing washwater and solids handling facilities; and make associated improvements to electrical and control systems. This maintenance, replacement, and modernization project is required to improve the treatment plant reliability by replacing systems which have reached the end of their useful life, to bring the facilities into conformance with current safety regulations for chemical containment, and to facilitate treatment of lower quality raw water. Completing the Denniston Improvements Project is vital to the security and reliability of the District's water supply. The design for the WTP improvements has been completed and the District is in the process of selecting a contractor for the project. The engineer's construction cost estimate for this project is $6.7 million. The proposed Capital Improvement Program and District Financing Plan for FY2011/12 to 2020/21 provides funding for the project. The WTP improvements are anticipated to be complete by October 2012.

Also, as discussed above under potential future water supply projects, the District is exploring several potential new local water supply projects including:

- Diversions from San Vicente Creek,
- Pilarcitos Well improvements, and
- Potential development of Lower Pilarcitos Creek groundwater supplies.

The development of one or more of these potential projects would further enhance the District's local supplies and minimize the need for imported supplies.



WEST YOST ASSOCIATES
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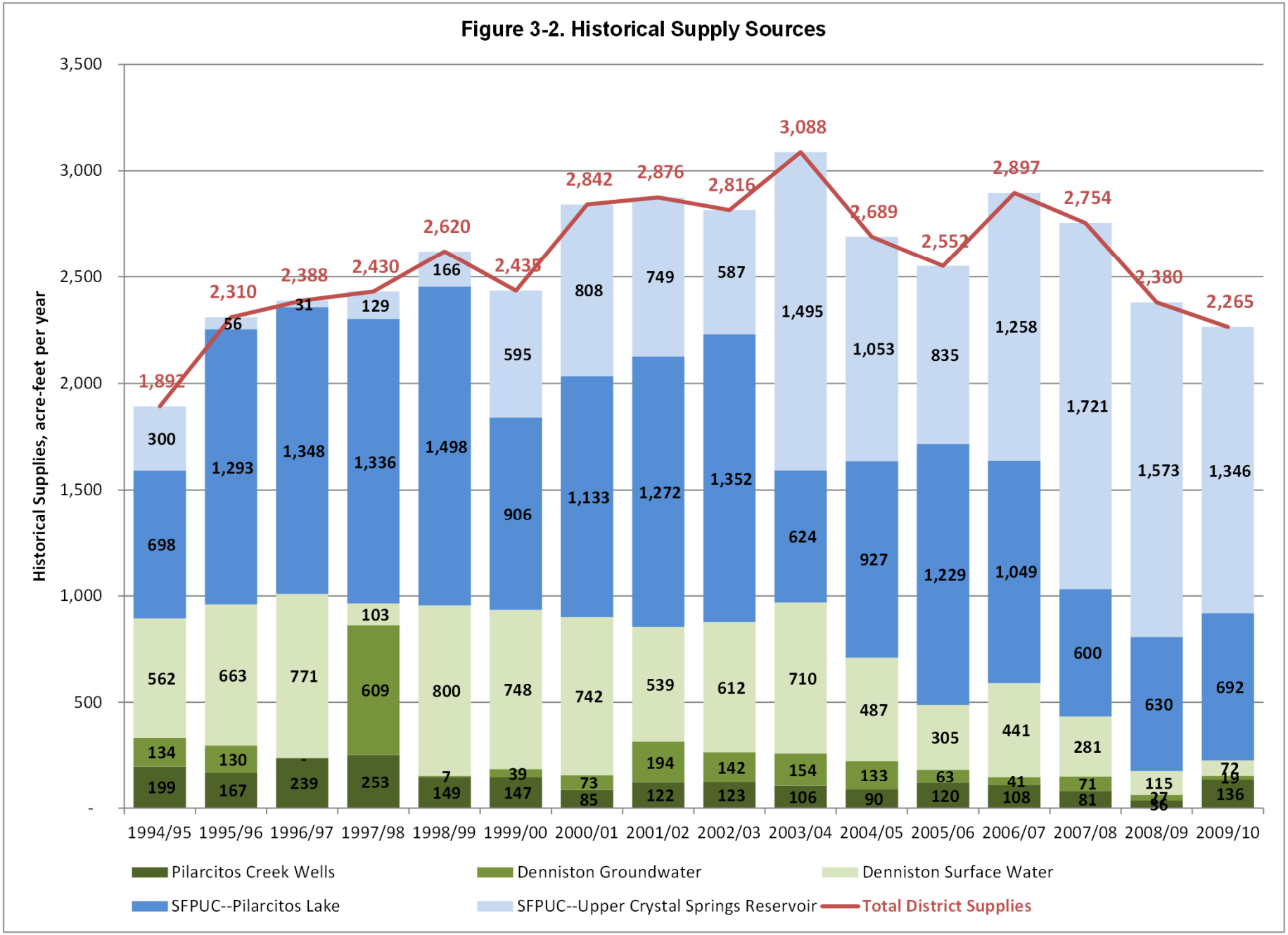
Last Revised: 03-28-11



WEST YOST ASSOCIATES
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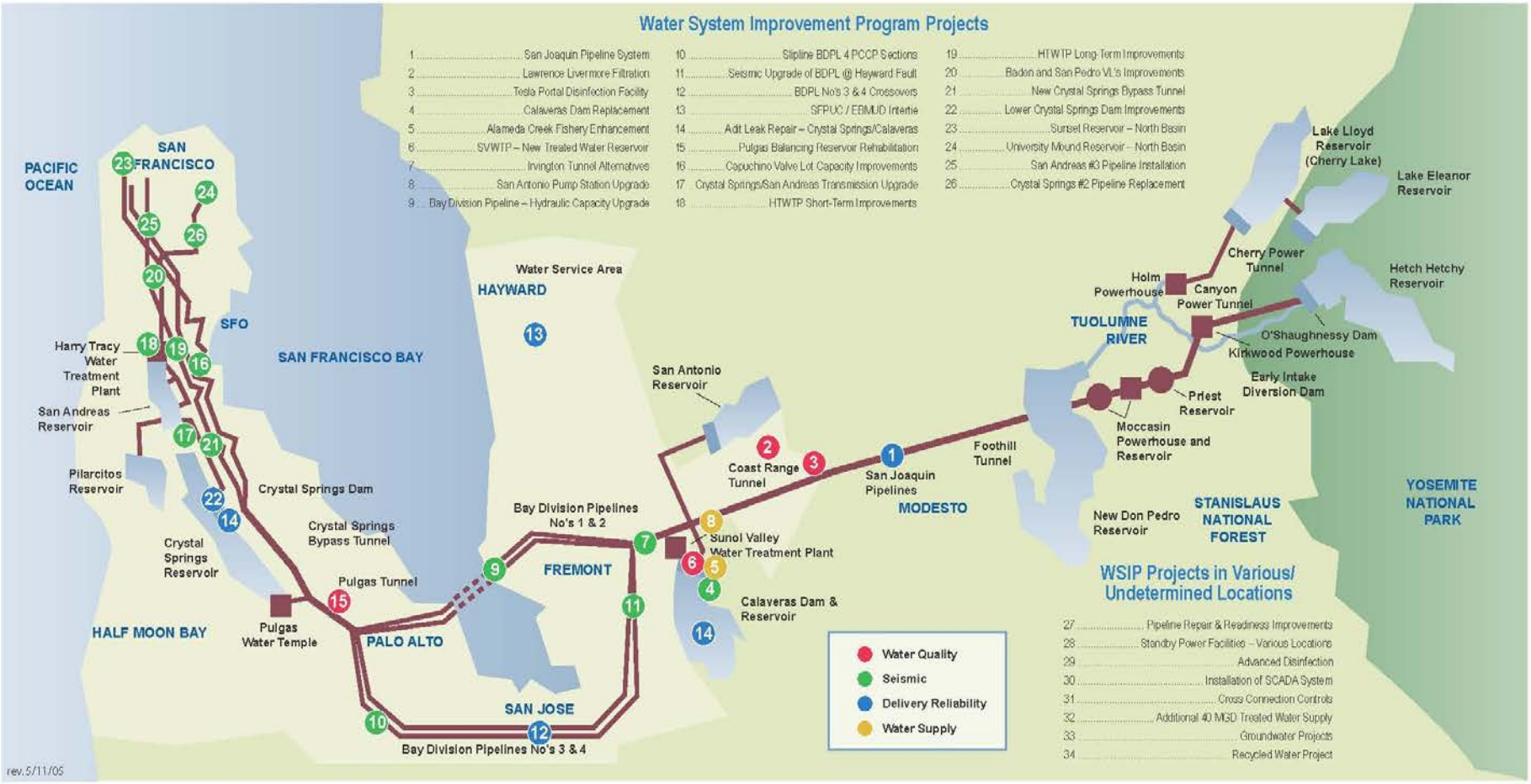
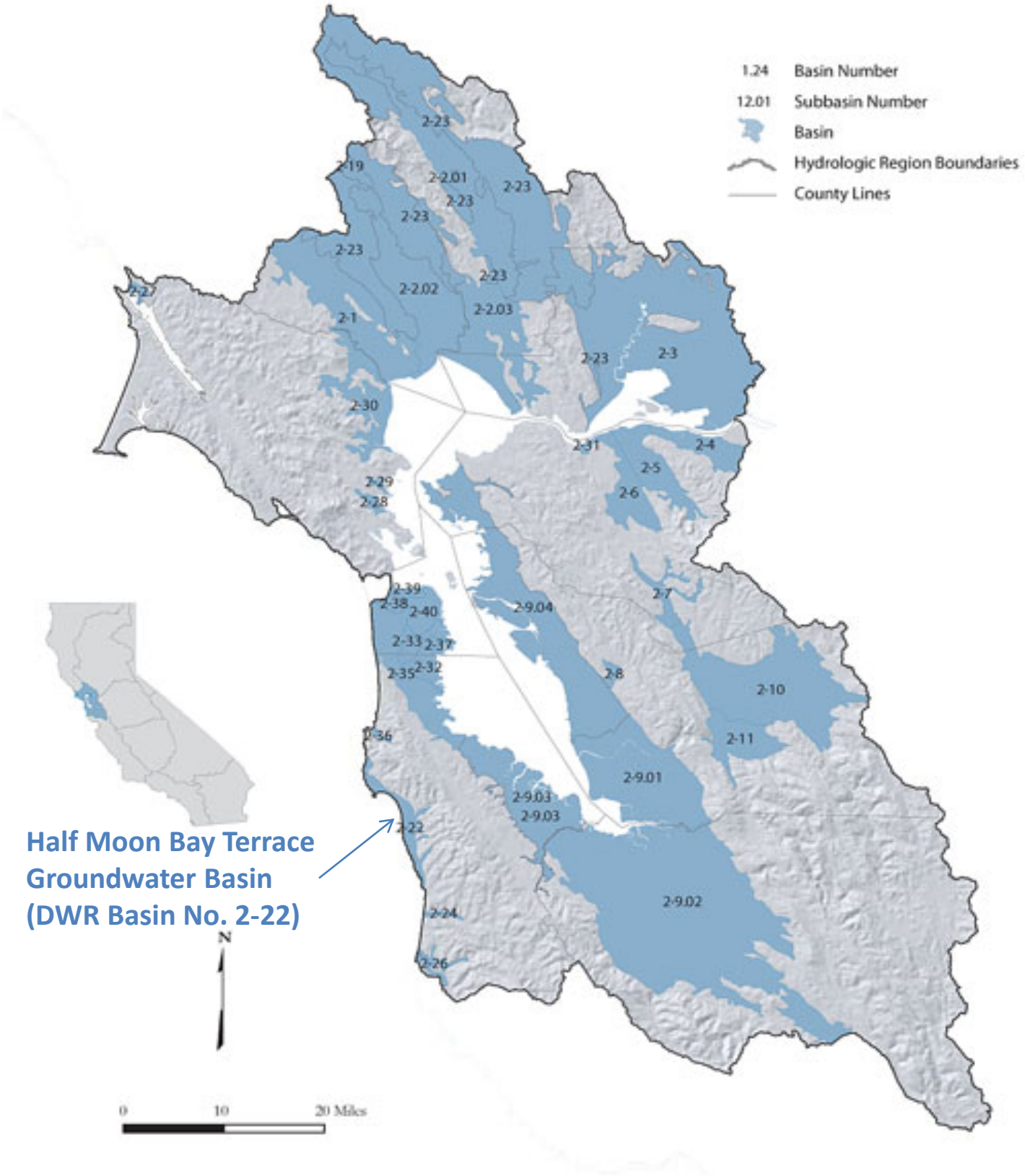
Last Revised: 03-28-11

Figure 3-3. SFPUC Water Supply Improvement Program



Source: BAWSCA, March 2011

Figure 3-4. San Francisco Bay Hydrologic Region and Half Moon Bay Terrace Groundwater Basin Location



Source: DWR Bulletin 118, Update 2003

Figure 3-5. Locations of District Wells and Groundwater Sub-basins

Source: Midcoast Groundwater Study Phase III, San Mateo California, Balance Hydrologics, Inc., June 2010

4.1 OVERVIEW OF WATER USE

As described in Chapter 2, the District's service area consists of small residential communities surrounded by agricultural or light ranching activities. Commercial development is limited to the populated areas along State Route 1 and Highway 92 and at Pillar Point Harbor. Floriculture is the largest industry in the area.

This chapter presents a summary of the District's past and projected water use, as well as a description of the District's compliance with the SBx7-7, which requires water suppliers to reduce their per capita water use by 2015 and 2020.

Future water use in the District's service areas has been projected based on the projected service area population in the District's service area (see Table 2-3) and the City's per capita water use targets, as established in accordance with SBx7-7 (described later in this chapter). Water demand projections have also been prepared for the District by Maddaus Water Management (Maddaus) to demonstrate how the District's implementation of water conservation measures will reduce future water demands and assist the District in complying with the SBx7-7 per capita water use targets.

4.2 PAST AND CURRENT WATER USE BY WATER USE SECTOR

Water Code §10631 (e)(1)(2)

(e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

Actual water use by the District's customers, by water use sector, in FY 2004/05 is summarized in Table 4-1.

Table 4-1. Water Deliveries—Actual (FY 2004/05)[a] (DWR Table 3)

Water Use Sectors	FY 2004/05 (Actual)				
	Metered		Non Metered		Total Deliveries, AFY
	# of Accounts	Deliveries, AFY	# of Accounts	Deliveries, AFY	
Single Family	5,860	1,426	0	0	1,426
Multi-Family	421	168	0	0	168
Commercial[b]	314	156	0	0	156
Business[c]	80	180	0	0	180
Industrial	0	0	0	0	0
Municipal	42	87	0	0	87
Institutional/Governmental	9	3	0	0	3
Landscape Irrigation	51	194	0	0	194
Agriculture (Floriculture)	38	362	0	0	362
Other[d]	693	13	0	0	13
Total[e]	7,508	2,590	0	0	2,590

(a) Based on "Adjusted Sales Class Consumption Data FY10FY5.xlsx" provided by the District.
(b) Includes Marine and Recreation accounts and water uses.
(c) Includes Hotel and Restaurant accounts and water uses.
(d) Includes portable meters and fire meters.
(e) Does not include unaccounted for water. Unaccounted for water (UAFW) in FY 2004/05 was 99 AFY, or about 3.7 percent of the District's total water production.

Actual water use by the District's customers, by water use sector, in FY 2009/10 is summarized in Table 4-2.

Table 4-2. Water Deliveries—Actual (FY 2009/10)[a] (DWR Table 4)

Water Use Sectors	FY 2009/10 (Actual)				
	Metered		Non Metered		Total Deliveries, AFY
	# of Accounts	Deliveries, AFY	# of Accounts	Deliveries, AFY	
Single Family	6,186	1,271	0	0	1,271
Multi-Family	111	92	0	0	92
Commercial[b]	324	127	0	0	127
Business[c]	86	152	0	0	152
Industrial	0	0	0	0	0
Municipal	42	75	0	0	75
Institutional/Governmental	8	3	0	0	3
Landscape Irrigation	60	202	0	0	202
Agriculture (Floriculture)	36	293	0	0	293
Other[d]	860	5	0	0	5
Total[e]	7,713	2,221	0	0	2,221

(a) Based on "Adjusted Sales Class Consumption Data FY10FY5.xlsx" provided by the District.
(b) Includes Marine and Recreation accounts and water uses.
(c) Includes Hotel and Restaurant accounts and water uses.
(d) Includes portable meters and fire meters.
(e) Does not include unaccounted for water. UAFW was 44 AFY in FY 2009/10, or about 1.9 percent of the District's total water production.

4.3 PROJECTED WATER USE BY WATER USE SECTOR

4.3.1 Water Demand Projections Based on Implementation of Various Water Conservation Measures

In 2005, Maddaus developed a Demand Side Management Least Cost Planning Decision Support System (DSS) Model for the District as part of the Capital Improvement Program for the SFPUC Regional Water System. The DSS Model is an end-use model which breaks down water demand to specific end uses such as toilets, faucets, or irrigations systems. The end use approach allows for detailed criteria to be considered when estimating future water demands, such as the effects of fixture replacement, plumbing codes, and conservation efforts. The 2005 DSS Model for the District has subsequently been updated (in 2006 to review regional conservation measures and in 2009 to evaluate the BAWSCA Water Conservation and Implementation Plan). The updated DSS Model has been used for this 2010 UWMP to develop water demand projections for the District assuming implementation of plumbing code and the District's existing water conservation programs[1].

[1] The District's existing water conservation measures are discussed in Chapter 5 of this 2010 UWMP.

Table 4-3 provides a summary of the projected water demands within the District's service area based on the Maddaus projections using the DSS Model.

Table 4-3. Summary of Maddaus Water Demand Projections Using DSS Model

	2015	2020	2025	2030	2035
Maddaus Water Demand Projection with Plumbing Code and Conservation Savings from Existing District Programs, AFY	2,925	2,901	2,893	2,897	2,892

4.3.2 Water Demand Projections Based on SBx7-7 Per Capita Water Use Targets

Per the DWR Guidebook and SBx7-7 requirements, the District's projected water demands for the purposes of this 2010 UWMP are to be consistent with the District's SBx7-7 per capita water use targets. Calculation of projected water demands based on the SBx7-7 targets results in slightly different demand projections than those calculated by Maddaus. This is because the Maddaus projections, as described above, are based on an assumed number of connections by water use sector, an assumed future growth in the number of connections by water use sector and implementation of specific water conservation measures by the District. The water demand projections based on the District's SBx7-7 targets are solely based on the adopted per capita water use targets for 2015 and 2020 and the District's projected future service area population (based on ABAG estimates as described in Chapter 2). Overall, the Maddaus water demand projections assuming plumbing code and the District's existing conservation programs yield demand projections which are close to those required by SBx7-7, indicating that the District's continued implementation of existing water conservation programs will essentially enable the District to meet its adopted SBx7-7 targets. This is demonstrated in Table 4-4.

Table 4-4. Comparison of Maddaus Water Demand Projections to SBx7-7 Targets

	2015	2020	2025	2030	2035
Maddaus Water Demand Projection with Plumbing Code and Conservation Savings from Existing District Programs, AFY	2,925	2,901	2,893	2,897	2,892
Equivalent Per Capita Water Use (based on District's projected service area population—see Table 2-3), gpcd	127	125	123	122	110
Projected Water Demands based on Adopted SBx7-7 Targets, AFY	2,850	2,787	2,822	2,859	3,149
District's Adopted SBx7-7 Targets, gpcd[(a)]	124	120	120	120	120

[(a)] Assumes 2020 target applies to future years through at least 2035.
gpcd = gallons per capita per day

As shown, the Maddaus demand projections for 2015 through 2030 result in per capita water uses that are slightly above the District's adopted targets. This is an indication that some additional water conservation measures beyond those included in the plumbing code and the District's existing water conservation program may need to be implemented for the District to comply with its adopted SBx7-7 targets. For 2035, however, based on the projections shown above, the District's continued implementation of its existing water conservation program will result in a lower per capita water use than that required by SBx7-7. It should be noted that actual future water demands will depend on a number of factors and will likely be somewhat different than those projected.

Based on the District's SBx7-7 interim per capita water use target for 2015 (124 gpcd), projected water use by the District's customers, by water use sector, in 2015 is summarized in Table 4-5.

Table 4-5. Water Deliveries—Projected (2015) (DWR Table 5)

Water Use Sectors	2015				
	Metered		Non Metered		Total Deliveries, AFY
	# of Accounts[a]	Deliveries, AFY[b]	# of Accounts	Deliveries, AFY	
Single Family	6,277	1,231	0	0	1,231
Multi-Family	113	171	0	0	171
Commercial[c]	278	162	0	0	162
Business[d]	60	87	0	0	87
Industrial	0	0	0	0	0
Municipal	57	301	0	0	301
Institutional/Governmental	21	58	0	0	58
Landscape Irrigation	48	214	0	0	214
Agriculture (Floriculture)	37	412	0	0	412
Other[e]	0	0	0	0	0
Total[f]	6,890	2,636	0	0	2,636

(a) Number of accounts based on Maddaus account projections.
(b) Future water use projections prepared by Maddaus assuming plumbing code and conservation savings from existing programs. Deliveries shown are approximately 97 percent of those values to reduce the overall 2015 demand projection to the SBx7-7 target for 2015.
(c) Includes Marine and Recreation accounts and water uses.
(d) Includes Hotel and Restaurant accounts and water uses.
(e) Includes portable meters and fire meters.
(f) Does not include unaccounted for water.

Based on the District's SBx7-7 final per capita water use target for 2020 (120 gpcd), projected water use by the District's customers, by water use sector, in 2020 is summarized in Table 4-6. It should be noted that for purposes of this 2010 UWMP, the future water deliveries for floriculture in 2020 (and through 2035) are projected to remain "flat" at 412 AFY based on the estimated deliveries in 2015. This is a conservative estimate as actual water deliveries to floriculture customers may decrease in the future due to the relatively high cost of water.

Table 4-6. Water Deliveries—Projected (2020) (DWR Table 6)

Water Use Sectors	2020				
	Metered		Non Metered		Total Deliveries, AFY
	# of Accounts[a]	Deliveries, AFY[b]	# of Accounts	Deliveries, AFY	
Single Family	6,345	1,183	0	0	1,183
Multi-Family	114	166	0	0	166
Commercial[c]	287	161	0	0	161
Business[d]	62	89	0	0	89
Industrial	0	0	0	0	0
Municipal	57	298	0	0	298
Institutional/Governmental	21	57	0	0	57
Landscape Irrigation	48	212	0	0	212
Agriculture (Floriculture)[e]	37	412	0	0	412
Other[f]	0	0	0	0	0
Total[g]	6,972	2,578	0	0	2,578

(a) Number of accounts based on Maddaus account projections.
(b) Future water use projections prepared by Maddaus assuming plumbing code and conservation savings from existing programs. Deliveries shown are approximately 95 percent of those values to reduce the overall 2020 demand projection to the SBx7-7 target for 2020.
(c) Includes Marine and Recreation accounts and water uses.
(d) Includes Hotel and Restaurant accounts and water uses.
(e) Deliveries for floriculture are assumed to be the same as in 2015.
(f) Includes portable meters and fire meters.
(g) Does not include unaccounted for water.

Assuming that the District's adopted 2020 per capita water use target (120 gpcd) will also apply to future years, at least through 2035, projected water use by the District's customers, by water use sector, in 2025, 2030 and 2035 is summarized in Table 4-7. Again, as noted above for 2020, the future water deliveries for floriculture in 2025 through 2035 are projected to remain "flat" at 412 AFY based on the estimated deliveries in 2015.

Table 4-7. Water Deliveries—Projected (2025, 2030 and 2035) (DWR Table 7)

Water Use Sectors	Metered					
	2025		2030		2035	
	# of Accounts[a]	Deliveries, AFY[b]	# of Accounts[a]	Deliveries, AFY[b]	# of Accounts[a]	Deliveries, AFY[b]
Single Family	6,423	1,188	6,507	1,196	6,546	1,327
Multi-Family	115	166	117	167	117	186
Commercial[c]	296	167	306	172	315	198
Business[d]	64	92	66	96	68	112
Industrial	0	0	0	0	0	0
Municipal	58	308	59	316	59	357
Institutional/Governmental	21	58	22	60	22	67
Landscape Irrigation	49	219	49	225	50	254
Agriculture (Floriculture)[e]	37	412	37	412	37	412
Other[f]	0	0	0	0	0	0
Total[g]	7,064	2,610	7,162	2,645	7,214	2,913

(a) Number of accounts based on Maddaus account projections.
(b) Future water use projections prepared by Maddaus assuming plumbing code and conservation savings from existing programs. Deliveries shown for 2025 are approximately 97 percent of those values to reduce the overall 2025 demand projection to the SBx7-7 target for 2020 and beyond. Deliveries shown for 2030 are approximately 98 percent of those values to reduce the overall 2030 demand projection to the SBx7-7 target for 2020 and beyond. Deliveries shown for 2035 are approximately 110 percent of those values as the Maddaus demand projection is lower than that required to meet the SBx7-7 target for 2020 and beyond.
(c) Includes Marine and Recreation accounts and water uses.
(d) Includes Hotel and Restaurant accounts and water uses.
(e) Deliveries for floriculture are assumed to be the same as in 2015.
(f) Includes portable meters and fire meters.
(g) Does not include unaccounted for water.

4.3.3 Projected Water Demand for Lower Income Households

On October 7, 2005, SB 1087 was signed into law, requiring public agencies and private entities providing water or sewer services to grant priority for those services to proposed developments that include housing units for lower income households (Government Code Section 65589.7).

The District currently serves a total of 691 lower-income units. The City of Half Moon Bay 2007-2014 Housing Element (certified June 25, 2010) indicates that there are 141 existing lower-income units in the City of Half Moon Bay (33 very low income and 108 very low senior income). The remaining 550 lower-income units are in the County area served by the District and according to the Housing Sub-element for San Mateo County (2004) include 160 very low income units (Moonridge Development), 246 extremely low income units, and 144 very low

income units. Most of these units, although they are developed as multi-family units are metered and billed as single family residential units. It is estimated that 98 percent of the lower income units are billed as single family accounts and 2 percent are billed as multi-family accounts. Based on the District's total number of single family and multifamily connections, these lower income units represent about 11 percent of the District's total single family accounts[2] and about 2 percent of multi-family accounts[3]. For purposes of this 2010 UWMP, it is assumed that these existing percentages will be maintained in the future and that projected water demands for the lower income households will be proportional to these percentages.

Projected future water use by the District's low income customers is summarized in Table 4-8.

Table 4-8. Low Income Projected Water Demands, AFY (DWR Table 8)

Low Income Water Demands	2015	2020	2025	2030	2035
Single Family Residential[(a)]	136	131	131	132	147
Multi-Family Residential[(b)]	3	3	3	3	4
Total	139	134	134	135	151

(a) Based on 11 percent of the projected future single family residential water demand (see Tables 4-3, 4-4 and 4-5 above).
(b) Based on 2 percent of the projected future multi-family residential water demand (see Tables 4-3, 4-4 and 4-5 above).

4.4 SALES TO OTHER AGENCIES

The District does not currently sell water to other agencies, as shown in Table 4-9.

Table 4-9. Sales to Other Agencies, AFY (DWR Table 9)

Water Distributed	2010 (actual)	2015	2020	2025	2030	2035
None	0	0	0	0	0	0
Total	0	0	0	0	0	0

[2] Total lower income units = 691 units; 98% assumed to be single family = 677 units; 677 lower income single family units/6,186 total single family accounts in FY2009/10 = 11%.

[3] Total lower income units = 691 units; 2% assumed to be multi-family = 14 units; 14 lower income multi-family units/111 total multi-family accounts in FY2009/10 times an average of 7 multi-family units per account = 2%.

4.5 ADDITIONAL WATER USES AND LOSSES

Additional water uses include such uses as saline barriers and groundwater recharge. The District does not use water for such uses. Water losses occur due to distribution system leaks and other unmetered water uses (such as firefighting, main flushing, etc.). Estimates of unaccounted-for system losses are documented in Table 4-10.

Table 4-10. Additional Water Uses and Losses, AFY (DWR Table 10)

Water Use	2010 (actual)	2015	2020	2025	2030	2035
Saline Barriers	0	0	0	0	0	0
Groundwater Recharge	0	0	0	0	0	0
Conjunctive Use	0	0	0	0	0	0
Raw Water	0	0	0	0	0	0
Recycled Water	0	0	0	0	0	0
System losses[(a)]	44	214	209	212	214	236
Other	0	0	0	0	0	0
Total	44	214	209	212	214	236

(a) Actual unaccounted for system losses in 2010 were about 1.9% of total production. To be conservative, future unaccounted for system losses are estimated to be 7.5 percent of total production. System losses may include leaks, flushing, fires, flow testing, backflushing, etc.

Table 4-11 summarizes the current and projected total water demands for the District's service area through the year 2035. As described above, these future total water demands are consistent with the District's per capita water use targets for 2015 (interim target of 124 gpcd) and for 2020 and beyond (final target of 120 gpcd).

Table 4-11. Total Water Use, AFY (DWR Table 11)[(a)]

Water Use	2010 (actual)	2015	2020	2025	2030	2035
Total Water Deliveries	2,221	2,636	2,578	2,610	2,645	2,913
Sales to Other Water Agencies	0	0	0	0	0	0
Additional Water Uses and Losses[(a)]	44	214	209	212	214	236
Total	2,265	2,850[(b)]	2,787[(c)]	2,822[(d)]	2,859[(e)]	3,149[(f)]

(a) Future unaccounted for water is conservatively estimated to be 7.5 percent of total production.
(b) Consistent with District's interim gpcd target of 124 gpcd per SBx7-7 (124 gpcd x 20,515 service area population = 2,850 AFY).
(c) Consistent with District's final gpcd target of 120 gpcd per SBx7-7 (120 gpcd x 20,736 service area population = 2,787 AFY).
(d) Consistent with District's final gpcd target of 120 gpcd per SBx7-7 (120 gpcd x 20,991 service area population = 2,822 AFY).
(e) Consistent with District's final gpcd target of 120 gpcd per SBx7-7 (120 gpcd x 21,265 service area population = 2,859 AFY).
(f) Consistent with District's final gpcd target of 120 gpcd per SBx7-7 (120 gpcd x 23,427 service area population = 3,149 AFY).

4.5.1 Retail Agency Demand Projections Provided to Wholesale Suppliers

As described above, SFPUC provides water supplies to the District on a wholesale basis. Table 4-12 summarizes the District's demand projections provided to SFPUC through 2035. It should be noted that these demand projections assume normal year availability of the District's local supplies.

Table 4-12. Retail Agency Demand Projections Provided to Wholesale Suppliers, AFY (DWR Table 12)

Wholesaler	Contracted Volume	FY 2009/10 (actual)	2015	2020	2025	2030	2035
SFPUC	2,455[a]	2,038	1,970[b]	1,907[b]	1,942[b]	1,979[b]	2,269[b]

[a] Based on 800 MG/year, or 2.18 MGD
[b] Assumes normal year availability of local supplies (see Chapter 3).

4.6 COMPLIANCE WITH SBX7-7

4.6.1 Overview

The SBx7-7 was one of the four policy bills enacted as part of the November 2009 Comprehensive Water Package. The Water Conservation Act of 2009 provides the regulatory framework to support the statewide reduction in urban per capita water use described in the 20x2020 Water Conservation Plan (DWR and others 2010). It also addresses agricultural water and commercial, industrial, and institutional (CII) water use.

Per SBx7-7, each urban retail water supplier must determine and report its existing baseline water consumption and establish either its own or cooperative targets. This reporting is to begin with the 2010 UWMP, which is required by the Water Conservation Act of 2009.

The District's compliance with SBx7-7 is described in detail in the March 2011 technical memorandum included in Appendix F of this 2010 UWMP. The District developed its baseline and target per capita water uses on an individual basis, and did not participate in a regional alliance. As described in the technical memorandum and summarized below, the District utilized the minimum reduction requirement to establish an Interim (2015) Per Capita Water Use Target of 124 gpcd, and a Final (2020) Per Capita Water Use Target of 120 gpcd.

The District held a public hearing on April 12, 2011 to discuss and adopt the Target Method and resulting interim and final targets. The following issues were discussed during the public hearing:

- Allow community input regarding the urban retail water supplier's implementation plan for complying with SBx7-7;
- Consider the economic impacts of the urban retail water supplier's implementation plan for complying with SBx7-7; and

- Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.

4.6.2 Determination of Baseline and Target Per Capita Water Use

As described in Appendix F, the District's baseline per capita water uses were determined based on the methodologies described in DWR's October 1, 2010 *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use* (DWR Methodologies).

Consistent with DWR Methodology 1 (Gross Water Use), the District's gross water use is based on the metered quantity of water purchased by the District from the SFPUC and obtained from its local supply sources. Metering locations area described in the memorandum provided in Appendix F.

Consistent with DWR Methodology 2 (Service Area Population), the District's service area population has been estimated using data from the United States Census Bureau for the Census tracts which coincide with the District's service area. The District's baseline per capita water use was based on the parameters shown in Table 4-13.

Table 4-13. Base Period Ranges (DWR Table 13)

Base	Parameter	Value	Units
10- to 15-year base period	FY 2008/09[(a)] total water deliveries	2,380	AFY
	2008 total volume of delivered recycled water	0	AFY
	2008 recycled water as a percent of total deliveries	0	Percent
	Number of years in base period[(b)]	10	Years
	Year beginning base period range	FY 1997/98	
	Year ending base period range[(c)]	FY 2006/07	
5-year base period	Number of years in base period	5	Years
	Year beginning base period range	FY 2003/04	
	Year ending base period range[(d)]	FY 2007/08	

Units = AFY
(a) The District's fiscal year begins on July 1 and ends on June 30 (example: FY 2008/09 starts on July 1, 2008 and continues through June 30, 2009)
(b) If the 2008 recycled water percent is less than 10 percent, then the first base period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater; the first base period is a continuous 10- to 15-year period.
(c) The ending year must be between December 31, 2004 and December 31, 2010.
(d) The ending year must be between December 31, 2007 and December 31, 2010.

Since the District had no recycled water deliveries in FY 2008/09, a 10-year base period was used to calculate the District's baseline per capita water use (for purposes of Water Code Section 10608.20). The calculation of this 10-year baseline per capita water use is summarized in Table 4-14.

Table 4-14. Base Daily Per Capita Water Use: 10- to 15-Year Range (DWR Table 14)

Base Period Year		Distribution System Population	Daily System Gross Water Use, mgd	Annual Daily Per Capita Water Use, gpcd
Sequence Year	Fiscal Year			
Year 1	FY 1997/98	17,954	2,169,205	121
Year 2	FY 1998/99	18,444	2,338,630	127
Year 3	FY 1999/00	18,452	2,173,479	118
Year 4	FY 2000/01	18,668	2,536,932	136
Year 5	FY 2001/02	18,884	2,566,959	136
Year 6	FY 2002/03	19,100	2,513,836	132
Year 7	FY 2003/04	19,316	2,756,192	143
Year 8	FY 2004/05	19,617	2,400,822	122
Year 9	FY 2005/06	19,766	2,277,863	115
Year 10	FY 2006/07	19,915	2,585,973	130
			Base Daily Per Capita Water Use[(a)]	128

[(a)] Average of annual daily per capita water use for the 10-year period from FY 1997/98 to FY 2006/07.

The calculation of the District's 5-year baseline per capita water use (for purposes of Water Code Section 10608.22) is shown in Table 4-15.

Table 4-15. Base Daily Per Capita Water Use: 5-Year Range (DWR Table 15)

Base Period Year		Distribution System Population	Daily System Gross Water Use, mgd	Annual Daily Per Capita Water Use, gpcd
Sequence Year	Fiscal Year			
Year 1	FY 2003/04	19,316	2,756,192	143
Year 2	FY 2004/05	19,617	2,400,822	122
Year 3	FY 2005/06	19,766	2,277,863	115
Year 4	FY 2006/07	19,915	2,585,973	130
Year 5	FY 2007/08	20,064	2,458,548	123
			Base Daily Per Capita Water Use[(a)]	127

[(a)] Average of annual daily per capita water use for the 5-year period from FY 2003/04 to FY 2007/08.

As described in Appendix F, Target Method 3 based on hydrologic regions provided the more favorable per capita water use targets for the District with an interim (2015) target of 126 gpcd and a final (2020) target of 124 gpcd. However, the minimum reduction requirements per Water Code Section 10608.22 control the District's analysis. The District's targets based on the minimum reduction requirements are as follows:

- The interim (2015) per capita water use target is 124 gpcd (based on the midpoint between the District's 10-year baseline per capita water use of 128 gpcd and the minimum reduction target of 120 gpcd (95 percent of the District's 5-year baseline per capita water use of 127 gpcd))
- The final (2020) per capita water use target is 120 gpcd (based on 95 percent of the District's 5-year baseline per capita water use of 127 gpcd).

These interim and final targets have been used to project the City's future water demands (described above) using the City's projected future service area population (see Table 2-3).

4.6.3 District Programs to Achieve Water Demand Reduction Goals

As discussed above, the District's implementation of plumbing code and existing water conservation programs (described in Chapter 5) will result in future demands which are close to those required by SBx7-7, indicating that the District's continued implementation of existing water conservation programs will essentially enable the District to meet its adopted SBx7-7 targets. However, some additional water conservation measures beyond those included in the plumbing code and the District's existing water conservation program may need to be implemented for the District to comply with its adopted SBx7-7 targets. It should be noted that actual future water demands will depend on a number of factors, and will likely be somewhat different than those projected, and will therefore need to be closely monitored and tracked.

The District's water conservation programs are funded by water rates. The need for additional water conservation programs to meet the SBx7-7 per capita water use targets may require additional funding, which may, in turn, impact future water rates. The additional programs and their potential financial impacts will be thoroughly evaluated by the District to minimize impacts to water rates.

4.6.4 Progress Toward Meeting the Urban Water Use Targets

Water Code 10608.40

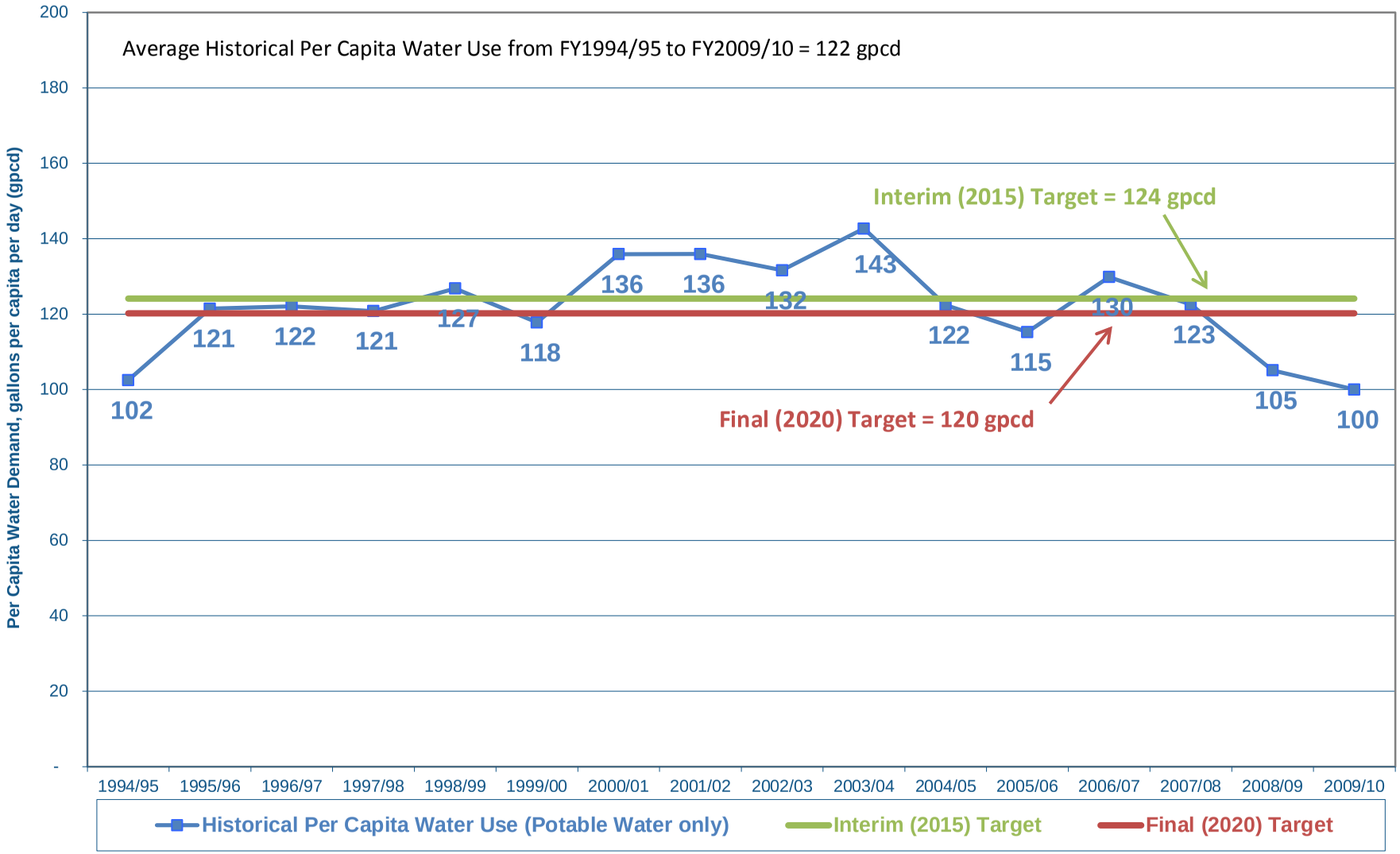
Urban water retail suppliers shall report to the department on their progress in meeting their urban water use targets as part of their urban water management plans submitted pursuant to Section 10631.

As shown in Figure 4-1, in the last 16 years, the District's per capita water use has averaged 122 gpcd (ranging from a low of 100 gpcd to a high of 143 gpcd). In the last couple of years (FY2008/09 and FY2009/10) the District's per capita water use has dropped significantly, likely as a result of recent drought conditions (and associated water conservation) and economic conditions. Although the recent drop in per capita water use may not be entirely sustainable as customers revert to some of their pre-drought water use habits, as described above, the District's continued implementation of existing water conservation measures is anticipated to help the

District meet its SBx7-7 targets. The District will closely monitor its per capita water use in the coming years to assess if additional programs will need to be implemented to meet the 2015 and 2020 per capita water use targets.

The District will report its progress in meeting the established 2015 and 2020 per capita water use targets in the 2015 and 2020 UWMP.

Figure 4-1. Comparison of Historical Per Capita Water Use to Adopted SBx7-7 Targets



5.1 OVERVIEW

The District has been implementing water use efficiency programs and practicing conservation techniques since the 1970's when water rationing was implemented due to drought. In 1991, the District became a voluntary signatory to the California Urban Water Conservation Council's (CUWCC's) Memorandum of Understanding (MOU). By becoming a signatory, the District agreed to implement Best Management Practices, as described in the CUWCC's MOU regarding urban water conservation in California. Since becoming a signatory to the MOU, the District has implemented and promoted its water use efficiency programs to help customers reduce water demand. The District reports to the CUWCC on its coverage of the recommended Best Management Practices on a fiscal year basis.

The Urban Water Management Planning Act (Water Code Section 10631 (j)) allows for an urban retail water agency that is a signatory (member) of the CUWCC to meet the Demand Management Measure (DMM) requirements by documenting that the CUWCC has determined the urban water agency is complying (coverage) with all of the provisions of the MOU. Documentation of the District's compliance is provided in Appendix G.

5.2 CUWCC REORGANIZATION OF THE BMPS

In 2009, the CUWCC restructured the organization of its BMPs to group them according to type. Table 5-1 provides an overview of the reorganization of the CUWCC BMPs. The 14 CUWCC BMPs have now been reorganized into two primary categories: foundational BMPs and programmatic BMPs. Although the BMP names and organization have been modified, they still correlate to the 14 DMMs identified in the UWMP Act (Water Code Section 10631(f)).

Table 5-1. Demand Management Measures and CUWCC BMPs

CUWCC BMP Organization and Names (2009 MOU)				UWMP DMMs	
Type	Category	BMP#	BMP Name	DMM# (previous BMP#)	DMM Name
Foundational	Utility Operations Programs	1.1.1	Conservation Coordinator	L (12)	Water conservation coordinator
		1.1.2	Water Waste Prevention	M (13)	Water waste prohibition
		1.1.3	Wholesale Agency Assistance Programs	J (10)	Wholesale agency programs
		1.2	Water Loss Control	C (3)	System water audits, leak detection, and repair
		1.3	Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections	D (4)	Metering with commodity rates for all new connections and retrofit of existing connections
		1.4	Retail Conservation Pricing	K (11)	Conservation pricing
	Education Programs	2.1	Public Information Programs	G (7)	Public information programs
		2.2	School Education Programs	H (8)	School education programs
Programmatic	Residential	3.1	Residential assistance program	A (1)	Water survey programs for single-family residential and multifamily residential customers[(a)]
				B (2)	Residential plumbing retrofit
		3.2	Landscape water survey	A (1)	Water survey programs for single-family residential and multifamily residential customers[(a)]
		3.3	High-Efficiency Clothes Washing Machine Financial Incentive Programs	F (6)	High-efficiency washing machine rebate programs
		3.4	WaterSense Specification (WSS) toilets	N (14)	Residential ultra-low-flush toilet replacement programs
	Commercial, Industrial, and Institutional	4	Commercial, Industrial, and Institutional	I (9)	Conservation programs for commercial, industrial, and institutional accounts
	Landscape	5	Landscape	E (5)	Large landscape conservation programs and incentives

Source: 2010 UWMP Guidebook, Table E-1

[(a)] Components of DMM A (Water survey programs for single-family residential and multifamily residential customers) applies to both BMP 3.1 (Residential assistance program) and BMP 3.2 (Landscape water survey)

5.3 CUWCC COMPLIANCE OPTIONS

Compliance with the BMP water savings goals included in the CUWCC MOU can be accomplished in one of three ways including:

- Accomplishing the specific measures as listed in the CUWCC MOU for each BMP,
- Accomplishing a set of measures which achieves equal or greater water savings, referred to as the Flex Track Menu option, and
- Accomplishing set water savings goals as measured in gallons per capita per day consumption, referred to as the GPCD option.

5.3.1 Implementation of Specific BMP Measures

Under this option, compliance with the BMPs is based on implementation of the specific measures listed in the CUWCC MOU for each BMP. As described in this chapter, the District is implementing most of the BMPs, but may not be meeting the specific coverage requirements for each individual BMP. Therefore, the District has not selected this compliance option.

5.3.2 CUWCC Flex Track Menu Option

A new option with the recent amendments to the CUWCC MOU is the Flex Track Menu. With this option, the signatory must achieve water savings greater than or equal to that which they would have achieved using only the BMP list items. The Flex Track Menu Options would allow the District to implement water use efficiency programs not listed as a traditional best management practice and still get credit for the amount of water saved. However, the District has not implemented the Flex Track Menu Option.

5.3.3 GPCD Option

With the updated CUWCC MOU this reporting period, the District has an option of meeting coverage requirements by meeting a GPCD target. The District has chosen this option for meeting its MOU coverage requirements for the current reporting period.

Table 5-2 documents the compliance targets required under the CUWCC GPCD compliance option for the District. This table shows the target and the highest acceptable boundary for compliance for each reporting period for the current CUWCC MOU.

Table 5-2. Biennial GPCD Compliance Table

Fiscal Year	Report	Target		Highest Acceptable Bound	
		% Base	gpcd	% Base	gpcd
2010	1	96.4%	122.6	100%	127.2
2012	2	92.8%	118.1	96.4%	122.6
2014	3	89.2%	113.5	92.8%	118.1
2016	4	85.6%	108.9	89.2%	113.5
2018	5	82.0%	104.3	82.0%	104.3

The District's calculated compliance for the year 2010 is 100.1 GPCD, which meets the required 2010 target for coverage compliance with the CUWCC's MOU (122.6 GPCD).

Because the District became a signatory of the MOU in 1991, the District is eligible to file an appeal to adjust the baseline period to reflect per capita water demands in the period prior to their signing the MOU. The District will consider filing such an appeal, since it implemented BMP's prior to 1997 (baseline period). The District would consider filing an appeal with the goal of aligning the Water Conservation Act of 2009 compliance targets to the CUWCC compliance targets.

5.4 DESCRIPTION OF DMM/BMP IMPLEMENTATION

DMM A: Residential Water Survey Programs for Single-Family and Multi-Family (CUWCC Programmatic BMP 3.0 Residential)

The District has not implemented the residential water survey program for residential customers. The District will consider implementing this BMP in order to meet GPCD compliance targets for both the CUWCC MOU and the Water Conservation Act of 2009. The results of a benefit cost analysis indicate that the benefit cost ratio for the District would be 1.25, making it cost effective for the District to implement. The estimated savings is approximately 11 AFY.

DMM B: Residential Plumbing Retrofit (CUWCC Programmatic BMP 3.0 Residential)

The District provides water efficient showerheads and aerators to single family and multi-family customers. The District also provides dye tablets and instructions on how to test toilets for a leaking flapper. In addition, the District provides automatic shut off nozzles for garden hoses at no charge during the summer months. The estimated annual water savings from distributing low flow showerheads and aerators to residential customers is documented in Table 5-3. Since 2005, it is estimated that this program has cumulatively saved approximately 91 AF of water.

Table 5-3. Residential Plumbing Retrofit Estimated Water Savings, AFY

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
Showerhead	3.99	3.92	1.57	1.85	2.04	1.20
Bathroom Aerator	1.07	0.95	0.52	0.36	0.61	0.37
Kitchen Aerator	0.98	0.80	1.45	0.55	0.47	0.38
Total[(a)]	6.04	5.67	2.54	2.76	3.12	1.95

[(a)] Annual totals shown are the additional incremental savings achieved during each year.

DMM C: System Water Audits, Leak Detection and Repair (CUWCC Foundational BMP 1.2 Water Loss Control)

The District performs an annual water audit that conforms to AWWA Method 36. Table 5-4 documents the District's water audit results. In 2009, the District started to use the IWA/AWWA Water Audit Method, as published in the third edition of AWWA's M36: Water Audits and Loss Control Programs. This method derives a water audit validity score which is a measure of the level of confidence in the audit results. The CUWCC MOU requires a water audit validity score of 66 or higher by the year 2012.

Table 5-4. System Water Audit Results

	FY 2007	FY 2008	FY 2009	FY 2010
Unaccounted Water	11%	1%	1%	2%
Water Audit Validity Score	NA	NA	78	70

In 2008, the District replaced its El Granada pipeline which services the north end of the District's service area. After the replacement of this pipeline, the District has a seen a reduction in the amount of real water losses.

DMM D: Metering with Commodity Rates (CUWCC Foundational BMP 1.3 Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections)

All customers are metered in the District's service area and all customers are charged a commodity or volumetric rate along with base charges. Advanced meter reading (AMR) technology has been installed on our top commercial customers' meters so that they can be billed monthly and be provided with more timely and complete water consumption data. A written meter plan has been submitted to the CUWCC, as required by the MOU.

DMM E: Large Landscape Conservation Programs and Incentives (CUWCC Programmatic BMP 5.0 Landscape)

The District has participated in a regional large landscape water budget program through BAWSCA. This program is for large landscape customers that have a meter dedicated to irrigation. This program is not offered to customers who use private well water to supplement their irrigation needs. The large landscape program attempts to improve communication and influence large urban landscape customers to irrigate more efficiently.

The services of a consultant are used to provide targeted customers with a report that shows a description of the landscape, the actual water use, a water budget and water use over the water budget for the site. It has been estimated that this program regionally results in water savings of about 10 percent, since the program started in 2003. In addition to the reports, customers with dedicated irrigation meters can arrange to have a water survey to fine tune their existing water budget and to get advice on how to make their irrigation systems more water efficient.

DMM F: High Efficiency Washing Machine Rebate Program (CUWCC Programmatic BMP 3.0 Residential)

The District offers a high efficiency washing machine rebate for residential customers. The District has partnered, through BAWSCA, with PG&E to offer a combined energy and water rebate, except for a brief time of offering rebates through the CUWCC's Smart Rebates Program. The estimated annual water saving for this program is documented in Table 5-5. Since 2005, the cumulative water savings is estimated to be 40 AF.

Table 5-5. High Efficiency Washing Machine Rebate Estimated Annual Water Savings, AFY

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
High Efficiency Clothes Washer[(a)]	2.00	2.15	2.02	0.77	2.50	2.79

[(a)] Annual totals shown are the additional incremental savings achieved during each year.

DMM G: Public Information Programs (CUWCC Foundational BMP 2.1 Public Information)

The District has an active public information and outreach program. In addition, the District participates with BAWSCA and the SFPUC on regional outreach efforts regarding regional water system improvements and water use efficiency topics. To encourage the use of water efficient fixtures, the District has become a promotional partner to EPA's WaterSense Program. The District utilizes as many outreach methods as possible, as shown in the Table 5-6.

Table 5-6. Public Outreach Methods

Newspaper Advertisements in the Half Moon Bay Review	Flash Advertisements on the Website for the Half Moon Bay Review
Billing Statement Inserts	Annual Half Moon Bay Pumpkin Festival
Messages on Billing Statements	Newsletters
Website	Bulletin Board
Public Speaking Venues	Annual Dream Machines Event
High Bill Notification by Phone and Email	

DMM H: School Education Programs (CUWCC Foundational BMP 2.2 School Education)

The District participates in regional school education programs through BAWSCA. One of these programs is the Water Wise School Education Kits Program. The kits are designed for fourth and fifth grades and provide curriculum that meets California State Board of Education content standards for public schools. The District offers other educational materials that are age or grade appropriate to educators in our service area. Table 5-7 lists some of the materials available.

Table 5-7. Education Materials	
The Story of Drinking Water	Captain Hydro Workbook
California Water Story	California Water Map
Water Cycle Poster	Water Cycle Brochures
California Water Map	California Water Facts

DMM I: Conservation Programs for Commercial, Industrial and Institutional (CUWCC Programmatic BMP 4.0 Commercial, Industrial and Institutional (CII))

The District offers toilet and urinal rebates along with free pre-spray rinse nozzles. Restaurant table cards, informing customers that water is only served upon request, are made available free of charge to restaurants in the District's service area. Table 5-8 documents the estimated annual CII water savings.

Table 5-8. Estimated Annual CII Water Savings, AFY

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
Toilets	0.00	0.00	0.02	0.00	0.00	0.00
Spray Rinse Nozzles	4.00	0.00	0.00	0.00	0.00	0.34
Total[(a)]	4.00	0.00	0.02	0.00	0.00	0.34

[(a)] Annual totals shown are the additional incremental savings achieved during each year.

DMM J: Wholesale Agency Programs (CUWCC Foundational BMP 1.1.3 Wholesale Agency Assistance Programs)

This DMM/BMP is not applicable as the District is not a water wholesaler.

DMM K: Conservation Pricing (CUWCC Foundational BMP 1.4 Conservation Pricing)

The District has tiered rates for its residential customers and at least 70 percent of its revenue is generated from the volumetric rate charged to customers. A copy of the District's current water rate schedule is provided in Appendix H.

DMM L: Water Conservation Coordinator (CUWCC Foundational BMP 1.1 Utility Operational Programs)

The District has a Water Resource Analyst that performs the duties of the Water Conservation Coordinator. The District supplements this position with the use of consultants and by participating in regional water use efficiency programs with BAWSCA.

DMM M: Water Waste Prohibition (CUWCC Foundational BMP 1.1 Utility Operational Programs)

The District has an ordinance that prohibits the wasteful use of water during normal water years. This ordinance conforms to the requirements in the CUWCC MOU. For dry year conditions, or during other water supply shortages, the District has a Water Shortage Contingency Plan which includes specific water use restrictions. The District's Water Shortage Contingency Plan is described in Chapter 8 and is included in Appendix I of this 2010 UWMP.

The District also has a "high bill notification" system in place attempting to inform customers that they might have a leak or an irrigation controller that is not properly programmed before they receive their billing statement.

The District recently enacted an Indoor Water Use Efficiency Ordinance (Ordinance No. 2010-01) that targets new development, remodels, and new water services. The ordinance, which went into effect on January 1, 2011, specifies water use efficiency standards for both commercial and residential customers.

DMM N: Residential Ultra Low Flush Toilet Replacement Programs (CUWCC Programmatic BMP 3.0 Residential)

The District offers residential toilet rebates and included high efficiency toilet rebates in 2007. In 2010, the District modified their rebate program to only offer rebates for the installation of high efficiency toilets that meet the EPA WaterSense specifications. Table 5-9 documents the estimated annual water savings from residential toilet replacement from 2005 through 2010. The CUWCC's estimate for the District's cumulative water savings from 1999 through 2008 for this BMP is 622 AF.

Table 5-9. Residential Toilet Replacement Estimated Annual Water Savings, AFY

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
Toilet Replacement	1.86	1.04	1.02	0.78	0.66	1.51

(a) Annual totals shown are the additional incremental savings achieved during each year.

5.5 REGIONAL COORDINATION

As a member agency of BAWSCA, the District participates in regional water use efficiency programs and public outreach efforts. BAWSCA and its member agencies look for opportunities to work with other water agencies, including the SFPUC and the Santa Clara Valley Water District (SCVWD), and leverage available resources to implement water use efficiency projects. For example, in 2005, BAWSCA and the SFPUC entered into a Memorandum of Understanding (MOU) regarding the administration of a Spray Valve Installation Program. Through this MOU, BAWSCA and the SFPUC worked cooperatively to offer and coordinate the installation of water conserving spray valves to food service providers throughout the BAWSCA service area. In addition, BAWSCA participates in the Bay Area Efficient Clothes Washer Rebate Program, which is a residential rebate program offered by all of the major Bay Area water utilities.

Through participation in this program, BAWSCA and its participating member agencies were the recipients of $187,500 in Proposition 50 grant funds, which became available in Fiscal Year 2006/2007.

More recently, as part of the Bay Area Integrated Regional Water Management Plan, BAWSCA and the other major Bay Area water utilities submitted a Proposition 84 Implementation Grant Proposal in January 2011 to support regional water conservation efforts that offer drought relief and long-term water savings. The proposed project includes a package of water conservation programs to improve water use efficiency throughout the San Francisco Bay Area. The project provides direct funding, financial incentives (rebates), and/or subsidies for the implementation of programs that achieve reduced water demand, by all classes of water users (including residential, commercial, industrial and institutional). Four specific programs were selected for the project because they were determined to provide the most quantifiable and sustainable water savings, including:

- Water-Efficient Landscape Rebates, Training and Irrigation Calculator,
- High-Efficiency Toilet/Urinal Direct Install and/or Rebates,
- High-Efficiency Clothes Washer Rebates, and
- Efficient Irrigation Equipment Rebates.

BAWSCA and its member agencies will continue to look to partner with each other and the other Bay Area water utilities, as appropriate, to develop regional water conservation efforts that extend beyond local interests to examine costs, benefits and other related issues on a system-wide level. The goal is to maximize the efficient use of water regionally by capitalizing on variations in local conditions and economies of scale.

Water Code § 10633

The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of 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.

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of 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.

(g) 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.

6.1 COORDINATION

The SAM Wastewater Treatment Plant (WWTP) provides secondary wastewater treatment to the City of Half Moon Bay, as well as two other coastal sanitary districts (Granada Sanitary District and Montara Water and Sanitary District). As described in Chapter 1, the District has coordinated the development of this 2010 UWMP with SAM.

6.2 WASTEWATER QUANTITY, QUALITY AND CURRENT ISSUES

Water Code § 10633 (a)

The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of 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.

The SAM regional system includes over 100 miles of sewers (gravity, force mains, and transmission pipelines), over 20 pump and lift stations, a treatment plant and an ocean outfall.

Wastewater generated within the District's service area is collected and conveyed by pump stations and transmission lines[1].

SAM's original WWTP, which started operation in 1984, provided secondary treatment capacity for up to 2 mgd. In 1999, a major plant upgrade was completed and expanded the permitted plant capacity to 4.0 mgd, which increased the plant's ability to handle peak wet weather flows.

The WWTP is currently designed to accommodate average dry weather flows of 4.0 mgd and peak hour wet-weather flows of 15 mgd. The WWTP's current average dry weather discharge is 1.5 mgd. Treated wastewater is discharged to the Pacific Ocean through a 20-inch pipeline, which extends 1,900 feet offshore to a depth of 40 feet. The SAM WWTP operates under a Waste Discharge Requirements (WDR) and a National Pollutant Discharge Elimination System (NPDES) Permit issued by the Regional Water Quality Control Board.

SAM WWTP processes consist of primary treatment and secondary treatment. Primary treatment includes screening, grit removal and primary sedimentation. Secondary treatment consists of conventional activated sludge treatment and secondary clarification prior to ocean discharge. The following is a short description of each of the treatment processes at the SAM WWTP:

- Headworks: The headworks provide preliminary treatment of the incoming raw sewage to the SAM plant. Sewage passes through two mechanically cleaned bar screens to remove debris. Debris removed from the screens is compacted, dried and taken to the landfill. Following the bar screens, the flow is pumped to the grit removal tanks. Wastewater is pumped with eight self-priming pumps that are equipped with variable speed drives to allow pumping over the range of 0.3 mgd in the early morning to 15.0 mgd during peak hour wet weather flow.
- Grit Removal: The grit removal tanks use air bubbles to separate out non-organic materials such as sand and pebbles while allowing the organic material to pass on for treatment.
- Primary Sedimentation Basins: After grit removal, the flow is moved to the three primary sedimentation basins where the organic materials (sludge) from the wastewater can settle to the bottom. Once the sludge has settled to the bottom, it is pumped to the anaerobic digesters for further treatment. After the sludge (bio-solids) has been processed, it is dewatered and disposed of off-site.
- Aeration Basins: The clarified flow from the primary sedimentation basin is continually aerated with small bumbles to grow a culture of bacteria and microorganisms, which assimilate the dissolved and suspended wastes. The culture, known as "mixed liquor" forms large particles that can be settled out from the flow.
- Secondary Clarifiers: The flow is then moved to the secondary clarifiers where the particles from the mixed liquor settle to the bottom and is returned to the aeration

[1] It should be noted that SAM's wastewater service area is somewhat larger than the District's water service area. It is estimated that 80 percent of SAM's total wastewater service area is located within the District's water service area (City of Half Moon Bay and Granada Sanitary District).

basins to seed the incoming flow with the active culture. The clear water above flows to the chlorine contact tanks for further treatment.

- Chlorine Contact Tanks: Here, the flow is disinfected with liquid sodium hypochlorite.
- Effluent Pump Station: The pump station uses three vertical turbine pumps to convey the final effluent to the ocean via a deepwater outfall. Sodium bisulfite solution is added at the pump station to remove chlorine and prevent toxicity to fish and other marine life.
- Ocean Outfall: Final effluent is dispersed to the ocean waters through the deepwater ocean outfall.

Table 6-1 indicates the past, current and projected amount of water collected and treated in the District's service area.

Table 6-1. Wastewater Collection and Treatment, AFY (DWR Table 21)

Type of Wastewater	2005 (actual)[a]	2010 (actual)[a]	2015[b]	2020[b]	2025[b]	2030[b]	2035[b]
Wastewater collected & treated in service area	1,411	1,666	1,691	1,709	1,730	1,753	1,931
Volume that meets recycled water standards [c]	0	0	0	0	0	0	0

(a) 2005 and 2010 wastewater collected within the District's water service area are based on 80 percent of total wastewater collected in SAM's water service area (SAM's wastewater service area is somewhat larger than the District's water service area). 2005 wastewater collected by SAM was 1,764 AFY; therefore, wastewater collected within the District's service area in 2005 is estimated to be 80% of 1,764 AFY (1,411 AFY). 2010 wastewater collected by SAM was 2,083 AFY; therefore, wastewater collected within the District's service area in 2010 is estimated to be 80% of 2,083 AFY (1,666 AFY). SAM wastewater flows based on correspondence with Sewer Authority Mid-Coastside, Steve Leonard, Manager - January 27, 2011 and February 24, 2011.
(b) Wastewater projections within the District's water service area are based on an increase in wastewater flows proportional to the projected population growth within the District's water service area (see Table 2-3).
(c) SAM's WWTP processes consist of primary treatment and secondary treatment.

6.3 WASTEWATER DISPOSAL AND POTENTIAL RECYCLED WATER USES

Water Code § 10633 (b)(c)(d)

The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse,

groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

6.3.1 Wastewater Disposal

Table 6-2 presents the amount of wastewater that is projected to be disposed of through the ocean outfall.

Table 6-2. Disposal of Wastewater (Non-recycled water, AFY)[(a)] (DWR Table 22)

Method of Disposal	Treatment Level	2010 (actual)[(a)]	2015[(b)]	2020[(b)]	2025[(b)]	2030[(b)]	2035[(b)]
Ocean Outfall	Secondary	1,666	1,691	1,709	1,730	1,753	1,931
	Total	1,666	1,691	1,709	1,730	1,753	1,931

(a) 2010 wastewater disposal from the District's water service area is based on 80 percent of total wastewater disposal from SAM's water service area (SAM's wastewater service area is somewhat larger than the District's water service area). 2010 wastewater disposal by SAM was 2,083 AFY; therefore, wastewater disposal from the District's service area in 2010 is estimated to be 80% of 2,083 AFY (1,666 AFY). SAM wastewater disposal based on correspondence with Sewer Authority Mid-Coastside, Steve Leonard, Manager - January 27, 2011 and February 24, 2011.

(b) Wastewater disposal projections within the District's water service area are based on an increase in wastewater disposal proportional to the projected population growth within the District's water service area (see Table 2-3).

6.3.2 Current Recycled Water Use

At this time, the District does not produce or sell recycled water to its customers. The District adopted a policy, by Resolution (No. 2008-10), regarding the distribution of recycled water within its jurisdiction on October 14, 2008. This policy asserted the District's desire to distribute and sell recycled water and it asserted the District's statutory rights to be the agency solely responsible for providing recycled water within its jurisdiction.

SAM is the wastewater authority in the District's service area and the recycled water producer. SAM is an agency formed by a Joint Powers Authority agreement between the City of Half Moon Bay, the Montara Water and Sanitary District and the Granada Sanitary District. It is important to note that SAM's service area is larger than the District's service area, since it receives wastewater from another water district. The District wishes to cooperate with SAM to develop a project that will enable the District to provide recycled water within the District's jurisdiction.

Table 6-3 summarizes 2010 recycled water use, as projected in the District's 2005 UWMP, and 2010 actual use.

Table 6-3. 2005 UWMP Recycled Use Projection Compared to 2010 Actual, AFY (DWR Table 24)

Use Type	Actual 2010	2005 Projection for 2010
Agricultural Irrigation	0	0
Landscape Irrigation	0	150
Commercial Irrigation	0	0
Golf course Irrigation	0	430
Wildlife Habitat	0	0
Wetlands	0	0
Industrial Reuse	0	0
Groundwater Recharge	0	0
Seawater Barrier	0	0
Geothermal/Energy	0	0
Indirect Potable Reuse	0	0
Stream Augmentation	0	0
Total	0	580

6.3.3 Potential Recycled Water Uses

There has been strong community support and there have been multiple studies over the years by both SAM and the District on the feasibility of recycled water use. Some of the more recent studies are listed below:

- 2008 Recycled Water Study, Sewer Authority Mid-Coastside, SRT Consultants, October 2008
- Water Reuse Feasibility Study, Sewer Authority Mid-Coastside, Carollo Engineers, August 2005
- Water Reclamation Program: Preliminary Economic Feasibility Study, Coastside County Water District, Carollo Engineers, August 2003

Discussions of recycled water, within the District's service area, have focused on three potential uses listed below.

- Turf irrigation (golf courses, cemeteries, parks)
- Agricultural irrigation (crops, nurseries, cut flowers, tree farms)
- Stream flow augmentation (Pilarcitos Creek)

One of the potential users of the recycled water within the District's jurisdiction, Ocean Colony Partners LLC., has written to the District and SAM to express their interest in using recycled water at two golf courses that they operate.[2] Ocean Colony Partners LLC described the ability to purchase up to 800,000 gpd of recycled water for the irrigation of two golf courses and related areas with an annual estimate of 134 million gallons, or 412 AF, between March and November of each year (groundwater, supplemented with water from the District, is the current supply that is being used to meet these existing non-potable demands).

The District and SAM cooperated in a recycled water pilot study in 2009, under Regional Water Board Order No. 91-042. SAM used a temporary auxiliary treatment process that included an ultra-filtration membrane module and ultraviolet disinfection. The recycled water met the requirements of Disinfected Secondary 2.2 Recycled Water in California Code of Regulations Title 22 Division 4 Chapter 3. The District distributed the recycled water by a water tanker to Ocean Colony Partners Golf Course and the District also provided a temporary recycled water storage tank on-site at the golf course.

Another potential customer that could use recycled water for turf irrigation is a cemetery located approximately 5 miles east and 1,100 feet in elevation above the SAM WWTP. The cemetery currently irrigates approximately 80 acres of land, and plans on eventually expanding throughout its 505-acre property. Water usage has averaged about 0.2 mgd over an 8-month irrigation period (approximately 150 AFY). The use of recycled water at the cemetery would eliminate high quality potable water that is currently provided by the District and used solely for turf irrigation. By using recycled water at the cemetery, the District would also be able to increase water availability and reliability during dry periods.[3] The obstacles for providing water to this user are the cost of the infrastructure (5 miles of new pipeline) and the cost of pumping water from sea level to an elevation of 1,100 feet.

Table 6-4 provides a summary of the potential recycled water uses within the District's service area.

[2] Correspondence from Bruce Russell of Kenmark Real Estate Group, Inc. to John F. Foley III of SAM and David R. Dickson of Coastside County Water District, August 5, 2009.

[3] *Water Reclamation Program: Preliminary Economic Feasibility Study*, Coastside County Water District, Carollo Engineers, August 2003.

Table 6-4. Potential Future Recycled Water Use, AFY (DWR Table 23)

User Type	Description	Feasibility	2015	2020	2025	2030	2035
Agricultural Irrigation	Potential for Two to Three Agricultural Users	Yes	0	276	276	276	276
Landscape Irrigation	Cemetery	Yes	0	0	150	150	150
Commercial Irrigation	Limited Demand for Commercial Irrigation	Not Applicable	0	0	0	0	0
Golf Course Irrigation	Two Golf Courses	Yes	0	412	412	412	412
Wildlife Habitat	See Stream Augmentation	Yes	0	0	0	0	0
Wetlands	No known Need for Wetlands Restoration	Not Applicable	0	0	0	0	0
Industrial Reuse	No Industrial Uses in Service Area	Not Applicable	0	0	0	0	0
Groundwater Recharge	No Known Need for Groundwater Recharge	Not Applicable	0	0	0	0	0
Seawater Barrier	No known Need for Barrier	Not Applicable	0	0	0	0	0
Geothermal/ Energy	No Geothermal Energy in Area	Not Applicable	0	0	0	0	0
Indirect Potable Reuse	No known Need for Indirect Potable Use	Not Applicable	0	0	0	0	0
Stream Augmentation	Lower Pilarcitos Creek	Technically Feasible but Unknown Economic Feasibility	0	0	0	0	0
		Total	0	688	838	838	838

6.4 POTENTIAL AND PROJECTED USE, OPTIMIZATION PLAN WITH INCENTIVES

Water Code § 10633 (e)(f)

The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of 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.

6.4.1 Potential and Projected Use

There are no projected uses of recycled water at this time. The District and SAM must come to an agreement over the principles of how SAM would produce the recycled water and how the District would distribute the recycled water.

6.4.2 Description of Potential Financial Incentives

Since the District does not currently offer recycled water to its customers, there are currently no financial incentives used to encourage recycled water use.

The District joined the Bay Area Recycled Water Coalition, a partnership of public agencies committed to developing recycled water as a resource for the residents of the San Francisco Bay area, as a means to procure funding for recycled water. The District requested, on behalf of the Mid-Coastside Region Water Reclamation Project, $3.275 million dollars with a construction status listed as 2012. The funding source is the CALFED section of the Federal budget.

SAM has been pursuing other funding sources. Descriptions of their attempts to find outside funding from grants and loans can be found at http://www.samcleanswater.org/rw.htm.

Table 6-5 shows how potential future financial incentives may encourage the potential use of recycled water use in the future.

Table 6-5. Methods to Encourage Recycled Water Use (DWR Table 25)

	Projected Results[(a)], AFY					
Actions	2010	2015	2020	2025	2030	2035
Future Financial Incentives (potential grants and loans)	0	0	688	838	838	838
Total	0	0	688	838	838	838

[(a)] Based on the potential recycled water uses shown in Table 6-4.

6.4.3 Optimizing the Use of Recycled Water

The District does not have a recycled water master plan. The last formal study the District produced was the *Water Reclamation Program: Preliminary Economic Feasibility Study* in 2003.

The District's efforts are focused on reaching an agreement with the local wastewater authority (SAM) to allow for the production and distribution of recycled water in the District's service area. The primary obstacle the District is facing in providing recycled water in its jurisdiction is the fact that the local wastewater authority is not producing recycled water and, therefore, not making recycled water available to the District to sell and distribute, and the high cost of required infrastructure.

Water Code § 10635 (a),(c)

(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

7.1 NORMAL YEAR SUPPLY AND DEMAND COMPARISON

7.1.1 Normal Year Supply

As described in Chapter 3, the District's Normal Year supplies are anticipated to be as follows:

- Up to about 800 MG/yr (2,455 AFY) of purchased supplies from the SFPUC;
- About 48 to 50 MG/yr (150 AFY) from the District's Pilarcitos Creek wells;
- About 40 MG/yr (120 AFY) of groundwater from the District's Denniston Project; and
- About 200 MG/yr (610 AFY) of surface water from the District's Denniston Project.

The District plans to use its available local supplies first, and then purchase supplies from SFPUC as needed to meet the Normal Year demands (described below).

Table 7-1 shows the anticipated Normal Year Supplies through 2035.

Table 7-1. Normal Year Water Supply, AFY

Supply	FY 2009/10 (actual)	2015	2020	2025	2030	2035
Supplies Purchased from SFPUC	2,038	1,970	1,907	1,942	1,979	2,269
Pilarcitos Creek Wells	136	150	150	150	150	150
Denniston Groundwater	19	120	120	120	120	120
Denniston Surface Water	72	610	610	610	610	610
Total	2,265[(a)]	2,850	2,787	2,822	2,859	3,149
% of FY 2009/10		126%	123%	125%	126%	139%

[(a)] The District's actual water demands in FY2009/10 were unusually low due to customer's water conservation savings due to continuing drought conditions and statewide economic conditions. This reduced demand in FY 2009/10 was experienced by many water suppliers in California due to statewide drought conditions and economic conditions.

7.1.2 Normal Year Demand

As described in Chapter 4, the District's Normal Year demands have been projected based on the District's adopted SBx7-7 per capita water use targets of 124 gpcd for 2015 and 120 gpcd for 2020 and subsequent years. Projected Normal Year demands through 2035 are shown in Table 7-2.

Table 7-2. Normal Year Water Demands, AFY

Supply	FY 2009/10 (actual)	2015	2020	2025	2030	2035
Demand[(a)]	2,265[(b)]	2,850	2,787	2,822	2,859	3,149
% of FY 2009/10		126%	123%	125%	126%	139%

(a) Water demand projection is based on the District's compliance with its SBx7-7 per capita water use targets (interim target of 124 gpcd in 2015 and final target of 120 gpcd in 2020 and in subsequent years) (see Chapter 4).
(b) The District's actual water demands in FY2009/10 were unusually low due to customer's water conservation savings due to continuing drought conditions and statewide economic conditions. This reduced demand in FY 2009/10 was experienced by many water suppliers in California due to statewide drought conditions and economic conditions.

7.1.3 Normal Year Comparison

As shown in Table 7-3, the District's Normal Year supplies are adequate to meet projected Normal Year demands.

Table 7-3. Supply and Demand Comparison—Normal Year, AFY (DWR Table 32)

Supply	FY 2009/10 (actual)	2015	2020	2025	2030	2035
Supply Totals (from Table 7-1)	2,265	2,850	2,787	2,822	2,859	3,149
Demand Totals (from Table 7-2)	2,265	2,850	2,787	2,822	2,859	3,149
Difference	0	0	0	0	0	0
Difference as % of Supply	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Figure 7-1 shows the District's supplies and demands under Normal Year conditions through 2035.

7.2 SINGLE DRY YEAR SUPPLY AND DEMAND COMPARISON

7.2.1 Single Dry Year Supply

As described in Chapter 3, the District's Single Dry Year supplies are anticipated to be as follows:

- Up to about 662 MG/yr (2,032 AFY) of purchased supplies from the SFPUC (about a 17 percent reduction from Normal Year SFPUC supplies);
- About 25 MG/yr (75 AFY) from the District's Pilarcitos Creek wells (a 50 percent reduction from Normal Year supplies);
- About 20 MG/yr (60 AFY) of groundwater from the District's Denniston Project (a 50 percent reduction from Normal Year supplies); and
- About 100 MG/yr (305 AFY) of surface water from the District's Denniston Project (a 50 percent reduction from Normal Year supplies).

In Single Dry Years the District plans to use its available local supplies first, and then purchase the maximum available supplies from SFPUC to minimize required demand reductions by its customers.

Table 7-4 shows the anticipated Single Dry Year Supplies through 2035.

Table 7-4. Single Dry Year Water Supply, AFY

	FY 2009/10 (actual)	2015	2020	2025	2030	2035
Supplies Purchased from SFPUC	2,038	2,032	2,032	2,032	2,032	2,032
Pilarcitos Creek Wells	136	75	75	75	75	75
Denniston Groundwater	19	60	60	60	60	60
Denniston Surface Water	72	305	305	305	305	305
Total	2,265	2,472	2,472	2,472	2,472	2,472
% of Normal	100%	87%	89%	88%	86%	78%

7.2.2 Single Dry Year Demand

The District's projected Single Dry Year demands assume a reduction from Normal Year Demands of about 11 to 22 percent as a result of customer's awareness of the need to conserve water and the District's implementation of water conservation measures and education programs. The demand reductions for 2015 through 2030 (ranging from 11 to 14 percent) are consistent with those assumed under Stage 2 of the District's Water Shortage Contingency Plan (described in Chapter 8). The 22 percent reduction in 2035 is consistent with reductions assumed under Stage 3 of the District's Water Shortage Contingency Plan.

Projected Single Dry Year demands through 2035 are shown in Table 7-5.

Table 7-5. Single Dry Year Water Demands, AFY

	FY 2009/10 (actual)	2015	2020	2025	2030	2035
Demand	2,265	2,472	2,472	2,472	2,472	2,472
% of Normal	100%	87%	89%	88%	86%	78%

7.2.3 Single Dry Year Comparison

As shown in Table 7-6, with a reduction in demands as a result of water conservation, the District's Single Dry Year supplies are adequate to meet projected Single Dry Year demands.

Table 7-6. Supply and Demand Comparison—Single Dry Year, AFY (DWR Table 33)

	FY 2009/10 (actual)	2015	2020	2025	2030	2035
Supply Totals	2,265	2,472	2,472	2,472	2,472	2,472
Demand Totals	2,265	2,472	2,472	2,472	2,472	2,472
Difference	0	0	0	0	0	0
Difference as % of Supply	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Difference as % of Demand	0%	0%	0%	0%	0%	0%

Figure 7-2 shows the District's supplies and demands under Single Dry Year conditions through 2035.

7.3 MULTIPLE DRY YEARS SUPPLY AND DEMAND COMPARISON

7.3.1 Multiple Dry Year Supply

As described in Chapter 3, the District's Multiple Dry Year supplies are anticipated to be as follows:

- First Year
  - District supplies will be the same as the Single Dry Year supplies (see discussion above)

- Second Year
  - Up to about 575 MG/yr (1,765 AFY) of purchased supplies from the SFPUC (about a 28 percent reduction from Normal Year SFPUC supplies);
  - No supply from the District's Pilarcitos Creek wells (a 100 percent reduction from Normal Year supplies);
  - About 8 MG/yr (24 AFY) of groundwater from the District's Denniston Project (an 80 percent reduction from Normal Year supplies); and
  - About 40 MG/yr (122 AFY) of surface water from the District's Denniston Project (an 80 percent reduction from Normal Year supplies).
- Third Year
  - Up to about 575 MG/yr (1,765 AFY) of purchased supplies from the SFPUC (about a 28 percent reduction from Normal Year SFPUC supplies);
  - No supply from the District's Pilarcitos Creek wells (a 100 percent reduction from Normal Year supplies);
  - No supply of groundwater from the District's Denniston Project (a 100 percent reduction from Normal Year supplies); and
  - No supply of surface water from the District's Denniston Project (a 100 percent reduction from Normal Year supplies).

It should be noted that in the second and third years of the multiple dry year period, the District will likely take advantage of 150 AFY interruptible supplies that it normally provides to the Skylawn Cemetary for irrigation purposes. In these dry years, these supplies would not longer be delivered to the Skylawn Cemetary and would then become available to the District to meet other more critical water demand needs.

As in Single Dry Years, in Multiple Dry Years, the District plans to use its available local supplies first, and then purchase the maximum available supplies from SFPUC to minimize required demand reductions by its customers.

Table 7-7 shows the anticipated Multiple Dry Year Supplies through 2035.

Table 7-7. Multiple Dry Year Water Supply, AFY

		3-Year Dry Period Beginning				
		2015	2020	2025	2030	2035
Multiple-dry year first year supply	Supplies Purchased from SFPUC	2,032	2,032	2,032	2,032	2,032
	Pilarcitos Creek Wells	75	75	75	75	75
	Denniston Groundwater	60	60	60	60	60
	Denniston Surface Water	305	305	305	305	305
	Interruptible Supply	0	0	0	0	0
	Total Supply	2,472	2,472	2,472	2,472	2,472
Multiple-dry year second year supply	Supplies Purchased from SFPUC	1,765	1,765	1,765	1,765	[a]
	Pilarcitos Creek Wells	0	0	0	0	[a]
	Denniston Groundwater	24	24	24	24	[a]
	Denniston Surface Water	122	122	122	122	[a]
	Interruptible Supply	150	150	150	150	[a]
	Total Supply	2,061	2,061	2,061	2,061	[a]
Multiple-dry year third year supply	Supplies Purchased from SFPUC	1,765	1,765	1,765	1,765	[a]
	Pilarcitos Creek Wells	0	0	0	0	[a]
	Denniston Groundwater	0	0	0	0	[a]
	Denniston Surface Water	0	0	0	0	[a]
	Interruptible Supply	150	150	150	150	[a]
	Total Supply	1,915	1,915	1,915	1,915	[a]

[a] The District's supplies beyond 2035 have not been evaluated for this 2010 UWMP. These future supplies will be evaluated in the District's 2015 UWMP.

7.3.2 Multiple Dry Year Demand

The District's projected Multiple Dry Year demands assume the following reductions from Normal Year Demands.

- Demand reductions in the first year are assumed to be consistent with the Single Dry Year demand reductions of about 11 to 22 percent as a result of customer's awareness of the need to conserve water and the District's implementation of water conservation measures and education programs; these reductions are consistent with those assumed under Stages 2 and 3 of the District's Water Shortage Contingency Plan.
- Demands in the second year of a three-year multiple dry year period are assumed to be further reduced from the first year of the three-year multiple dry period and are assumed to be reduced by 26 to 29 percent; these reductions are consistent with those assumed under Stage 3 of the District's Water Shortage Contingency Plan.

- Demands in the third year of a three-year multiple dry year period are assumed to be further reduced from the first and second years of the three-year multiple dry period and are assumed to be reduced by 32 to 36 percent; these reductions are consistent with those assumed under Stage 4 of the District's Water Shortage Contingency Plan.

Projected Multiple Dry Year demands through 2035 are shown in Table 7-8.

Table 7-8. Multiple Dry Year Water Demands, AFY

	3-Year Dry Period Beginning				
	2015	2020	2025	2030	2035
Multiple-dry year first year demand[(a)]	2,472	2,472	2,472	2,472	2,472
Multiple-dry year second year demand[(b)]	2,061	2,061	2,061	2,061	[(c)]
Multiple-dry year third year demand[(d)]	1,915	1,915	1,915	1,915	[(c)]

(a) Demands in the first year of a three-year multiple dry year period are assumed to be the same as the single dry year demands and are about 78 to 89 percent of normal year demands.
(b) Demands in the second year of a three-year multiple dry year period are assumed to be further reduced from the first year of the three-year multiple dry period and are about 71 to 74 percent of normal year demands.
(c) The District's demands beyond 2035 have not been evaluated for this 2010 UWMP. These future demands will be evaluated in the District's 2015 UWMP.
(d) Demands in the third year of a three-year multiple dry year period are assumed to be further reduced from the first and second years of the three-year multiple dry period and are about 64 to 68 percent of normal year demands.

7.3.3 Multiple Dry Year Comparison

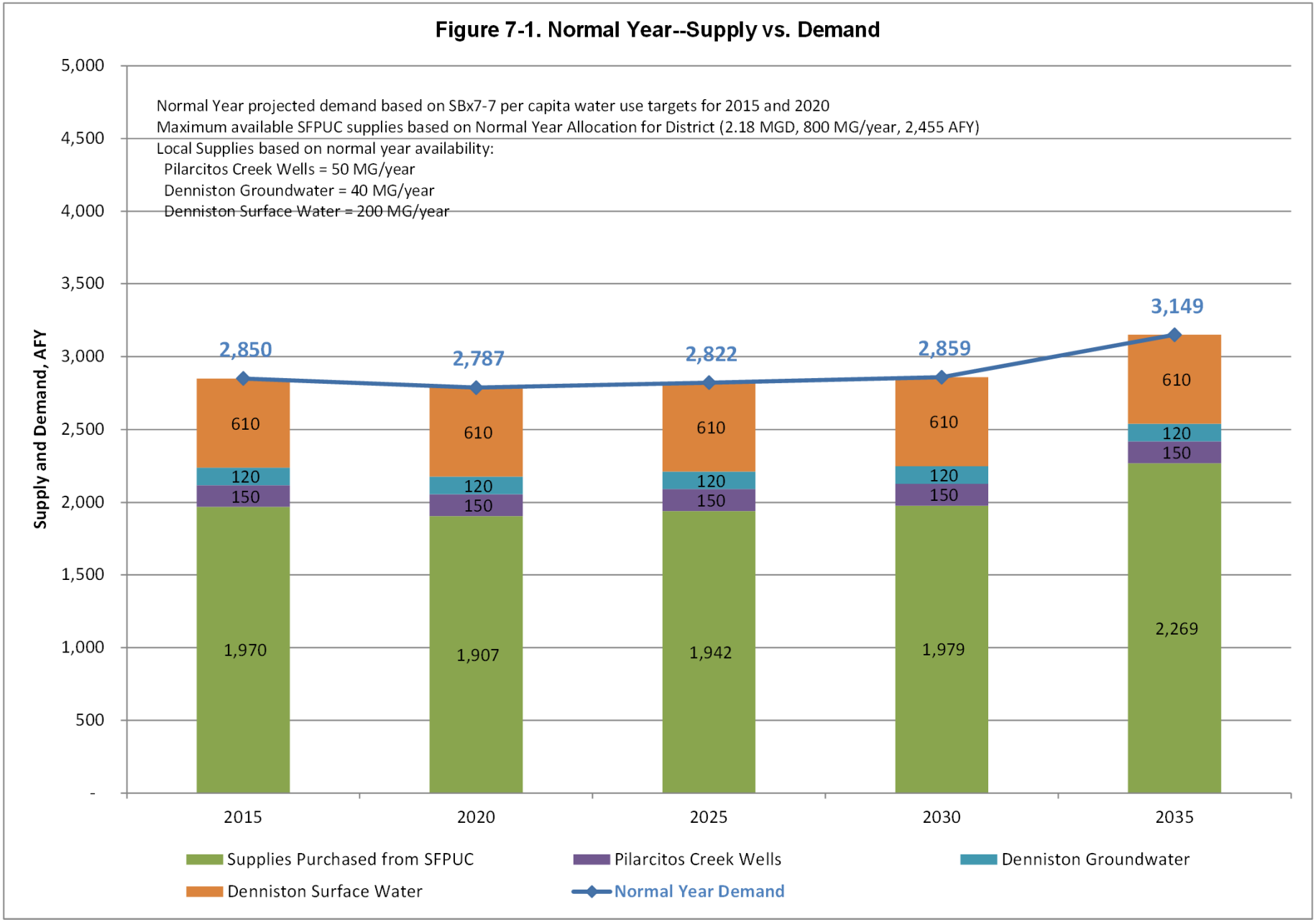
As shown in Table 7-9, with a reduction in demands as a result of water conservation and the use of the District's interruptible supplies in the second and third dry years, the District's Multiple Dry Year supplies are adequate to meet projected Multiple Dry Year demands.

Table 7-9. Supply and Demand Comparison—Multiple Dry Year, AFY (DWR Table 34)

		3-Year Dry Period Beginning				
		2015	2020	2025	2030	2035
Multiple-dry year first year supply	Supply Totals	2,472	2,472	2,472	2,472	2,472
	Demand Totals	2,472	2,472	2,472	2,472	2,472
	Difference	0	0	0	0	0
	Difference as % of Supply	0%	0%	0%	0%	0%
	Difference as % of Demand	0%	0%	0%	0%	0%
Multiple-dry year second year supply	Supply Totals	2,061	2,061	2,061	2,061	[a]
	Demand Totals	2,061	2,061	2,061	2,061	[a]
	Difference	0	0	0	0	[a]
	Difference as % of Supply	0%	0%	0%	0%	[a]
	Difference as % of Demand	0%	0%	0%	0%	[a]
Multiple-dry year third year supply	Supply Totals	1,915	1,915	1,915	1,915	[a]
	Demand Totals	1,915	1,915	1,915	1,915	[a]
	Difference	0	0	0	0	[a]
	Difference as % of Supply	0%	0%	0%	0%	[a]
	Difference as % of Demand	0%	0%	0%	0%	[a]

[b] The District's supplies and demands beyond 2035 have not been evaluated for this 2010 UWMP. These future supplies and demands will be evaluated in the District's 2015 UWMP.

Figure 7-3 shows the District's supplies and demands under Multiple Dry Year conditions through 2035.



Coastside County Water District
2010 Urban Water Management Plan Update

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Last Revised: 03-28-11

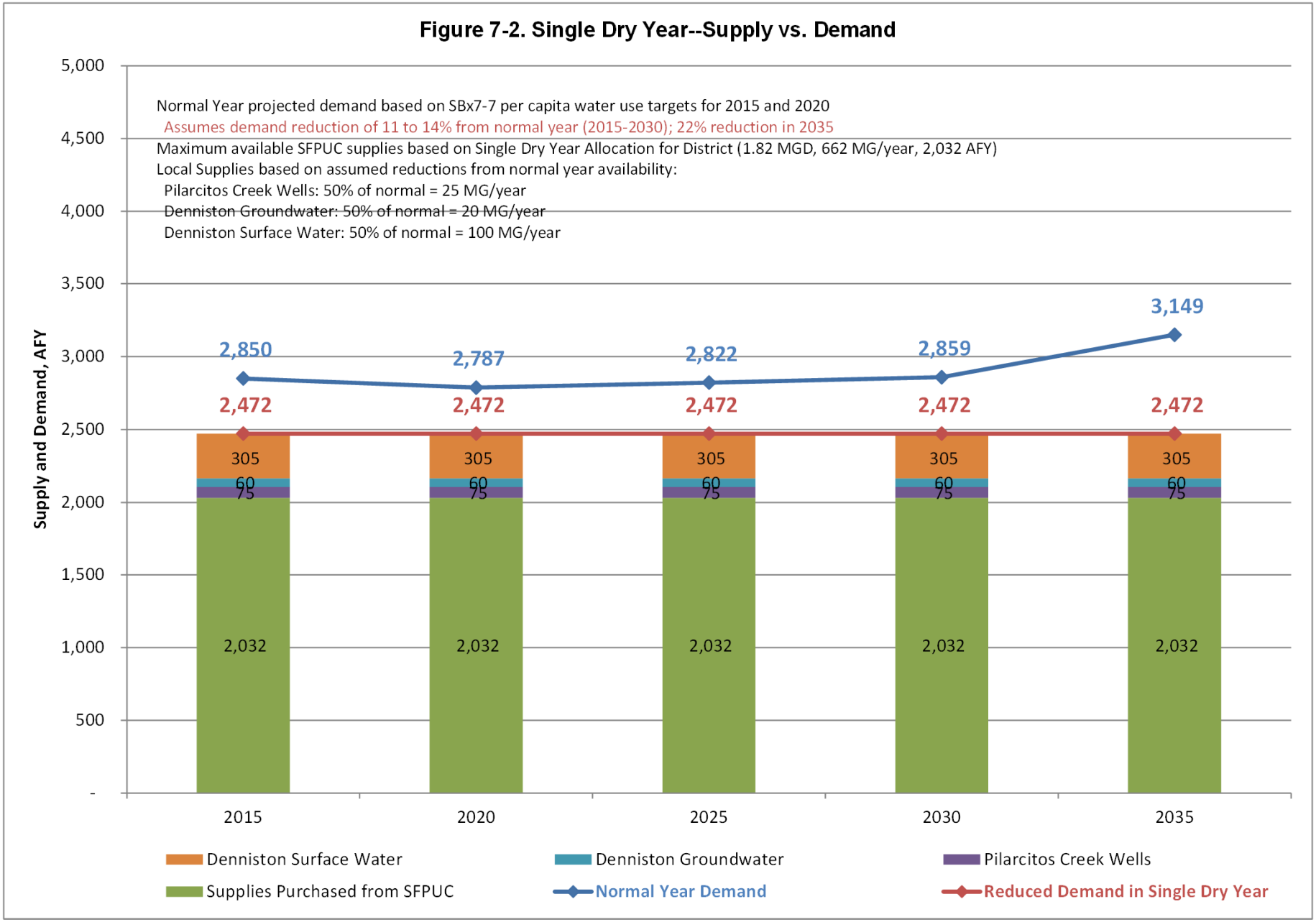
Figure 7-2. Single Dry Year--Supply vs. Demand
Normal Year projected demand based on SBx7-7 per capita water use targets for 2015 and 2020
Assumes demand reduction of 11 to 14% from normal year (2015-2030); 22% reduction in 2035
Maximum available SFPUC supplies based on Single Dry Year Allocation for District (1.82 MGD, 662 MG/year, 2,032 AFY)
Local Supplies based on assumed reductions from normal year availability:
Pilarcitos Creek Wells: 50% of normal = 25 MG/year
Denniston Groundwater: 50% of normal = 20 MG/year
Denniston Surface Water: 50% of normal = 100 MG/year
Supply and Demand, AFY
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
-
2,850
2,787
2,822
2,859
3,149
2,472
2,472
2,472
2,472
2,472
305
305
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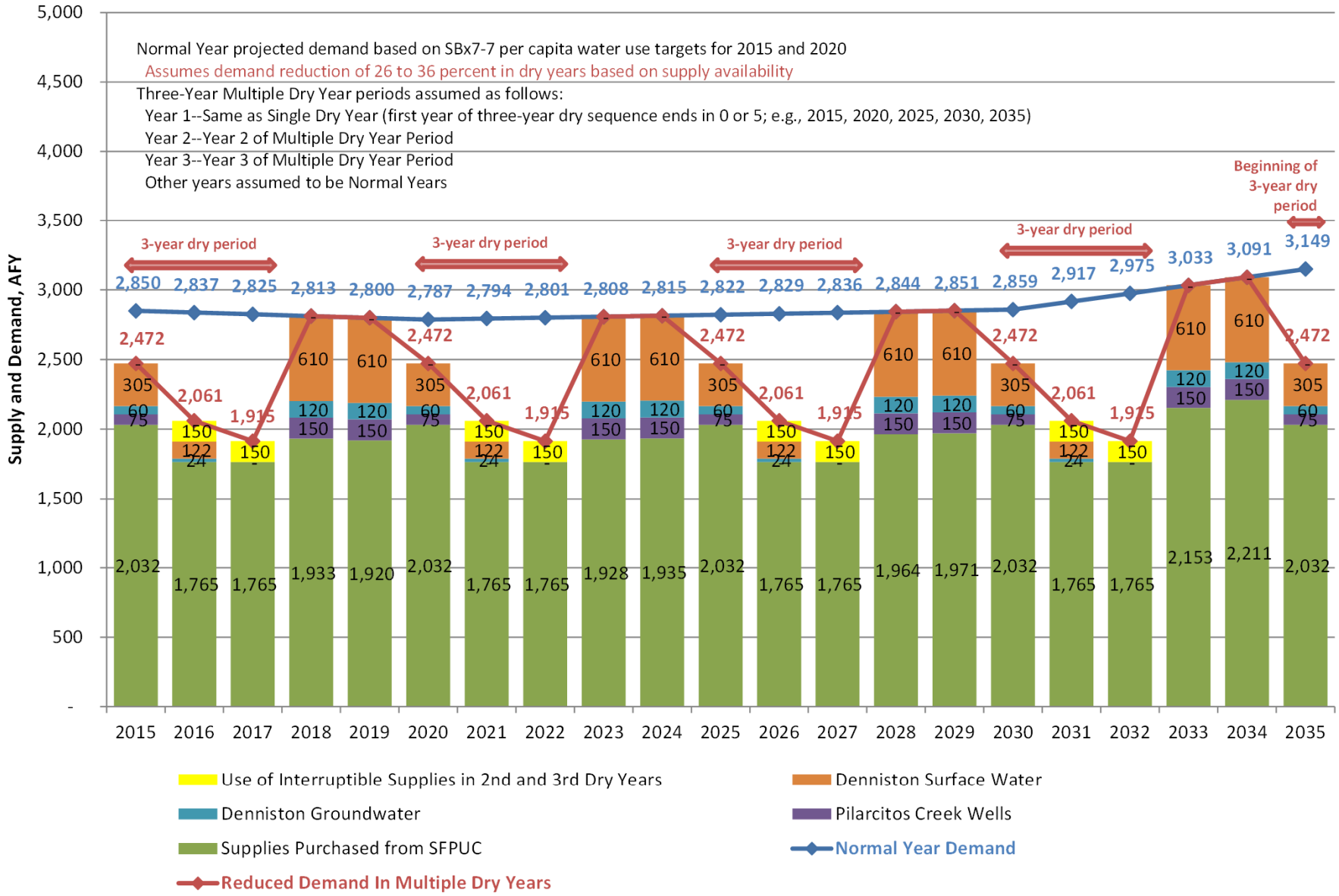
75
75
75
2,032
2,032
2,032
2,032
2,032
2015
2020
2025
2030
2035
Denniston Surface Water
Denniston Groundwater
Pilarcitos Creek Wells
Supplies Purchased from SFPUC
Normal Year Demand
Reduced Demand in Single Dry Year

Figure 7-3. Multiple Dry Year--Supply vs. Demand



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Last Revised: 03-28-11

Coastside County Water District
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8.1 OVERVIEW

Water Code § 10632

The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

(b) 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.

(c) 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.

(d) 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.

(e) 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.

(f) Penalties or charges for excessive use, where applicable.

(g) 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.

(h) A draft water shortage contingency resolution or ordinance.

(i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

This chapter describes the District's Water Shortage Contingency Plan (WSCP) which was adopted by the District Board of Directors on April 12, 2011. A copy of the District's WSCP is provided in Appendix I. This recently adopted WSCP is an update to the WSCP contained in the District's 2005 UWMP.

8.2 STAGES OF ACTION

The District's WSCP provides five stages of response based on increasing severity, as progressively more serious conditions warrant. This type of response would be appropriate to a drought, emergency supply outage condition, or other water shortages. These stages would be declared by the Board of Directors, as recommended by staff. Each water shortage episode is unique and will require individual water use restrictions to fit those unique circumstances.

Table 8-1 summarizes the five stages, their triggers, and their corresponding water use reduction objectives.

Table 8-1. Rationing Stages to Address Water Supply Shortages (DWR Table 35)		
Stage Number	Water Supply Condition	Supply Shortage (%) (Demand Reduction Objective %)
1	Water Shortage Advisory	0 to 5%
2	Water Shortage Warning	5 to 10%
3	Water Shortage Emergency	10 to 20%
4	Severe Water Shortage Emergency	20 to 30%
5	Critical Water Shortage Emergency	30 to 50%

As described in Chapter 3, the District is dependent on imported water purchased from the SFPUC. Therefore, the SFPUC's determination will be critical to implementing the District's WSCP and determining which stage will be implemented.

The SFPUC will notify the District by April 15th of each year if there will be a water shortage. The magnitude of the water shortage will be determined by June 1st and the District's allocation from the SFPUC will become effective July 1st.

The District monitors local precipitation to assist in determining the adequacy of local surface and groundwater sources. During periods of less than normal precipitation, the District will make a determination on how productive local sources will be for the upcoming fiscal year.

The District will evaluate the SFPUC supply reduction and the District's projected reduction in local supplies to determine the total reduction in production and the corresponding needed reduction in demand to be implemented on July 1st.

8.3 CATASTROPHIC SUPPLY INTERRUPTION PLAN

8.3.1 SFPUC Supplies

With respect to emergency response for the SFPUC Regional Water System, the SFPUC has prepared the *SFPUC Regional Water System Emergency Response and Recovery Plan* (ERRP), completed in 2003 and updated in 2006. The purpose of this plan is to describe the SFPUC RWS emergency management organizations, roles and responsibilities within those organizations, and emergency management procedures. This contingency plan addresses how to respond to and to recover from a major RWS seismic event, or other major disaster. The ERRP complements the other SFPUC emergency operations plans at the Department, Division and Bureau levels for major system emergencies.

The SFPUC has also prepared in an *SFPUC-Suburban Customer Water Supply Emergency Operations and Notification Plan.* The plan was first prepared in 1996 and has been updated several times – most recently in July of 2010. The purpose of this plan is to provide contact information, procedures and guidelines to be implemented by the following entities when a potential or actual water supply problem arises: the SFPUC Water Supply and Treatment Division (WS&TD), Water Quality Bureau (WQB), and SFPUC wholesale customers,

BAWSCA, and City Distribution Division (CDD – considered to be a customer for the purposes of this plan). For the purposes of this plan, water quality issues are treated as potential or actual supply problems. SFPUC's water transmission system is primarily gravity fed, from the Hetch Hetchy Reservoir to the City and County of San Francisco. Within San Francisco's in-city distribution system, the key pump stations have generators in place and all others have connections in place that would allow portable generators to be used.

Although water conveyance throughout the RWS would not be greatly impacted by power outages because it is gravity fed, the SFPUC has prepared for potential regional power outages as follows:

- The Tesla disinfection facility, the Sunol Valley Water Treatment Plant, and the San Antonio Pump Station, have back-up power in place in the form of generators or diesel powered pumps. Additionally, both the Sunol Valley Water Treatment Plant and the San Antonio Pump Station would not be impacted by a failure of the regional power grid because it runs off of the SFPUC hydro-power generated by the RWS.
- Both the Harry Tracy Water Treatment Plant and the Baden Pump Station have back-up generators in place.
- Additionally, the WSIP includes projects which will expand the SFPUC's ability to remain in operation during power outages and other emergency situations.

8.3.2 Local Supplies

If local sources were impacted by a drought or a natural disaster, the District would rely more on SFPUC's Upper Crystal Springs Reservoir, as a source of water. However, raw water from Upper Crystal Springs Reservoir must be pumped over the Cahill Ridge to the Nunes Water Treatment Plant, which requires electricity.

During a power outage or facility failure at the Crystal Springs Pump Station, the District would rely on the Denniston Project, Pilarcitos Lake and Pilarcitos Creek wells (Pilarcitos Creek wells can only be operated from November through March). If the water level in Pilarcitos Lake is below the outlet, with permission from the SFPUC, the District could set up a temporary pumping system to draw water out of Pilarcitos Lake to supply the District. The District's Nunes Water Treatment Plant has a generator that can operate the plant during a power failure and the District has a portable generator on a trailer that can be deployed where it is needed.

The District office and corporation yard have sufficient water and emergency rations to support a full crew for three days. An emergency generator is maintained in operable condition at all times at the District office and corporation yard.

8.3.3 Emergency Water Supply Agreement

The District and MWSD entered into an agreement on October 18, 2010 for the mutual benefit of both districts, to provide a temporary, interruptible supply of water for use during a water shortage emergency.

For the purposes of this agreement, emergency water supply is defined as a temporary and interruptible supply of water to help alleviate a water shortage emergency. The water shortage emergency is when ordinary demands and requirements of the District's water users cannot be satisfied without depleting its water supply to the extent that there would be insufficient water for human consumption, sanitation and fire protection. The water shortage emergency has to be due to a lack of water supply caused by circumstances outside the District's reasonable control or damage to the water system facilities, as a result of a "Force Majeure". For the purposes of this agreement, Force Majeure means; fire, flood, earthquake, natural calamity or acts of God, and governmental action or inaction.

The implementation of this agreement is still under review by both agencies, but the District would likely only receive an emergency water supply from the MWSD during a critical water shortage emergency, as defined in this Plan.

8.4 PROHIBITIONS, CONSUMPTION REDUCTION METHODS AND PENALTIES

8.4.1 Water Waste Ordinance

The District originally adopted an ordinance (Ordinance No. 1997-01) in 1997 that established rules and regulations prohibiting wasteful water use during a normal water supply situation and providing enforcement thereof. This ordinance was updated in October 2008 (Ordinance No. 2008-01) to conform to the CUWCC's memorandum of understanding (MOU) for best management practices. A copy of the District's current adopted Water Waste Ordinance is included in Appendix I of this 2010 UWMP.

During times of mandatory rationing, this ordinance will not apply. The District will need to implement, with the Board of Directors approval, additional and specific regulations to prevent water waste during periods of mandatory rationing.

8.4.2 Consumption Reduction Measures

Table 8-2 describes the consumption reduction measures associated with each stage of the District's WSCP.

Table 8-2. Requested and Mandatory Water Use Prohibitions and Consumption Reduction Methods (DWR Tables 36 and 37)

Stage	Overview of Actions for Each Stage	Requested and Mandatory Consumer Actions	Water Use Reduction (%)
1	Under Stage 1, the public is informed as early as meaningful data are available that a possible shortage may occur. The District's water waste ordinance would be enforced to the maximum extent possible. The District would request voluntary water conservation to encourage behavior changes and a reduction in irrigation. District staff would assess local sources and begin to prepare for implementation of mandatory rationing. This stage relies heavily on voluntary cooperation and support of customers to meet consumption reduction goals.	• Enforce water waste ordinance to the maximum extent • Implement a public information campaign • Coordinate with the BAWSCA and the SFPUC • Coordinate and communicate actions with all District staff • Implement a supply, production and consumption monitoring and reporting plan • Plan for continuation and escalation of water shortage conditions • Encourage leak detection and repair • Educate public on water waste prohibitions	0 to 5%
2	If water supply conditions worsen, Stage 2 would begin to implement mandatory restrictions on water use. This stage would be a transitional stage to prepare customers and the District for the Water Shortage Emergency.	• Continue with actions and measures from Stage 1 • Escalate public information campaign • Encourage meter reading by customers, so they can track their own water usage • Perform outreach to major customers, regarding water supply status • Designate days and times that irrigation is allowed, if voluntary measures are not meeting goals • Study the impacts to revenue and develop a budget strategy for mitigating losses • Inform the City of Half Moon Bay and the County of San Mateo of water supply status • Inform the Coastside Fire Protection District of water supply status and request cooperation in reducing training exercises • Prohibit the cleaning of exterior surfaces • Suspend routine flushing of water mains • Emphasize leak detection and repair for the system and customers	5 to 10%
3	Stage 3 escalates mandatory restrictions and transitions into water allocations. The District would transition into water allocations, if it hasn't already needed to implement allocations. Restrictions would emphasize reducing or prohibiting decorative landscape irrigation for commercial and residential customers. Penalties and surcharges would be implemented for non-compliance with mandatory restrictions.	• Continue with actions and measures taken in stages 1 and 2 • Establish a hotline to respond to questions and reports of water waste • Implement residential and non-residential water allocations • Consider going to system-wide monthly billing • Consider a temporary moratorium on new connections • Consider implementing drought rates and drought surcharges • Consider prohibiting the installation of new lawn (turf) • Provide information on legal gray water use for irrigation • Contact the Coastside Fire Protection District and consider eliminating fire training exercises that use water • Evaluate water waste prohibitions and consider adding more prohibitions	10 to 20%
4	Stage 4 would include mandatory restrictions and water allocations. At this stage decorative landscape irrigation would be prohibited and residential allocations would be severely reduced from the previous stage. Penalties and surcharges would continue to be implemented for non-compliance with mandatory restrictions.	• Continue with actions and measures taken in stages 1, 2 and 3 • Adjust residential and commercial allocations for a more severe water shortage • Consider the prohibition of all new landscape installation • Only allow irrigation for the survival of approved trees and edible crops • Schedule staff for enforcement and customer service on the weekends • Prohibit on-site fleet, dealership and residential vehicle washing • Prohibit the use of portable meters, except for sewer agency • Consider deferring capital improvement projects	20 to 30%
5	Stage 5 is the most severe. The need for demand reduction could include a combination of mandatory measures, penalties and rate surcharges. Allocations would be implemented to meet the minimum health and safety standards. This could be used as the last stage of a progressive situation, such as a drought of increasing severity, or to address an immediate crisis, such as; a facility failure, natural disaster or power failure.	• Continue with actions and measures from stages 1, 2, 3 and 4 • Adjust allocations for a critical water shortage emergency • Provide special notification to major users and the hospitality industry in the area • Close public pools and public showers • Prohibit water used for recreational purposes (showers and restrooms at public parks and camping facilities) • Consider purchasing bottled water to provide to customers for nominal charge or free of charge • For extended catastrophic emergencies consider the use of a portable treatment plant (membrane) to treat groundwater, brackish water or saltwater to supplement water supplies	30 to 50%

8.4.3 Water Use Allocations

In developing the allocations among the different sales categories and stages, the needs for public health and a healthy economy were considered. During a water shortage, the priority for public health, sanitation and safety are given priority over other water uses.

Table 8-3 shows the residential water supply allocations at the different stages of a water shortage. This table shows the progression of reducing residential demand during the different water shortage stages and confirms that enough water has been allocated to meet the basic domestic sanitation needs of the residential population. The baseline (zero deficiency) is based on the most recent five-year average demand by sales class. The most severe water shortage stage allocates approximately 34 gallons per day per person. With high efficiency fixtures and significant hardship, 34 gallons per day per person should provide sufficient water to meet the health and safety standards for residential customers. There will be some individuals with special medical needs that will need additional water allocated and any rationing scenarios implemented will need to take into account customers with special needs.

Table 8-3. Residential Water Use Allocation by Stage

Stage	Percent of Allocation	Estimated Residential Per Capita Water Use, gpcd
0	100%	61
1	95%	58
2	90%	55
3	80%	49
4	75%	46
5	58%	34

Additional information on these allocations, including allocations for non-residential customers, is provided in the District's WSCP contained in Appendix I.

8.4.4 Penalties and Charges

The District's Water Waste Ordinance includes penalties for violations of the provisions of the ordinance. These include an initial written notice, followed up by the installation of a flow-restricting device on the customer's service line if the customer fails to take remedial action within the time specified in the written notice. In the event that a further violation is observed by the District, after installation of a flow-restricting device, the District may discontinue service.

During prior water shortage periods, the District implemented excess use fees for residential customers who consumed more water than their allocation. The fees were determined based on an allocation formula that considered, among other things, the number of residents per residential housing unit. Other enforcement measures used by the District included the installation of flow restrictors on a water service and turning off water service for specified time periods.

Similar excess water use charges may be implemented again if the District's WSCP is implemented and if water use allocations are necessary (possibly in Stages 3, 4 and 5). In addition, the District may institute a water shortage surcharge to recover the increased costs of operations, maintenance and additional staffing needed for enforcement of rules and regulations (if authorized and approved per the requirements of Proposition 218).

Table 8-4 summarizes the District's warnings, penalties, and charges for excessive water use listed by water shortage stage.

Table 8-4. Penalties and Charges for Excessive Water Use (DWR Table 38)

Stage	Warnings, Penalties, and Charges
1	Per the District's Water Waste Ordinance (in place at times when mandatory rationing is not required): • Written notice to customer specifying the nature of the waste and the time of occurrence and directing the customer to take remedial action • If the customer continues such use or fails to take the remedial action within the time specified, the District may install a flow-restricting device on the customer's service line • In the event that a further violation is observed by the District, after installation of a flow-restricting device, the District may discontinue service The customer is responsible for paying the District's costs incurred in installing and removing a flow-restricting device and/or terminating and restoring service
2	
3	Once water use allocations are implemented, excess water use charges may be imposed. In addition, water shortage rates and surcharges may be imposed.
4	
5	

8.5 IMPACTS ON REVENUES AND EXPENDITURES

Successful water rationing programs lead to reduced water sales and reduced revenues. However, the District's expenditures do not decline in proportion to reduced sales because a large part of the District's expenditures are related to fixed capital costs, maintenance and operations. In addition, the District will pay more for imported water because the SFPUC will raise their wholesale rates to cover their reduced water sales and their increased administrative costs. During periods of rationing, the District's administrative costs and staffing costs will increase due to enforcement of new rules and complex billing structures.

Consequently, retail water rates will increase during years of water shortages when rationing programs are implemented. The District has an emergency reserve that it can use to cover a portion of the increased costs, until it can implement and realize the benefit of adjusted water rationing rates, surcharges and penalties. The District will need to follow Proposition 218 requirements for the drought rates, which might cause a slight delay in the actual implementation of the drought rates, unless these rates are previously established.

8.6 WATER USE MONITORING AND BILLING

The District monitors water sales by category on a monthly basis. Water sales by category (*e.g*., residential, commercial, restaurant, etc.) for each month are compared to water sales in the same month in the previous year and are evaluated for trends based on a 12-month running average (based on total residential water sales, total non-residential water sales, and total overall water sales). Similarly, the District monitors water production by source on a monthly basis and evaluates predicted versus actual production by source on a monthly basis. The General Manager provides a report to the Board of Directors each month on monthly water sales and monthly water production.

The District currently has a mix of monthly and bi-monthly billing. It would be beneficial for both the District and customers to have all customers on monthly billing during mandatory rationing. Monthly billing gives the customer faster feedback on meeting reduction goals and gives the District time to notify and work with customers having difficulty meeting reduction goals. For the District to go to monthly billing, it would require hiring additional temporary staff to read meters and process the customer service tasks.

8.7 SAMPLE DROUGHT ORDINANCE

The District has developed a sample Drought Ordinance which it would refine based on actual conditions to be adopted at the time of a water shortage. The sample Drought Ordinance is included as Appendix A of the District's WSCP (provided in Appendix I of this 2010 UWMP).

9.1 PLAN ADOPTION

Water Code §10642 After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

The 2010 Coastside County Water District UWMP Update was adopted by the District Board of Directors on June 14, 2011. The resolution for adoption by the District Board of Directors (Resolution No. 2011-09) is included in Appendix B.

9.2 PLAN SUBMITTAL TO DWR AND CALIFORNIA STATE LIBRARY

Water Code §10644 (a) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

Within 30 days of adoption of the 2010 UWMP, the adopted 2010 UWMP will be provided to the Department of Water Resources and the California State Library.

In addition, the District will submit the adopted 2010 UWMP to DWR using the DWR Online Submittal Tool (DOST) when the DOST system becomes available.

9.3 PROVISION OF ADOPTED PLAN TO CITIES, COUNTIES AND OTHER STAKEHOLDERS

Water Code §10635(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

Water Code §10644 (a) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

Within 30 days of adoption of the 2010 UWMP, the adopted 2010 UWMP, including the Water Supply Reliability section, will be provided to the following agencies:

- City of Half Moon Bay
- County of San Mateo – Planning
- San Francisco Public Utilities Commission (SFPUC)
- Bay Area Water Supply and Conservation Agency (BAWSCA)
- Sewer Authority Mid-Coastside (SAM)

9.4 PLAN AMENDMENTS AND CHANGES

Should this 2010 UWMP be amended or changed, copies of amendments or changes to the plan shall be submitted to DWR, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

9.5 PLAN AVAILABILITY

> *Water Code §10645 Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.*

Within 30 days of submitting the adopted 2010 UWMP to DWR, copies of the adopted 2010 UWMP will be made available during normal business hours at the following locations:

- Coastside County Water District, 766 Main Street, Half Moon Bay
- Half Moon Bay Library, 620 Correas Street, Half Moon Bay

A copy of the adopted 2010 UWMP will also be available on the District's website:

- Coastside County Water District website (http://www.coastsidewater.org)

9.6 PLAN IMPLEMENTATION

> *Water Code §10643 An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.*

The District is committed to the implementation of the programs discussed in this 2010 UWMP. In particular, the District will implement the conservation programs (described in Chapter 5) to reduce per capita water use and meet the District' SBx7-7 per capita water use targets for 2015 and 2020. Also, the District will continue to make water system improvements to enhance the reliability of the District's water supply portfolio to meet the future needs of the District's water service area.

10.1 REFERENCES

Association of Bay Area Governments (ABAG), 2009 Population Projections.

Balance Hydrologics, Inc., Midcoast Groundwater Study Phase III, San Mateo County, California, prepared for County of San Mateo Planning and Building Department, June 2010.

Bay Area Water Supply and Conservation Agency (BAWSCA), Urban Water Management Plan Common Language on SFPUC Supply Availability and Reliability, received March 2011.

California Department of Water Resources, Bulletin 118 California's Groundwater, 2003 Update.

California Department of Water Resources, Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan, Final March 2011.

California Irrigation Management Information System (CIMIS) website (http:/wwwcimis.water.ca.gov), Historical Climate Data for Station #104 (DeLaveaga) located near Santa Cruz, California..

City of Half Moon Bay, 2007-2014 Housing Element, certified June 25, 2010.

Coastside County Water District, 2005 Urban Water Management Plan, adopted December 13, 2005.

Coastside County Water District, Water Shortage Contingency Plan, adopted April 12, 2011.

County of San Mateo, Housing Sub-Element, 2004.

De Novo Planning Group, City of Half Moon Bay Housing Element, Public Review Draft, prepared for City of Half Moon Bay, June 2009.

Earth Sciences Associates, Groundwater Development Potential in the Half Moon Bay and El Granada Area, August 1986.

Kleinfelder, Midcoast Groundwater Study Phase II , San Mateo County, California, prepared for County of San Mateo Planning and Building Department, January 8, 2007 (revised October 2008) (Summary and Errata dated April 2009).

Maddaus Water Management, Updates to DSS Model for 2010 Urban Water Management Plan, March 1, 2011.

San Francisco Public Utilities Commission, Letter from Paula Kehoe to Nicole Sandkulla of BAWSCA describing regional water system supply reliability for use in wholesale customer's 2010 UWMP, dated March 31, 2011.

Todd Engineers and Kennedy/Jenks Consultants, Lower Pilarcitos Creek Groundwater Basin Study, June 2003.

United States Census Bureau, Historical (1990 and 2000) Service Area Population.

Western Regional Climate Center website (http://www.wrcc.dri.edu), Historical Rainfall Data for Half Moon Bay, California.