



**Estero Municipal Improvement District (EMID)
Serving City of Foster City/Part of City of San Mateo**

2010-2015 URBAN WATER MANAGEMENT PLAN

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Section 1 Plan Preparation

Public Participation

Estero Municipal Improvement District (EMID) has encouraged community participation in its Urban Water Management Planning efforts. Public notices were published in the local newspapers in accordance with Government Code Section 6066. The Public Notice and the draft Urban Water Management Plan (UWMP) were posted on the City's website. Draft copies were also made available for review at the District offices. Copies were also sent to anyone who requested it. The final UWMP was adopted at the May 16, 2011 District Board meeting. Appendix A is the EMID Resolution which formally adopted the UWMP.

Coordination

EMID is a member of the Bay Area Water Supply and Conservation Agency (BAWSCA). BAWSCA is a group of agencies and cities in the San Francisco Bay Area who share a common interest of purchasing water from SFPUC. BAWSCA meets regularly to share information and coordinate water related issues.

Within EMID, water conservation efforts by various departments are coordinated by the EMID District Manager. Various policies for water conservation efforts have been developed and adopted by the EMID Board of Directors.

Description of BAWSCA

BAWSCA was created on May 27, 2003 to represent the interests of the 26 agencies that include cities, water districts, a water company, and a university, in Alameda, Santa Clara and San Mateo counties that purchase water on a wholesale basis from the San Francisco Regional Water System (RWS). Collectively, the BAWSCA agencies are referred to as the Wholesale Customers.

BAWSCA is the only entity that has the authority to directly represent the needs of the wholesale customers that depend on the RWS. Through BAWSCA, the wholesale customers can work with the San Francisco Public Utilities Commission (SFPUC) on an equal basis to ensure the RWS is rehabilitated and maintained 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.

Compliance with the Urban Water Management Planning Act lies with each agency that delivers water to its customers. In this instance, the responsibility for completing an UWMP lies with the individual BAWSCA member agencies. BAWSCA's role in the development of

the 2010 UWMP updates is to work closely with its member agencies and the SFPUC to maintain consistency among the multiple documents being developed.

Coordination with Other Agencies

Table 1 summarizes the effort that EMID has made to inform the public and other water agencies regarding this update of the UWMP. A copy of the draft UWMP and Notice of Intention to Adopt were sent to all agencies listed in the table.

Table 1
Coordination with Appropriate Agencies

Entities	Contacted for Assistance	Sent Copy of Draft	Sent Notice of Intention to Adopt	Received Comments
SFPUC	✓	✓	✓	
BAWSCA	✓	✓	✓	✓
General Public	Published Meeting Notice	Available for Review	Published Meeting Notice	
San Mateo County		✓	✓	
City of San Mateo		✓	✓	
Mid Peninsula Water Agency		✓	✓	
California Water Service		✓	✓	

Plan Adoption, Submittal and Implementation

The Water Code Division 6 states that every urban water supplier with more than 3,000 customers or supplying more than 3,000 acre feet of water annually to its customers shall prepare and adopt the UWMP in accordance with the Urban Water Management Planning Act. EMID falls under both categories and therefore is required to prepare this update. EMID prepared this update in 2011. In accordance with the Urban Water Management Planning Act, the Plan was adopted by the EMID Board of Directors on May 16, 2011. The adopted plan will be sent to City of San Mateo and San Mateo County, no later than 60 days after submission of the plan. The previous version of the UWMP was prepared and adopted by the EMID Board of Directors on November 21, 2005.

By preparing this update, EMID is eligible to apply for Department of Water Resources (DWR) administered State grants, loans, and drought assistance when they are available. Once adopted, the UWMP will be submitted to the DWR within 30 days. The UWMP plan contains all information necessary to meet the requirements of the Urban Water Management Planning Act.

Section 2

System Description

Service Area Description

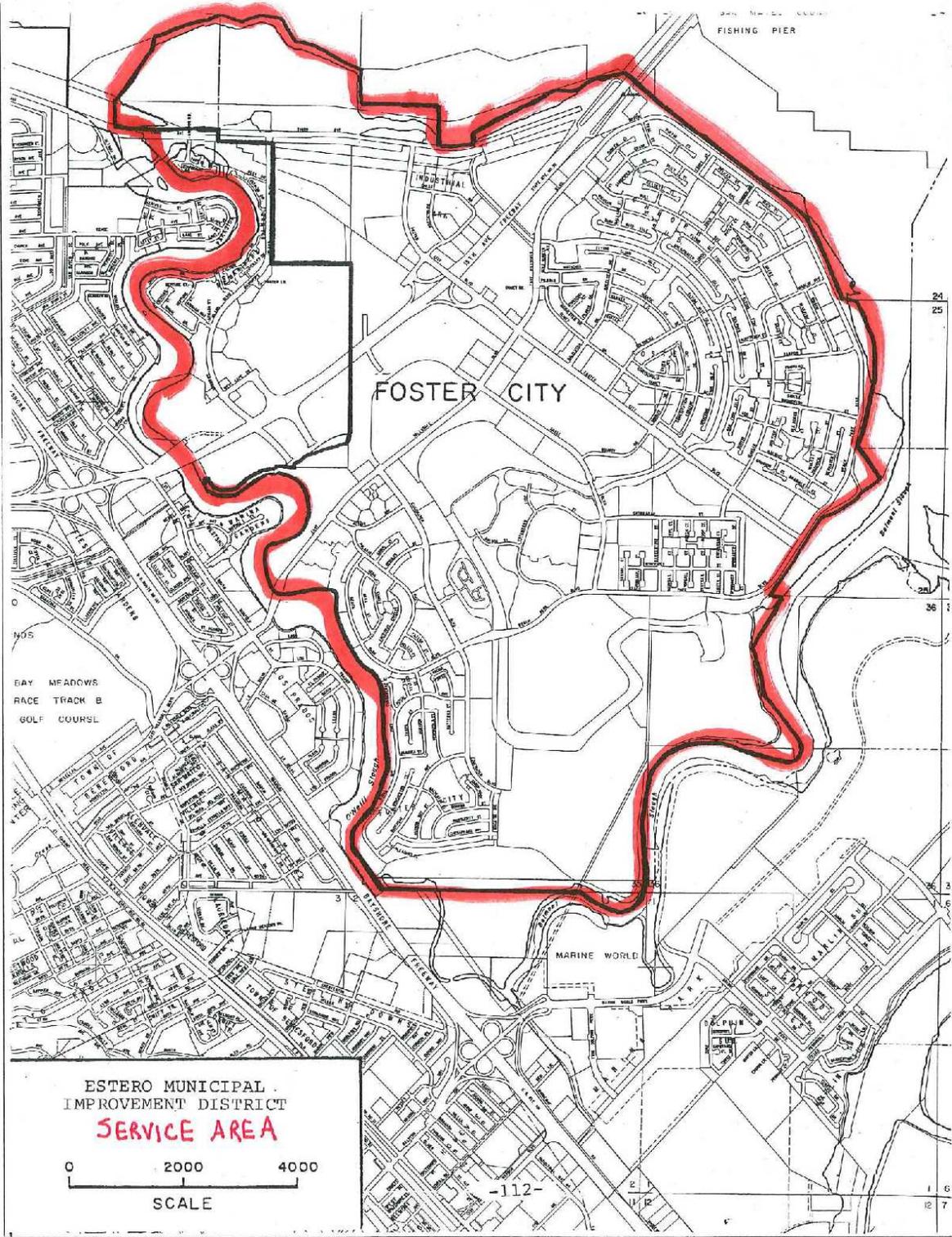
EMID, serving a population of approximately 36,100 is located midway between San Francisco and San Jose. It is ten miles south of San Francisco International Airport and adjacent to the entrance of the San Mateo/Hayward Bridge. The service area of EMID consists of the City of Foster City and the Mariner's Island area of the City of San Mateo (See Figure 1). EMID's customers are mostly residential with a broad cross-section of offices, commercial businesses, and a small number of industrial businesses. Water supply to EMID is provided via a single 24-inch transmission line connected to the SFPUC's 54-inch main Crystal Springs No. 2. The connection point is located in the City of San Mateo on Crystal Springs Road. EMID owns and operate three steel tanks and one concrete tank. Each steel tanks can store four million gallons and the concrete tank can store eight million gallons, for a total storage of twenty (20) million gallons.

A massive construction operation was necessary to convert the land to Foster City that we have today. Approximately eighteen million cubic yards of fill were necessary to provide gradient for the storm water runoff and cover for the utility lines as well as support for the buildings. Two hundred and twelve (212) acres of lagoons were created for collection of storm water which is pumped into the San Francisco Bay. To pay for these large front end costs and to operate the community during the early years prior to incorporation or annexation, the State created the EMID. The legislation provided for a turnover of control to the residents as they began occupying the city. By 1971, there were more than 10,000 residents, and they voted for incorporation as a city. Since then, public facilities, commercial development, and new homes have continued to be developed. Today, the City of Foster City is at approximately 99 percent build-out. The population is expected to increase due to multiple planned redevelopment projects.

Climate

The climate in the area served by EMID is mostly sunny. The average temperature for the year is around 60 degrees Fahrenheit. Average rainfall is less than 19 inches per year with the greatest rainfall occurring generally in December and January. Wind is generally from the north-west with the mean hourly velocity of 10 miles per hour.

Figure 1
EMID Service Area



Service Area Population

Table 2 shows the projected population within EMID service area from 2010 to 2035 in five (5) year increments. As shown in the table, population within EMID service area is projected to increase. The population has been increasing steadily since 1971 when the city was incorporated.

Table 2
Current and Projected Population ¹

	2010	2015	2020	2025	2030	2035
Service Area Population	36,100	37,088	37,924	38,492	38,869	39,223

¹ See Appendix J: Tab 3A, Attachment C Spreadsheet tool 2011-01-11 from BAWSCA.

Section 3 System Demands and Conservations

Senate Bill SBX7-7

Senate Bill 7-7, also known as SBX7-7 was enacted in November 2009 requiring water agencies to implement measures to increase water use efficiency. One major component in SBX7-7 is to reduce water use 20% by December 31, 2020. EMID's target demand, demand reductions to meet target demand, implementation plan, and economic impacts of SBX7-7 are described in this Section.

Gross Water Demands

Table 3 shows EMID's water purchases from 1995 to 2010 in units and in acre/feet.

**Table 3
Water Purchases from SFPUC
(Units and Acre/Feet) ¹**

Year	1995	1996	1997	1998	1999	2000	2001	2002
Water Purchases (Units)	2,448,053	2,556,067	2,758,362	2,557,951	2,717,973	2,775,419	2,828,678	2,680,119
Water Purchases (Acre/Feet)	5,620	5,868	6,332	5,872	6,239	6,371	6,493	6,152

Year	2003	2004	2005	2006	2007	2008	2009	2010
Water Purchases (Units)	2,574,271	2,704,052	2,552,238	2,574,403	2,704,223	2,648,725	2,476,909	2,355,079
Water Purchases (Acre/Feet)	5,909	6,207	5,859	5,910	6,208	6,081	5,686	5,407

As shown below in Table 4, EMID's gross water use projections without implementation of any conservation measures is projected to be 168 gallon per capita per day (gpcd) or 6.37 million gallons per day (MGD) in year 2020. However, with the implementation of the plumbing codes, Program Environmental Impact Report (PEIR) commitments, and Water Conservation Implementation Plan (WCIP) savings, the water use projection is reduced to 154 gpcd or 5.86 MGD. EMID's current master supply contract with SFPUC is 5.9 MGD. Analysis for 2025 and 2030 assume no change in gpcd consumption.

¹ 1 unit = 748 gallons, 1 acre/feet = 325,851 gallons

Table 4 ¹
Gross Water Use Projections

Year	Population Projections	Gross Water Use Projections with No Conservation		Gross Water Use Projects w/ Plumbing Codes and 2004 PEIR Commitments		Gross Water Use Projections with Plumbing Codes, 2004 PEIR Commitments, and WCIP Savings	
		Gpcd	MGD	gpcd	MGD	gpcd	MGD
2015	37,088	163	6.05	157	5.82	154	5.71
2020	37,924	168	6.37	160	6.07	154	5.84
2025	38,492	168	6.47	160	6.16	154	5.93
2030	38,869	168	6.53	160	6.22	154	5.99

Baselines and Target Projections

EMID's baseline demand is 161 gpcd using EMID's 10-year average consumption from June 1995 to June 2005. ² As shown in the Table 5, target demands using Method 1 of SBX7-7 are 143 gpcd for 2015 and 129 gpcd for 2020 ³. It also shows target projections of 153 gpcd for 2015 and 139 gpcd for 2020 if proposed projects identified in the 2008 Water Supply Assessment report ⁴ are included. Capacity of the water system is not a limiting factor for housing development (including Housing Element) identified in the General Plan, which includes the housing projects identified in the 2008 WSA Report.

1 From Tab 3C, Attachment C Spreadsheet tool 2011-01-11 from BAWSCA. See Appendix J.

2 From Tab 5-A8, Attachment C Spreadsheet tool 2011-01-11 from BAWSCA. See Appendix J.

3 From Tab 3C, Attachment C Spreadsheet tool 2011-01-11 from BAWSCA. See Appendix J.

4 In October of 2008, EMID prepared the Water Supply Assessment Report for Gilead Sciences Corporate Campus, Mirabella San Francisco Bay/Parkview Plaza, Chess/Hatch Drive Office, and Pilgrim/Triton projects. The WSA concluded that 432 AFY or 0.40 MGD of additional demand will be generated from the proposed projects, resulting in additional 10 gpcd.

Table 5
Baseline Demand and SBX7-7 Target Projections

Year	Projected Population	Current Baseline Demand (10-year average)		SBX7-7 Method 1 Target		SBX7-7 Method 1 Plus 2008 WSA Target		
		gpcd	MGD	gpcd	MGD	gpcd	MGD	AFY
2015	37,088	161	5.97	143	5.30	153	5.67	6361
2020	37,924	161	6.11	129	4.89	139	5.27	5909
2025	38,492	161	6.20	129	4.97	139	5.35	5998
2030	38,869	161	6.26	129	5.01	139	5.40	6057

Current Baseline Demand and SBX7-7 Target Comparison

Table 6 shows conservation requirements based on SBX7-7 target projections. To meet the SBX7-7 target projections, EMID must reduce its consumption by 8 gpcd or 0.30 MGD in 2015 and 22 gpcd or 0.84 MGD in 2020.

Table 6
Conservation Requirements

Year	Current Baseline Demand		SBX7-7 Method 1 Plus 2008 WSA		Conservation Requirement Relative to SBX7-7 Plus 2008 WSA	
	gpcd	MGD	Gpcd	MGD	gpcd	MGD
2015	161	5.97	153	5.67	8	0.30
2020	161	6.11	139	5.27	22	0.84
2025	161	6.20	139	5.35	22	0.85
2030	161	6.26	139	5.40	22	0.86

Water Use Reduction Plan

EMID is already reducing water consumption. Conservation-based water rates were implemented in July 2010, for residential and irrigation customers, and additional water savings has already been realized. As shown in Table 7, water consumption for the period July 1, 2010 – February 28, 2011 is 3.8% lower than during the same period for the previous year for these classifications.

Table 7
Water Consumption (units)
July 1 to February 28¹

	7/1/09- 2/28/10	7/1/10- 2/28/11	Change	%
Single-Family	500,799	469,136	(31,663)	(6.3)
Multi-Family				
Duplexes	2,914	2,890	(24)	(0.8)
Townhomes	140,643	135,339	(5,304)	(3.8)
Apartments/Condos	420,157	420,057	(100)	(0.0)
Irrigation	426,641	406,646	(19,995)	(4.7)
Total	1,491,154	1,434,068	(57,086)	(3.8)

EMID's conservation based rates, combined with its water rebate programs, education programs, and other conservation efforts outlined in its Demand Management Measures in Section 6, are projected to reduce water consumption to meet the 2020 target. Past, current and future water use by customer type is shown below. All accounts are metered, and there is no agricultural sector within EMID service area.

Table 8
Water Consumption by Customer Type – Past, Current, and Future

	Year	Water Use Sectors	Single Family	Multi - Family	Commercial/ Institutional ²	Industrial	Landscape Irrigation	Misc.	Un-Accounted	Totals
Actual	2005	# of Accounts	4,654	2,899	198	68	26		488	8,333
		Deliveries AF/Y	1,655	2,021	484	86	26		1,575	5,847
	2010	# of Accounts	4,800	2,691	226	70	481	53		8,321
		Deliveries AF/Y	1,403	1,816	506	71	1,141	6	462	5,407
	Base line ³	Deliveries AF/Y	1,727	2,025	596	119	1,489	6	554	6,515
Projected	2015	# of Accounts	4,800	3,100	231	70	481	53		8,735
		Deliveries AF/Y	1,635	2,092	582	78	1,427	6	541	6,361
	2020	# of Accounts	4,800	3,550	235	70	481	53		9,189
		Deliveries AF/Y	1,323	2,276	582	78	1,141	6	502	5,909
	2025	# of Accounts	4,800	3,550	240	70	481	53		9,194
		Deliveries AF/Y	1,309	2,276	670	86	1,141	6	510	5,998
	2030	# of Accounts	4,800	3,550	245	70	481	53		9,199
		Deliveries AF/Y	1,254	2,276	770	95	1,141	6	515	6,057

1 From March 28, 2011 Staff Report: Review of Projected Water Rates for FY 2011-2012: Policy Direction for Rate Notification under Proposition 218

2 Based on 2008 data, Commercial sector represents 86% and Institutional sector represents 14%

3 Baseline total of 6,515 AF/Y is calculated by taking baseline of 161 gcpd multiplied by 36,100 (2010 population). This total is distributed amongst customer classifications based on breakdown of consumption during the baseline period (1995-2005).

Regional Water Conservation Implementation Plan

In September 2009, BAWSCA completed the Water Conservation Implementation Plan (WCIP). The goal of the WCIP is to develop an implementation plan for BAWSCA and its member agencies to attain the water efficiency goals that the agencies committed to in 2004 as part of the Program Environmental Impact Report (PEIR) for the Water System Improvement Program (WSIP) which is further described in Section 4. The WCIP's goal was expanded to include identification of how BAWSCA member agencies could use water conservation as a way to continue to provide reliable water supplies to their customers through 2018 given the SFPUC's 265 million gallons per day (MGD) Interim Supply Limitation. The SFPUC imposed the Interim Supply Limitation on October 31, 2008, to limit the volume of water that the BAWSCA member agencies and San Francisco can collectively purchase from the RWS to 265 MGD until at least 2018.

Based on the WCIP development and analysis process, BAWSCA and its member agencies identified five new water conservation measures, which, if implemented fully throughout the BAWSCA service area, could potentially save an additional 8.4 MGD by 2018 and 12.5 MGD by 2030. The demand projections for the BAWSCA member agencies, as transmitted to the SFPUC on June 30, 2010, indicate that collective purchases from the SFPUC will stay below 184 MGD through 2018 as a result of revised water demand projections, the identified water conservation savings, and other actions.

Several member agencies have elected to participate in the BAWSCA regional water conservation programs and BAWSCA continues to work with individual member agencies to incorporate the savings identified in the WCIP into their future water supply portfolios with the goal of maintaining collective SFPUC purchases below 184 MGD through 2018.

Regional Coordination On Demand Management

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: residential, and 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:

- 1) Water-Efficient Landscape Rebates, Training and Irrigation Calculator,
- 2) High-Efficiency Toilet/Urinal Direct Install and/or Rebates,
- 3) High-Efficiency Clothes Washer Rebates, and
- 4) 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.

Economic Impacts

EMID views water reliability as a core component of the economic vitality of the areas served by the District. Without a reliable water supply, businesses such as hotels, restaurants, and biotechnology companies do not have a core resource to maintain their businesses in this area. This has an impact, then, on employment opportunities for residents living in the District and the neighboring communities. Further, reliable water supply is vital to serve the resident living within the community, a lack of which will inhibit the opportunities to develop multi-family residential units that helps meet the City's affordable housing requirements. In short, the water use reduction program will allow EMID to ensure reliable water that will have an impact on property values (and, thus, property taxes), sales tax generation, and transient occupancy taxes.

With respect to the economic impact on customers, EMID matches its fixed costs (e.g., maintenance, infrastructure) in the form of a fixed meter charge, and its variable costs (e.g., water purchased from SFPUC) to the base consumption rate. To the extent that water consumption is reduced, it should not have a direct impact on the need for EMID itself to raise its consumption rate. However, the SFPUC's wholesale rate is almost entirely a variable rate, which means that if revenue declines, they will need to raise their rate to EMID to make up for lost revenue, which we will be required to pass along to customers. Nevertheless, customers that conserve water will pay lower costs as their water consumption portion of their bill should decline for lower water consumption.

EMID's water rate model calculates a base consumption rate that serves as the basis for the rate structure for each customer class. If customers maintain their water consumption in accordance with the standards established by EMID (e.g., 20 ccf bi-monthly for single-family residential units), then they will pay the base consumption rate. Customer classes subject to the conservation-based water rate structures (i.e., tiered water rates for

residential customers, water budget model based rates for irrigation customers) could pay higher fees if their usage exceeds EMID standards. However, those “penalties” will go back into water rebate programs to provide the means for those customers to reduce water consumption to meet the 20% reduction plan by December 31, 2020.

County” entered into in July 2009 (WSA). The new WSA replaced the Settlement Agreement and Master Water Sales Contract that expired June 2009. The WSA addresses the rate-making methodology used by the City in setting wholesale water rates for its wholesale customers in addition to addressing water supply and water shortages for the RWS. The WSA has a 25 year term.

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

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

Individual Supply Guarantees

In 2009, EMID, along with 25 other Bay Area water suppliers, signed a Water Supply Agreement (WSA) with San Francisco, supplemented by an individual Water Supply Contract. These contracts, which expire in 25 years, provide for a 184 MGD, expressed on an annual average basis) Supply Assurance to the SFPUC’s wholesale customers collectively. EMID’s Individual Supply Guarantee (ISG) is 5.9 MGD (or approximately 6,600 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, as noted above.

Water Treatment and Distribution Facilities

EMID delivers potable water supplies through its distribution system at 40 to 60 psi. EMID purchases 100% of the water from SFPUC. SFPUC treats its water to meet all drinking water standards. There are two (2) water pressure reducing stations along the transmission main that reduce the SFPUC water pressure from 120 psi to the operating range of 40 to 60 psi. EMID has only one pressure zone and there is adequate head pressure from SFPUC supply to distribute water directly into the distribution system without pumping.

EMID maintains and operates four (4) above ground water storage tanks with a total

capacity of 20 million gallons. A booster pump station is available to pump water from the storage tanks into the distribution system. The pump station has two (2) electrical pumps and three (3) engine drive pumps. The engine drive pumps are powered by natural gas with propane backup.

Groundwater

The service area for EMID is not within an area of usable ground water. Consequently, the plan does not consider any use of ground water to supplement the SFPUC supply.

Transfer Opportunities

EMID has two (2) separate 12-inch emergency supply connections with California Water Service Company (serves the City of San Mateo), and Mid Peninsula Water Agency (serves the City of Belmont, San Carlos, and part of Redwood City). Agreements are in place with both agencies to use the connections during emergencies as indicated in Table 9.

**Table 9
Transfer and Exchange Opportunities**

Source Transfer Agency	Transfer or Exchange	Short Term Only (Emergency)
Mid Peninsula Water Agency	✓	✓
California Water Service Company	✓	✓

Desalinated Water Opportunities

As a member agency of BAWSCA, EMID continues to participate in BAWSCA's effort to explore regional desalination opportunities.

EMID will pursue opportunities to partner with other BAWSCA Agency members to obtain additional water supply via a conjunctive source. This may include partnering with North Coast County Water District's preliminary study of constructing a Desalination Facility.

Recycled Water Opportunities

Recycled water is not presently viable as a potable water source. It is suitable only for dust control and landscape irrigation. Currently, the South Bayside System Authority in Redwood City is the only source for acceptable reclaimed water in San Mateo County. The reclaimed water from the San Mateo Water Quality Control Plant (SMWQCP) meets health standards for irrigation use. Unfortunately, the salt in the water makes it infeasible to use for irrigation unless desalination is accomplished or plants are extremely salt-tolerant.

In addition, there are no pipelines to distribute reclaimed water within EMID. Distribution of reclaimed water by water trucks is an expensive alternative compared to using EMID water. Reclaimed water is an alternative during times when the availability of EMID potable water is severely restricted.

Wastewater collection system for EMID consists of more than 51 miles of pipelines and 49 lift stations. Wastewater collected is pumped to SMWQCP for treatment. SMWQCP is jointly owned by the City of Foster City and the City of San Mateo. The average daily wastewater flow (ADWF) collected and pumped to the treatment plant is approximately 3.0 million gallons per day (MGD). Wastewater is treated using mechanical, biological, and chemical processes prior to being discharged into San Francisco Bay.

Future Water Projects

EMID

The (CIP 760) Water Main Condition Survey and Improvements Project, completed in 2009 included the construction of access ports along the City's 24-inch high pressure water transmission main. The new project (CIP 612) Water Main Condition Survey Project will inspect the condition of the pipeline using the most recent leak detection technologies available to monitor and access the internal condition of the pipeline and obtain additional information on the condition of the water main. Staff will work with current leaders in the field of leak detection technology to develop a program to perform internal pipeline investigation in Summer 2011. Based on the results of the survey, construction costs will be identified and improvements prioritized.

SFPUC (Water System Improvement Plan)

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

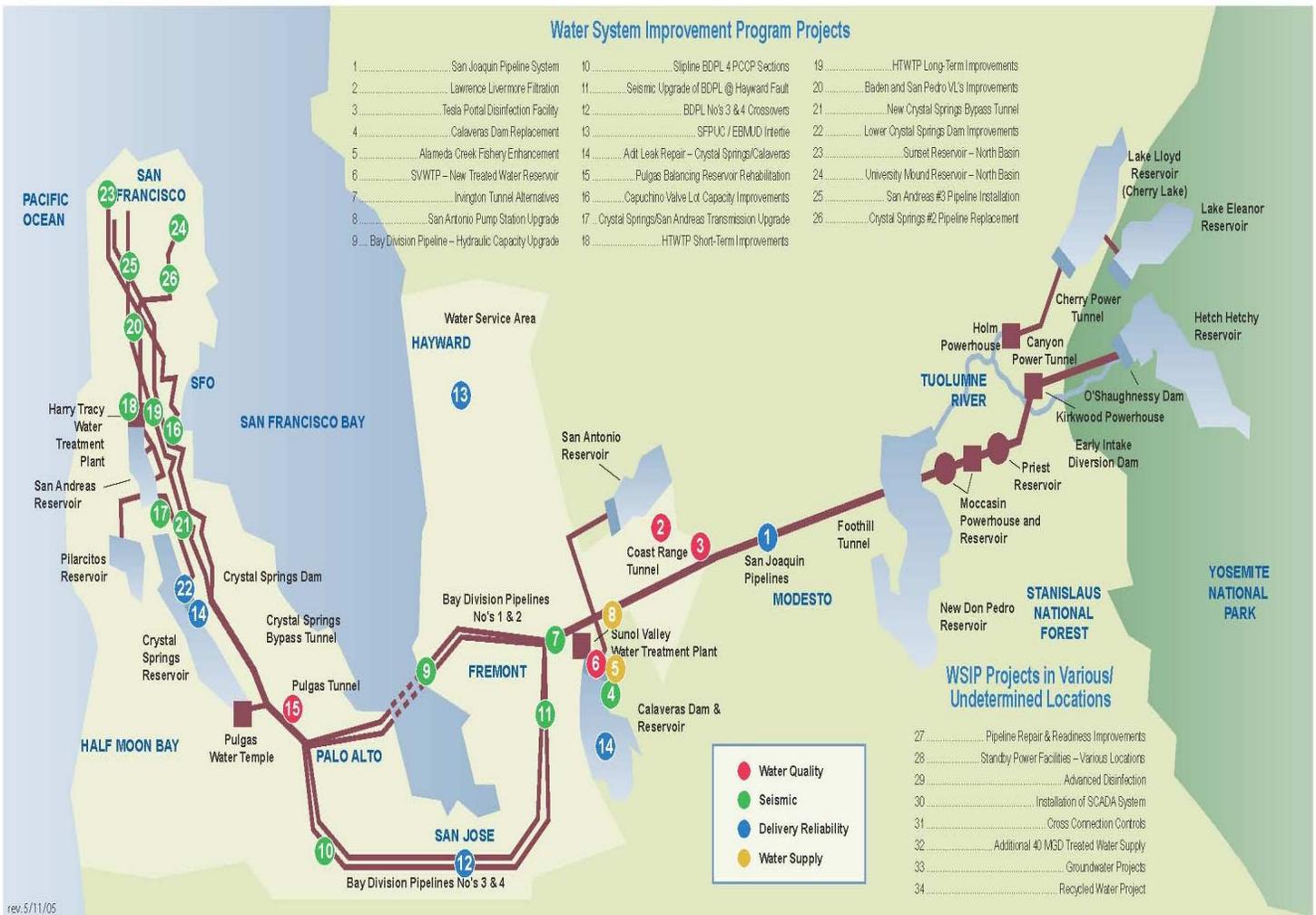
A Program Environmental Impact Report (PEIR) was prepared in accordance with the California Environmental Quality Act for the WSIP. The PEIR, certified in 2008, analyzed the broad environmental effects of the projects in the WSIP at a program level and the water supply impacts of various alternative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

In approving the WSIP, the Commission adopted a Phased WSIP Variant for water supply that was analyzed in the PEIR. This Phased WSIP Variant established a mid-term water supply planning milestone in 2018 when the Commission would reevaluate water demands

through 2030. At the same meeting, the Commission also imposed the Interim Supply Limitation which limits the volume of water that the member agencies and San Francisco can collectively purchase from RWS to 265 MGD until at least 2018. Although the Phased WSIP Variant included a mid-term water supply planning milestone, it did include full implementation of all proposed WSIP facility improvement projects to insure that the public health, seismic safety, and delivery reliability goals were achieved as soon as possible.

As of July 1, 2010, the WSIP was 27% complete overall with the planning and design work over 90% complete. The WSIP is scheduled to be completed in December 2015.

Figure 3
SFPUC Capital Improvement Projects



Section 5

Water Supply Reliability and Water Shortage Contingency Planning

EMID'S Water Shortage Contingency Plan

In 1993, in accordance with the requirements of Assembly Bill 11X, EMID developed a comprehensive water shortage contingency plan. The Water Shortage Contingency Plan is intended to be used as a planning tool to assist in the development of future rationing programs. This plan provides a framework for management of voluntary and mandatory water reduction stages. The plan allows for flexibility to establish more detailed programs once the specifics of a water shortage are known.

Note: The plan as described below was developed in 1993. Based on recent changes to the water rate structure, all or part of this Water Shortage Contingency Plan will need to be revisited at the time of drought. The Water Shortage Contingency Plan could be implemented in conjunction with SFPUC's mandate during future water shortage situations.

Rationing Stages and Triggering Levels

Since 1970, there have been two 4- to 5-year droughts. As a water purveyor, EMID must respond to SFPUC's triggering levels for demand reduction at each stage. It is the water storage volume at SFPUC's nine reservoirs that triggers each demand reduction stage. When SFPUC imposes a water rationing program, EMID's strategy has been to respond with the same goals as the program imposed by SFPUC.

The Water Shortage Contingency Plan describes the triggering levels and actions to be considered for each stage of a water shortage. The Water Shortage Contingency Plan has three stages with each stage set to respond to increasingly more severe conditions. The third stage will be implemented at such a time that the water supply conditions reach a hydrologic circumstance not previously experienced by the SFPUC. The current plan calls for system wide consumption to be reduced by 45 percent. This is described in more detail in the draft of the San Francisco 2000 UWMP.

Stage I

This stage is a continuing effort to conserve water regardless of water supply. Stage I is in effect even when there is no drought. This stage involves continued efforts to encourage the public not to waste water. This stage also includes the enforcement of current regulations requiring the installation of ultra low flow toilets on new construction. ULF toilet rebate program and water conservation device give away programs are also in effect during this stage.

Stage II

This stage is triggered when the total volume of water storage in SFPUC's reservoirs falls below the two-year water demand base by 5 to 20 percent. The Stage II shortage will result in a mandatory water conservation program with a goal of reducing water use between 10 to 20 percent as dictated by SFPUC and determined necessary by the EMID Board. This stage includes increased public education such as water bill inserts advising customers how to save water. A resolution would be adopted by the EMID Board declaring a water shortage emergency and implementing mandatory water conservation measures in accordance with Chapter 8.60 of the EMID code (Appendix G).

Stage III

Stage III is triggered when the total volume of water storage in SFPUC's reservoirs falls below the two-year water demand base by 20 to 30 percent. This stage of water shortage would result in a mandatory water rationing program with a goal of reducing the water use by 20 to 30 percent as determined necessary. The EMID Board would adopt a resolution declaring a water shortage emergency and implementing mandatory water rationing measures in accordance with Chapter 8.60 of the EMID code. In this and the next stage a larger range of prohibited uses would be considered and a penalty for overuse will be charged as indicated in Rate Structure under Rationing for Excess Water Use as described below in the Rate Structure under Rationing for Excess Water Use paragraph.

Water Allotment Methods

EMID has established the following allocation method for each customer type (classification).

Single Family	Per-Capita with Assumed Occupancy for Inside, Percentage Reduction for Outside
Duplex	Per-Capita with Assumed Occupancy for Inside, Percentage Reduction for Outside
Townhouse/Apartments	Per-Capita with Assumed Occupancy for Inside, Percentage Reduction for Outside
Commercial	Percentage Reduction Inside and Outside
Industrial	Percentage Reduction Inside and Outside
Governmental/Institutional	Percentage Reduction Inside and Outside
Irrigation/Landscaping	Allotment based on square footage of green area

Rate Structure under Rationing for Excess Water Use

EMID has essentially the same graduating scale of excess use charges as those imposed by SFPUC. As the percent of water use over the allotment increases, so does the excess use charge. The following table shows excess use charges established for various stages during water rationing.

Excess Water Consumption

0%	- 5.00% over allotment
5.01%	- 10.00% over allotment
10.01%	- 20.00% over allotment
20.01%	+ over allotment

Monetary Penalty

No Penalty
3 X SFPUC Rate
7 X SFPUC Rate
9 X SFPUC Rate

Mechanism to Determine Reductions in Water Use

Under normal water supply conditions, the amount of potable water purchased from SFPUC is recorded daily. EMID has two master meters that are connected to SFPUC's main line.

For each month during water rationing, a comparison table showing the amount of water purchased versus the amount of water purchased during the same month in 1987, which was the most recent year with normal rainfall, would be prepared, and reported to the District Manager. The table would also compare the amount of water purchased versus the water allotments provided to EMID by SFPUC. If reduction goals are not met, the District Manager would notify the District Board so that corrective action(s) can be taken.

Estimate of Minimum Supply for Next Three Years

EMID recognizes that it is better to enter into a water shortage alert early, to establish necessary rationing programs and policies, to gain public support and participation, and to reduce the overall usage so that the restrictions put on EMID by SFPUC can be met. EMID feels that the three-year worst case supply projections will result in the same level of rationing that was adopted briefly but not implemented in 1991 as a result of the droughts from 1987-1992. EMID experienced 3 driest years during 1987 – 1989.

Table 10 displays the three year estimated minimum water supply to EMID from SFPUC. This information is provided in the Drought Implementation Plan (DRIP), adopted by EMID Board on March 7, 2011. EMID's normal supply assurance with SFPUC is 5.90 MGD.

Table 10
Projected Deliveries for Three Multiple Dry Years

	One Critical Dry Year	Current Deliveries During Multiple Dry Years		
		Year 1	Year 2	Year 3
System-Wide Shortage (%)	10%	10%	20%	20%
Wholesale Allocation (MGD) ¹	152.6	152.6	132.5	132.5
EMID Allocation Factor (%) ²	3.00	3.00	3.00	3.00
EMID Allocation (AFY)	5,132	5,132	4,456	4,456
EMID Allocation (MGD)	4.58	4.58	3.98	3.98
Allocation as % of 5.9 MGD Assurance	78	78	67	67

Table 10A shows supply and demand comparison for a single dry year. The calculated supply would not meet the projected demand in any single dry year, from 2015-2030. In this case, the District would implement additional measures as described in Stage I of the Water Shortage Contingency Plan to reduce consumption.

Table 10A
Supply and Demand Comparison – Single Dry Year

	2015	2020	2025	2030
Supply Totals (AFY)	5,132	5,132	5,132	5,132
Demand Totals (AFY)³	6,361	5,909	5,998	6,057
Difference (AFY)	(1,229)	(777)	(866)	(925)
Difference as % of Supply	-23.9%	-15.1%	-16.9%	-18.0%
Difference as % of Demand	-19.3%	-13.1%	-14.4%	-15.3%

Table 10B shows similar results with demands projections higher than supplies for all years during multiple dry year events. During multiple dry year events, the District would declare emergency and implement additional measures as described in Stage II/III of the Water Shortage Contingency Plan to reduce consumption.

1 See Appendix E: March 31, 2011 SFPUC letter to Nicole Sankulla.

2 See Appendix F. The Allocation Factor is based on the current Tier 2 Drought Implementation Plan (DRIP) value of 3.00%. The Allocation Factor will be recalculated by BAWSCA each year as it is based on a variety of factors including historical water purchases over the last 3 years.

3 See Table 5: SBX7-7 Method 1 Plus 2008 WSA Target

Table 10B
Supply and Demand Comparison – Multiple Dry Year Events

		2015	2020	2025	2030
Multiple Dry Year (AFY) First Year	Supply Totals	5,132	5,132	5,132	5,132
	Demand Totals	6,361	5,909	5,998	6,057
	Difference	(1,229)	(777)	(866)	(925)
	Difference as % of Supply	-23.9%	-15.1%	-16.9%	-18.0%
	Difference as % of Demand	-19.3%	-13.1%	-14.4%	-15.3%
Multiple Dry Year (AFY) Second Year	Supply Totals	4,456	4,456	4,456	4,456
	Demand Totals	6,361	5,909	5,998	6,057
	Difference	(1,905)	(1,453)	(1,542)	(1,601)
	Difference as % of Supply	-42.8%	-32.6%	-34.6%	-35.9%
	Difference as % of Demand	-29.9%	-24.6%	-25.7%	-26.4%
Multiple Dry Year (AFY) Third Year	Supply totals	4,456	4,456	4,456	4,456
	Demand totals	6,361	5,909	5,998	6,057
	Difference	(1,905)	(1,453)	(1,542)	(1,601)
	Difference as % of Supply	-42.8%	-32.6%	-34.6%	-35.9%
	Difference as % of Demand	-29.9%	-24.6%	-25.7%	-26.4%

Catastrophic Supply Interruption Plan/Water Shortage Emergency Response

EMID has maintained emergency contingency plans in the event of service interruption from SFPUC. EMID will continue to participate with the emergency planning committees developed by the PUC to identify the procedures and interactions between Agencies for emergency response. EMID will also continue to participate in inter-departmental planning and coordination with the County OES.

Possible Catastrophe Scenarios include:

- Regional Power Outage
- Major Earthquake
- Terrorist attack on the Water Supply

The following summarizes the actions EMID will take during a water supply catastrophe:

- Notification to its customers of the supply catastrophe
- Activate Emergency Operations Center (EOC)
- Follow procedures in the Emergency Response Plan (ERP)

Water Supply Reliability - Long Term Reliable Water Supply Strategy

BAWSCA's water management objective is to ensure that a reliable, high quality supply of water is available where and when people within the BAWSCA service area need it. A reliable supply of water is required to support the health, safety, employment, and economic opportunities of the existing and expected future residents in the BAWSCA service area and to supply water to the agencies, businesses, and organizations that serve those communities. BAWSCA is developing the Long-Term Reliable Water Supply Strategy (Strategy) to meet the projected water needs of its member agencies and their customers through 2035 and to increase their water supply reliability under normal and drought conditions.

The Strategy is proceeding in three phases. Phase I was completed in 2010 and defined the magnitude of the water supply issue and the scope of work for the Strategy. Phase II of the Strategy is currently under development and will result in a refined estimate of when, where, and how much additional supply reliability and new water supplies are needed throughout the BAWSCA service area through 2035, as well as a detailed analysis of the water supply management projects, and the development of the Strategy implementation plan. Phase II will be complete by 2013. Phase III will include the implementation of specific water supply management projects. Depending on cost-effectiveness, as well as other considerations, the projects may be implemented by a single member agency, by a collection of the member agencies, or by BAWSCA in an appropriate timeframe to meet the identified needs. Project implementation may begin as early as 2013 and will continue throughout the Strategy planning horizon, in coordination with the timing and magnitude of the supply need.

The development and implementation of the Strategy will be coordinated with the BAWSCA member agencies and will be adaptively managed to ensure that the goals of the Strategy, i.e., increased normal and drought year reliability, are efficiently and cost-effectively being met.

Reliability of the 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 goals and objectives of the WSIP related to water supply are:

Program Goal	System Performance Objective
Water Supply – <i>meet customer water needs in non-drought and drought periods</i>	<ul style="list-style-type: none"> • Meet average annual water demand of 265 million gallons per day (MGD) from the SFPUC watersheds for retail and wholesale customers during non-drought years for system demands through 2018. • Meet dry-year delivery needs through 2018 while limiting rationing to a maximum 20 percent system-wide reduction in water service during extended droughts. • Diversify water supply options during non-drought and drought periods. • Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers.

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

Water Supply – All Year Types

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

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

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

Water Supply – Dry-Year Types

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

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

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

Projected SFPUC System Supply Reliability

The SFPUC has provided the attached table [Appendix E Table 3: Projected System Supply Reliability Based on Historical Hydrologic Period from 3/31/10 letter from P. Kehoe] presenting the projected RWS supply reliability. This table assumes that the wholesale customers purchase 184 MGD from the RWS through 2030 and the implementation of the dry-water water supply projects included in the WSIP. The numbers represent the wholesale share of available supply during historical year types per the Tier One Water Shortage Allocation Plan. This table does not reflect any potential impact to RWS yield from the additional fishery flows required as part of Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements Project.

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

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

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

Reduction in Demand

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

Table 11
Water Deliveries in SFPUC Service Area ¹

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

Increase in Rationing

The adopted WSIP provides for a dry year water supply program that, when implemented, would result in system-wide rationing of no more than 20 percent. The PEIR identified the following drought shortages during the design drought; 3.5 out of 8.5 years at 10 percent rationing and 3 out of 8.5 years at 20 percent. If the SFPUC did not develop a supplemental water supply in dry years to offset the effects of the fishery flows on water supply, rationing would increase during dry years. If the SFPUC experiences a drought between 2013 and 2018 in which rationing would need to be imposed, rationing would increase by approximately 1 percent in shortage years. Rationing during the design drought would increase by approximately 1 percent in rationing years.

Supplemental Supply

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

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

Meeting the Level of Service Goal for Delivery Reliability

The SFPUC has stated a commitment to meeting its contractual obligation to its wholesale customers of 184 mgd and its delivery reliability goal of 265 mgd with no greater than 20 percent rationing in any one year of a drought. In Resolution No. 10-0175 adopted by the

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

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

Commission on October 15, 2010, the Commission directed staff to provide information to the Commission and the public by March 31, 2011 on how the SFPUC has the capability to attain its water supply levels of service and contractual obligations. This directive was in response to concerns expressed by the Commission and the Wholesale Customers regarding the effect on water supply of the instream flow releases required as a result of the Lower Crystal Springs Dam Improvement Project and the Calaveras Dam Replacement Project. In summary, the SFPUC has a projected shortfall of available water supply to meet its LOS goals and contractual obligations. The SFPUC has stated that current decreased levels of demand keep this from being an immediate problem, but that in the near future, the SFPUC must resolve these issues. Various activities are underway by the SFPUC to resolve the shortfall problem. SFPUC staff will report back to the Commission by August 31, 2011 to provide further information on actions to resolve the shortfall problem.

Water Shortage Contingency Planning

2018 Interim Supply Limitation

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

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.

Interim Supply Allocations

The Interim Supply Allocations (ISAs) refers to each individual wholesale customer's share of the Interim Supply Limitation (ISL). On December 14, 2010, the Commission established each agency's ISA through 2018. In general, the Commission based the allocations on the lesser of the projected fiscal year 2017-18 purchase projections or Individual Supply Guarantees. The ISAs are effective only until December 31, 2018 and do not affect the Supply Assurance or the Individual Supply Guarantees, both discussed separately herein. San Francisco's Interim Supply Allocation (ISA) is 81 MGD. EMID's individual ISA is 5.9 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.

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 FY 2011/12.

Drought Planning

Drought Implementation Plan (DRIP)

EMID adopted the Tier 2 Drought Implementation Plan on March 7, 2011 (See Appendix F for Resolution No. 3126, and Exhibit A: Water Shortage Allocation Plan and Exhibit B: Tier 2 Drought Implementation Plan Among Wholesale Customers). Summary of the Plan is below.

Tier One Drought Allocations

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

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

Table 12
Tier One Drought Allocations for SFPUC and Wholesale Customers

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.

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.

Section 6

Determination of Demand Management Measures (DMM) Implementations

DMM 1 – Water Survey Programs for Single-Family and Multi-Family Residential Customers

Implementation Description: Residential customer surveys are performed on an informal basis by the customer or by EMID following a high water bill complaint. More recently, EMID has implemented a Water Conservation Landscape Program, and created incentive programs, as described in DMM 5 benefitting multi-family residential customers.

DMM 2 – Residential Plumbing Retrofit

Implementation Description: EMID Board approved the rebate program, effective July 1, 2010, encouraging customers to install smart irrigation controllers. Incentive programs are available to multi-family residential units for segregating domestic and irrigation meters. The program includes waiving meter installation fees, in addition to offering a below-market-rate three-year loan of up to \$50,000 to assist homeowners associations and apartment owners. Metering domestic and irrigation separately will allow customers and landscape professionals to better manage their consumption and implement more effective conservation methods.

DMM 3 – System Water Audits, Leak Detection and Repair

Implementation Description: EMID’s unaccounted for water is approximately 7 percent. Water supply to EMID is recorded by two (2) master meters. The meters are read daily using wireless technology. Water distributed to customers is also metered, with the exception of water used from fire hydrants. Water from the hydrants is used for flushing, fire fighting and training, and construction. These activities account for a portion of the “unaccounted” for water.

EMID has trained staff and equipment to detect leaks in the distribution system. Staff routinely performs regular visual inspections and responds to public complaints. Repairs are performed immediately when leaks are detected. EMID started a meter-replacement program in 2008 to replace all touch-read meters (over 8,200) with radio-read meters. Approximately 50% of the meters have been replaced and all are expected to be replaced by 2014. The new meters are more accurate and capable of reporting unusual consumption patterns instantaneously. Unaccounted for water is anticipated to decrease when all meters are replaced.

Effective May 1, 2011, EMID implemented a rebate program where single family residential units can receive up to \$300 for domestic water use audit and \$750 for irrigation water use audits. These audits are performed by EMID’s Landscape Consultant who will provide a detailed report and recommendations for the customer on ways to conserve water.

DMM 4 – Metering with Commodity Rates

Implementation Description: Approximately 8,200 metered accounts are in EMID’s service area. In July 2010, EMID adopted a tier-rate rate structure for residential domestic and commercial irrigation. Single-family and multi-family residential customers are subject to a 3-tier rate structure with inclining block rates for each tier. Irrigation customers are subject to a Water Budget rate model based upon landscaped area and evapotranspiration methodologies for determining appropriate water usage on a monthly basis, with any water consumption over the budget amount subject to a penalty rate. Excess revenues generated from these tiered rates are deposited into a Water Sustainability Fund for purposes of funding water rebate programs. During drought, EMID plans to implement a graduating scale for excess use charges as proposed by SFPUC, where excess use charge increases as the consumption over allotment increases.

DMM 5 – Large Landscape Conservation Programs and Incentives

Implementation Description: A significant portion of water consumption within EMID comes from outdoor landscaping. To educate and assist customers with their conservation efforts, EMID has implemented a Water Conservation Landscape Program. The program provides landscape audits, workshops, and water use reports. Nearly all of the 250 customers participate in the program.

EMID has created rebate incentive programs in the form of Smart Irrigation Controller rebates and Efficient Irrigation System rebates that provide up to \$5,000 (respectively) per year to each customer for the installation of controllers, sprinkler heads, and other water-efficient irrigation infrastructure.

EMID has also prepared a booklet called “Planting and Irrigation Guidelines” to assist developers, landscape professionals, and property owners in selecting appropriate plant materials and installing irrigation systems to create water efficient gardens appropriate to Foster City soil and climate conditions (Appendix H). This booklet is available to the public at various locations throughout the City. It is also distributed at the Foster City’s annual Arts and Wine festival and at other city sponsored events.

DMM 6 – High-Efficiency Washing Machine Rebate Programs

Implementation Description: This program was implemented in 2000 and continuing today. Since program inception, over 2045 washing machine rebates, totaling \$235,000, were provided to customers for replacing old clothes washers with new ENERGY STAR water conserving units. The program is administered by BAWSCA and funded by EMID, which provides a rebate of \$175 per washing machine.

DMM 7 – Public Information Programs

Implementation Description: Water conservation information is posted on the City of Foster City website. Public information is also distributed at city sponsored events. Another way EMID educates the public is through the Environmental Sustainability Task Force (ESTF). ESTF is a 15-member citizen committee dedicated to advising the City on helping the Foster City community be more sustainable through public outreach and education. ESTF coordinates a series of public outreach activities ranging from public workshops to

an Earth Day Sustainability Fair. ESTF works with the EMID to identify key water-users and develop programs to target those areas with the greatest potential to impact the community’s water use. EMID also offers Residential Landscape Classes where “Planting and Irrigation Guidelines” booklets are distributed.

In addition, EMID has sent out individual letters to residential customers who use 200% or more of the median usage for residential units to educate them that their usage is well above the normal and to invite them to participate in rebate programs as a means toward reducing their usage. Additional letters will then be sent out to those using 125% to 200% of median usage upon the successful implementation of those letters to the 200%+ customers.

DMM 8 – School Education Programs

Implementation Description: EMID continues to work with local schools and teachers to promote water conservation. Presentation of the water system and tours of the local water facilities are part of planned activities for school kids and teachers during the annual Public Works week.

DMM 9 – Conservation Programs for Commercial, Industrial, and Institutional Accounts

Implementation Description: EMID provides rebates for this group in the form of high-efficiency toilet / urinal rebate programs of up to \$150 per unit subject to a maximum of \$10,000 in any one year, and a commercial washing machine rebate program that provides \$300 per washing machine. In addition, many of the customers in these categories are also irrigation customers, which are eligible for the rebate programs identified in DMM 5 above.

DMM 10 – Wholesale Agency Programs

Implementation Description: EMID is a retailer, not a wholesaler and therefore this Demand Management Measure is not applicable.

DMM 11 – Conservation Pricing

Implementation Description: The water rates effective July 1, 2010 required a 9% increase in water revenues to fund the operations and capital improvement requirements of the Water Enterprise. Fixed meter charges increased by 4% based on the fixed costs associated with water operations, whereas the base consumption rate is being increased by 20% based on a significant increase in the cost of water that EMID will pay to the San Francisco Public Utilities Commission. In addition, EMID implemented conservation-based water rate structures that affect residential and irrigation customers which comprise 88% of the total water consumed by EMID.

The tiers in effect as of April 1, 2011 for each customer type are identified below:

Bi-Monthly Consumption:	Consumption Rate
Single Family Residential	
≤ 10 CCF of water	75% of Base Consumption Rate
> 10 CCF, ≤ 20 CCF of water	100% of Base Consumption Rate

Over 20 CCF of water	200% of Base Consumption Rate
Multi Family Residential	
< 5 CCF of water per living unit	75% of Base Consumption Rate
> 5 CCF, < 10 CCF of water per living unit	100% of Base Consumption Rate
Over 10 CCF of water per living unit	175% of Base Consumption Rate
Irrigation Customers	
≤ 100% of Annual Water Budget	100% of Base Consumption Rate
> 100% of Annual Water Budget	200% of Base Consumption Rate

DMM 12 – Water Conservation Coordinator

Implementation Description: EMID does not have a dedicated Water Conservation Coordinator. Responsibilities related to water conservation efforts are administered by staff members from various departments. Regional planning and coordination efforts are handled by BAWSCA with input from agency representative.

DMM 13 – Water Waste Prohibition

Implementation Description: EMID prohibits water waste and is enforced by the code enforcement division. Following excerpt is taken from the EMID Municipal Code:

“No customer shall knowingly permit leaks or waste of water. Where water is wastefully or negligently used on a customer's premises, seriously affecting the general service, the district may discontinue the service if such conditions are not corrected within the time specified in the written notice.” (Ord. 46 § 74, 1971)

DMM 14– Residential Ultra-Low Flush Toilet Replacement Programs

Implementation Description: This is an ongoing program since 1992. Under the program, customers receive rebates for High Efficiency (HE) toilets. HE toilets use 1.28 gallons or less per flush. The program allows single-family units, townhomes, and condominiums to receive up to \$150 or 50% of the total labor and material cost, whichever is less, per toilet. Up to 3 toilets per household is eligible for the rebate. Since the program inception, approximately 1,800 rebate checks have been processed representing 3,650 toilets for approximately \$455,000.

Current EMID regulations require HE toilets to be installed in all new construction. Requirements to install HE toilets are incorporated during the development review process and installations are inspected prior to issuing occupancy.

Additional Water Conservation Demand Management Measures

In 2009, Foster City replaced two soccer fields, approximately 3.5 acres, with synthetic turf. Construction to replace two additional fields with synthetic turf is scheduled for FY 2011/2012.

Residential Turf Rebate Program

Effective May 1, 2011, EMID is implementing a residential synthetic turf replacement rebate program. Customers will receive \$4 per square foot, up to \$2000 maximum, for replacing existing lawn and irrigation system with synthetic surface.

“Lawn Be Gone” Rebate Program

In FY 2010/2011, EMID implemented a “Lawn Be Gone” conversion program (administered by BAWSCA), where a rebate is given to replace existing lawn with approved list of drought resistant plant materials. Single-family residential customers can receive \$0.50 per square foot, up to a maximum of \$500 rebate. Irrigation customers can receive \$0.50 per square foot, up to a maximum of \$3,000.

Planned Water Supply Projects and Programs

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 Water Supply Master Plan (2000).

Program Environmental Impact Report (PEIR)

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

In approving the WSIP, the Commission adopted a Phased WSIP Variant for water supply that was analyzed in the PEIR. This Phased WSIP Variant established a mid-term water supply planning milestone in 2018 when the Commission would reevaluate water demands through 2030. At the same meeting, the Commission also imposed the Interim Supply Limitation which limits the volume of water that the member agencies and San Francisco can collectively purchase from RWS to 265 MGD until at least 2018. Although the Phased WSIP Variant included a mid-term water supply planning milestone, it did include full implementation of all proposed WSIP facility improvement projects to insure that the public health, seismic safety, and delivery reliability goals were achieved as soon as possible.

As of July 1, 2010, the WSIP was 27% complete overall with the planning and design work

over 90% complete. The WSIP is scheduled to be completed in December 2015. WSIP is shown in Figure 3.

Development of Desalinated Water

Desalinated opportunities are discussed in Section 4.

Section 7 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:

- 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 Regional Water System (RWS) or the overall operation of the RWS through 2030.

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

Section 8 Completed UWMP Checklist

No.	UWMP requirement ^a	Calif. Water Code reference	Additional clarification	UWMP location
PLAN PREPARATION				
4	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	10620(d)(2)		Section 1
6	Notify, at least 60 days prior to the public hearing on the plan required by Section 10642, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Any city or county receiving the notice may be consulted and provide comments.	10621(b)		Section 1
7	Provide supporting documentation that the UWMP or any amendments to, or changes in, have been adopted as described in Section 10640 et seq.	10621(c)		Appendix A
54	Provide supporting documentation that the urban water management plan has been or will be provided to any city or county within which it provides water, no later than 60 days after the submission of this urban water management plan.	10635(b)		Section 1
55	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	10642		Section 1, Appendix D
56	Provide supporting documentation that the urban water supplier made the plan available for public inspection and held a public hearing about the plan. For public agencies, the hearing notice is to be provided pursuant to Section 6066 of the Government Code. The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water. Privately-owned water suppliers shall provide an equivalent notice within its service area.	10642		Section 1
57	Provide supporting documentation that the plan has been adopted as prepared or modified.	10642		Section 1
58	Provide supporting documentation as to how the water supplier plans to implement its plan.	10643		Section 1

No.	UWMP requirement ^a	Calif. Water Code reference	Additional clarification	UWMP location
59	Provide supporting documentation that, in addition to submittal to DWR, the urban water supplier has submitted this UWMP to the California State Library and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. This also includes amendments or changes.	10644(a)		Section 1
60	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the urban water supplier has or will make the plan available for public review during normal business hours	10645		Section 1
SYSTEM DESCRIPTION				
8	Describe the water supplier service area.	10631(a)		Section 2
9	Describe the climate and other demographic factors of the service area of the supplier	10631(a)		Section 2
10	Indicate the current population of the service area	10631(a)	Provide the most recent population data possible. Use the method described in "Baseline Daily Per Capita Water Use." See Section M.	Section 2
11	Provide population projections for 2015, 2020, 2025, and 2030, based on data from State, regional, or local service area population projections.	10631(a)	2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	Section 2
12	Describe other demographic factors affecting the supplier's water management planning.	10631(a)		Section 3
SYSTEM DEMANDS				
1	Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	10608.20(e))		Section 3
2	<i>Wholesalers:</i> Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions. <i>Retailers:</i> Conduct at least one public hearing that includes general discussion of the urban retail water supplier's implementation plan for complying with the Water Conservation Bill of 2009.	10608.36 10608.26(a))	Retailers and wholesalers have slightly different requirements	Section 3, Section 6

No.	UWMP requirement ^a	Calif. Water Code reference	Additional clarification	UWMP location
3	Report progress in meeting urban water use targets using the standardized form.	10608.4		Section 3
25	Quantify past, current, and projected water use, identifying the uses among water use sectors, for the following: (A) single-family residential, (B) multifamily, (C) commercial, (D) industrial, (E) institutional and governmental, (F) landscape, (G) sales to other agencies, (H) saline water intrusion barriers, groundwater recharge, conjunctive use, and (I) agriculture.	10631(e)(1)	Consider 'past' to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years.	Section 3
33	Provide documentation that either the retail agency provided the wholesale agency with water use projections for at least 20 years, if the UWMP agency is a retail agency, OR, if a wholesale agency, it provided its urban retail customers with future planned and existing water source available to it from the wholesale agency during the required water-year types	10631(k)	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030.	Appendix I
34	Include projected water use for single-family and multifamily residential housing needed for lower income households, as identified in the housing element of any city, county, or city and county in the service area of the supplier.	10631.1(a)		Section 3
SYSTEM SUPPLIES				
13	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, and 2030.	10631(b)	The 'existing' water sources should be for the same year as the "current population" in line 10. 2035 and 2040 can also be provided.	Section 4
14	Indicate whether groundwater is an existing or planned source of water available to the supplier. If yes, then complete 15 through 21 of the UWMP Checklist. If no, then indicate "not applicable" in lines 15 through 21 under the UWMP location column.	10631(b)	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other.	Section 4
15	Indicate whether a groundwater management plan been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	10631(b)(1)		not applicable
16	Describe the groundwater basin.	10631(b)(2)		not applicable
17	Indicate whether the groundwater basin is adjudicated? Include a copy of the court order or decree.	10631(b)(2)		not applicable

No.	UWMP requirement ^a	Calif. Water Code reference	Additional clarification	UWMP location
18	Describe the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. If the basin is not adjudicated, indicate "not applicable" in the UWMP location column.	10631(b)(2)		not applicable
19	For groundwater basins that are not adjudicated, provide information as to whether DWR has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition. If the basin is adjudicated, indicate "not applicable" in the UWMP location column.	10631(b)(2)		not applicable
20	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	10631(b)(3)		not applicable
21	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	10631(b)(4)	Provide projections for 2015, 2020, 2025, and 2030.	not applicable
24	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	10631(d)		Section 4
30	Include a detailed description of all water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years, excluding demand management programs addressed in (f)(1). Include specific projects, describe water supply impacts, and provide a timeline for each project.	10631(h)		Section 4
31	Describe desalinated water project opportunities for long-term supply, including, but not limited to, ocean water, brackish water, and groundwater.	10631(i)		Section 4
44	Provide information on recycled water and its potential for use as a water source in the service area of the urban water supplier. Coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	10633		Section 4
45	Describe the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	10633(a)		Section 4

No.	UWMP requirement ^a	Calif. Water Code reference	Additional clarification	UWMP location
46	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	10633(b)		Not applicable
47	Describe the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.	10633(c)		Section 4
48	Describe and quantify the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.	10633(d)		Section 4
49	The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	10633(e)		Section 4
50	Describe the actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.	10633(f)		Section 4
51	Provide a plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.	10633(g)		Section 4
WATER SHORTAGE RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING ^b				
5	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	10620(f)		Section 5
22	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage and provide data for (A) an average water year, (B) a single dry water year, and (C) multiple dry water years.	10631(c)(1)		Section 5
23	For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.	10631(c)(2)		Section 5

No.	UWMP requirement ^a	Calif. Water Code reference	Additional clarification	UWMP location
35	Provide an urban water shortage contingency analysis that specifies stages of action, including up to a 50-percent water supply reduction, and an outline of specific water supply conditions at each stage	10632(a)		Section 5
36	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.	10632(b)		Section 5
37	Identify actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.	10632(c)		Section 5
38	Identify additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.	10632(d)		Section 5, Appendix G
39	Specify consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.	10632(e)		Section 5
40	Indicated penalties or charges for excessive use, where applicable.	10632(f)		Section 5
52	Provide information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments, and the manner in which water quality affects water management strategies and supply reliability	10634	For years 2010, 2015, 2020, 2025, and 2030	Section 5
53	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. Base the assessment on the information compiled under Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.	10635(a)		Section 5
DEMAND MANAGEMENT MEASURES				

No.	UWMP requirement ^a	Calif. Water Code reference	Additional clarification	UWMP location
26	Describe how each water demand management measures is being implemented or scheduled for implementation. Use the list provided.	10631(f)(1)	Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules.	Section 6
27	Describe the methods the supplier uses to evaluate the effectiveness of DMMs implemented or described in the UWMP.	10631(f)(3)		Section 6
28	Provide an estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the ability to further reduce demand.	10631(f)(4)		Section 3
29	Evaluate each water demand management measure that is not currently being implemented or scheduled for implementation. The evaluation should include economic and non-economic factors, cost-benefit analysis, available funding, and the water suppliers' legal authority to implement the work.	10631(g)	See 10631(g) for additional wording.	Section 5
32	Include the annual reports submitted to meet the Section 6.2 requirements, if a member of the CUWCC and signer of the December 10, 2008 MOU.	10631(j)	Signers of the MOU that submit the annual reports are deemed compliant with Items 28 and 29.	Not applicable

Section 9 Appendices

- Appendix A EMID Resolution Approving the 2010 UWMP
- Appendix B EMID Resolution No. 2365 Approving a Water Shortage Contingency Plan
- Appendix C EMID Resolution No. 2190 Establishing a Methodology for Calculating Mandatory Water Rationing Allotments and Creating an Excess Water Use Penalty
- Appendix D Public Participation Notice
- Appendix E Table 3: Projected System Supply Reliability Based on Historical Hydrologic Period from 3/31/10 letter from P. Kehoe
- Appendix F Resolution Adopting Tier 2 Drought Implementation Plan (Includes Exhibit A: Water Shortage Allocation Plan and Exhibit B: Tier 2 Drought Implementation Plan Among Wholesale Customers)
- Appendix G Chapter 8.60 of EMID Code on Water Conservation and Rationing
- Appendix H Planting and Irrigation Guidelines Booklet
- Appendix I Email to SFPUC providing wholesale agency with retail agency (EMID) water use projections
- Appendix J Attachment C Spreadsheet tool from BAWSCA
- Appendix K Notice of Public Hearing

Section 10 References

1. 2005 Urban Water Management Plan (EMID)
2. Common Language from BAWSCA
3. "Water Shortage Contingency Plan for Estero Municipal Improvement District (EMID), January 1993", EMID
4. City of Foster City/EMID 2011 Policy Calendar
5. City of Foster City/EMID 2008 Water Supply Assessment Report for Gilead Sciences Corporate Campus Project, Mirabella San Francisco Bay/Parkview Plaza Project, Chess/Hatch Drive Office Project
6. Attachment C Spreadsheet Tool from BAWSCA
7. City of Foster City Housing Element (General Plan adopted February 1, 2010)
8. Water Conservation Bill of 2009 (SB X7-7)
9. Urban Water Management Planning Act, California Water Code, Division 6
10. Guidebook to Assist Water Suppliers to Prepare a 2010 Urban Water Management Plan
11. EMID Water Supply Agreement and Individual Water Sales Contract with SFPUC

APPENDIX

RESOLUTION NO. 3131

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE ESTERO MUNICIPAL IMPROVEMENT DISTRICT APPROVING THE 2010-2015 URBAN WATER MANAGEMENT PLAN (UWMP)

ESTERO MUNICIPAL IMPROVEMENT DISTRICT

WHEREAS, Assembly Bill (AB) 797 (Water Code Section 10610 et seq., known as the Urban Water Management Planning Act enacted by the California Legislature during the 1983-1984 Regular Session, which subsequently has been amended by AB 2661, mandates that every supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, prepare an UWMP; and

WHEREAS, EMID is an urban supplier of water providing water to over 30,000 customers; and

WHEREAS, EMID updated and adopted an UWMP in November 21, 2005 per District Resolution No. 2950 in compliance with AB 797; and

WHEREAS, to comply with AB 2661, the UWMP is required to be updated every five years on December 31 of years ending in 0 or 5; and

WHEREAS, this year a 6-month extension has been granted to provide additional time for agencies to comply with the Senate Bill 7-7 (SBX7-7) requirements to reduce water consumption 20% by 2020; and

WHEREAS, the Plan has been updated and must be adopted by July 1, 2011, and filed with the California Department of Water Resources within thirty (30) days of adoption after public review and hearing; and

WHEREAS, a Notice of Public Hearing was published in the local newspapers for consideration of the 2010-2015 UWMP at the Estero Municipal Improvement District's meeting of May 16, 2011, on said date the Public Hearing was opened, held and closed.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Estero Municipal Improvement District as follows:

1. The 2010-2015 UWMP is hereby adopted; and
2. The District Manager is directed to file the 2010-2015 UWMP with the California Department of Water Resources within thirty (30) days of adoption of the Plan; and

3. The District Manager is hereby authorized and directed to implement the Water Conservation Programs as set forth in the 2010-2015 UWMP, which include water shortage contingency analysis and recommendations to the EMID Board of Directors regarding necessary procedures, rules, and regulations to carry out effective and equitable water conservation and water recycling programs; and
4. In the event of a water shortage, the District Board is hereby authorized to declare a Water Shortage Emergency according to the Water Shortage Stages and Triggers indicated in the Plan, and implement necessary elements of the Plan.

PASSED AND ADOPTED as a Resolution of the Estero Municipal Improvement District at the regular meeting held on the 16th day of May, 2011, by the following vote:

AYES: Directors Bronitsky, Frisella, Kiesel, Wykoff, and President Koelling

NOES: None

ABSENT: None

ABSTAIN: None


LINDA KOELLING, PRESIDENT

ATTEST:


DORIS L. PALMER, DISTRICT SECRETARY

RESOLUTION NO. 2365

Appendix B

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE ESTERO MUNICIPAL
IMPROVEMENT DISTRICT APPROVING A WATER SHORTAGE CONTINGENCY PLAN

ESTERO MUNICIPAL IMPROVEMENT DISTRICT

WHEREAS, Assembly Bill ABX1-11, signed by the Governor on October 13, 1991, requires that each California urban water supplier providing municipal water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre feet of water annually must prepare and adopt a Water Shortage Contingency Plan as an adjunct to their Urban Water Management Plan; and

WHEREAS, the adopted Water Shortage Contingency Plan must be filed with the California Department of Water Resources within 30 days of adoption in order to ensure eligibility to receive drought assistance from the State; and

WHEREAS, within 30 days after such filing, the District must make the plan available for public review during normal business hours.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Estero Municipal Improvement District that:

1. The Estero Municipal Improvement District Water Shortage Contingency dated January 1993 has been prepared in accordance with all provisions of ABX1-11, has been reviewed at a properly noticed public hearing and is hereby adopted and shall be fully implemented within the next 30 days.
 2. The District Secretary is hereby authorized and directed to attach a certified copy of this resolution to the Water Shortage Contingency Plan and to file a copy of the plan with the California Department of Water Resources.
 3. The District Secretary is further directed to keep a copy of the Water Shortage Contingency Plan available for public review during normal business hours.
-

RESOLUTION NO. 2365

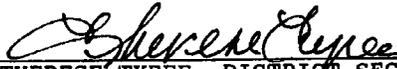
PASSED AND ADOPTED as a Resolution of the Board of Directors
of the Estero Municipal Improvement District at the
Regular Meeting held on the 1st day of
March, 1993, by the following vote:

AYES: Directors Battaglia, Chinn, Field, Fitzgerald, and
President Bramlett
NOES: None
ABSENT: None
ABSTAIN: None



OWEN BRAMLETT, PRESIDENT

ATTEST:



THERESE TYREE, DISTRICT SECRETARY

RESOLUTION NO. 2190

Appendix C

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE ESTERO MUNICIPAL IMPROVEMENT DISTRICT ESTABLISHING A METHODOLOGY FOR ESTABLISHING MANDATORY WATER RATIONING ALLOTMENTS AND CREATING AN EXCESS WATER USAGE PENALTY

ESTERO MUNICIPAL IMPROVEMENT DISTRICT

WHEREAS, the District Board has declared that a water emergency exists and that mandatory water rationing measures are to be implemented as set forth in Sections 8.60.010 through 8.60.130 of District Ordinance No. 107; and

WHEREAS, the following are defined for the purpose of this resolution:

Unit of water - 100 cubic feet or 748 gallons

Allotment - the amount of water a customer may use each month without having to pay an excess water usage penalty.

Excess Water Usage Penalty - a penalty charged for water consumed over a customer's allotment.

WHEREAS, the methodology for determining the allotments for each customer is as follows:

- o For residential customers, allotments shall be based upon the estimated number of persons living in each unit. For each person, the base allotment shall be 55 gal/person/day.

Single-Family Dwelling (land use code 100) is 4 persons per dwelling unit and at 55 gal/day/person - 220 gal/day base usage allowed. In addition to the base usage, the following outside usage is allowed:

Units/Single Family Unit/Month

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	2	4	5	5	6	5	4	1	0

Duplex (land use code 200) is 3 persons per dwelling unit and at 55 gal/day/person - 165 gal/day base usage is allowed. In addition to the base usage, the following outside usage is allowed:

Same as Single-Family Dwelling

Town House (land use code 300) is 3 persons per dwelling unit and at 55 gal/day/person - 165 gal/day base usage is allowed. In addition to the base usage, the following outside usage is allowed:

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No outside allocation. Resident must appeal to the Appeals Board. If approved, the same formula as single-family dwelling shall be applied.

Apartment/Condo (land use code 400) is 2.5 persons per dwelling unit and at 55 gal/day/person - 137.5 gal/day base usage is allowed. In addition to the base usage, the following outside usage is allowed:

Outside usage: Outside allotment calculated as:
.0400 units/100 sq. ft./mo. with a monthly multiplier as follows:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	2	4	5	5	6	5	4	1	0

To appeal a base allotment, a residential customer is required to submit a written statement to the Appeals Board specifying reason for adjustment in allocation. An increase of an additional 40 gallons per extra person over the estimated number per land use code may be allowed.

- o For all non-residential land uses and use codes 500 and greater, the allotment shall be determined as follows:

Base allocation - The base consumption for each meter shall be determined by averaging its water consumption for the months of January, February, March, and December 1987. The allocation for each billing period will be 85 percent of the average consumption for the winter months listed above. This shall be the base allocation for each period.

Outside allocation - Outside water is considered all water used above the base allocation for the months of April through November. The amount of water consumed over and above the base consumption during the months of April through November 1987 is determined by subtracting 85 percent of the base consumption from the amount of water consumed during each of the above described months. Each customer is allocated 40 percent of the outside consumption amount.

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WHEREAS, an excess water usage penalty shall be implemented for all land use codes as follows:

<u>Excess Water Consumption</u>	<u>Monetary Penalty</u>
0% - 5% over allotment	.75 per unit
5.01% - 10.00% over allotment	2.32 per unit
10.01% - 20.00% over allotment	4.42 per unit
20.01% + over allotment	5.47 per unit

NOW, THEREFORE, BE IT RESOLVED as follows:

1. Mandatory water rationing shall become effective upon the Public Utilities Commission of the San Francisco Water Department's approving and adopting mandatory water rationing.
2. Allocations for each meter within the Estero Municipal Improvement District shall be calculated as described above.
3. An excess water usage penalty as described above shall become effective August 1, 1990, upon the Public Utilities Commission of the San Francisco Water Department's approving and adopting mandatory water rationing during the month of May, 1990.
4. The District Manager is hereby authorized to modify the above water allocations when and if deemed necessary.

PASSED AND ADOPTED as a Resolution of the Board of Directors of the Estero Municipal Improvement District at the regular meeting held on the 7th day of May, 1990, by the following vote:

AYES: Directors Battaglia, Fitzgerald, Martinson, Oliver, and
President Chinn

NOES: None

ABSENT: None

ABSTAIN: None

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ROGER CHINN, PRESIDENT

ATTEST:



RICHARD D. WYKOFF, DISTRICT SECRETARY
BY THERESE TYREE, DEPUTY DISTRICT SECRETARY

APPENDIX D



NEWS

Contact: Andra Lorenz
(650) 286-3215
alorenz@fostercity.org

FOR IMMEDIATE RELEASE

Estero Municipal Improvement District Updates Urban Water Management Plan

Foster City, CA; February 22, 2011 – In compliance with state law, the Estero Municipal Improvement District (EMID) is beginning the process of reviewing and updating its Urban Water Management Plan (UWMP). The state of California requires that this plan be updated every five years. The Plan was last updated in 2005 and must be adopted by the EMID Board of Directors by July 2011.

The Estero Municipal Improvement District provides potable water to residents in Foster City and the Mariners Island area of San Mateo. The Urban Water Management Plan outlines the EMID's projections for the amount of water that will be supplied, how it will be used and how the District plans to achieve a conservation goal of 20% reduction by 2020.

The District encourages its water customers to participate in the review process. Proposed revisions to the Plan will be made available for public review at Foster City's City Hall, 610 Foster City Boulevard and the Foster City Public Library, 1000 East Hillsdale Boulevard. A public hearing is expected to be held in May or June 2011.

To learn more about the current Urban Water Management Plan, the schedule for considering changes to it, or how to participate in the process, please contact Project Engineer Leah Edwards, 610 Foster City Boulevard, Foster City, CA 94404, (650) 286-3277 or ledwards@fostercity.org.

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**SAN FRANCISCO PUBLIC UTILITIES COMMISSION**

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



March 31, 2011

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

EDWIN M. LEE
MAYOR

FRANCESCA VIOTOR
PRESIDENT

ANSON MORAN
VICE PRESIDENT

ANN MOLLER CAEN
COMMISSIONER

ART TORRES
COMMISSIONER

VINCE COURTNEY
COMMISSIONER

ED HARRINGTON
GENERAL MANAGER

Dear Nicole,

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

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

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

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

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

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

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

Sincerely,

A handwritten signature in blue ink that reads "Paula Kehoe". The signature is written in a cursive style with a long horizontal flourish at the end.

Paula Kehoe
Director of Water Resources



**Table 1
Projected Deliveries for Three
Multiple Dry Years**

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

Table 2

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

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

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

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

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

RESOLUTION NO. 3126

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE ESTERO MUNICIPAL IMPROVEMENT DISTRICT FOR APPROVAL AND ADOPTION OF THE TIER 2 DROUGHT IMPLEMENTATION PLAN PURSUANT TO SECTION 3.11.C OF THE WATER SUPPLY AGREEMENT WITH SAN FRANCISCO

ESTERO MUNICIPAL IMPROVEMENT DISTRICT

THIS RESOLUTION IS ADOPTED in light of the following facts and circumstances:

1. The Estero Municipal Improvement District is one of 26 agencies in San Mateo, Santa Clara and Alameda Counties which purchase water from the City and County of San Francisco (San Francisco) pursuant to a Water Supply Agreement entered into in 2009 (Agreement). Collectively these 26 agencies are referred to in the Agreement as Wholesale Customers.

2. Section 3.11 of the Agreement addresses times when insufficient water is available in the San Francisco Regional Water System to meet the full demands of all users. Section 3.11.C provides that during periods of water shortage caused by drought, the San Francisco Public Utilities Commission (SFPUC) will allocate available water between its retail customers and the Wholesale Customers collectively, in accordance with a schedule contained in the Water Shortage Allocation Plan set forth in Exhibit A (Attachment H to the WSA Agreement: Water Shortage Allocation Plan).

3. Section 3.11.C authorizes the Wholesale Customers to adopt a Drought Allocation Plan, including a methodology for allocating the water which is collectively available to the 26 Wholesale Customers among each individual Wholesale Customer (Tier 2 Plan). It also commits the SFPUC to honor allocations of water unanimously agreed to by all Wholesale Customers or, if unanimous agreement cannot be achieved, water allocations that have been adopted by the Board of Directors of the Bay Area Water Supply and Conservation Agency (BAWSCA). The Agreement also provides that the SFPUC can allocate water supplies as necessary during a water shortage emergency if no agreed upon plan for water allocation has been adopted by the 26 Wholesale Customers or the BAWSCA Board of Directors.

4. Commencing in October 2009, representatives appointed by the managers of each of the Wholesale Customers have been meeting to develop a set of principles to serve as guidelines for an equitable allocation methodology, as well as formulas and procedures, to implement those principles. These discussions, and supporting technical analyses, have been conducted with the assistance of BAWSCA staff.

5. The Tier 2 Plan, attached to this resolution as Exhibit B, has been endorsed by all of the Wholesale Customer representatives who participated in the formulation process and they have committed to recommend that it be formally adopted by the governing body of their respective agencies.

6. The Tier 2 Plan allocates the collective Wholesale Customer share among each of the 26 wholesale customers through December 31, 2018 to coincide with San Francisco's deferral of decisions about additional water supply until at least 2018.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Estero Municipal Improvement District as follows:

1. The Tier 2 Drought Implementation Plan, a copy of which is attached hereto as Exhibit B, is approved.

2. This approval is conditioned upon all of the other 25 Wholesale Customers approving the Plan, such approvals being evidenced through adoption of similar resolutions or, in the case of private-sector organizations, by other equivalently binding written commitments signed by an executive officer acting within the scope of delegated authority, and all such approvals occurring on or before June 30, 2011.

If such resolutions or binding commitments are not adopted by that date, this resolution will automatically expire and be of no further effect after June 30, 2011, unless it has been extended prior thereto by further action of the Board of Directors.

PASSED AND ADOPTED as a resolution of the Board of Directors of the Estero Municipal Improvement District at the regular meeting held on the 7th day of March, 2011, by the following vote:

AYES: Directors Bronitsky, Frisella, Kiesel, Wykoff, and President Koelling

NOES: None

ABSENT: None

ABSTAIN: None


LINDA KOELLING, PRESIDENT

ATTEST:



DORIS L. PALMER, DISTRICT SECRETARY

ATTACHMENT H

WATER SHORTAGE ALLOCATION PLAN

This Interim Water Shortage Allocation Plan ("Plan") describes the method for allocating water between the San Francisco Public Utilities Commission ("SFPUC") and the Wholesale Customers collectively during shortages caused by drought. The Plan implements a method for allocating water among the individual Wholesale Customers which has been adopted by the Wholesale Customers. The Plan includes provisions for transfers, banking, and excess use charges. The Plan applies only when the SFPUC determines that a system-wide water shortage due to drought exists, and all references to "shortages" and "water shortages" are to be so understood. This Plan was adopted pursuant to Section 7.03(a) of the 1984 Settlement Agreement and Master Water Sales Contract and has been updated to correspond to the terminology used in the June 2009 Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County and Santa Clara County ("Agreement").

SECTION 1. SHORTAGE CONDITIONS

1.1. Projected Available SFPUC Water Supply. The SFPUC shall make an annual determination as to whether or not a shortage condition exists. The determination of projected available water supply shall consider, among other things, stored water, projected runoff, water acquired by the SFPUC from non-SFPUC sources, inactive storage, reservoir losses, allowance for carryover storage, and water bank balances, if any, described in Section 3.

1.2 Projected SFPUC Purchases. The SFPUC will utilize purchase data, including volumes of water purchased by the Wholesale Customers and by Retail Customers (as those terms are used in the Agreement) in the year immediately prior to the drought, along with other available relevant information, as a basis for determining projected system-wide water purchases from the SFPUC for the upcoming year.

1.3. Shortage Conditions. The SFPUC will compare the available water supply (Section 1.1) with projected system-wide water purchases (Section 1.2). A shortage condition exists if the SFPUC determines that the projected available water supply is less than projected system-wide water purchases in the upcoming Supply Year (defined as the period from July 1 through June 30). When a shortage condition exists, SFPUC will determine whether voluntary or mandatory actions will be required to reduce purchases of SFPUC water to required levels.

1.3.1 Voluntary Response. If the SFPUC determines that voluntary actions will be sufficient to accomplish the necessary reduction in water use throughout its service area, the SFPUC and the Wholesale Customers will make good faith efforts to reduce their water purchases to stay within their annual shortage allocations and associated monthly water use budgets. The SFPUC will not impose excess use charges during periods of voluntary rationing, but may suspend the prospective accumulation of water bank credits, or impose a ceiling on further accumulation of bank credits, consistent with Section 3.2.1 of this Plan.

1.3.2 Mandatory Response. If the SFPUC determines that mandatory actions will be required to accomplish the necessary reduction in water use in the SFPUC service area, the SFPUC may implement excess use charges as set forth in Section 4 of this Plan.

1.4. Period of Shortage. A shortage period commences when the SFPUC determines that a water shortage exists, as set forth in a declaration of water shortage emergency issued by the SFPUC pursuant to California Water Code Sections 350 et seq. Termination of the water shortage emergency will be declared by resolution of the SFPUC.

SECTION 2. SHORTAGE ALLOCATIONS

2.1. Annual Allocations between the SFPUC and the Wholesale Customers. The annual water supply available during shortages will be allocated between the SFPUC and the collective Wholesale Customers as follows:

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 water allocated to the SFPUC shall correspond to the total allocation for all Retail Customers.

2.2 Annual Allocations among the Wholesale Customers. The annual water supply allocated to the Wholesale Customers collectively during system wide shortages of 20 percent or less will be apportioned among them based on a methodology adopted by all of the Wholesale Customers, as described in Section 3.11(C) of the Agreement. In any year for which the methodology must be applied, the Bay Area Water Supply and Conservation Agency (“BAWSCA”) will calculate each Wholesale Customer’s individual percentage share of the amount of water allocated to the Wholesale Customers collectively pursuant to Section 2.1. Following the declaration or reconfirmation of a water shortage emergency by the SFPUC, BAWSCA will deliver to the SFPUC General Manager a list, signed by the President of BAWSCA’s Board of Directors and its General Manager, showing each Wholesale Customer together with its percentage share and stating that the list has been prepared in accordance with the methodology adopted by the Wholesale Customers. The SFPUC shall allocate water to each Wholesale Customer, as specified in the list. The shortage allocations so established may be transferred as provided in Section 2.5 of this Plan. If BAWSCA or all Wholesale Customers do not provide the SFPUC with individual allocations, the SFPUC may make a final allocation decision after first meeting and discussing allocations with BAWSCA and the Wholesale Customers.

The methodology adopted by the Wholesale Customers utilizes the rolling average of each individual Wholesale Customer’s purchases from the SFPUC during the three immediately

preceding Supply Years. The SFPUC agrees to provide BAWSCA by November 1 of each year a list showing the amount of water purchased by each Wholesale Customer during the immediately preceding Supply Year. The list will be prepared using Customer Service Bureau report MGT440 (or comparable official record in use at the time), adjusted as required for any reporting errors or omissions, and will be transmitted by the SFPUC General Manager or his designee.

2.3. Limited Applicability of Plan to System Wide Shortages Greater Than Twenty

Percent. The allocations of water between the SFPUC and the Wholesale Customers collectively, provided for in Section 2.1, apply only to shortages of 20 percent or less. The SFPUC and Wholesale Customers recognize the possibility of a drought occurring which could create system-wide shortages greater than 20 percent despite actions taken by the SFPUC aimed at reducing the probability and severity of water shortages in the SFPUC service area. If the SFPUC determines that a system wide water shortage greater than 20 percent exists, the SFPUC and the Wholesale Customers agree to meet within 10 days and discuss whether a change is required to the allocation set forth in Section 2.1 in order to mitigate undue hardships that might otherwise be experienced by individual Wholesale Customers or Retail Customers. Following these discussions, the Tier 1 water allocations set forth in Section 2.1 of this Plan, or a modified version thereof, may be adopted by mutual written consent of the SFPUC and the Wholesale Customers. If the SFPUC and Wholesale Customers meet and cannot agree on an appropriate Tier 1 allocation within 30 days of the SFPUC's determination of water shortage greater than 20 percent, then (1) the provisions of Section 3.11(C) of the Agreement will apply, unless (2) all of the Wholesale Customers direct in writing that a Tier 2 allocation methodology agreed to by them be used to apportion the water to be made available to the Wholesale Customers collectively, in lieu of the provisions of Section 3.11(C).

The provisions of this Plan relating to transfers (in Section 2.5), banking (in Section 3), and excess use charges (in Section 4) shall continue to apply during system-wide shortages greater than 20 percent.

2.4. Monthly Water Budgets. Within 10 days after adopting a declaration of water shortage emergency, the SFPUC will determine the amount of Tier 1 water allocated to the Wholesale Customers collectively pursuant to Section 2.1. The SFPUC General Manager, using the Tier 2 allocation percentages shown on the list delivered by BAWSCA pursuant to Section 2.2, will calculate each Wholesale Customer's individual annual allocation. The SFPUC General Manager, or his designee, will then provide each Wholesale Customer with a proposed schedule of monthly water budgets based on the pattern of monthly water purchases during the Supply Year immediately preceding the declaration of shortage (the "Default Schedule"). Each Wholesale Customer may, within two weeks of receiving its Default Schedule, provide the SFPUC with an alternative monthly water budget that reschedules its annual Tier 2 shortage allocation over the course of the succeeding Supply Year. If a Wholesale Customer does not deliver an alternative monthly water budget to the SFPUC within two weeks of its receipt of the Default Schedule, then its monthly budget for the ensuing Supply Year shall be the Default Schedule proposed by the SFPUC.

Monthly Wholesale Customer water budgets will be derived from annual Tier 2 allocations for purposes of accounting for excess use. Monthly Wholesale Customer water budgets shall be adjusted during the year to account for transfers of shortage allocation under Section 2.5 and

transfers of banked water under Section 3.4.

2.5. Transfers of Shortage Allocations. Voluntary transfers of shortage allocations between the SFPUC and any Wholesale Customers, and between any Wholesale Customers, will be permitted using the same procedure as that for transfers of banked water set forth in Section 3.4. The SFPUC and BAWSCA shall be notified of each transfer. Transfers of shortage allocations shall be deemed to be an emergency transfer and shall become effective on the third business day after notice of the transfer has been delivered to the SFPUC. Transfers of shortage allocations shall be in compliance with Section 3.05 of the Agreement. The transferring parties will meet with the SFPUC, if requested, to discuss any effect the transfer may have on its operations.

SECTION 3. SHORTAGE WATER BANKING

3.1. Water Bank Accounts. The SFPUC shall create a water bank account for itself and each Wholesale Customer during shortages in conjunction with its resale customer billing process. Bank accounts will account for amounts of water that are either saved or used in excess of the shortage allocation for each agency; the accounts are not used for tracking billings and payments. When a shortage period is in effect (as defined in Section 1.4), the following provisions for bank credits, debits, and transfers shall be in force. A statement of bank balance for each Wholesale Customer will be included with the SFPUC's monthly water bills.

3.2. Bank Account Credits. Each month, monthly purchases will be compared to the monthly budget for that month. Any unused shortage allocation by an agency will be credited to that agency's water bank account. Credits will accumulate during the entire shortage period, subject to potential restrictions imposed pursuant to Section 3.2.1. Credits remaining at the end of the shortage period will be zeroed out; no financial or other credit shall be granted for banked water.

3.2.1. Maximum Balances. The SFPUC may suspend the prospective accumulation of credits in all accounts. Alternatively, the SFPUC may impose a ceiling on further accumulation of credits in water bank balances based on a uniform ratio of the bank balance to the annual water allocation. In making a decision to suspend the prospective accumulation of water bank credits, the SFPUC shall consider the available water supply as set forth in Section 1.1 of this Plan and other reasonable, relevant factors.

3.3. Account Debits. Each month, monthly purchases will be compared to the budget for that month. Purchases in excess of monthly budgets will be debited against an agency's water bank account. Bank debits remaining at the end of the fiscal year will be subject to excess use charges (see Section 4).

3.4. Transfers of Banked Water. In addition to the transfers of shortage allocations provided for in Section 2.5, voluntary transfers of banked water will also be permitted between the SFPUC and any Wholesale Customer, and among the Wholesale Customers. The volume of transferred water will be credited to the transferee's water bank account and debited against the transferor's water bank account. The transferring parties must notify the SFPUC and BAWSCA of each transfer in writing (so that adjustments can be made to bank accounts), and will meet with the SFPUC, if requested, to discuss any affect the transfer may have on SFPUC operations. Transfers of banked water shall be deemed to be an emergency transfer and shall become effective on the third business day after notice of the transfer has been delivered to the SFPUC.

If the SFPUC incurs extraordinary costs in implementing transfers, it will give written notice to the transferring parties within ten (10) business days after receipt of notice of the transfer. Extraordinary costs means additional costs directly attributable to accommodating transfers and which are not incurred in non-drought years nor simply as a result of the shortage condition itself. Extraordinary costs shall be calculated in accordance with the procedures in the Agreement and shall be subject to the disclosure and auditing requirements in the Agreement. In the case of transfers between Wholesale Customers, such extraordinary costs shall be considered to be expenses chargeable solely to individual Wholesale Customers and shall be borne equally by the parties to the transfer. In the case of transfers between the SFPUC and a Wholesale Customer, the SFPUC's share of any extraordinary transfer costs shall not be added to the Wholesale Revenue Requirement.

3.4.1. Transfer Limitations. The agency transferring banked water will be allowed to transfer no more than the accumulated balance in its bank. Transfers of estimated prospective banked credits and the "overdrafting" of accounts shall not be permitted. The price of transfer water originally derived from the SFPUC system is to be determined by the transferring parties and is not specified herein. Transfers of banked water shall be in compliance with Section 3.05 of the Agreement.

SECTION 4. WHOLESALE EXCESS USE CHARGES

4.1. Amount of Excess Use Charges. Monthly excess use charges shall be determined by the SFPUC at the time of the declared water shortage consistent with the calendar in Section 6 and in accordance with Section 6.03 of the Agreement. The excess use charges will be in the form of multipliers applied to the rate in effect at the time the excess use occurs. The same excess use charge multipliers shall apply to the Wholesale Customers and all Retail Customers. The excess use charge multipliers apply only to the charges for water delivered at the rate in effect at the time the excess use occurred.

4.2 Monitoring Suburban Water Use. During periods of voluntary rationing, water usage greater than a customer's allocation (as determined in Section 2) will be indicated on each SFPUC monthly water bill. During periods of mandatory rationing, monthly and cumulative water usage greater than a Wholesale Customer's shortage allocation and the associated excess use charges will be indicated on each SFPUC monthly water bill.

4.3. Suburban Excess Use Charge Payments. An annual reconciliation will be made of monthly excess use charges according to the calendar in Section 6. Annual excess use charges will be calculated by comparing total annual purchases for each Wholesale Customer with its annual shortage allocation (as adjusted for transfers of shortage allocations and banked water, if any). Excess use charge payments by those Wholesale Customers with net excess use will be paid according to the calendar in Section 6. The SFPUC may dedicate excess use charges paid by Wholesale Customers toward the purchase of water from the State Drought Water Bank or other willing sellers in order to provide additional water to the Wholesale Customers. Excess use charges paid by the Wholesale Customers constitute Wholesale Customer revenue and shall be included within the SFPUC's annual Wholesale Revenue Requirement calculation.

SECTION 5. GENERAL PROVISIONS GOVERNING WATER SHORTAGE ALLOCATION PLAN

5.1. Construction of Terms. This Plan is for the sole benefit of the parties and shall not be construed as granting rights to any person other than the parties or imposing obligations on a party to any person other than another party.

5.2. Governing Law. This Plan is made under and shall be governed by the laws of the State of California.

5.3. Effect on Agreement. This Plan describes the method for allocating water between the SFPUC and the collective Wholesale Customers during system-wide water shortages of 20 percent or less. This Plan also provides for the SFPUC to allocate water among the Wholesale Customers in accordance with directions provided by the Wholesale Customers through BAWSCA under Section 2.2, and to implement a program by which such allocations may be voluntarily transferred among the Wholesale Customers. The provisions of this Plan are intended to implement Section 3.11(C) of the Agreement and do not affect, change or modify any other section, term or condition of the Agreement.

5.4. Inapplicability of Plan to Allocation of SFPUC System Water During Non-Shortage Periods. The SFPUC's agreement in this Plan to a respective share of SFPUC system water during years of shortage shall not be construed to provide a basis for the allocation of water between the SFPUC and the Wholesale Customers when no water shortage emergency exists.

5.5. Termination. This Plan shall expire at the end of the Term of the Agreement. The SFPUC and the Wholesale Customers can mutually agree to revise or terminate this Plan prior to that date due to changes in the water delivery capability of the SFPUC system, the acquisition of new water supplies, and other factors affecting the availability of water from the SFPUC system during times of shortage.

SECTION 6. ALLOCATION CALENDAR

6.1. Annual Schedule. The annual schedule for the shortage allocation process is shown below. This schedule may be changed by the SFPUC to facilitate implementation.

6.1.1

In All Years

Target Dates

- | | |
|--|---|
| 1. SFPUC delivers list of annual purchases by each Wholesale Customer during the immediately preceding Supply Year | November 1 |
| 2. SFPUC meets with the Wholesale Customers and presents water supply forecast for the following Supply Year | February |
| 3. SFPUC issues initial estimate of available water supply | February 1 |
| 4. SFPUC announces potential first year of drought (if applicable) | February 1 |
| 5. SFPUC and Wholesale Customers meet upon request to exchange information concerning water availability and projected system-wide purchases | February 1-May 31 |
| 6. SFPUC issues revised estimate of available water supply, and confirms continued potential shortage conditions, if applicable | March 1 |
| 7. SFPUC issues final estimate of available water supply | April 15 th or sooner if adequate snow course measurement data is available to form a robust estimate on available water supply for the coming year. |
| 8. SFPUC determines amount of water available to Wholesale Customers collectively | April 15 th or sooner if adequate snow course measurement data is available to form a robust estimate on available water supply for the coming year. |

In Drought Years

Target Dates

- | | |
|---|---|
| 9. SFPUC formally declares the existence of water shortage emergency (or end of water shortage emergency, if applicable) under Water Code Sections 350 et. seq. | April 15-31 |
| 10. SFPUC declares the need for a voluntary or mandatory response | April 15-31 |
| 11. BAWSCA submits calculation to SFPUC of individual Wholesale Customers' percentage shares of water allocated to Wholesale Customers collectively | April 15- 31 |
| 12. SFPUC determines individual shortage allocations, based on BAWSCA's submittal of individual agency percentage shares to SFPUC, and monthly water budgets (Default Schedule) | April 25—May 10 |
| 13. Wholesale Customers submit alternative monthly water budgets (optional) | May 8-May 24 |
| 14. Final drought shortage allocations are issued for the Supply Year beginning July 1 through June 30 | June 1 |
| 15. Monthly water budgets become effective | July 1 |
| 16. Excess use charges indicated on monthly Suburban bills | August 1 (of the beginning year) through June 30 (of the succeeding year) |
| 17. Excess use charges paid by Wholesale Customers for prior year | August of the succeeding year |

EXHIBIT B

TIER 2 DROUGHT IMPLEMENTATION PLAN AMONG WHOLESALE CUSTOMERS

This Tier 2 Drought Implementation (Plan) describes the method for allocating the water made available by the San Francisco Public Utilities Commission (SFPUC) among the Wholesale Customers during shortages caused by drought. This Plan is adopted pursuant to Section 3.11.C of the July 2009 Water Supply Agreement between the City and County of San Francisco and the Wholesale Customers (Agreement).

SECTION 1. APPLICABILITY AND INTEGRATION

Section 1.1 Applicability. This Plan applies when, and only when, the SFPUC determines that a system-wide water shortage of 20 percent or less exists, as set forth in a declaration of water shortage emergency adopted by the SFPUC pursuant to California Water Code Sections 350 *et seq.* This Plan applies only to water acquired and distributed by the SFPUC to the Wholesale Customers and has no effect on water obtained by a Wholesale Customer from any source other than the SFPUC.

Section 1.2 Integration with Tier 1 Water Shortage Allocation Plan. The Agreement contains, in Attachment H, a Water Shortage Allocation Plan which, among other things, (a) provides for the allocation by the SFPUC of water between Direct City Water Users (e.g., retail water customers within the City and County of San Francisco) and the Wholesale Customers collectively during system-wide water shortages of 20 percent or less, (b) contemplates the adoption by the Wholesale Customers of this Plan for allocation of the water made available to Wholesale Customers collectively among the 26 individual Wholesale Customers, (c) commits the SFPUC to implement this Plan, and (d) provides for the transfer of both banked water and shortage allocations between and among the Wholesale Customers and commits the SFPUC to implement such transfers. That plan is referred to as the Tier 1 Plan.

The Tier 1 Plan also provides the methodology for determining the Overall Average Wholesale Customer Reduction, expressed as a percentage cutback from prior year's normal SFPUC purchases, and Overall Wholesale Customer Allocation, in million gallons per day, both of which are used in determining the Final Allocation Factor for each Wholesale Customer. The Overall Average Wholesale Customer Reduction is determined by dividing the volume of water available to the Wholesale Customers (the Overall Wholesale Customer Allocation), shown as a share of available water in Section 2 of the Tier 1 Plan, by the prior year's normal total Wholesale Customers SFPUC purchases and subtracting that value from one.

This Plan is referred to in the Agreement as the Tier 2 Plan. It is intended to be integrated with the Tier 1 Plan described in the preceding paragraph. Terms used in this Plan are intended to have the same meaning as such terms have in the Tier 1 Plan.

SECTION 2. ALLOCATION OF WATER AMONG WHOLESALE CUSTOMERS

Section 2.1 Annual Allocations Among the Wholesale Customers. The annual water supply allocated by the SFPUC to the Wholesale Customers collectively during system-wide shortages of 20 percent or less shall be apportioned among them based on the methodology described in this Section.

Section 2.2 Methodology for Allocating Water Among Wholesale Customers. The water made available to the Wholesale Customers collectively will be allocated among them in proportion to each Wholesale Customer's Allocation Factor, adjusted as described in the following subsections below. The Wholesale Customer Allocation Factors will only be calculated at the onset of a drought and will remain the same until such time as the SFPUC declares the shortage condition over. The Wholesale Customer Allocation Factors will be recalculated during subsequent shortage periods for use during those specific periods.

Section 2.2.1 Step One: Determination of Base/Seasonal Purchase Cutback For Each Wholesale Customer. The first step requires calculating the Wholesale Customer's Base/Seasonal Purchase Cutback. This calculation has seven parts. An example of Steps 1b-1f is presented in Table 2. Step 1g is shown in columns 3-6 in Table 3. For steps 1b-1g, the calculation uses average monthly production values for the three years preceding the drought for all potable supply sources, expressed as a monthly value in hundred cubic feet:

- Step 1a: Each agency's total annual purchases from the SFPUC will be compared to its Individual Supply Guarantee (ISG), with any annual purchases above its ISG subtracted from that agency's total annual SFPUC purchases by subtracting the amount on a monthly basis in proportion to the agency's monthly SFPUC purchase pattern,
- Step 1b: Calculate Average Monthly and Total Production for the three fiscal years immediately preceding the drought, excluding years during which shortage allocations were in effect, based on monthly production data from the SFPUC and Wholesale Customers,
- Step 1c: Calculate Base Component which is equal to the Average Monthly Production during the base months of December, January, February and March, multiplied by 12,
- Step 1d: Calculate Seasonal Component as the difference between Total Production and Base Component,
- Step 1e: Calculate an agency's Base/Seasonal Allocation, expressed in hundred cubic feet, by multiplying the Base Component by one minus the Base Reduction Percentage, or 90%, and the Seasonal Component by the percentage needed (Seasonal Reduction Percentage) to achieve the required Overall Average Wholesale Customer Reduction, which is expressed as a percentage,

- Step 1f: Calculate the Base/Seasonal Allocation Cutback Percentage for each agency by dividing its Base/Seasonal Allocation by the agency's Total Production, and
- Step 1g: Calculate the Base/Seasonal Purchase Cutback Percentage by multiplying the Base/Seasonal Allocation Cutback percentage times the lesser of: (a) the immediately preceding SFPUC purchases or (b) ISG, adjusting the Seasonal percentage above until the total reduction equals the Overall Average Wholesale Customer Reduction.

Additionally, adjustments to the Base Component for Stanford University will be made to remove that two week time period that the University is completely closed during the winter break per policy set by the University President as long as that policy remains in place. This adjustment will be removed at such time as the seasonal closure policy is terminated by Stanford University.

Section 2.2.2 Step Two: First Adjustment for San Jose and Santa Clara. The resulting Base/Seasonal Purchase Cutback Percentage in Section 2.2.1 for San Jose and Santa Clara will be compared to the highest Base/Seasonal Purchase Cutback percentage of the other Wholesale Customers. If both San Jose's and Santa Clara's percentage reductions are larger than the highest percentage reduction among any other Wholesale Customers, the Base/Seasonal Purchase Cutback percentage established under Section 2.2.1 will remain unchanged. If either San Jose's percentage cutback or Santa Clara's percentage cutback, or both, is smaller than the highest Base/Seasonal Purchase Cutback percentage of other Wholesale Customers, the Base/Seasonal Allocation (in mgd) of San Jose or Santa Clara, or both, will be reduced so that the percentage cutback of each is no smaller than that of the Wholesale Customers' otherwise highest percentage cutback. The amount of shortage allocation (in mgd) removed from San Jose and/or Santa Clara will be reallocated among the remaining Wholesale Customers in proportion to the Base/Seasonal Allocation of each.

Section 2.2.3 Step Three: Determination of Weighted Purchase Cutback For Each Wholesale Customer. Each agency's weighted allocation is calculated by multiplying its Adjusted Base/Seasonal Allocation in Section 2.2.2 by 66.66% and its Fixed Component by 33.33%. The Fixed Component is (i) the Wholesale Customer's ISG provided for in the Agreement, or (ii) in the case of Hayward, 25.11 mgd, or (iii) in the case of San Jose and Santa Clara, consistent with the limit on purchases from SFPUC set forth in Section 4.05 of the Agreement, e. g., 4.5 mgd each. The amount of the Fixed Component for each Wholesale Customer is shown on Table 1.

Section 2.2.4 Step Four: Second Adjustment for San Jose and Santa Clara. The resulting Weighted Allocations for San Jose and Santa Clara will be compared to the highest Weighted Purchase Cutback, shown as a percentage, of the other Wholesale Customers. If both San Jose's and Santa Clara's percentage cutback is larger than the highest percentage cutback among other Wholesale Customers, the Weighted Purchase Cutbacks established under Section 2.2.3 will remain unchanged. If either San Jose's

percentage cutback or Santa Clara's percentage cutback, or both, is smaller than the highest percentage cutback of any other Wholesale Customers, the Weighted Shortage Allocation (in mgd) of San Jose or Santa Clara, or both, will be reduced so that the percentage reduction of each is no smaller than that of the Wholesale Customers' otherwise highest Weighted Percentage Cutback. The amount of allocation (in mgd) removed from San Jose and/or Santa Clara will be reallocated among the remaining Wholesale Customers in proportion to the Weighted Shortage Allocation of each.

Section 2.2.5 Step Five: Adjustment for Minimum and Maximum Cutbacks. Using the Adjusted Weighted Purchase Cutbacks, either a 10% minimum cutback or maximum cutback, as defined below, is applied to any agency whose Adjusted Weighted Purchase Cutback falls outside this range:

- A minimum 10% cutback is applied to the individual agency Adjusted Weighted Allocation, with the reapportioned water being placed in the hardship bank for allocation to East Palo Alto.
- A maximum cutback of the average cutback plus 20% (e.g. 15% average cutback results in a maximum cutback of $15\% + 20\% = 35\%$) is applied to the individual agency Adjusted Weighted Allocation, with the water necessary to meet that level being subtracted in proportion to each Wholesale Customer's Adjusted Weighted Allocation from all remaining agencies, except those at agencies subject to the minimum cutback above.

The result is the Adjusted Minimum/Maximum Purchase Cutback, expressed as a percentage.

Section 2.2.6 Step Six: Adjustment to Provide Sufficient Supply for East Palo Alto.

In order to provide for sufficient water supply for water customers served by the City of East Palo Alto (EPA), the maximum Final Purchase Cutback applied at any given time to EPA will be equal to 50% of the Overall Average Wholesale Customer Reduction. The water needed to accommodate the guaranteed maximum cutback to EPA will be provided in two ways:

- First, water from the hardship bank provided by the 10% minimum cutback will be first added to the EPA Adjusted Weighted Purchase Allocation, and
- Second, the balance of water needed for EPA will be deducted on a prorated basis from those agencies with a pre-drought residential per capita water use greater than 55 gallons per capita per day (as documented in the most recent BAWSCA Annual Survey) in proportion to each agency's Min./Max. Adjusted Allocation and who are not subject to the minimum and maximum reductions already applied per Section 2.2.5

The result is the Allocation with EPA Adjustment, expressed as an mgd.

Section 2.2.7 Step Seven: Determination of Final Allocation Factor. Each Wholesale Customer's Final Allocation Factor is the fraction expressed as a percentage, the numerator of which is the particular Wholesale Customer's "Final Allocation with EPA Adjustment" (in mgd) as calculated in Steps One through Six and the denominator of which is the Overall Wholesale Customer Allocation (in mgd), a number provided by the SFPUC during the drought period as determined by the SFPUC in the Tier 1 Plan.

Section 2.2.8 Example Calculation. Table 2 presents a sample of the calculations involved in Steps 1b-1f. Table 3 presents a sample of the calculations involved in Step 1g and Steps Two through Seven, using the values from Tables 1 and 2 and recent water use data for the other values. Tables 2 and 3 are presented for illustrative purposes only and do not supersede the foregoing provisions of this Section 2.2. In the event of any inconsistency between this Section 2.2 and Tables 2 and 3, the text of this section will govern.

Section 2.3 Calculation of Individual Wholesale Customer Allocation Factors; Directions to SFPUC. The Tier 1 Plan contemplates that in any year in which the methodology described above must be applied, the Bay Area Water Supply and Conversation Agency (BAWSCA) will calculate each Wholesale Customer's individual percentage share of the amount of water made available to the Wholesale Customers collectively, following the methodology described above and defined above as Wholesale Customer Allocation Factors. The Tier 1 Plan requires SFPUC to allocate water to each Wholesale Customer in accordance with calculations delivered to it by BAWSCA.

Each Wholesale Customer authorizes BAWSCA to perform the calculations required, using water sales data furnished to it by the SFPUC, and to deliver to SFPUC a list of individual Wholesale Customer Allocation Factors so calculated as contemplated by the Tier 1 Plan. Neither BAWSCA nor any officer or employee of BAWSCA shall be liable to any Wholesale Customer for any such calculations made in good faith, even if incorrect.

SECTION 3. GENERAL PROVISIONS

Section 3.1 No Third-Party Beneficiaries. This Plan is for the sole benefit of the Wholesale Customers and shall not be construed as granting rights to any person other than another Wholesale Customer.

Section 3.2 Governing Law. This Plan is made under and shall be governed by the laws of the State of California.

Section 3.3 Effect on Water Supply Agreement. This Plan describes the method for allocating water from the SFPUC among the Wholesale Customers during system-wide water shortages of 20 percent or less declared by the SFPUC. The provisions of this Plan, and the Tier 1 Plan contained in Attachment H to the Agreement with which it is integrated, are intended to implement Section 3.11 of the Agreement. The Plans do not

affect, change or modify any other section, term or condition of the Agreement or of the individual Water Sales Contracts between each Wholesale Customer and San Francisco.

Section 3.4 Amendment. This Plan may be amended only by the written agreement of all Wholesale Customers.

Section 3.5 Termination. This Plan shall expire on December 31, 2018. It may be terminated prior to that date only by the written agreement of all Wholesale Customers.

TABLE 1 - FIXED COMPONENT FOR USE IN TIER 2 ALLOCATION CALCULATION

<u>Wholesale Customer</u>	<u>Fixed Component</u>
ACWD	13.76
Brisbane/GVMID	0.98
Burlingame	5.23
Coastside	2.18
CWS Total	35.68
Daly City	4.29
East Palo Alto	1.96
Estero	5.90
Hayward	25.11
Hillsborough	4.09
Menlo Park	4.46
Mid Pen WD	3.89
Millbrae	3.15
Milpitas	9.23
Mountain View	13.46
North Coast	3.84
Palo Alto	17.07
Purissima Hills	1.62
Redwood City	10.93
San Bruno	3.25
San José	4.50
Santa Clara	4.50
Stanford	3.03
Sunnyvale	12.58
Westborough	1.32

TABLE 2 - BASE/SEASONAL CUTBACK CALCULATION FOR TIER 2 DROUGHT IMPLEMENTATION PLAN (DRIP) (Steps 1b-1f of DRIP Calculation)

BASE/SEASONAL CUTBACK CALCULATION
3 YEAR ROLLING AVERAGE OF TOTAL PRODUCTION
 All Units In Hundred Cubic Feet (HCF) Except Where Otherwise Notes

Base Percentage Reduction =	10.00%
Seasonal Percentage Reduction =	65.00%
Number of Fiscal Years in Average =	1.0

Three-year averages by source

	July	August	September	October	November	December	January	February	March	April	May	June	Total
SFPUC Net	9,492,234	8,865,793	8,847,818	7,624,081	5,785,671	5,320,333	4,925,451	4,167,812	4,333,119	5,780,803	7,102,580	7,427,737	79,673,432
Groundwater	1,969,068	2,014,327	1,682,556	1,449,343	1,179,106	1,375,812	1,099,608	983,756	1,084,734	1,389,622	1,662,344	1,647,268	17,537,545
Other	2,744,449	2,669,344	2,537,606	2,418,221	1,644,468	874,833	1,391,142	1,320,782	1,606,115	2,004,769	2,517,082	2,675,045	24,403,836
Subtotal	14,205,751	13,549,464	13,067,981	11,491,646	8,609,245	7,570,977	7,416,201	6,472,350	7,023,968	9,175,195	11,281,986	11,750,050	121,614,813
SFPUC Excess	(36,886)	(33,367)	(35,125)	(28,015)	(18,394)	(11,600)	(10,843)	(11,088)	(8,721)	(16,898)	(25,409)	(27,984)	(264,330)
Net	14,168,865	13,516,097	13,032,856	11,463,631	8,590,851	7,559,378	7,405,358	6,461,262	7,015,246	9,158,297	11,256,577	11,722,066	121,350,483
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)

Three-year rolling monthly production average by Wholesale Customer with SFPUC purchases limited to ISG on a yearly basis

	July	August	September	October	November	December	January	February	March	April	May	June	Total Production	Base Component	Seasonal Component	Base/Seasonal Allocation	Base/Seasonal Cutback % (To Tab 2, Col 4)
ACWD	2,598,324	2,521,779	2,356,517	2,088,213	1,483,726	1,389,921	1,331,023	1,102,420	1,303,110	1,683,608	2,074,964	2,226,985	22,160,590	15,379,420	6,781,170	16,214,887	26.83%
Brisbane/GVMID	35,597	36,251	34,821	31,630	25,808	17,907	20,064	11,403	17,339	16,961	25,289	28,775	301,845	200,139	101,706	215,722	28.53%
Burlingame	237,426	236,780	214,046	203,879	183,921	127,936	130,576	132,703	110,995	141,580	164,657	202,117	2,086,616	1,506,630	579,986	1,558,962	25.29%
Coastside	118,409	120,160	102,807	103,917	69,291	70,976	72,928	57,246	48,396	79,714	90,816	102,112	1,036,773	748,636	288,136	774,620	25.29%
CWS	2,139,140	2,093,378	1,954,875	1,694,788	1,100,278	996,843	1,007,651	846,173	1,026,988	1,408,292	1,697,865	1,805,399	17,771,671	11,632,966	6,138,705	12,618,216	29.00%
Daly City	324,019	340,112	305,711	309,038	318,039	278,252	269,650	234,447	294,435	260,687	261,671	250,006	3,446,067	3,230,352	215,715	2,982,817	13.44%
East Palo Alto	100,845	98,204	99,301	92,276	74,634	56,388	70,278	60,063	54,918	67,468	89,886	71,174	935,435	724,941	210,494	726,120	22.38%
Estero	304,604	294,448	299,906	248,800	231,729	136,155	133,622	145,923	92,203	162,122	208,383	252,034	2,509,929	1,523,709	986,220	1,716,515	31.61%
Hayward	983,955	851,762	917,490	828,612	740,510	843,184	700,858	519,840	611,449	572,724	849,545	836,615	9,256,544	8,025,993	1,230,551	7,654,087	17.31%
Hillsborough	250,428	239,293	339,873	187,852	149,425	70,505	57,857	46,840	68,263	77,287	127,533	179,470	1,794,626	730,395	1,064,231	1,029,836	42.62%
Menlo Park	205,878	197,865	195,391	171,845	118,504	78,597	80,370	82,369	70,962	108,772	169,161	151,171	1,630,885	936,894	693,991	1,086,101	33.40%
Mid Pen WD	174,821	168,580	176,218	154,115	126,396	83,564	95,477	90,390	83,076	124,092	124,306	141,794	1,542,829	1,057,521	485,308	1,121,627	27.30%
Milbrae	132,776	130,963	122,123	112,057	102,206	73,644	74,678	70,473	68,880	78,212	89,547	112,449	1,168,008	863,025	304,983	883,467	24.36%
Milpitas	560,066	511,819	499,068	456,297	339,619	346,470	345,211	313,013	348,809	390,135	458,282	487,604	5,056,393	4,060,509	995,884	4,003,018	20.83%
Mountain View	696,607	601,089	571,691	507,741	332,245	317,851	306,054	307,473	316,164	466,737	552,409	584,813	5,560,874	3,742,626	1,818,248	4,004,750	27.98%
North Coast	175,214	142,592	149,874	131,114	136,038	107,334	115,408	100,129	70,449	138,934	123,139	96,305	1,486,530	1,179,960	306,570	1,169,264	21.34%
Palo Alto	710,992	687,471	674,410	599,590	409,114	261,926	291,888	274,558	221,426	413,454	602,470	529,719	5,677,018	3,149,394	2,527,624	3,719,123	34.49%
Purissima Hills	116,098	102,177	112,087	86,968	57,418	30,674	27,294	31,514	18,976	46,701	77,214	85,712	792,832	325,373	467,459	456,447	42.43%
Redwood City	593,464	576,449	627,527	521,009	427,638	275,051	298,520	280,891	257,786	377,386	415,099	397,489	5,048,309	3,336,744	1,711,565	3,602,117	28.65%
San Bruno	177,048	195,589	172,534	162,980	128,108	140,430	140,637	109,929	143,808	160,884	162,280	183,615	1,877,842	1,604,412	273,430	1,539,671	18.01%
Stanford	127,534	102,493	119,688	94,886	78,913	65,097	99,295	69,251	59,292	81,719	90,169	118,440	1,106,776	878,805	227,971	870,714	21.33%
Sunnyvale	1,150,141	1,043,040	991,516	862,693	653,331	669,034	578,608	502,957	578,103	757,643	906,030	960,437	9,653,533	6,986,106	2,667,427	7,221,095	25.20%
Westborough	39,266	51,302	44,708	44,615	38,399	23,623	51,170	33,520	35,133	29,513	31,342	41,224	463,815	430,338	33,477	399,021	13.97%
	11,952,651	11,343,597	11,082,182	9,694,915	7,325,290	6,461,362	6,299,117	5,444,948	5,879,536	7,644,625	9,392,057	9,845,460	102,365,739	72,254,888	30,110,851	75,568,197	26.18%
San Jose	1,166,894	1,084,954	1,005,465	846,564	569,616	484,680	495,721	417,476	510,636	726,102	910,264	999,166	9,217,538	5,725,539	3,491,999	6,375,185	30.84%
Santa Clara	1,049,320	1,087,546	945,209	922,152	695,945	613,336	610,520	598,838	625,074	787,570	954,256	877,440	9,767,206	7,343,304	2,423,902	7,457,339	23.65%
	14,168,865	13,516,097	13,032,856	11,463,631	8,590,851	7,559,378	7,405,358	6,461,262	7,015,246	9,158,297	11,256,577	11,722,066	121,350,483	157,578,619	66,137,603	89,400,721	26.33%

Column Notes

- (1) thru (12) Calculated as the net potable water supply production for all sources, three-year rolling average, by month, and by suburban purchaser, with ISG limits imposed on Annual SFPUC Purchases from Step 1a (Step 1b)
- (13) Sum of columns (1) thru (12)
- (14) Base Component: Calculated as the winter average usage (Cols 6 through 9 - December through March), multiplied by 12 (Step 1c)
- (15) Seasonal Component: Calculated as the total production (Col 13) minus the base component (Col 14) (Step 1d)
- (16) Base/Seasonal Allocations: Calculated as the Base Component minus the Base Reduction plus the Seasonal Component minus the Seasonal Reduction (Step 1e)
- (17) Base/Seasonal Cutback: Calculated as the ratio of an agency's Base/Seasonal Allocation to its Total Production, minus 1, expressed as a percent (Step 1f)

TABLE 3 - CALCULATION OF FINAL PURCHASE CUTOBACK AND ALLOCATION FACTOR FOR TIER 2 DROUGHT IMPLEMENTATION PLAN (DRIP)

Overall Average Wholesale Customer Reduction: 26.84%
 Reduction from purchases in: FY 08-09

Base = 10.00%
 Seasonal = 65.00%

Weighted average for Column 10:
 0.33 = ISG component (Col. 2)
 0.67 = Base/Sea component (Col. 9)

Variable component = Base/Seasonal Allocation (with ISG cap)
 Minimum (Column 19) = 10.00%
 Ceiling (Col. 21) = avg. cutback + 20.00%

Minimum residential per capita use threshold (Column 29) = 55.00 gpcpd

Wholesale Customers	Agency Information		Initial Allocations Based on Weighted Fixed (ISG) and Variable (Base/Seasonal) Components Adjusting for SI/SC										Adjustment for Minimum and Maximum Cutobacks					Adjustment for East Palo Alto				Final Allocation Factor						
	FY 08-09 SFPUC Purchase	Fixed Comp.	Base/Seasonal Allocations		IS/SC Adjustment		Weighted Allocation				2nd SI/SC Adjustment		Minimum Cutoback Adj.		Maximum Cutoback Adjustment			Agencies To Which EPA Adjustment										
			Lesser of Purchase or ISG	Seasonal Allocation	Base/Seasonal Allocation	Base/Seasonal Purchase Cutoback	Subtotal Allocation Factors	Adjusted Base/Seasonal Allocation	Weighted ISG-Base/Seasonal Avg	Weighted Allocation	Weighted Shortage Allocation	Weighted Purchase Cutoback	Subtotal Allocation Factors	Adjusted Shortage Allocation	Adjusted Purchase Cutoback	Adjusted for 10.00% Cutoback	Adjusted for 46.84% Cutoback	Cutoback Over Cap	Agencies To Which Cutoback Over Cap Is Redistributed	Min/Max Adjusted Allocation	Adj. Min/Max Purchase Cutoback		FY 08-09 Residential Per Capita	Which EPA Adjustment	Share of EPA Adjustment	Allocations With EPA Adjustments	Final Purchase Cutoback	
ACWD	11.24	13.76	11.24	-26.83%	8.22	-26.83%	7.19%	8.35	10.14	7.00%	8.37	-25.55%	7.26%	8.43	-24.99%	-24.99%	-24.99%	8.43	8.43	8.40	-25.29%	91.40	8.40	-0.019	8.376	-2.860	-25.45%	7.01%
Burbank/GV/MID	0.62	0.98	0.62	-28.53%	0.44	-28.53%	0.39%	0.45	0.62	0.43%	0.52	-16.72%	0.45%	0.52	-16.10%	-16.10%	0.52	0.52	0.52	-16.43%	62.89	0.52	-0.001	0.516	-0.103	-16.62%	0.43%	
Burlingame	4.28	5.23	4.28	-25.29%	3.20	-25.29%	2.79%	3.25	3.00	2.70%	3.22	-24.70%	2.80%	3.24	-24.13%	-24.13%	3.24	3.24	3.23	-24.43%	89.50	3.23	-0.007	3.224	-0.052	-24.60%	2.70%	
Coastside	1.97	2.18	1.97	-25.29%	1.47	-25.29%	1.38%	1.49	1.72	1.19%	1.42	-27.83%	1.23%	1.43	-27.29%	-27.29%	1.43	1.43	1.42	-27.58%	68.30	1.42	-0.003	1.421	-0.345	-27.74%	1.39%	
CWS Total	35.84	35.68	35.68	-29.00%	25.33	-29.31%	22.15%	25.73	29.01	20.05%	23.95	-31.17%	20.79%	24.13	-32.67%	-32.67%	24.13	24.13	24.03	-32.94%	107.12	24.03	-0.034	23.977	-11.858	-33.00%	20.07%	
Daly City	4.10	4.29	4.10	-13.44%	3.55	-13.44%	3.11%	3.61	3.83	2.65%	3.16	-22.90%	2.75%	3.19	-22.32%	-22.32%	3.19	3.19	3.18	-22.63%	50.00	3.18	-0.029	22.63%	3.176	-0.929	-22.63%	2.66%
East Palo Alto	1.92	1.96	1.92	-22.38%	1.49	-22.38%	1.30%	1.51	1.66	1.15%	1.37	-28.55%	1.19%	1.38	-28.02%	-28.02%	1.38	1.38	1.375	-28.30%	45.30	1.375	-0.005	1.370	-0.257	-13.42%	1.39%	
Esoto	5.14	5.90	5.14	-31.61%	3.52	-31.61%	3.08%	3.57	4.34	3.00%	3.58	-30.34%	3.11%	3.61	-29.82%	-29.82%	3.61	3.61	3.60	-30.10%	85.40	3.60	-0.008	3.588	-1.556	-30.26%	3.00%	
Hayward	18.97	25.11	18.97	-17.31%	15.69	-17.31%	13.72%	15.93	18.96	13.10%	15.65	-17.50%	13.59%	15.77	-16.88%	-16.88%	15.77	15.77	15.71	-17.21%	64.00	15.71	-0.035	15.670	-3.301	-17.40%	13.12%	
Hillsborough	3.68	4.09	3.68	-42.62%	2.11	-42.62%	1.85%	2.14	2.79	1.93%	2.30	-37.47%	2.00%	2.32	-37.01%	-37.01%	2.32	2.32	2.31	-37.26%	289.50	2.31	-0.005	2.303	-1.375	-37.40%	1.93%	
Menlo Park	3.34	4.46	3.34	-33.40%	2.23	-33.40%	1.95%	2.26	2.99	2.06%	2.47	-26.25%	2.14%	2.48	-25.69%	-25.69%	2.48	2.48	2.47	-25.99%	104.60	2.47	-0.006	2.468	-0.874	-26.16%	2.07%	
Pacifica	3.16	3.89	3.16	-27.30%	2.30	-27.30%	2.01%	2.33	2.85	1.97%	2.35	-25.64%	2.04%	2.37	-25.08%	-25.08%	2.37	2.37	2.36	-25.38%	83.90	2.36	-0.005	2.354	-0.808	-25.55%	1.97%	
Mid Pen WD	2.39	3.15	2.39	-24.36%	1.81	-24.36%	1.58%	1.84	2.27	1.57%	1.88	-21.65%	1.63%	1.89	-21.06%	-21.06%	1.89	1.89	1.88	-21.38%	75.70	1.88	-0.004	1.878	-0.516	-21.55%	1.57%	
Milbrae	6.91	9.23	6.91	-20.83%	5.47	-20.83%	4.79%	5.56	6.77	4.68%	5.59	-19.16%	4.85%	5.63	-18.56%	-18.56%	5.63	5.63	5.61	-18.88%	65.10	5.61	-0.013	5.595	-1.318	-19.06%	4.68%	
Mountain View	9.81	13.46	9.81	-27.98%	7.07	-27.98%	6.18%	7.18	9.25	6.39%	7.64	-22.19%	6.63%	7.69	-21.61%	-21.61%	7.69	7.69	7.66	-21.92%	78.80	7.66	-0.017	7.646	-2.109	-22.10%	6.40%	
North Coast	3.05	3.84	3.05	-21.34%	2.40	-21.34%	2.10%	2.43	2.90	2.00%	2.39	-21.50%	2.08%	2.41	-20.91%	-20.91%	2.41	2.41	2.40	-21.23%	57.10	2.40	-0.005	2.395	-0.652	-21.40%	2.00%	
Palo Alto	11.63	17.07	11.63	-34.07%	7.62	-34.09%	6.66%	7.74	10.82	7.48%	8.93	-23.25%	7.75%	9.00	-22.65%	-22.65%	9.00	9.00	8.96	-22.96%	107.00	8.96	-0.020	8.943	-2.691	-23.12%	7.49%	
Piedmont Hills	2.01	1.62	1.62	-43.43%	0.94	-43.47%	0.82%	0.95	1.17	0.81%	0.97	-51.85%	0.82%	0.98	-51.49%	-51.49%	0.98	0.98	0.97	-51.80%	1.07	0.97	-0.017	0.953	-0.942	-46.84%	0.89%	
Redwood City	10.35	10.93	10.35	-28.65%	7.38	-28.65%	6.45%	7.50	8.63	5.96%	7.12	-31.15%	6.18%	7.18	-30.63%	-30.63%	7.18	7.18	7.15	-30.91%	85.40	7.15	-0.016	7.132	-2.214	-31.06%	5.97%	
San Bruno	1.94	3.25	1.94	-18.01%	1.59	-18.01%	1.39%	1.62	2.15	1.49%	1.78	-8.42%	1.54%	1.79	-7.74%	-10.00%	-0.044	1.75	1.75	-10.00%	66.20	1.75	-0.004	1.746	-0.194	-10.00%	1.46%	
Stanford	2.27	3.03	2.27	-21.33%	1.78	-21.33%	1.56%	1.81	2.22	1.53%	1.83	-19.39%	1.59%	1.84	-18.79%	-18.79%	1.84	1.84	1.83	-19.11%	N/A	1.83	-0.004	1.831	-0.438	-19.29%	1.53%	
Sunnyvale	10.62	12.58	10.62	-23.20%	7.94	-23.20%	6.95%	8.07	9.56	6.60%	7.89	-25.20%	6.85%	7.95	-25.16%	-25.16%	7.95	7.92	7.92	-25.46%	89.20	7.92	-0.018	7.898	-2.721	-25.62%	6.61%	
Westborough	0.95	1.22	0.95	-13.97%	0.82	-13.97%	0.72%	0.83	0.99	0.69%	0.82	-13.80%	0.71%	0.82	-13.21%	-13.21%	0.82	0.82	0.82	-13.56%	48.50	0.82	-0.002	0.818	-0.129	-13.56%	0.69%	
Subtotal	156.19		156.19	-26.18%	114.37	-26.18%	100.00%	116.16	139.55		115.18	-26.20%	100.00%	116.05		-25.70%	116.09	113.28	115.65		107.46			115.689	-40.503	-25.93%		
San José	4.46	4.50	4.46	-30.84%	3.08	-30.84%		2.07	2.87	1.99%	2.37	-46.78%		2.15	-51.85%	-51.85%		2.37	2.37		63.20			2.370	-2.088	-46.84%	1.98%	
Santa Clara	2.64	4.50	2.64	-23.65%	2.01	-23.65%		1.33	2.31	1.59%	1.90	-27.78%		1.37	-51.85%	-51.85%		1.40	1.40		46.84%			1.401	-1.235	-46.84%	1.17%	
Total	163.29		163.29	-26.33%	119.46	-26.84%		119.46	141.73	100.00%	119.46	-26.84%		119.46	-26.84%	-0.044	-26.84%	-0.449	119.87	113.28	119.42		107.46	0.000	119.461	-13.826	-26.84%	100.00%

First SI/SC Adjustment
 1. Largest permanent customer cutoback: -53.47%
 2a. Adjusted SC allocation: 1.28 (Applying largest permanent customer cutoback)
 2b. Santa Clara adjustment: -0.79 (Difference between initial and adjusted alloc.)
 3a. Adjusted SJ allocation: 2.97 (Applying largest permanent customer cutoback)
 3b. San José adjustment: -1.01 (Difference between initial and adjusted alloc.)
 4. Total Adjustment: -1.80 (2b + 3b)

Second SI/SC Adjustment
 1. Largest permanent customer cutoback: -51.85%
 2a. Adjusted SC allocation: 1.57
 2b. Santa Clara adjustment: -0.63
 3a. Adjusted SJ allocation: 2.13
 3b. San José adjustment: -0.23
 4. Total Adjustment: -0.86

**All values in \$/G unless noted otherwise

Column Notes

- Agency Information
 (1) SFPUC Purchases: From Tab 1
 (2) Fixed Component: Individual Supply Guarantees for most agencies from Tab 1; 4.5 mgpd for SJ & SC; projected 2018 demand before conservation used as surrogate for Hayward

Base/Seasonal Allocations

- (3) Lesser of Purchase or ISG: The lesser of column (1) or column (2).
 (4) Base/Seasonal Allocation Cutoback: From Tab 3, column (17).
 (5) Base/Seasonal Allocation: column (3) reduced by the Base/Seasonal cutoback in column (4).
 (6) Base/Seasonal Purchase Cutoback: The change between column (5) and column (1) shown as a percentage.

- First San Jose/Santa Clara Adjustment: This adjustment is made so that Santa Clara's and San Jose's cutobacks are at least as great as the highest cutoback by the permanent customers.
 (7) Subtotal Allocation Factors: The ratio of each permanent agency's column (5) allocation to the column (5) subtotal.
 (8) Adjusted Base/Seasonal Allocation: Redistributes "First SI/SC Adjustment" line 4 value among the permanent customers based on the proportionate shares in column (8).

Allocations Based on Weighted ISG Base/Seasonal Average

- (9) Weighted ISG-Base/Seasonal Avg: 33% of column (2) plus 67% of column (8).
 (10) Allocation Factors: Each agency's proportionate share of column (9).
 (11) Weighted Shortage Allocation: Column (9) times the available water supply (column (5) total).
 (12) Weighted Purchase Cutoback: The change between column (11) and column (1) shown as a percentage.

Second San Jose/Santa Clara Adjustment: This adjustment is made so that Santa Clara's and San Jose's cutobacks are at least as great as the highest cutoback by the permanent customers.

- (13) Subtotal Allocation Factors: The ratio of each permanent agency's column (1) allocation to the column (1) subtotal.
 (14) Adjusted Weighted Shortage Allocation: Redistributes "Second SI/SC Adjustment" line 4 value among the permanent customers based on the proportionate shares in column (13).

Column Notes

- Adjustment for Minimum Cutoback: This adjustment forces a 10% minimum cutoback with the reallocated water being placed in a hardship bank for later application to East Palo Alto
 (16) Adjusted for 10% Minimum Cutoback: Decreases any percentage cutoback in column (15) that is less than the minimum 10% floor to equal the 10% floor.
 (17) Additional Cutoback for Hardship Bank: The difference between column (15) and column (16) times column (1).

Adjustment for Maximum Cutoback: This adjustment is made so that the maximum cutoback applied to any agency is equal to the Overall Average BARRICA Reduction + 20%.

- (18) Adjusted for Maximum Cutoback: Caps the cutoback in column (18) to no more than 20% more than the average cutoback.
 (19) Cutoback Over Cap: The difference between column (18) and column (15) times column (1).
 (20) Allocations Adjusted for Cap: Purchases in column (1) reduced by the cutobacks in column (19).
 (21) Agencies to Which Cutoback Over Cap is Redistributed: Agencies that are not subject to the minimum or maximum adjustments in columns (17) and (19).
 (22) Minimum/Maximum Adjusted Allocation: Redistributes the excess cutoback in column (19) by the proportions in column (21) to agencies shown in column (21).
 (23) Adjusted Min/Max Purchase Cutobacks: The change between column (22) and column (1) shown as a percentage.

Adjustment for East Palo Alto (Low Residential Gallons per Capita per Day Adjustment)

- (24) Residential Per Capita Usage: From Tab 1.
 (25) Agencies To Which EPA Adjustment Applies: Column (22) agency allocations, except those whose GPCD is less than 55 GPCD & those who are impacted by the min./max. cutoback.
 (26) Share of EPA Adjustment: EPA value equal to difference 50% of the Overall Average Wholesale Customer Reduction and the sum of column (17) total (Hardship Bank value) and EPA allocation in column (22). Individual agency proportionate shares of EPA's adjustment based on column (25).
 (27) Allocation with EPA Adjustment: Column (22) plus column (26).

Final Allocations

- (28) Final Purchase Cutoback: Column (27) minus column (1) expressed as BARRICA
 (29) Final Purchase Cutoback: The change between column (31) and column (1) shown as a percentage.
 (30) Final Allocation Factor: Each agency's allocation from Column (27) divided by the total water allocated to the wholesale agencies (total in Column (27)), shown as a percentage



TO: BAWSCA Appointed Water Management Representatives
FROM: Arthur R. Jensen, Chief Executive Officer/General Manager
DATE: November 5, 2010
SUBJECT: Tier 2 Drought Implementation Plan

Summary

The Tier 2 Drought Implementation Plan (Tier 2 Plan or DRIP), which was developed with your agency's participation, is now ready for adoption by your agency. This Plan, along with the Tier 1 Plan, which has already been adopted, establishes how the water available to the Wholesale Customers will be allocated among themselves. Your agency must adopt the Tier 2 Plan by resolution. Accompanying this memorandum is a template resolution (Enclosure 1) for use by your agency in adopting the Tier 2 Plan.

The Tier 1 Plan, which allocates water from the San Francisco Regional Water System (RWS) among San Francisco retail and Wholesale Customers during system-wide shortages of 20% or less, was adopted by your agency and San Francisco as part of the 2009 Water Supply Agreement (WSA). The WSA authorizes the Wholesale Customers to adopt a methodology for allocating the water, which is collectively available to the 26 Wholesale Customers, among each individual Wholesale Customer. A copy of the Tier 1 Plan is attached to this memorandum as Enclosure 2.

The Tier 2 Plan, which documents the Tier 2 allocation methodology, is shown as Exhibit A and has been endorsed by all of the Wholesale Customer Appointed Water Management Representatives who participated in the formulation process for the past year. Agency staff of all the Wholesale Customers have committed to recommend that the Tier 2 Plan be formally adopted by the governing body of their respective agencies.

Action Required

In order to implement the Tier 2 Plan as recommended by the Appointed Water Management Representatives, the template resolution endorsing and adopting the Tier 2 Plan must be adopted by all 26 Wholesale Customers. In order to ensure the Tier 2 Plan is adopted by all agencies in time for inclusion into the 2010 Urban Water Management Plans, please adopt the Plan by March 31, 2011. However, the resolution is written to allow until June 30, 2011 for adoption by all Wholesale Customers. If all Wholesale Customers have not adopted the Tier 2 Plan by June 30th of next year, then all of the resolutions adopting the Tier 2 Plan will not take effect and will automatically expire.

Background

In July 2009, in connection with adoption of the WSA, the Wholesale Customers and San Francisco adopted a Water Shortage Allocation Plan to allocate water from the RWS to retail and Wholesale Customers during system-wide shortages of 20% or less (the Tier 1 Plan). The Tier 1 Plan replaced the prior Tier 1 Interim Water Shortage Allocation Plan, adopted in 2000 and expired in June 2009, which allocated water for shortages up to 20%. The provisions of the Tier 1 Plan allow wholesale customers to “bank” drought allocations and to voluntarily transfer them to each other and San Francisco. The Tier 1 plan also presents an updated schedule for actions preceding and during a drought.

Section 3.11.C of the WSA authorizes the Wholesale Customers to adopt a methodology for allocating the water which is collectively available to the 26 Wholesale Customers among each individual Wholesale Customer (the “Tier 2 Plan”). The Tier 2 Plan adopted in 2000 expired in June 2009. The WSA also commits the SFPUC to honor allocations of water unanimously agreed to by all Wholesale Customers or, if unanimous agreement cannot be achieved, water allocations that have been adopted by the Board of Directors of the Bay Area Water Supply and Conservation Agency (“BAWSCA”). The WSA also provides that the SFPUC can allocate water supplies as necessary during a water shortage emergency if no agreed upon plan for water allocation has been adopted by the 26 Wholesale Customers or the BAWSCA Board of Directors.

Commencing in October 2009, Appointed Water Management Representatives of each of the Wholesale Customers have been meeting to develop a set of principles to serve as guidelines for an equitable allocation methodology, as well as formulas and procedures, to implement those principles. These principles include:

- Providing certainty of drought allocations with consistent and pre-determined rules for calculation;
- Providing sufficient amounts of water for basic needs of customers;
- Creating an incentive for water conservation at all times and the development and management of alternative water supplies;
- Avoiding preventable, adverse economic impacts;
- Avoiding reallocation of water supply assets and investments among agencies without mutual consent and compensation; and
- Recognizing inherent differences in land use and climate.

The discussions, and supporting technical analyses, were conducted with the assistance of BAWSCA staff.

On August 25, 2010, the Appointed Water Management Representatives unanimously agreed to recommend adoption of the Tier 2 Plan to each of their respective governing bodies.

Term of Tier 2 Drought Implementation Plan

The Tier 2 Plan term is through December 31, 2018. The Tier 2 Plan allocates the collective Wholesale Customer share among each of the 26 wholesale customers through 2018 to coincide with San Francisco's deferral of decisions about additional supply until at least 2018. At the same time, the SFPUC imposed the Interim Supply Limitation which limits the volume of water that the RWS could deliver to San Francisco and the Wholesale Customers to 265 MGD until at least 2018.

The adoption and implementation of the Tier 1 and 2 Plans and San Francisco's unilateral imposition of the Interim Supply Limitation are independent and unrelated. The Tier 1 and Tier 2 Drought Allocation Plans apply only during times of water shortages caused by drought. San Francisco's Interim Supply Limitation applies in all years through at least 2018, regardless of water supply availability.

Effect of Tier 2 Drought Implementation Plan

The Tier 2 Plan will establish an allocation formula that will determine how the available water from the RWS will be allocated among the individual Wholesale Customers in system-wide shortages up to 20%.

In general, the allocation formula can be described as follows:

- 33.3% weight applied to individual agency's Individual Supply Guarantee (with slight variations for Hayward, San Jose, and Santa Clara)
- 66.6% weight applied to a Base/Seasonal calculation using 3 year average monthly production values for all supply sources
- 10% minimum cutback and maximum cutback equal to no more than the average cutback plus 20%
- Guaranteed sufficient supply of water to East Palo Alto to meet health and safety needs for its community

Supporting Documents and Enclosures

Enclosed are several supporting documents that may be useful for your agency in developing the staff report and/or presentation for your governing board on this subject. These enclosures include:

- Template Agency Resolution (Enclosure 1)
 - Exhibit A: Tier 2 Drought Allocation Plan and attachments (including an example calculation).
- Tier 1 Plan as adopted as part of 2009 Water Supply Agreement (Enclosure 2)

Memo To: Water Management Representatives
November 5, 2010
Page 4 of 4

In addition, the spreadsheets used for calculating Tier 2 Allocations will be transmitted to you via e-mail.

Procedure & Schedule

The sample resolution (Enclosure 1) should be reprinted (modified if necessary to fit your agency's preferred format) and presented to your governing board in time for it to be enacted well in advance of the requested March 31, 2011 deadline. Once the resolution has been adopted by your agency, please send a copy of the signed resolution to:

Ms. Nicole M. Sandkulla Water Resources Manager Bay Area Water Supply and Conservation Agency 155 Bovet Road, Suite 302 San Mateo, CA 94402
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Once all agencies have adopted the resolutions, the Tier 2 Plan will take effect. If you or other members of your agency's staff have any questions about the enclosed resolution or supporting material, please call Ms. Sandkulla at (650) 349-3000. If your city attorney or district counsel has legal questions, they should feel free to call Ms. Allison Schutte at (415) 995-5823.

Respectfully submitted,



ARTHUR R. JENSEN, CEO/General Manager
Bay Area Water Supply and Conservation Agency

Enclosures

cc: BAWSCA Board of Directors

Chapter 8.60 of EMID Municipal Code

WATER CONSERVATION AND RATIONING

8.60.010 Definitions.

As used in this chapter:

- A. "District board" means the board of directors of the Estero municipal improvement district.
- B. "District" means the Estero municipal improvement district.
- C. "District president" means the president of the board of directors of the Estero municipal improvement district.
- D. "District manager" means the district manager of the Estero municipal improvement district.
- E. "District engineer" means the district engineer of the Estero municipal improvement district.
- F. "District counsel" means the district counsel of the Estero municipal improvement district.
- G. "District secretary" means the district secretary of the Estero Municipal improvement district.
- H. "Finance director" means the finance director of the Estero municipal improvement district.
- I. "User" and "customer" mean any person, firm, partnership, association, corporation, company, organization or governmental entity taking water from or using water supplied by the Estero municipal improvement district.
- J. "Unit of water" is one hundred cubic feet of water.
- K. "Water" means water supplied by the Estero municipal improvement district.
- L. "Irrigation" means the watering of grass, lawn, groundcover, shrubbery, annual flowers/plantings, open ground, gardens, trees or other vegetation.
- M. "Water emergency" means any condition related to the district's available water supply which limits its ability to supply a normal amount of water to district customers. (Ord. 116 (part), 1992)

8.60.020 Declaration of water emergency.

In accordance with the provisions of Chapter 3 of the California Water Code, the district board may declare a water shortage emergency condition to prevail and therefore a need to implement mandatory water conservation and/or water rationing which shall remain in effect until the district board determines that the state of water emergency no longer exists. (Ord. 116 (part), 1992)

8.60.030 Mandatory water conservation and rationing policy.

During a state of water emergency, it is the policy of the district to prohibit or restrict certain uses of water which is obtained from the district water supply and to prescribe penalties for violations. (Ord. 116 (part), 1992)

8.60.040 Prohibition of nonessential uses during state of water shortage emergency.

The provisions of this chapter shall apply to all users of water obtained from the district. Notwithstanding other provisions of the Foster City Municipal and Estero Municipal Improvement District Codes inconsistent with this chapter, the provisions of this chapter shall remain in effect

until such time as the district board declares the water shortage emergency over. (Ord. 116 (part), 1992)

8.60.050 Nonessential uses/water conservation.

Upon the district board declaring a water shortage emergency condition to prevail and declaring that water conservation measures are required, it shall be unlawful to use water obtained from the district water supply in the following ways, with the following results or during the following times or conditions:

- A. Washing cars, boats, trailers or other vehicles with a hose that does not have an automatic shut-off device;
- B. Watering grass, lawn, groundcover, shrubbery, annual flowers/plantings, open ground, gardens, trees or other vegetation in a manner that results in runoff into sidewalks, gutters and streets or during periods of precipitation, or to an extent which allows excess water to run to waste;
- C. Watering grass, lawn, groundcover, shrubbery, annual flowers/plantings, open ground, gardens, trees or other vegetation during the hours of ten a.m. through six p.m. on any day of the week;
- D. Allowing or failing to attend to the escape of water through leaks, breaks or malfunction within the water user's plumbing or distribution system for any period of time within which such leak, break or malfunction should reasonably have been discovered and corrected. It shall be presumed that a period of twenty-four hours after the water user discovers or is notified of such break, leak or malfunction is a reasonable time within which to correct such condition or to make arrangement for correction;
- E. Cleaning buildings, structures, walkways, sidewalks, driveways, patios, tennis courts, parking lots or other hard-surfaced areas without prior approval of the water appeals board;
- F. Operating, cleaning or flushing any ornamental fountain or body of water unless there are extenuating circumstances as determined by the appeals board;
- G. Operating a car wash unless water for such use is recycled;
- H. Taking or using water from any fire hydrant unless specifically authorized by permit from the appeals board, except by legally constituted fire protection agencies for fire suppression purposes;
- I. Filling any swimming pool or spa unless there are extenuating circumstances as determined by the appeals board;
- J. Serving water in restaurants except upon request by the customer;
- K. Flushing fire hydrants and water mains unless there is an emergency as determined by the District Engineer;
- L. Running water or washing with water that results in flooding or runoff in or on sidewalks, gutters and streets;
- M. Excess watering of new planting or replanting of any water-dependent landscaping including, but not limited to, any replacement, additional or new grass, lawn, groundcover, shrubbery, annual flowers/plantings, trees, gardens or other vegetation until such time as the district board has determined that the water shortage emergency is over. The planting and replanting should be done in a manner which minimizes the amount of water required;
- N. Using water for consolidation of backfill or dust control;
- O. Any other use of water which is determined to be wasteful as determined by the district engineer. (Ord. 116 (part), 1992)

8.60.060 Nonessential uses/water rationing.

Upon the district board declaring a water shortage emergency condition to prevail and declaring that water rationing measures are required, it shall be unlawful to use water obtained from the district water supply in the following ways, with the following results or during the following times or conditions:

- A. Using water in excess of the following allocations:

1. Residential customers: as specified by resolution of the district board,
 2. Industrial customers: as specified by resolution of the district board,
 3. Commercial, institutional and governmental customers: as specified by resolution of the district board,
 4. Irrigation and outside water usage customers: as specified by resolution of the district board;
- B. Washing cars, boats, trailers or other vehicles with a hose unless the hose has a positive water shut-off device;
 - C. Watering grass, lawn, groundcover, shrubbery, annual flowers/plantings, open ground, gardens, trees or other vegetation in a manner that results in runoff into sidewalks, gutters and streets or during periods of precipitation, or to an extent which allows excess water to run to waste;
 - D. Watering grass, lawn, groundcover, shrubbery, annual flowers/plantings, open ground, gardens, trees or other vegetation during the hours of ten a.m. through six p.m. on any day of the week;
 - E. Allowing or failing to attend to the escape of water through leaks, breaks or malfunction within the water user's plumbing or distribution system for any period of time within which such break, leak or malfunction should reasonably have been discovered and corrected. It shall be presumed that a period of twenty-four hours after the water user discovers or is notified of such break, leak or malfunction is a reasonable time within which to correct such condition or to make arrangement for correction;
 - F. Cleaning buildings, structures, walkways, sidewalks, driveways, patios, tennis courts, parking lots or other hard-surfaced areas without prior approval of the water appeals board;
 - G. Operating, cleaning, flushing, filling or refilling of any ornamental fountain or body of water, unless there are extenuating circumstances as determined by the appeals board;
 - H. Operating a car wash unless water for such use is recycled;
 - I. Taking or using water from any fire hydrant unless specifically authorized by permit from the appeals board, except by legally constituted fire protection agencies for fire suppression purposes;
 - J. Draining and then filling or refilling of any swimming pool or spa unless there are extenuating circumstances as determined by the appeals board;
 - K. Serving water in restaurants except upon request by the customer;
 - L. Flushing fire hydrants and water mains unless there is an emergency as determined by the district engineer;
 - M. Running water or washing with water that results in flooding or runoff in or on sidewalks, gutters and streets;
 - N. Excess watering of new planting or replanting of plant material of any type, including but not limited to, any replacement, additional or new grass, lawn, groundcover, shrubbery, annual flowers/plantings, trees, gardens or other vegetation until such time as the district board has determined that the water shortage emergency is over. Planting and replanting should be done in a manner which minimizes the amount of water required;
 - O. Using water for consolidation of backfill or dust control;
 - P. Any other use of water which is determined to be wasteful as determined by the district engineer. (Ord. 116 (part), 1992)

8.60.070 Authority to enforce/penalties.

All peace officers of the city of Foster City and public officers and employees duly authorized by the district manager shall enforce this chapter pursuant to Chapter 5C, Title 3, Part 2 of the Penal Code (Section 853.5 et seq). This authority is based on Section 836.5 of the Penal Code. In the performance of their duties the above referred to peace officers and officers and employees have the authority to issue citations to appear in court for violations of this chapter.

A. Violation of any provisions of this chapter, including the use of water in excess of the allotments set forth in subsection A of section 8.60.060 is subject to penalties as provided for in Section 356 of the California Water Code. Additionally, the district may require installation of a flow-restricting device on the water service line.

- B. Charges for installation of flow-restricting devices and restoration of service shall be specified by resolution of the district board.
- C. Continued water consumption in excess of the allocation may result in discontinuance of water service by the district.
- D. A charge of one hundred dollars shall be paid prior to reactivating water service.
- E. Except as specifically stated elsewhere, any violation of the provisions of this chapter shall be punishable as an infraction, the penalty for which shall be as follows:
 - 1. A fine not exceeding one hundred dollars for a first violation;
 - 2. A fine not exceeding two hundred dollars for a second violation within one year;
 - 3. A fine not exceeding five hundred dollars for each additional violation within one year. (Ord. 116 (part), 1992)

8.60.080 Disconnection.

Any user in violation of the provisions of Section 8.60.050 or 8.60.060 who fails to take corrective action after the first notification of the violation shall be subject to disconnection of water service. Upon disconnection of water service, a written notice shall be served upon the violator, or conspicuously posted at the entrance to the location where the violation has occurred and which shall state the time, place and general description of the violation and the method by which reconnection may be accomplished. (Ord. 116 (part), 1992)

8.60.090 Appeals board, appeals and exceptions.

- A. An appeals board shall be established that is comprised of the district manager, finance director and the district president or their designees.
- B. A written appeal for an exception to use water contrary to the provisions of Sections 8.60.050 and/or 8.60.060 or for an adjustment in an allocation of water may be made to the appeals board. Such appeal shall clearly state the basis for the appeal, the cause or reason why special consideration should be given by the appeals board, any corrective measures that must and will be taken and when they will be completed, the specific relief sought and any other pertinent information. The appeals board may:
 - 1. Allow the planting of materials selected from an approved list of drought-tolerant plant materials obtained from the district and which are planted in low water use landscape designs and which employ low water use irrigation systems. The written appeal shall include a complete description of the planting request including the exact number and type of materials to be planted, how low water use landscape designs and irrigation systems will be used, and any other descriptive information likely to be of assistance to the appeals board in rendering a decision; or
 - 2. Allow the use of water otherwise restricted or prohibited; or
 - 3. Adjust an allocation of water if it finds that:
 - a. Failure to do so would cause an emergency condition adversely affecting the health, sanitation, fire protection or safety of the user or the public, and/or;
 - b. The user has adopted all practicable water-conservation measures, and/or;
 - c. Failure to do so would cause unnecessary and undue hardship to the customer or the public.
- C. Any user who believes that an activity or condition which resulted in the disconnection of water service pursuant to this chapter did not constitute a violation of this chapter may appeal the disconnection in writing to the appeals board. If the appeals board finds that the activity or conduct did not constitute a violation of this chapter or was reasonable or unavoidable or for another reason should not be penalized, the user shall be reconnected to the water supply system and the reconnection charge shall be refunded. (Ord. 116 (part), 1992)

8.60.100 Reconnection.

A. Where water service is disconnected as authorized in Section 8.60.080, it shall be immediately reconnected upon correction of the condition or activity and payment of a reconnection charge of one hundred dollars.

B. Those water users that are serviced by a master meter for both domestic supply and irrigation and who are disconnected for violating any of the provisions contained within this chapter, shall, upon receiving written notice from the district engineer, do and be subject to the following:

1. Post a cash bond in an amount determined by the district engineer to install a separate water service line and meter for the property owner's irrigation system within sixty days of the water disconnection.

2. If the owner fails to install the new water service line and meter within the sixty days, the district shall utilize the cash bond to pay for installation costs associated with installing the water service line and meter. Any funds remaining after the installation of the water service line and meter shall be returned to the customer. Additional funds may be collected from the user by the district if the original amount was insufficient to complete installation of the service line and meter. (Ord. 116 (part), 1992)

8.60.110 New connections.

Water service connections to accommodate new developments, new construction or new users shall be granted only if water saving fixtures or devices are incorporated into the users plumbing and landscape irrigation system. For new developments in which water dependent landscaping is required as a use permit condition, the district shall require a cash bond or other form of security subject to approval of the district counsel from the developer in an amount equal to the estimated cost of landscaping plus ten percent. Cash deposits will be placed in an account in which the interest shall accrue to the developer. (Ord. 116 (part), 1992)

8.60.120 Excess water use charge.

A. An excess use charge as determined by resolution of the district board may be levied for water used in excess of the allocations specified by resolution of the district board.

B. Additional charges to all users may be imposed to compensate for a loss of revenue to the district or to pay for any additional cost to the district associated with the purchase of more water. (Ord. 116 (part), 1992)

8.60.130 Waiver of excess water use charge.

Written application for a waiver of an excess water use charge may be made to the appeals board. Such application shall contain all of the information required in Section 8.60.090 of this chapter.

A. The appeals board may waive a specific excess water use charge if it finds, based upon information and/or facts presented, that sufficient justification is present to allow such a waiver.

B. A waiver may be granted for one or more of the following reasons:

1. Water used in excess of the allocation was for the protection of health and/or sanitation or for the protection of property in the case of fire.

2. Water used in excess of allocation was the result of a condition unknown to the user which has subsequently been corrected to the satisfaction of the appeals board.

C. A waiver shall not be granted unless the user has adopted and has demonstrated all practicable water conservation or rationing measures, nor shall a waiver be granted on the basis of economic hardship. (Ord. 116 (part), 1992)

City of Foster City
PLANTING AND IRRIGATION
GUIDELINES



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FOSTER CITY PLANTING AND IRRIGATION GUIDELINES

I. INTRODUCTION

A. BACKGROUND

Efficient use of water in California is a key issue as the State's population and demand for water continues to grow. The recent droughts of 1976-77, 1987-90 and the possibility of future droughts put tremendous demand on this precious limited resource. This has forced many water agencies throughout the State to undertake strict conservation measures and, in many cases, including rationing.

Within Foster City a major portion of water consumption in residential and commercial sites is used to water outdoor landscaping. With this in mind, the Estero Municipal Improvement District has developed the following water conserving planting and irrigation guidelines. The purpose of the landscape guidelines is to assist residents and businesses in reducing landscape water consumption.

These landscaping planting and irrigation guidelines are designed to aid developers, property owners and homeowners in selecting appropriate plant materials and in installing irrigation systems to create water conserving landscapes which are appropriate to local soil and weather conditions.

The guidelines have seven sections: Section I, *Introduction*; Section II, *Landscape Planting and Irrigation Guidelines for New and Existing Landscapes*; Section III, *Miscellaneous Water Conservation Measures*; Section IV, *Low-Water Using (Drought Tolerant) Plant List*; Section V, *Maintenance of New and Existing Landscapes for Water Conservation*; Section VI, *Glossary of Terminology*; and Section VII, *Sources and References*.

B. OVERVIEW OF FOSTER CITY'S ENVIRONMENT

Climate

Foster City's climate is heavily influenced by the ocean and San Francisco Bay, creating cool summers with frequent fog or wind, and cool, wet winters. The temperatures are mild, typically ranging from the 60°s to 80°s in the summer to the high 30°s to 50°s in the winter. Foster City seldom suffers serious or heavy frosts, consequently many subtropical plants can thrive here. However, heat-loving plants may find the summers a little too cool to bloom. Wind from the bay is common throughout the City, with the heaviest salt-laden winds occurring along the bay frontage. Generally, unless plants grown in these areas are sheltered from the salty winds, only those with wind and salt tolerance will be able to survive. There are a large variety of low-water using plants ideally suited to the climate within Foster City. A low-water-using landscape need not be dull or unattractive. In fact, many water conserving plants offer year-round flowers, fruit, and showy foliage. Choosing the proper plants for the climatic conditions at a specific site is the key to a successful, healthy, and beautiful landscape.

Soils

The majority of the soils within Foster City are fill material obtained from Bay dredging. This, coupled with the fact that development progressed over a number of years, has resulted in a variety of soil types throughout the City. These variations in soil type can have a major impact on plant growth and irrigation rates. Much of the dredged soils contain high quantities of dissolved salts and minerals which, if high enough in concentration, require periodic leaching. Some soils may have very poor permeability which requires careful water application to avoid runoff. Poor soil conditions need to be identified in order to apply proper corrective measures for healthy plant growth.

Even within a given site, there may be soil and climatic variations or "microclimates" that require special attention in the design process. All of these weather and soil conditions must be considered when selecting plant materials and designing an irrigation system for a site. These guidelines provide a framework for developing a low-water using planting program for use in Foster City landscapes. It is highly recommended that a competent professional be consulted during the design process to ensure that all aspects of the site's unique properties are considered in the final landscape plan.

C. APPLICABILITY

These guidelines are applicable to the following new and existing landscape installations:

1. Single Family Homes
2. Model Homes
3. Townhomes, Condominiums, Apartments
4. Industrial Sites
5. Office Sites
6. Retail Sites
7. Institutional Sites, Churches
8. Public Works Projects

II. LANDSCAPE PLANTING AND IRRIGATION GUIDELINES FOR NEW AND EXISTING LANDSCAPES

These planting and irrigation guidelines are intended to aid in designing and selecting low-water using plant materials and water conserving irrigation systems for both new and existing landscapes.

A. LANDSCAPE PLANTING

1. Replacing Existing Landscaping
 - a. If redesigning your entire landscape at one time is not feasible, begin by replacing the "thirsty" plants with low-water using plants. You can stagger the replacement of existing plants over several months. Prioritize replacing areas of landscaping with the highest visibility and/or use first, such as front yard or entry areas. If you choose to replace a limited area instead of the entire existing landscaping, you will need to modify your existing irrigation system to properly apply

water to your new landscaping. If the section of landscaping you are replacing is fairly large, it is highly recommended that you replace the existing irrigation system instead of upgrading it. *Replacement of the irrigation system allows it to be designed properly, ensuring correct and efficient water application. (See the following section on irrigation systems.)*

- b. Maintain as much existing low-water using vegetation as possible when upgrading your landscaping. Try to incorporate these plant materials into your overall design instead of replacing them. *Established vegetation will use much less water than newly planted nursery stock.*
- c. To save even more water in the future, turfgrass areas can be replaced with low-water using ground covers.

2. Plant Selection

- a. Select low-water using plant materials that are suitable to Foster City's climate and cultural conditions. *(See the low-water using list of plants in Section IV for examples.)*
- b. For sites within the City that experience heavy salt-laden winds, choose plants suitable to those conditions. The low-water using plant list also denotes which plants can survive under these conditions. *Plants not tolerant of salty winds will survive only if they are grown in a sheltered location.*
- c. Some areas of Foster City have high saline soils. Saline soil conditions are detrimental to the health of plants. Choose plants suitable to these conditions. *(See the low-water using plant list, as these plants have been specifically chosen for Foster City's soil types and climate conditions.) To determine if you have this type of soil problem, see Item 6 below on obtaining a soils test.*

3. Turf Grass and Annuals

- a. The use of turf grasses and annuals (such as petunias, marigolds, etc.) should be limited in the landscape. Annuals should be treated as turf because of their high water use. The combined planting areas of annuals and turf should not exceed 25 percent of the total landscaped areas. *Limiting turf areas saves water. More than half of a typical household's water use goes to irrigating lawn areas. Limiting turf and annuals to 25 percent of planted areas can save a considerable amount of water and still provide an attractive landscape.*
- b. Turf should not be used in narrow strip areas such as: median strips or islands in parking lots, areas less than eight feet wide, and areas

between curbs and sidewalk. *Irrigating small narrow areas of turf results in high rates of runoff. Irrigating larger lawn areas will allow water a greater chance of soaking into the soil or running off into the surrounding landscaping.*

- c. Turf should be a low-water using variety of grass. Use "tall fescue" or "hard fescue" variety instead of the typical "bluegrass" mixes. *Low-water using grasses use 10 to 20 percent less water than "bluegrass" mixes.*
- d. Avoid planting turf on slopes exceeding a 4:1 ration (see glossary for definition). *Planting turf on steeper slopes encourages more runoff and is difficult to mow.*

4. Grouping Plant Materials

Plant materials should be planted in groups based upon their water needs. For example, turf areas with annuals should be located in one area, while low-water using trees or shrubs should be planted in another area. *The grouping of plants with like water requirements allows you to design the irrigation system to water these plant groups separately. This creates an efficient irrigation system and minimizes water waste.*

5. Planting Time

Landscape plant materials can be planted any time of the year. However, the best time to begin planting your landscape is in the fall. *Planting in the cooler humid and rainy fall weather promotes root growth and allows plants to become established before the warm summers. Established plants will require less water in summer.*

6. Soils and Soil Amendments

- a. The soil at your site should be tested for agricultural suitability and fertility. This type of soils test will list the nutrients necessary to add to the soil to encourage healthy plant growth. It will also tell you if the soil is highly saline and what can be done to correct the problem. *Saline soils can stunt a plant's growth and may eventually kill it. Plants may not show signs of salt damage for some time, at which point it may have stunted the plant permanently. Soils tests are relatively inexpensive and a good insurance measure when considering the time and money you invest in your new landscaping.*
- b. Organic amendments should be added to all planting areas. Rototill a two-inch lawyer of organic amendments, such as nitrogen stabilized redwood, thoroughly into the top six to eight inches of soil (or as recommended by the soil's report). *Organic matter will improve the soil's ability to absorb and retain water and nutrients.*

c. Leaching

Soils with high salt concentrations will require periodic leaching to prevent damage to plants. Follow the recommendations of the soils report on how much or how often leaching must be done. *Leaching is heavily watering the soil to flush the salts down below the plant's root zone.*

7. Backfill Planting Mix

Mix one part organic amendment to three parts existing soil (or as recommended by the soils report). Use this soil mix to fill the planting holes when you place your trees or shrubs in the ground. *This will help to retain soil moisture.*

8. Mulching

A two-inch layer of bark mulch should be added over all non-turf areas in your landscape. *This mulch layer will moderate soil temperatures, reduce water loss through evaporation, and discourage weed growth.*

Fertilizing

Fertilizer should be applied on a regular basis to encourage healthy plant growth. Be careful not to over fertilize. *Over fertilizing can cause excessive plant growth and increased water demand. It can also burn and damage a plant's roots, making it more susceptible to water stress and disease. (See the section on maintenance for information on proper fertilization procedures.)*

B. IRRIGATION SYSTEMS

1. Irrigation System Design

Irrigation systems should be designed by a licensed landscape architect, certified irrigation designer, or other competent professional. *A properly designed irrigation system can provide water conserving benefits.*

2. Automatic Irrigation Controller

a. All new irrigation systems should include an automatic controller. Existing irrigation systems with manual controls should be retrofitted with automatic control valves and an automatic controller. The controller should be capable of the following:

1. Multiple start capacity
2. Flexible calendar program
3. Capable of dual or multiple programming
4. Rain switch to temporarily bypass program in times of rain

5. Battery back-up to retain program in power outages

Adding an automatic controller allows for precise water application and can provide considerable water savings. These features allow for different summer and winter irrigation schedules.

- b. The controller should operate the irrigation system between the hours of 6:00 p.m. and 10:00 a.m. *Operating the system during these hours when the sun is down or of less intensity minimizes water loss due to evaporation.*
- c. The controller should be programmed to operate the irrigation system so as to minimize water runoff (see Item 5 below on programming controller for soils with poor permeability). *This will require you to observe how long your planting areas need to be watered before runoff occurs and note how long an area can go before the plants require watering again. Once these facts are known, you can program the controller to provide only as much water as plants need.*

3. Moisture Sensing Devices

Moisture sensing devices can be added to the irrigation system for optimum water savings. Choose sensors that are compatible with your irrigation controller. *Moisture sensing devices detect the amount of water in the soil at the plant's root zone. They convey this information to the controller, which will then irrigate the plants only when they need water. This eliminates over and under watering. This system, once installed and set up, provides a nearly hassle free irrigation schedule that requires little or no seasonal program modifications.*

4. Separate Planting Groups Into Separate Irrigation Circuits

- a. Irrigation heads should be grouped in a valve circuit which irrigates groups of plants with like water needs. *By grouping plants with similar water needs into one irrigation circuit, the group can be irrigated separately from other planting groups and areas which may require different amounts of water. For example, turf areas require more water than ground cover areas and should be on a separate valve circuit.*
- b. Sun and shade areas should be grouped into separate irrigation valve circuits, as should sloped and flat ground areas. *Sun and shade planting areas have different water use requirements. Sloped areas require shorter watering cycles to avoid water runoff over the ground surface.*

- c. Trees in all planting areas should be irrigated with bubbler or drip emitters in addition to overhead spray which is used to irrigate turf, shrubs, and ground cover. *Trees require periodic deep watering to encourage healthy growth. This type of watering also encourages trees to develop deep roots which can tap into ground water table, thus, allowing trees to become self sufficient. Bubbler or drip emitters provide water at a slow rate allowing it to soak deep into the soil without runoff. Trees which do not receive deep root watering will be more prone to water stress and diseases during times of drought.*
- d. Shrubs should be irrigated with bubbler or drip emitter where appropriate. *This method eliminates overspray and uses less water than conventional overhead spray irrigation.*

5. Precipitation Rates

- a. All sprinkler heads within each irrigation circuit should have matched precipitation rates. Existing irrigation systems with older sprinkler heads can easily be retrofitted to this type of irrigation system. *Matched precipitation rate sprinkler heads provide uniform water coverage ensuring that all planting areas receive equal amounts of water.*
- b. Precipitation rate of the sprinklers should match with the permeability rate (water intake) of the soil to prevent runoff. *Water should not be applied faster than a soil can absorb it.*
- c. Soils with poor permeability (such as heavy clay soils) are more prone to runoff. The irrigation controller should be programmed to operate the valve circuits in multiple cycles of shorter durations. A minimum of one hour should pass between repeat cycles to allow water to penetrate into the soil. *No runoff should occur with each repeat cycle.*
- d. No overhead irrigation system should be used on slopes exceeding 2:1 (see glossary). Low flow bubblers and/or emitters should be used, as they have a low gallon per minute (gpm) output. *Overhead sprinklers on steep slopes will cause water runoff.*

6. Sprinkler Head Spacing

- a. Spacing should be head to head coverage with a maximum spacing of 50 percent of "throw diameter" (see glossary). *Proper head spacing ensures optimum water coverage. Consult the literature provided by the sprinkler head manufacturer for more information.*
- b. In windy areas use closer spacing, such as 45 percent of "throw diameter." The shorter distance between heads (45 percent of "throw diameter") should be perpendicular to the wind, with the longer spacing

(50 percent of "throw diameter") between the rows of heads parallel to the wind. Use low angle spray heads to combat the wind and prevent misting (see item 10 below).

- c. Triangular head spacing should be used where possible. *Triangular spacing provides more even water coverage than square spacing.*
- d. Square head spacing should be used in rectangular planting areas that are adjacent to paving or non-irrigated areas to minimize overspray. *Square spacing generally has less overspray than triangular space; however, coverage is not as even as in triangular spacing.*

7. Low-Head Runoff

Sprinkler heads installed at lower elevations in the valve circuit should have check valves installed to limit low-head runoff. *This occurs after the irrigation system has been stopped. Water in the irrigation pipes will drain out through the lowest heads in the system creating water, thus creating water waste.*

8. Turf Irrigation Heads

Four-inch pop-up heads should be used in new and existing lawn areas. *This prevents taller turf from blocking coverage and causing runoff.*

9. Drip and Bubbler Equipment

- a. All drip valve circuits should include a pressure regulator, filter and pressure gauge.
- b. Drip emitters should be placed within the drip line of the tree or shrub canopy. *This allows the water to soak into the soil where most of the plant's roots are located.*
- c. All bubbler valve circuits should use bubbler heads that put out a constant flow at 20 to 90 psi pressure or include a pressure regulating valve, riser or head. *Pressure regulators maintain a constant pressure in the irrigation circuit ensuring that the emitter, bubbler or head flow at a constant and even rate. This allows for more precise control of how much water is applied to the plant.*

10. Misting

- a. Misting sprinkler heads should be corrected. Correct by turning the heads adjustment screw until misting stops. *Misting occurs when the sprinkler head produces a mist or fog of water. This mist will drift away from the areas being irrigated. This creates considerable water waste.*

- b. **Fluctuating or high water pressure at the irrigation systems P.O.C. (point of connection to the municipal water service) can cause properly adjusted sprinklers to begin misting or fogging. Where this condition exists, a pressure regulating device should be installed at the P.O.C. of the irrigation system.**

11. System Adjustment

All sprinkler heads should be adjusted to optimize coverage and eliminate overspray. *Overspray occurs when the sprinkler heads spray beyond a planting area and onto paving or other non-irrigated surface.*

III. MISCELLANEOUS WATER CONSERVATION MEASURES

A. DECKING

Wood decking is a good alternative to a concrete patio. It has a soft and pleasing appearance and allows rain water to percolate into the soil during winter. Rain water can help replenish the water table, thereby reducing nearby trees' dependence on summer irrigation.

B. PERMEABLE PAVING SURFACES

Permeable paving is one which allows water to penetrate the soil below and reach plant roots. Some permeable paving can be used in place of concrete paths, walkways, and even driveways. Examples are listed below:

- a. Decomposed granite aggregate or "DG". This material is ideally suited for footpaths in the garden. It is made up of crushed granite and comes in several shades of gray and brown. To construct a pathway, headerboard is first installed to define and align the edges of the path, then the "DG" is installed and compacted. The final product is a hard, durable surface which rain and irrigation water can soak through.
- b. Bark mulch can be used to provide a walking surface in the landscape. There are many types of bark products available on the market, each with different colors and textures. It is the most economical and simplest form of permeable paving, and it lends an informal and natural character to landscape design.
- c. Brick can be used as walkways or patios, creating a formal rustic look. Many colors and types of brick can be used. The simplest way to install brick is to place it on a level one-inch layer of compacted sand with sand swept between the joints. Headerboards can be used along the edges to hold them in.
- d. Turf block is an open plastic or concrete brick like block which, if installed properly, can take vehicular traffic. Large areas of turf block can be installed to serve as driveways or parking areas. Each block has an opening or core allowing turf and ground cover to grow.
- e. Check with your local nursery which should have additional ideas or information for you to consider.

C. FOUNTAINS AND PONDS

1. Water bodies in the landscape should be considered the same as turf areas. Water surfaces combined with turf and annuals should not exceed 25 percent of the total planted area.

2. **Water features which spray water into the air are prohibited. *These features cause considerable water waste because of the evaporation caused by wind and sun.***

D. POOL AND SPA COVERS

Provide pool and spa covers to minimize water evaporation and heat loss.

E. SOIL POLYMERS

Soil polymers may be incorporated into the soil to improve water and nutrient retention. Avoid using polymers in soils that require periodic leaching. Apply per manufacturer's recommendations.

IV. LOW-WATER USING (DROUGHT TOLERANT) PLANT LIST

A. The following plant list has been adapted from the East Bay Municipal Utility District's book, Water-Conserving Plants & Landscapes for the Bay Area. Included are nine categories of information organized in a matrix. Below is a description of each category:

1. *Deciduous*: A plant which loses its leaves during winter.
2. *Evergreen*: A plant which has leaves all year round. Several plants are listed as both evergreen and deciduous. This means that the plant may become partially deciduous depending on how cold it becomes.
3. *Flowers*: A plant in this category will have a display of flowers during the growing season.
4. *Fall Color*: A plant which will produce a leaf display of color in the fall.
5. *Full Sun*: A plant that requires full sun exposure during the day for optimum growth. Growing such a plant in shady conditions can result in poor growth with little or no flowering.
6. *Partial Shade*: A type of plant that tolerates some sun but prefers shade during the day. Note: Many of these plants can take both conditions.
7. *Well-Drained Soil*: A plant that requires well-drained soil. Planting such a plant in poorly drained soil can result in poor growth and disease.
8. *Alkaline Soil*: Plants that can tolerate soils with high pH values (pH 8 to 9) and excessive levels of calcium and magnesium. A number of these plants can also tolerate high sodium levels. Consult with your nursery when selecting plants from this category for tolerance to saline soils. A soils test is highly recommended to determine if your soil has these conditions. Installing plants that are not tolerant of these conditions will result in very poor growth.
9. *Sea Coast Conditions*: Plants in this category are capable of performing well within 1,000 feet of the ocean or bay. Most of these plants can tolerate salt-laden air and winds.

B. When purchasing your plant materials, consult your local nursery about your soil conditions, wind, sun and shade exposures. The nursery employees can provide you with information and plant selections in order to help you make the right choices.

LOW-WATER USING (DROUGHT TOLERANT) PLANT LIST

	Sea Coast Conditions							
	Alkaline Soil							
	Well Drained Soil							
	Partial Shade							
	Full Sun							
	Fall Color							
	Flowers							
	Evergreen							
	Deciduous							
TREES								
Acacia baileyana - Bailey's Acacia		x	x		x			x
Agonis flexouosa - Peppermint Tree		x			x	x		x
Alnus cordata - Italian Alder	x				x	x		x
Callistemon species - Bottle Brush		x	x		x	x	x	x
Carpinus betulus "fastigiata" - Upright Betulus Hornbeam	x				x			
Casuarina cunninghamiana - River She-Oak		x			x			x
Cedrus atlantica - Atlas Cedar		x			x			x
Cerciscan adensis - Eastern Redbud	x		x	x	x			
Crataegus phaenopyrum - Washington Hawthorn	x		x	x	x			
Cupressus glabra - Smooth Arizona Cypress		x			x			x
Dodonea viscosa - Hopseed Brush		x			x		x	x
Eriobotrya deflexa - Bronz Loquat		x	x		x	x	x	
Eriobotrya japonica - Japanese Loquat		x	x		x	x	x	x
Eucalyptus ficifolia - Red Flowering Gum		x	x		x		x	
Eucalyptus leucoxydon rosea - Pink Flowered Ironbark		x	x		x		x	x
Eucalyptus microtheca - Coolibah Tree		x	x		x			x
Fraxinus oxycarpa raywood - Raywood Ash	x				x			
Fraxinus uhdei - Evergreen Ash		x			x			x
Fraxinus moraine - Moraine Ash	x			x	x		x	

LOW-WATER USING (DROUGHT TOLERANT) PLANT LIST

	Sea Coast Conditions								
	Alkaline Soil								
	Well Drained Soil								
	Partial Shade								
	Full Sun								
	Fall Color								
	Flowers								
	Evergreen								
	Deciduous								
TREES									
Geijera parviflora – Australian Willow		x			x			x	
Ginkgo biloba cultivars – Maidenhair Tee	x			x	x				x
Juglans nigra – Eastern Black Walnut		x		x	x				
Juniperus C. "torulosa" – Hollywood Juniper		x			x				
Koelreuteria bipinnata – Chinese Flame Tree	x	x	x	x	x	x	x	x	x
Koelreuteria paniculata – GoldenRain Tree	x		x		x				
Laurus "saratoga" – Hybrid Laurel		x			x	x		x	x
Ligustrum lucidum – Glossy Privet		x	x		x				
Malus "robinson" – Robinson Crabapple	x		x	x	x				
Melaleuca linarifolia – Flaxleaf Paperback		x	x		x	x			
Melaleuca quinquenervia – Cajeput Tree		x	x		x	x		x	x
Melaleuca styphelioides – Prickly Melaleuca		x	x		x	x			x
Metrosideros excelsus – New Zeland Christmas Tree		x	x		x	x			x
Myoporum Laetum – Myoporum		x	x		x	x		x	x
Olea europea – European Olive		x			x			x	x
Parkinsonia aculeata – Jerusalem Thorn	x		x		x			x	
Pinus eldarica – Eldarica Pine		x			x			x	
Pinus pinea – Italian Stone Pine		x			x				x
Pinus sylvestris – Scot's Pine		x			x	x			x
Pinus thunbergiana – Japanese Black Pine		x			x	x	x		x

LOW-WATER USING (DROUGHT TOLERANT) PLANT LIST

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	Alkaline Soil								
	Well Drained Soil								
	Partial Shade								
	Full Sun								
	Fall Color								
	Flowers								
	Evergreen								
	Deciduous								
TREES									
<i>Pittosporum undulatum</i> - Victorian Box		x	x		x	x	x		
<i>Platanus acerfolia</i> - London Plane Tree	x			x	x	x			
<i>Podocarpus gracilior</i> - African Fern Pine		x			x	x	x		
<i>Populus fremontii</i> "nevada" - Nevada Male Cottonwood	x			x	x	x			
<i>Populus nigra</i> "italica" - Lombardy Poplar	x			x	x	x	x	x	x
<i>Prunus cerasifera</i> cultivars - PurpleLeaf Plum	x		x		x		x		
<i>Pyrus kawakamil</i> - Evergreen Pear		x	x		x	x	x		
<i>Pyrus calleryana</i> cultivars - Flowering Pear	x	x	x	x	x			x	
<i>Quercus suber</i> - Cork Oak		x			x	x	x		
<i>Quercus ilex</i> - Holly Oak		x			x		x	x	x
<i>Quercus agrifolia</i> - Coast Live Oak		x			x	x	x		
<i>Robinia ambigua</i> "idahoensis" - Idaho Locust	x		x	x	x		x		
<i>Salix babylonica</i> - Common Willow	x				x	x	x	x	x
<i>Saphora japonica</i> - Chinese Scholar Tree	x		x		x	x			.
<i>Schinus molle</i> - California Pepper Tree	x				x			x	x
<i>Sequoia sempervirens</i> - Coast Redwood		x			x	x			x
<i>Tristania laurina</i> - Swamp Myrtle		x	x		x	x			
<i>Tristania conferta</i> - Brisbane Box		x	x		x		x		x

LOW-WATER USING (DROUGHT TOLERANT) PLANT LIST

	Sea Coast Conditions							
	Alkaline Soil							
	Well Drained Soil							
	Partial Shade							
	Full Sun							
	Fall Color							
	Flowers							
	Evergreen							
	Deciduous							
SHRUBS								
Abelia grandiflora - Glossy Abelia		x	x		x	x		
Agapathus africanus - Lily of the Nile		x	x		x	x	x	x
Alyogyne huegelii - Blue Hibiscus		x	x		x		x	x
Arbutus unedo - Strawberry Tree		x	x		x	x		x
Arctostaphylos densiflora "Howard McMinn" - Manzanita		x	x		x	x		x
Baccarus - Coyote Bush		x			x	x	x	x
Ceanothus species - Wild Lilac		x	x		x		x	
Cistus species - Rockrose		x	x		x			x
Coprosma kirka - Dwarf Mirror Plant		x			x	x	x	x
Correa species - Australian Fuschia		x	x		x	x	x	
Cotoneaster lacteus - Red Clusterberry		x	x		x	x		
Cotoneaster congesta "Likiang" - Likiang Cotoneaster		x	x		x			
Echium fastuosum - Pride-of-Madera		x	x		x	x	x	x
Esallonia dwarf species - Escallonia		x	x		x	x		x
Escallonia fradesii - Escallonia		x	x		x	x	x	x
Euryops pectinatus - Golden Shrub Daisy		x	x		x			x
Grevillea rosmarinifolia - Rosemary Grevillea		x			x		x	
Heteromeles arbutifolia - Toyon		x	x			x	x	
Leptospermum laevigatum - Australian Tea Tree		x	x		x	x		x
Myrica californica - Pacific Wax Myrtle		x			x	x		x

LOW-WATER USING (DROUGHT TOLERANT) PLANT LIST

	Sea Coast Conditions								
	Alkaline Soil								
	Well Drained Soil								
	Partial Shade								
	Full Sun								
	Fall Color								
	Flowers								
	Evergreen								
	Deciduous								
SHRUBS									
Myrsine africanum – African Box		x			x	x		x	
Nandina Species – Heavenly Bambo		x	x		x	x	x		x
Nerium oleander – Oleander		x	x		x				
Osmanthus fragrans – Sweet Olive		x	x		x	x		x	
Phormium tenax – New Zealand Flax		x	x		x			x	x
Photina fraseri – Fraser Photina		x	x		x	x			
Pinus mugo – Swiss Mountain Pine		x			x	x	x		x
Pittosporum eugenioides – Pittosporum tenuifolium		x			x	x	x		
Plumbago auriculata – Cape Plumbago		x	x		x	x			
Podocarpus macrophylla – Yew Pine		x			x	x			x
Prunus illicifolia – Holly-Leaf Catalina Cherry		x	x		x	x	x		x
Rhapiolepis species – India Hawthorn		x	x		x		x		
Rhus integrifolia – Lemonade Berry		x	x		x	x	x	x	x
Sarcococca ruscifolia – Fragrant Saracoccoca		x	x			x			
Sollya heterophylla – Australian Bluebell		x	x			x	x		x
Syzygium paniculatum – Australian Brush Cherry		x	x		x	x	x		x
Tetrapanax papyrifera – Rice Paper Plant		x	x		x	x	x	x	x
Viburnum tinus – Laurestinus		x	x		x	x	x	x	
Westringia rosmariniformis – Rosemary Bush Westringia		x	x		x		x		x
Xylosma congestum – Shiny Xylosma		x			x				

LOW-WATER USING (DROUGHT TOLERANT) PLANT LIST

	Sea Coast Conditions								
	Akaline Soil								
	Well Drained Soil								
	Partial Shade								
	Full Sun								
	Fall Color								
	Flowers								
	Evergreen								
	Deciduous								
PERENNIALS									
<i>Acanthus mollis</i> – Bear's Breech	x	x	x			x		x	x
<i>Agapanthus</i> species – Lily-of-the-Nile		x	x		x	x			x
<i>Aloe</i> species – Aloe		x	x		x	x	x		x
<i>Aspidistra elator</i> – Cast Iron Plant		x			x			x	x
<i>Dietes vegata</i> – Fortnight Lily		x	x		x	x		x	x
<i>Diplacus</i> hybrids – Monkey Flower		x	x		x	x			x
<i>Hemerocallis</i> species – Daylilies	x	x	x		x	x		x	x
<i>Iris douglasiana</i> – Douglas Iris		x	x		x	x	x		x
<i>Iris</i> hybrids – Iris	x		x		x	x		x	
<i>Lantana montevidensis</i> – Trailing Lantana		x	x		x				x
<i>Limonium perezii</i> – Sea Lavender		x	x		x	x	x	x	x
<i>Myosotis sylvatica</i> – Forget-Me-Not	x	x	x	x	x	x	x	x	x
<i>Santolina chamaecyparissus</i> – Gray Lavender Cotton		x	x		x		x	x	x
<i>Santolina virens</i> – Green Lavender Cotton		x	x		x		x	x	x
<i>Tulbaghia violacea</i> – Society Garlic		x	x		x	x			x
GROUND COVERS									
<i>Armeria maritime</i> – Sea Thrift		x	x		x		x		x
<i>Baccharis pilularis</i> "twin peaks" – Dwarf Coyote Brush		x			x				x
<i>Ceanothus gloriosus</i> "porrectus" – Mount Vision Ceanothus		x	x		x	x	x		

LOW-WATER USING (DROUGHT TOLERANT) PLANT LIST

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	Fall Color							
	Flowers							
	Evergreen							
	Deciduous							
GROUND COVERS								
Ceanothus hearstiorum - Hearst Ceanothus		x	x		x		x	
Cistus salvifolius - Sageleaf Rockrose		x	x		x			x
Coprosma kirkii - Creeping Coprosma		x			x			x
Festuca o. glauca - Blue Fescue		x			x	x	x	x
Gazania Species & Hybrids		x	x		x		x	x
Hypericum calycinum - St. John's Wort		x	x		x			x
Ice Plant Species		x	x		x		x	x
Oenothera berlandierii - Mexican Evening Primrose	x		x		x			x
Phyla nodiflora - Lippia (Good Lawn Substitute)	x	x	x		x			x
Polygonum capitatum - Pink Knotweed	x	x	x	x	x	x	x	x
Rosemarinus officinalis cultivars - Rosemary		x	x		x		x	x
Scaevola "mauve clusters" - Fan Flower		x	x		x	x	x	x
Stachys byzantina - Lamb's Ears		x	x		x	x	x	x
Verbena tenuisecta - Moss Verbena		x	x		x			
VINES								
Bougainvillea species - Bougainvillea	x		x		x			x
Campis radicans - Trumpet Creeper	x		x		x			x
Cissus antarctica - Kangaroo Ivy		x			x	x		x
Cissus antartica - Kangaroo Ivy		x			x	x		x

LOW-WATER USING (DROUGHT TOLERANT) PLANT LIST

	Sea Coast Conditions							
	Akaline Soil							
	Well Drained Soil							
	Partial Shade							
	Full Sun							
	Fall Color							
	Flowers							
	Evergreen							
	Deciduous							
VINES								
<i>Clytostoma callistegioides</i> - Lavender Trumpet Vine		x	x		x	x		
<i>Dicticus buccinatoria</i> - Blood Red Trumpet Vine		x	x		x		x	x
<i>Gelsemium sempervirens</i> - Carolina Jessamine		x	x		x	x		
<i>Hedera helix</i> - English Ivy		x			x	x	x	x
<i>Jasminum polyanthum</i> - Pink Jasmine		x	x		x		x	
<i>Lonicera hildebrandiana</i> - Giant Burmese Honeysuckle		x	x		x			x
<i>Macfadyena unguis-cati</i> - Cat's Claw	x	x	x		x			
<i>Parthenocissus tricuspidata</i> - Boston Ivy	x			x	x	x		x
<i>Passiflora caerulea</i> - Passion Vine		x	x			x		x
<i>Rosa banksiae</i> - Lady Banks Rose		x	x		x		x	x
<i>Solanum jasminoides</i> - Potatoe Vine	x	x	x		x			
<i>Wisteria species</i> - Wisteria	x		x		x	x		

V. MAINTENANCE OF NEW AND EXISTING LANDSCAPES FOR WATER CONSERVATION

A. PLANTING MAINTENANCE

Developing a regular maintenance program is essential to maintaining a healthy water conserving landscape. A poorly maintained landscape not only looks unattractive but can waste water and spread weeds, pests and diseases to nearby healthy landscapes. Factors which should be incorporated into a regular maintenance schedule are listed below:

1. Fertilizing

Fertilization should be based upon the recommendations of a soils analysis to ensure optimum nutrient levels for healthy plant growth. Be careful not to over fertilize as this will promote very fast growth that will use more water. Plants grown in this way are less able to tolerate drought.

2. Weeding

Regular weeding should be included in your maintenance program. Weeds compete with your landscape plants for water, nutrients, light, and space. In some cases, weeds can harbor insects and diseases. Weeds should be removed promptly to prevent them from spreading throughout your landscape.

3. Pruning

Pruning of trees and shrubs should be carried out to remove dead, injured, or diseased tissues and to develop proper limb and branch structures. Many shrubs can be pruned to form hedges and to control their sizes. Such pruning should be done on a regular basis rather than once every year or two. Heavy pruning (reducing the plant a quarter or a third) can create overly vigorous growth during the growing season, and this will use more water. Heavy pruning also exposes the soil to more light, which can increase moisture evaporation. A regular pruning program will help to ensure that your plants develop into beautiful specimens.

4. Pest and Disease Control

The effects of a drought are more likely to injure plants already stressed by insects or diseases. Consequently, such infestations should be eradicated as soon as possible by professionals who are knowledgeable about plant and insect infestations.

5. Aeration and Dethatching of Turf

Turf should be aerated and dethatched periodically. This increases the soil's permeability, reduces runoff, and promotes root growth.

6. Watering--When is Enough Enough?

- a. **Lawns:** Wait to water a lawn until you notice the color has changed from bright green to a dull blue-green. In addition, when walking on the lawn, while looking back, you should see footprints. These are all signs of water stress, indicating it is time to water.
- b. **Trees and Shrubs:** Regular deep watering encourages deep rooting. By doing this, trees and shrubs with deep roots can go longer between watering and should withstand the drought better. Plants with deep roots have a greater soil reservoir of moisture.
Shrubs and Small Trees: A simple test to see if shrubs and small trees need water is to stick a pencil four to six inches into the ground. If the tip is damp or wet, they do not need water. Remember to check several areas in the landscape, as sunny areas will tend to dry out more frequently than shady areas.
Large Trees: Their roots are typically two to four feet deep or more. You can check if the soil is dry at those depths by pushing a 1/4-inch diameter rod into the soil. The rod will slide easily through the wet areas, becoming harder to push in the dry spots. If the soil is dry where the roots are, it is time to irrigate. Check the soil again after you have irrigated to see if you have given the tree enough water. The best way to water trees is with bubblers or drip irrigation. They put out a small amount of water over a longer period of time, allowing for deep water penetration. If you do not have a bubbler or drip system, dig a circular basin (four to six inches deep) around the tree as wide as its drip line. For large trees, construct a circular basin two feet to three feet around the trunk. Fill the basin three times (allowing it to completely dry before refilling.) This should wet the soil to an adequate depth.
- c. **Ground Cover Areas:** You can check these areas using the pencil test.
- d. **General Tip:** Do not over water. Over watering will damage or kill plants. Do not continue to water an area if runoff occurs; instead, water the area several times allowing an hour or so between watering as this gives the water a chance to penetrate into the soil.
- e. **Moisture Sensing Devices:** Adding these to your automatic irrigation system will greatly simplify the task of watering and eliminate the guesswork of when and how much to water.
- f. See Section VII for sources of additional information.

B. IRRIGATION AND MAINTENANCE

On-going Irrigation Maintenance

- a. *Drip irrigation systems:* These systems require regular maintenance to ensure they properly operate. The filters should be removed and cleaned once a month. The emitters should also be checked once a month for plugged emitters. Poor maintenance can lead to clogged emitters and in turn unhealthy plants.
- b. *Bubblers and overhead spray irrigation systems:* These systems are less prone to clogging. Occasionally insects and other debris can find their way into the sprinkler heads, so they should be checked periodically during the growing season to make sure they are operating properly. These also require periodic adjustments to optimize their irrigation coverage. Typically each spray or bubbler head has an adjustment screw to change its coverage pattern. Spray heads should be adjusted to minimize overspray and misting.
- c. Broken equipment should be repaired or replaced as soon as possible. Faulty equipment can waste water.
- d. *Irrigation controller:* The controller's program should be modified as necessary throughout the year to provide adequate irrigation for the landscape plantings.

VI. GLOSSARY OF TERMINOLOGY

Alkaline Soil:

This is a soil with a pH value above eight. Some alkaline soils may also have high levels of salts. Both of these conditions can harm plants. A soils test should be done to determine this. Contact your local nursery--they can provide you with information on how to obtain a soils test.

Basins:

A circular basin four to six inches deep dug under the drip line of a tree. For larger trees, make the basin two feet to three feet around the trunk.

Bubblers:

An irrigation head that slowly bubbles water out at a low gpm. Typical gpm rates for bubblers range from 1/4 gpm to 2 gpm's. Overhead spray heads may have from 1/2 to 10 or more gpm's.

Drip Emitters:

They are usually small irrigation heads. They have water flow rates ranging from 1/4 to 1/2 gallon per hour. These low flow rates are ideally suited for soils with poor permeability.

Drip Line:

Drip line is the area of ground underneath the tree's or shrub's foliage. Generally, most of a tree's major roots are within the zone.

Drought Tolerant:

A plant that can survive long periods of little or no watering.

Ground Cover:

A small, low growing, spreading plant.

GPM:

Gallons per minute. The number of gallons per minute that typically flows out of a pipe, hose or irrigation head.

Head to Head Coverage:

A term used to describe a pattern in which the sprinkler heads are installed in the landscape. This pattern will apply water evenly to all planting areas being irrigated. An irrigation system not designed with head to head coverage will leave parts of the planting area dry.

Examples: The "throw diameter" is how far a sprinkler head sprays water. "Head to head coverage" (spacing of 50 percent of "throw diameter") for a sprinkler which has a 30 feet "diameter throw" will mean spacing it every 15 feet in the landscape. A 30 feet "diameter throw" will mean spacing it every 15 feet in the landscape. A 30 feet "diameter throw" sprinkler has a 15 feet "radius spray pattern." Since most all sprinklers on the market are described by their "radius spray pattern" (instead of their "throw diameter"), their spacing in the landscape (to have head to head coverage) is the same as their "radius of spray" rating. So a 12 feet "radius spray pattern" head is spaced every 12 feet.

Herbaceous Plants:

A non-woody plant that dies back each year and grows back the next growing season. Perennial plants can also be herbaceous.

Irrigation Controller:

An electronic control unit which can be programmed to turn on the remote control valves in the irrigation system (a remote control valve is one which is turned on by an electrical signal from the control; a manual valve requires you to physically turn it on and off). Many new controllers on the market are run by micro-computers and are quite easy to operate.

Irrigation Valve Circuit:

A single grouping of irrigation heads and pipes connected to one valve forms an "irrigation valve circuit." For example, heads watering the lawn will be on one circuit, while the shrub and ground cover heads will be on a different circuit. This way the controller can water each area independently from the other.

Leaching:

Soils with high levels of salts require periodic heavy flooding to leach or flush the salts out of the plant's root zone. (See Salt Intrusion below.)

Low Angle Heads:

Sprinkler heads which throw or spray water at a low angle (usually less than 30 degrees) above the ground. Some heads have a flat spray, which sprays water horizontally across the planting area. Regular sprinkler heads spray water at a 30 degree or more angle above the planting area.

Low Water Using Plants:

Plants which can thrive in the Foster City climate with a minimum amount of additional water beyond what normally is provided by an annual rainfall.

Microclimate:

A modification of the local climate by conditions unique to your site. For example: a small fence in a backyard located in an area subject to ocean winds will reduce the effects of the wind on plants growing there, thus, making it possible to allow plants not tolerant of such ocean winds to grow.

Overhead Spray:

A term used to describe an irrigation system which employs above-ground watering (where the water is sprayed into the air over the planting area). Drip and bubblers are not overhead spray systems.

Perennial Plants:

A non-woody plant that lives for two years or more.

Permeability:

A soil with poor permeability will absorb water very slowly. Soils with high permeability can absorb water faster.

Pop-Up Sprinkler Head:

A sprinkler head that pops up from its housing. These types of heads—though more expensive—should be used in all planting areas adjacent to sidewalks, driveways, and other areas of foot traffic. Pop-ups do not pose a tripping hazard.

Risers:

A sprinkler head mounted on a solid pipe jutting out of the ground. These should be used where tripping hazards do not occur; e.g., against wall, fences, etc.

Runoff:

Water that runs off the soil's surface, thus not reaching the plant's roots.

Salt Intrusion:

This occurs when salts from the subsurface layers of soil are drawn up via capillary action into the higher areas where plant's roots are located. (See "Leaching" above for more information.)

Soil Amendment:

An organic product (sawdust, manure, bark chippings, etc.) mixed into the soil to improve its moisture-holding capacity and permeability.

Soil Polymers:

A man-made, non-toxic material, when added to a soil, will greatly improve its water- and nutrient-holding capacity.

Slopes:

Four to one designates a horizontal to vertical relationship. This means that for every four feet of horizontal length, the soil rises one foot vertically. A two to one slope is steeper than a four to one slope.

Square Head Spacing:

A sprinkler head layout is where the heads are arranged in a square or box-like pattern (when viewed on plan or overhead).

Triangular Head Spacing:

A sprinkler head layout is where the heads are arranged in a triangular pattern (when viewed on plan or overhead).

Throw Diameter:

How far a sprinkler head sprays water. It is measured in feet. (See "Head to Head Coverage" for more information.)

Xeriscape:

Conservation of water through creative landscaping.

VII. SOURCES AND REFERENCES

A. SOURCES

The following list provides sources of additional information regarding many of the topics discussed above:

East Bay Municipal Utility District, Water-Conserving Plants & Landscapes for the Bay Area. Each drought tolerant plant is depicted in full color, making it easy to choose plants. There are also sections including soil amendments, irrigation systems, and lawn substitutes.

Lane Publishing Co., Sunset Western Garden Book. An excellent all-around garden book in designing and maintaining a landscape.

Lane Publishing Co., Sunset Waterwise Gardening. Full tips on watering, planting design, and selecting irrigation systems.

Lane Publishing Co., Sunset Magazine, "The Unthirsty 100." A list of drought tolerant plants that require little or no summer watering.

Lane Publishing Co., Sunset Magazine, July 1988, "Drip." An excellent article on understanding, designing and installation of drip irrigation systems.

Lane Publishing Co., Sunset Magazine, June 1987, "How Much Water Does Your Lawn Really Need?" An informative article on learning how to water your lawn and save water in the process.

Lane Publishing Co., Sunset Magazine, April 1987, "What About Those New Soil Polymers?" On how to choose and use soil polymers to increase your soil's water holding capacity.

Ortho Books, Easy Maintenance Gardening. How to have a beautiful garden with less effort.

Ortho Books, All About Pruning. An easy to understand book on pruning.

Ortho Books, All About Fertilizers, Soils & Water. An informative book covering these topics.

Reprints of the above magazine articles are available from Sunset Magazine, 80 Willow Road, Menlo Park, CA 94025-3691, (415) 321-3600.

B. REFERENCES

City of Richmond, Landscape Design and Development Guidelines.

Committee for Water Policy Consensus, Landscape Guidelines.

Department of Water Resources, Landscape Water Conservation Guidebook No. 8.

EBMUD, Creating a Water Conserving Landscape.

EBMUD, Landscape Water Conservation Guidelines, Planting Design Guidelines for Water Conservation.

EBMUD, Irrigation Guidelines for Water Conservation.

EBMUD, Water Conserving Plants & Landscapes for the Bay Area.

Public Utilities Commission, San Francisco Water Department, Water Conservation Policy & Guidelines for New Developments.

San Francisco Water Department, How to Save Water in the Landscape.

Lane Publishing Co., Sunset Western Garden Book.

Lane Publishing Co., Sunset Waterwise Gardening.

Lane Publishing Co., Sunset Magazine, "The Unthirsty 100."

Lane Publishing Co., Sunset Magazine, July 1988, "Drip."

Lane Publishing Co., Sunset Magazine, April 1987, "What About Those New Soil Polymers?"

Lane Publishing Co., Sunset Magazine, June 1987, "How Much Water Does Your Lawn Really Need?"

L. K. Smith, Environmental Design Consultants – International, 40 Ways to Save Water in Your Yard & Garden.

Sonoma County Water Agency, Xeriscape.

1990 Northern California Xeriscape Conference.

C. CONSULTANTS

Melvin Lee Associates, Landscape Architects.

Brookwater Design, Irrigation Consulting and Water Management.

Appendix I

Leah Edwards

From: Nicole Sandkulla [NSandkulla@bawsca.org]
Sent: Thursday, February 24, 2011 3:04 PM
To: Levin, Ellen
Cc: Art Jensen; Allison C. Schutte; Anona Dutton; Petrick, Molly; Alan Kurotori (akurotori@santaclaraca.gov); Alex Ameri (alex.ameri@hayward-ca.gov); Art Morimoto (amorimoto@burlingame.org); Cari Lemke; Carrasco, Anthony; cathya@midpeninsulawater.org; David Dickson (ddickson@coastsidewater.org); dbarrow@westboroughwater.com; eric.cartwright@acwd.com; Flegel, Elizabeth; Gregg Hosfeldt (gregg.hosfeldt@mountainview.gov); Henry Young (henryy@midpeninsulawater.org); James Craig; Jerry Flanagan; Justin Ezell (jezell@redwoodcity.org); Kathleen Phalen (kphalen@ci.milpitas.ca.gov); Klara Fabry (kfabry@sanbruno.ca.gov); koconnell@nccwd.com; ksteffens@menlopark.org; M. L. Gordon (acmoffice2415@yahoo.com); Mansour Nasser (Mansour.Nasser@sanjoseca.gov); Marty Laporte (martyl@bonair.stanford.edu); Marvin Rose (mrose@ci.sunnyvale.ca.us); mdebry@hillsca.org; Patrick Sweetland (psweetland@dalycity.org); Patrick Walter (pwalter@purissimawater.org); paulr@midpeninsulawater.org; Procos, Nicolas; Randy Breault; Rebecca Fotu (rlfotu@menlopark.org); rpoppp@ci.millbrae.ca.us; Ray Towne; Thomas.Niesar@acwd.com; Tim McAuliffe (tmcauliffe@burlingame.org); (mbolzowski@calwater.com); Alicia Sargiotto; Allison turner (alison.turner@mountainview.gov); Aparna Chatterjee; Brendan McCarthy; Brent Chester; Cathleen Brennan (cbrennan@coastsidewater.org); Cindy Bertsch; croyer@dalycity.org; Dana Jacobson; ECooney@HILLSBOROUGH.NET; Elvert, Catherine; gnathan@amwater.com; Howard Salamanca (hsalamanca@ci.milpitas.ca.gov); Jade Williams (jawilliams@calwater.com); Jeanette Kalabolas (jeanettek@midpeninsulawater.org); Krista Kuehnnackl; Leah Edwards; marilyn.mosher@hayward-ca.gov; Nicole Quesada (Nicole.Quesada@sanjoseca.gov); Nina Hawk (nhawk@santaclaraca.gov); Norm Dorais; Shelly Reider (sreider@ci.millbrae.ca.us); Stephanie Nevins (stephanie.nevins@acwd.com); Toni Harris; Tracy Ingebrigtsen (tracyi@bonair.stanford.edu); Val Conzet (vconzet@ci.sunnyvale.ca.us); Virginia Parks; William Lai; Zach Goldberg

Subject: FW: Projected SFPUC Purchases for UWMP Preparation Needed by February 17, 2011
Attachments: agency projected sfpuc purchases_2-24-11.pdf

Dear Ms. Levine,

In response to the e-mail below and the SFPUC's request for purchase projections from its Wholesale Customers for use in the SFPUC's Urban Water Management Plan 2011 Update, attached is the requested information that I have received from the BAWSCA agencies. The table below provides a summary display of the responses received from the BAWSCA member agencies as transmitted in this e-mail.

If you have any further questions, please contact me at the BAWSCA office. I will forward to the SFPUC any additional responses that are received at a later date.

Sincerely,
 Nicole Sandkulla

Updated Purchase Projections for SFPUC	
Agency Name	Projections Included in 2/24/11 E-Mail
ACWD	X
Brisbane	X

4/12/2011

Burlingame	x
Cal Water	x
Coastside	x
Daly City	x
East Palo Alto	
Estero	x
Guadalupe Valley	x
Hayward	x
Hillsborough	E-Mail Response Included, Projections Not Yet Available
Menlo Park	
Mid-Peninsula	x
Millbrae	x
Milpitas	x
Mountain View	E-Mail Response Included, Projections Not Yet Available
North Coast	
Palo Alto	
Purissima Hills	
Redwood City	x
San Bruno	x
San Jose	x
Santa Clara	x
Stanford	E-Mail Response Included, Projections Not Yet Available
Sunnyvale	x
Westborough	x

Nicole M. Sandkulla, P. E.
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Bay Area Water Supply and Conservation Agency
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EMail: NSandkulla@BAWSCA.org
Website: WWW.BAWSCA.org

From: Nicole Sandkulla [mailto:NSandkulla@bawscs.org]
Sent: Friday, February 04, 2011 12:03 PM
Subject: Projected SFPUC Purchases for UWMP Preparation Needed by February 17, 2011
Importance: High

Dear BAWSCA Water Management Representatives,

The San Francisco Public Utilities Commission (SFPUC) has requested projections from each of its wholesale customers of purchases from the San Francisco Regional Water System (System) in five year increments from

4/12/2011

2015 to 2030 (or 2035). The SFPUC will use this information to prepare its Wholesale Urban Water Management Plan for the System.

SFPUC's request is consistent with the requirements of Section 10631 of the California Water Code which states:

(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 available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

Historically, the SFPUC has relied on each agency's water purchase projections reported in the BAWSCA Annual Report. However, past purchase projections may not be appropriate for a variety of reasons:

- Changes in the economy and overall water use characteristics in the region
- Agencies are updating their projected needs and use of sources as they prepare their UWMP's
- Projections in the FY 2008-2009 Annual Report do not include the results of the Water Conservation Implementation Plan and the status of each agency's conservation programs

The SFPUC will need to document estimated water sales, including amounts for Wholesale Customers that are exempt from filing UWMP's. We recommend that those agencies that are not required to prepare UWMP's provide BAWSCA with the five-year projected purchases you wish the SFPUC to use in preparing its report.

As in the past, BAWSCA will support providing this information to the SFPUC in a coordinated fashion. To meet the SFPUC's deadline, please provide BAWSCA your projected SFPUC purchases in 5-year increments by close-of-business on Thursday, February 17, 2011. In addition to the numbers themselves, BAWSCA will forward to the SFPUC any qualifications that you wish to have associated with the data you provide at this time (e.g. that the data is draft and subject to modification as part of finalizing your agency UWMP). BAWSCA will forward information received to SFPUC on Friday, February 18th.

BAWSCA will only send to the SFPUC data that it receives from each of your agencies specifically for this purpose. No data will be provided to the SFPUC for agencies that do not provide data to BAWSCA.

Lastly, please note that BAWSCA will also utilize these purchase projections provided by each BAWSCA agency to prepare and submit the water purchase projections through 2018 due to the SFPUC by June 30, 2011 in compliance with Section 4.05 of the 2009 Water Supply Agreement unless otherwise notified of a change in the numbers by individual member agencies.

If you have any questions, please call me or Anona Dutton.

Sincerely,
Nicole Sandkulla

Nicole M. Sandkulla, P. E.

4/12/2011

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Table 1

Selection of Alliance Member Agencies and Summary Table

Interactive Spreadsheet for Preliminary Assessment of SB7x-7 Targets and Estimated Water Savings Requirements for BAWSCA Agencies on an Individual, Sub-Regional, and Regional Basis

Alliance Member Agencies	Population in FY 2009-10	Current Water Use (a) (gpcd)	Optimal Method 2020 Target (gpcd)	Individual Member Agency 2020 Water Conservation Requirement Relative to			
				Current Water Use (a)		2020 Gross Water Use Projection (Including Conservation) (b)	
				(gpcd)	(MGD)	(gpcd)	(MGD)
<input checked="" type="checkbox"/> Alameda County WD	332,000	148	124	24	8.0	16	5.8
<input checked="" type="checkbox"/> Burlingame	30,493	162	131	31	1.0	6	0.2
<input checked="" type="checkbox"/> CWS - Bear Gulch	55,810	229	170	59	3.3	8	0.6
<input checked="" type="checkbox"/> CWS - Mid-Peninsula	120,350	133	124	9	1.1	0	0.0
<input checked="" type="checkbox"/> CWS - South SF	56,010	148	124	24	1.3	32	1.8
<input checked="" type="checkbox"/> Coastside County WD	20,216	142	124	18	0.4	0	0.0
<input checked="" type="checkbox"/> Daly City	108,383	71	124	0	0.0	0	0.0
<input checked="" type="checkbox"/> East Palo Alto	29,690	67	124	0	0.0	4	0.1
<input checked="" type="checkbox"/> Estero Municipal WD	36,100	157	129	28	1.0	25	1.0
<input checked="" type="checkbox"/> Hayward	153,104	128	122	6	0.9	24	3.9
<input checked="" type="checkbox"/> Hillsborough	11,982	336	262	74	0.9	20	0.3
<input checked="" type="checkbox"/> Menlo Park	14,139	359	283	76	1.1	12	0.2
<input checked="" type="checkbox"/> Mid-Peninsula WD	26,130	126	120	6	0.2	5	0.2
<input checked="" type="checkbox"/> Millbrae	21,387	121	115	6	0.1	16	0.4
<input checked="" type="checkbox"/> Milpitas	70,817	161	140	21	1.5	17	1.4
<input checked="" type="checkbox"/> Mountain View	75,787	166	135	31	2.4	8	0.7
<input checked="" type="checkbox"/> North Coast County WD	40,401	81	124	0	0.0	0	0.0
<input checked="" type="checkbox"/> Palo Alto	65,408	205	178	27	1.8	10	0.7
<input checked="" type="checkbox"/> Redwood City	85,098	138	124	14	1.2	0	0.0
<input checked="" type="checkbox"/> San Bruno	40,165	96	124	0	0.0	0	0.0
<input checked="" type="checkbox"/> San Jose (c)	15,323	352	334	18	0.3	0	0.0
<input checked="" type="checkbox"/> Santa Clara	118,830	195	185	10	1.2	3	0.4
<input checked="" type="checkbox"/> Sunnyvale	138,826	154	134	20	2.8	20	2.9
<input checked="" type="checkbox"/> Westborough WD	12,690	82	124	0	0.0	0	0.0

Abbreviations:

"gpcd" = gallons per capita per day"

"MGD" = million gallons per day

Notes:

- (a) The current water use is equal to the maximum 5-year base water use.
- (b) The 2020 gross water use projection (including conservation) was provided by BAWSCA and consists of Strategy Phase I projections with plumbing codes, 2004 PEIR commitments, and WCIP savings. The gross water use is equal to the total demand projection less the recycled water use projection.
- (c) The portion of San Jose that receives water from the San Francisco Public Utilities Commission is included in calculations. This includes the North San Jose and Alviso services areas in the San Jose Municipal Water System.

Methodology	Optimal Method 2020 Target (gpcd)	2020 Water Conservation Requirement Relative to				
		Current Water Use (a)		2020 Gross Water Use Projection (Including Conservation) (b)		
		(gpcd)	(MGD)	(gpcd)	(MGD)	
Range of Individual Members	High	334	76	--	32	--
	Low	115	0	--	0	--
	(Total)	--	--	30.2	--	20.4
Selected Alliance	Population-Weighted Average	140	10	16.8	2	3.5
Regional Benefit (in MGD) from Forming Selected Regional Alliance (population-weighted average)				13.4		17.0

2020 Water Conservation Requirement Relative to:

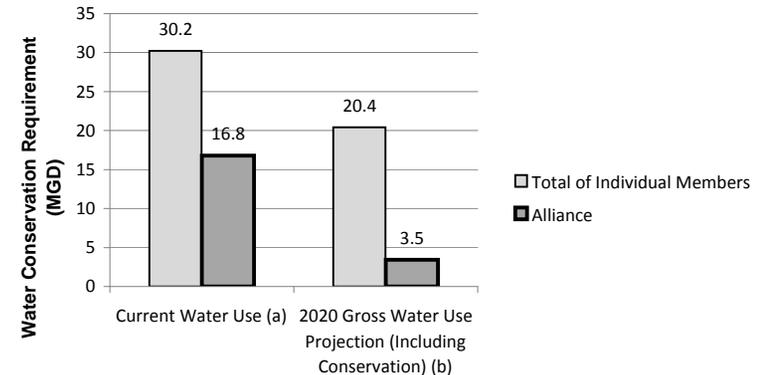


Table 2

SB7 Optimal Targets and Water Conservation Requirements

Interactive Spreadsheet for Preliminary Assessment of SB7x-7 Targets and Estimated Water Savings Requirements for BAWSCA Agencies on an Individual, Sub-Regional, and Regional Basis

Agency Number	BAWSCA Agency (a)	SB7 Method 1 Target (gpcd)	SB7 Method 3 Target (gpcd)	Selected Target (gpcd)	95% of Max 5-year Baseline Check (gpcd)	Optimal Method 2020 Target (gpcd)	Current Water Use (Max 5-year Baseline)		Optimal Method 2015 Target (gpcd)	Optimal Method 2020 Target (gpcd)	Optimal Method Conservation Requirement - 2015 - Relative to Current Water Use		Optimal Method Conservation Requirement - 2020 - Relative to Current Water Use		Alliance Proportional Conservation Requirement - 2020 (b) (MGD)
							(gpcd)	(MGD)			(gpcd)	(MGD)	(gpcd)	(MGD)	
1	Alameda County WD	124	124	124	141	124	148	49.14	136	124	12	3.98	24	7.97	4.43
3	Burlingame	131	124	131	154	131	162	4.94	147	131	15	0.46	31	0.95	0.53
4a	CWS - Bear Gulch	170	124	170	218	170	229	12.78	200	170	29	1.62	59	3.29	1.83
4b	CWS - Mid-Peninsula	109	124	124	126	124	133	16.01	129	124	4	0.48	9	1.08	0.60
4c	CWS - South SF	122	124	124	141	124	148	8.29	136	124	12	0.67	24	1.34	0.74
5	Coastside County WD	112	124	124	135	124	142	2.87	133	124	9	0.18	18	0.36	0.20
6	Daly City	62	124	124	--	124	71	7.70	98	124	0	0.00	0	0.00	0.00
7	East Palo Alto	58	124	124	--	124	67	1.99	96	124	0	0.00	0	0.00	0.00
8	Estero Municipal WD	129	124	129	149	129	157	5.67	143	129	14	0.51	28	1.01	0.56
10	Hayward	108	124	124	122	122	128	19.60	125	122	3	0.46	6	0.92	0.51
11	Hillsborough	262	124	262	319	262	336	4.03	299	262	37	0.44	74	0.89	0.49
12	Menlo Park	283	124	283	341	283	359	5.08	321	283	38	0.54	76	1.07	0.59
13	Mid-Peninsula WD	104	124	124	120	120	126	3.29	123	120	3	0.08	6	0.16	0.09
14	Millbrae	97	124	124	115	115	121	2.59	118	115	3	0.06	6	0.13	0.07
15	Milpitas	140	124	140	153	140	161	11.40	151	140	10	0.71	21	1.49	0.83
16	Mountain View	135	124	135	158	135	166	12.58	151	135	15	1.14	31	2.35	1.31
17	North Coast County WD	67	124	124	--	124	81	3.27	103	124	0	0.00	0	0.00	0.00
18	Palo Alto	178	124	178	195	178	205	13.41	192	178	13	0.85	27	1.77	0.98
20	Redwood City	111	124	124	131	124	138	11.74	131	124	7	0.60	14	1.19	0.66
21	San Bruno	83	124	124	--	124	96	3.86	110	124	0	0.00	0	0.00	0.00
22	San Jose (c)	469	124	469	334	334	352	5.39	343	334	9	0.14	18	0.28	0.16
23	Santa Clara	185	124	185	185	185	195	23.17	190	185	5	0.59	10	1.19	0.66
25	Sunnyvale	134	124	134	146	134	154	21.38	144	134	10	1.39	20	2.78	1.54
26	Westborough WD	75	124	124	--	124	82	1.04	103	124	0	0.00	0	0.00	0.00
Total		--	--	--	--	--	--	251.22	--	--	--	14.90	--	30.22	16.78
Population-Weighted Average		--	--	140	143	140	150	250.32	145	140	5	8.40	10	16.79	--
Group Calculation		125	124	125	141	125	148	246.98	137	125	11	18.47	23	38.62	--
Regional Benefit from Forming Alliance (population-weighted average)													13.43	--	

Abbreviations:

- "gpcd" = gallons per capita per day
- "MGD" = million gallons per day
- "SB7" = Senate Bill 7

Notes:

- (a) Brisbane, Guadalupe Valley Municipal Improvement District, Purissima Hills Water District, and Stanford University are not included as these agencies are not subject to SB7 at this time.
- (b) The Alliance Proportional Conservation Requirement was calculated for each selected agency based upon its proportion of the "Total Optimal Method Conservation Requirement – 2020 - Relative to Current Water Use" (in MGD) which represents the sum of the 2020 conservation requirement that will have to be met by each selected agency in the absence of any alliance. For example, if the individual 2020 Conservation Requirement – Relative to Current Water use for "Agency A" were 1 MGD, and the total conservation requirement, in the absence of an alliance, for selected Agencies A, B, and C were 3 MGD, then Agency A would be assigned one third of the Total Regional 2020 Conservation Requirement. It should be recognized that this represents only on methodology that could be used to assign conservation requirements under such an alliance.
- (c) The portion of San Jose that receives water from the San Francisco Public Utilities Commission is included in calculations. This includes the North San Jose and Alviso services areas in the San Jose Municipal Water System.

Table 3a
Worksheet for Entering BAWSCA Population Projections
 Interactive Spreadsheet for Preliminary Assessment of SB7x-7 Targets and Estimated Water Savings
 Requirements for BAWSCA Agencies on an Individual, Sub-Regional, and Regional Basis

Agency Number	BAWSCA Agency	Reported Population FY2009-2010	BAWSCA Population Estimates (a)			
			2005	2010	2015	2020
1	Alameda County WD	332,000	325,742	338,429	350,888	364,856
3	Burlingame	30,493	30,279	30,793	31,508	32,022
4a	CWS - Bear Gulch	55,810	68,112	69,416	70,749	72,078
4b	CWS - Mid-Peninsula	120,350	123,145	126,684	134,143	140,934
4c	CWS - South SF	56,010	50,420	52,120	54,891	57,174
5	Coastside County WD	20,216	19,099	19,775	20,369	20,933
6	Daly City	108,383	107,145	110,599	116,741	121,365
7	East Palo Alto	29,690	26,145	27,931	30,042	31,423
8	Estero Municipal WD	36,100	35,577	36,116	37,088	37,924
10	Hayward	153,104	145,405	151,079	156,059	161,553
11	Hillsborough	11,982	11,768	11,982	12,196	12,410
12	Menlo Park	14,139	12,138	12,483	13,000	13,380
13	Mid-Peninsula WD	26,130	26,817	27,334	28,255	29,175
14	Millbrae	21,387	21,611	22,231	23,368	24,092
15	Milpitas	70,817	64,416	68,783	73,845	79,204
16	Mountain View	75,787	71,979	75,083	78,186	82,291
17	North Coast County WD	40,401	40,782	41,103	41,939	42,774
18	Palo Alto	65,408	62,322	65,459	68,430	71,485
20	Redwood City	85,098	83,307	86,608	90,928	95,356
21	San Bruno	40,165	41,736	43,328	45,513	47,499
22	San Jose (b)	15,323	13,152	20,334	19,439	32,620
23	Santa Clara	118,830	110,012	118,459	125,397	131,732
25	Sunnyvale	138,826	141,485	146,608	141,485	146,608
26	Westborough WD	12,690	10,798	10,856	10,798	10,856
Total		1,679,139	1,643,392	1,713,593	1,775,257	1,859,744

Notes:

- (a) Population estimates were obtained from Table 2-1 in "2009-09 MWM&BC WCIP_FINAL_Report.pdf"
- (b) The portion of San Jose that receives water from the San Francisco Public Utilities Commission is included in calculations. This includes the North San Jose and Alviso services areas in the San Jose Municipal Water System.

Table 3b
Water Conservation Requirements

Interactive Spreadsheet for Preliminary Assessment of SB7x-7 Targets and Estimated Water Savings Requirements for BAWSCA Agencies on an Individual, Sub-Regional, and Regional Basis

Agency Number	BAWSCA Agency	2015 Water Conservation Requirement										2020 Water Conservation Requirement									
		Relative to:										Relative to:									
		2015 Gross Water Use Projection (a)										2020 Gross Water Use Projection (a)									
		Current Water Use		No Conservation		Plumbing Codes and 2004 PEIR		Plumbing codes, 2004 PEIR, and WCIP		Agency Specified 2011 UWMP		Current Water Use		No Conservation		Plumbing Codes and 2004 PEIR		Plumbing codes, 2004 PEIR, and WCIP		Agency Specified 2011 UWMP	
(gpcd)	(MGD)	(gpcd)	(MGD)	(gpcd)	(MGD)	(gpcd)	(MGD)	(gpcd)	(MGD)	(gpcd)	(MGD)	(gpcd)	(MGD)	(gpcd)	(MGD)	(gpcd)	(MGD)	(gpcd)	(MGD)		
1	Alameda County WD	12	3.98	24	8.39	9	3.05	6	2.09	0	0.00	24	7.97	38	13.84	20	7.28	16	5.73	0	0.00
3	Burlingame	15	0.46	11	0.34	0	0.00	0	0.00	0	0.00	31	0.95	35	1.13	10	0.33	6	0.19	0	0.00
4a	CWS - Bear Gulch	29	1.62	3	0.19	0	0.00	0	0.00	0	0.00	59	3.29	33	2.38	12	0.87	8	0.55	0	0.00
4b	CWS - Mid-Peninsula	4	0.48	12	1.62	0	0.00	0	0.00	0	0.00	9	1.08	18	2.49	2	0.21	0	0.00	0	0.00
4c	CWS - South SF	12	0.67	41	2.25	25	1.35	22	1.20	0	0.00	24	1.34	56	3.22	36	2.07	32	1.83	0	0.00
5	Coastside County WD	9	0.18	7	0.14	0	0.00	0	0.00	0	0.00	18	0.36	16	0.33	3	0.06	0	0.00	0	0.00
6	Daly City	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
7	East Palo Alto	0	0.00	26	0.80	17	0.51	13	0.39	0	0.00	0	0.00	23	0.71	11	0.34	4	0.12	0	0.00
8	Estero Municipal WD	14	0.51	20	0.75	14	0.53	11	0.41	0	0.00	28	1.01	39	1.48	31	1.16	25	0.97	0	0.00
10	Hayward	3	0.46	27	4.18	19	2.98	16	2.49	0	0.00	6	0.92	39	6.37	29	4.73	24	3.91	0	0.00
11	Hillsborough	37	0.44	18	0.22	0	0.00	0	0.00	0	0.00	74	0.89	55	0.69	25	0.31	20	0.25	0	0.00
12	Menlo Park	38	0.54	0	0.00	0	0.00	0	0.00	0	0.00	76	1.07	37	0.49	19	0.25	12	0.16	0	0.00
13	Mid-Peninsula WD	3	0.08	16	0.46	7	0.19	4	0.11	0	0.00	6	0.16	22	0.63	9	0.26	5	0.14	0	0.00
14	Millbrae	3	0.06	30	0.69	19	0.43	16	0.37	0	0.00	6	0.13	34	0.83	20	0.49	16	0.39	0	0.00
15	Milpitas	10	0.71	24	1.74	12	0.90	8	0.63	0	0.00	21	1.49	38	3.00	23	1.84	17	1.38	0	0.00
16	Mountain View	15	1.14	7	0.57	0	0.00	0	0.00	0	0.00	31	2.35	26	2.14	13	1.11	8	0.68	0	0.00
17	North Coast County WD	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
18	Palo Alto	13	0.85	22	1.49	5	0.37	2	0.12	0	0.00	27	1.77	35	2.51	15	1.09	10	0.69	0	0.00
20	Redwood City	7	0.60	8	0.73	0	0.00	0	0.00	0	0.00	14	1.19	14	1.32	0	0.00	0	0.00	0	0.00
21	San Bruno	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
22	San Jose (b)	9	0.14	0	0.00	0	0.00	0	0.00	0	0.00	18	0.28	0	0.00	0	0.00	0	0.00	0	0.00
23	Santa Clara	5	0.59	15	1.82	4	0.50	0	0.04	0	0.00	10	1.19	23	3.02	9	1.20	3	0.46	0	0.00
25	Sunnyvale	10	1.39	29	4.07	17	2.42	14	2.02	0	0.00	20	2.78	40	5.89	25	3.60	20	2.97	0	0.00
26	Westborough WD	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total		--	14.90	--	30.43	--	13.24	--	9.87	--	0.00	--	30.22	--	52.46	--	27.22	--	20.42	--	0.00
Population-Weighted Average		--	8.40	--	23.85	--	0.67	--	0.00	--	0.00	--	16.79	--	42.18	--	12.36	--	3.45	--	0.00
Group Calculation		--	18.47	--	31.35	--	28.56	--	23.16	--	0.00	--	38.62	--	70.08	--	40.26	--	31.35	--	0.00

Abbreviations:

"gpcd" = gallons per capita per day
 "MGD" = million gallons per day
 "PEIR" = San Francisco Public Utilities Commission Programmatic Environmental Impact Report
 "WCIP" = BAWSCA Water Conservation Implementation Plan

Notes:

- (a) The 2015 and 2020 gross water use projections are provided in Table 3c.
- (b) The portion of San Jose that receives water from the San Francisco Public Utilities Commission is included in calculations. This includes the North San Jose and Alviso services areas in the San Jose Municipal Water System.

Table 3c
Gross Water Use Projections

Interactive Spreadsheet for Preliminary Assessment of SB7x-7 Targets and Estimated Water Savings Requirements for BAWSCA Agencies on an Individual, Sub-Regional, and Regional Basis

Agency Number	BAWSCA Agency	Optimal Method SB7 Target and Resulting Demand				Gross Water Use Projections (no conservation) (a)				Gross Water Use Projections with Plumbing Codes and 2004 PEIR Commitments (a)				Gross Water Use Projections with Plumbing Codes, 2004 PEIR Commitments, and WCIP Savings (a)				Agency Specified 2011 UWMP Projections: Gross Water Use (a)			
		2015		2020		2015		2020		2015		2020		2015		2020		2015		2020	
		gpcd	(MGD)	gpcd	(MGD)	gpcd	(MGD)	gpcd	(MGD)	gpcd	(MGD)	gpcd	(MGD)	gpcd	(MGD)	gpcd	(MGD)	gpcd	(MGD)	gpcd	(MGD)
1	Alameda County WD	136	47.72	124	45.24	160	56.11	162	59.08	145	50.77	144	52.52	142	49.81	140	50.97	0	0.00	0	0.00
3	Burlingame	147	4.63	131	4.19	158	4.97	166	5.32	143	4.49	141	4.52	140	4.40	137	4.38	0	0.00	0	0.00
4a	CWS - Bear Gulch	200	14.15	170	12.25	203	14.34	203	14.63	186	13.16	182	13.12	183	12.96	178	12.80	0	0.00	0	0.00
4b	CWS - Mid-Peninsula	129	17.30	124	17.48	141	18.92	142	19.97	128	17.18	126	17.69	125	16.76	121	17.03	0	0.00	0	0.00
4c	CWS - South SF	136	7.47	124	7.09	177	9.72	180	10.31	161	8.82	160	9.16	158	8.67	156	8.92	0	0.00	0	0.00
5	Coastside County WD	133	2.71	124	2.60	140	2.85	140	2.93	129	2.64	127	2.66	127	2.59	124	2.59	0	0.00	0	0.00
6	Daly City	98	11.44	124	15.05	85	9.97	89	10.86	77	9.01	79	9.56	75	8.72	75	9.10	0	0.00	0	0.00
7	East Palo Alto	96	2.88	124	3.90	122	3.68	147	4.61	113	3.39	135	4.24	109	3.27	128	4.02	0	0.00	0	0.00
8	Estero Municipal WD	143	5.30	129	4.89	163	6.05	168	6.37	157	5.83	160	6.05	154	5.71	154	5.86	0	0.00	0	0.00
10	Hayward	125	19.51	122	19.71	152	23.69	161	26.08	144	22.49	151	24.44	141	22.00	146	23.62	0	0.00	0	0.00
11	Hillsborough	299	3.65	262	3.25	317	3.87	317	3.94	294	3.59	287	3.56	291	3.55	282	3.50	0	0.00	0	0.00
12	Menlo Park	321	4.17	283	3.79	312	4.06	320	4.28	299	3.89	302	4.04	295	3.84	295	3.95	0	0.00	0	0.00
13	Mid-Peninsula WD	123	3.48	120	3.50	139	3.94	142	4.13	130	3.67	129	3.76	127	3.59	125	3.64	0	0.00	0	0.00
14	Millbrae	118	2.76	115	2.77	148	3.45	149	3.60	137	3.19	135	3.26	134	3.13	131	3.16	0	0.00	0	0.00
15	Milpitas	151	11.15	140	11.09	175	12.89	178	14.09	163	12.05	163	12.93	159	11.78	157	12.47	0	0.00	0	0.00
16	Mountain View	151	11.81	135	11.11	158	12.38	161	13.25	149	11.66	148	12.22	146	11.40	143	11.79	0	0.00	0	0.00
17	North Coast County WD	103	4.32	124	5.30	92	3.87	93	3.96	88	3.70	87	3.70	86	3.62	83	3.57	0	0.00	0	0.00
18	Palo Alto	192	13.14	178	12.72	214	14.63	213	15.23	197	13.51	193	13.81	194	13.26	188	13.41	0	0.00	0	0.00
20	Redwood City	131	11.91	124	11.82	139	12.64	138	13.14	123	11.18	119	11.33	120	10.87	114	10.88	0	0.00	0	0.00
21	San Bruno	110	5.01	124	5.89	100	4.57	102	4.82	92	4.20	90	4.29	90	4.08	86	4.10	0	0.00	0	0.00
22	San Jose (b)	343	6.67	334	10.90	333	6.47	244	7.95	231	4.50	186	6.08	226	4.40	174	5.68	0	0.00	0	0.00
23	Santa Clara	190	23.83	185	24.37	205	25.65	208	27.39	194	24.33	194	25.57	190	23.87	188	24.83	0	0.00	0	0.00
25	Sunnyvale	144	20.37	134	19.65	173	24.44	174	25.54	161	22.79	159	23.25	158	22.39	154	22.62	0	0.00	0	0.00
26	Westborough WD	103	1.11	124	1.35	99	1.07	99	1.08	91	0.98	88	0.96	89	0.96	86	0.93	0	0.00	0	0.00
Total		--	256.49	--	259.91	--	284.22	--	302.54	--	261.03	--	272.73	--	255.63	--	263.82	--	0.00	--	0.00

Abbreviations:

- *gpcd* = gallons per capita per day
- *MGD* = million gallons per day
- *PEIR* = San Francisco Public Utilities Commission Programmatic Environmental Impact Report
- *SB7* = Senate Bill 7
- *WCIP* = BAWSCA Water Conservation Implementation Plan

Notes:

- (a) The gross water use is equal to the total water demand projections shown in Table 3d less the recycled water use projection also shown in Table 3d.
- (b) The portion of San Jose that receives water from the San Francisco Public Utilities Commission is included in calculations. This includes the North San Jose and Alviso services areas in the San Jose Municipal Water System.

Table 3d

Worksheet for Entering BAWSCA Total Demand and Recycled Water Use Projections

Interactive Spreadsheet for Preliminary Assessment of SB7x-7 Targets and Estimated Water Savings Requirements for BAWSCA Agencies on an Individual, Sub-Regional, and Regional Basis

Agency Number	BAWSCA Agency	Projected Recycled Water Use (a)		Total Demand Projections (no conservation) (a)				Total Demand Projections with Plumbing Codes and 2004 PEIR Commitments (a)				Total Demand Projections with Plumbing Codes, 2004 PEIR Commitments, and WCIP Savings (a)				Agency Specified 2011 UWMP Projections: Total Water Use (Including Recycled Water)					
		2015		2020		2015		2020		2015		2020		2015		2020		2015		2020	
		(MGD)	(MGD)	gpcd	(MGD)	gpcd	(MGD)	gpcd	(MGD)	gpcd	(MGD)	gpcd	(MGD)	gpcd	(MGD)	gpcd	(MGD)	gpcd	(MGD)	gpcd	(MGD)
1	Alameda County WD	0.00	0.00	160	56.11	162	59.08	145	50.77	144	52.52	142	49.81	140	50.97						
3	Burlingame	0.00	0.00	158	4.97	166	5.32	143	4.49	141	4.52	140	4.40	137	4.38						
4a	CWS - Bear Gulch	0.00	0.00	203	14.34	203	14.63	186	13.16	182	13.12	183	12.96	178	12.80						
4b	CWS - Mid-Peninsula	0.00	0.00	141	18.92	142	19.97	128	17.18	126	17.69	125	16.76	121	17.03						
4c	CWS - South SF	0.00	0.00	177	9.72	180	10.31	161	8.82	160	9.16	158	8.67	156	8.92						
5	Coastside County WD	0.00	0.00	140	2.85	140	2.93	129	2.64	127	2.66	127	2.59	124	2.59						
6	Daly City	0.03	0.03	86	10.00	90	10.89	77	9.04	79	9.59	75	8.75	75	9.13						
7	East Palo Alto	0.00	0.00	122	3.68	147	4.61	113	3.39	135	4.24	109	3.27	128	4.02						
8	Estero Municipal WD	0.00	0.00	163	6.05	168	6.37	157	5.83	160	6.05	154	5.71	154	5.86						
10	Hayward	0.00	0.00	152	23.69	161	26.08	144	22.49	151	24.44	141	22.00	146	23.62						
11	Hillsborough	0.00	0.00	317	3.87	317	3.94	294	3.59	287	3.56	291	3.55	282	3.50						
12	Menlo Park	0.00	0.00	312	4.06	320	4.28	299	3.89	302	4.04	295	3.84	295	3.95						
13	Mid-Peninsula WD	0.00	0.00	139	3.94	142	4.13	130	3.67	129	3.76	127	3.59	125	3.64						
14	Millbrae	0.00	0.00	148	3.45	149	3.60	137	3.19	135	3.26	134	3.13	131	3.16						
15	Milpitas	1.39	1.39	193	14.28	195	15.48	182	13.44	181	14.32	178	13.17	175	13.86						
16	Mountain View	1.00	1.00	171	13.38	173	14.25	162	12.66	161	13.22	159	12.40	155	12.79						
17	North Coast County WD	0.00	0.00	92	3.87	93	3.96	88	3.70	87	3.70	86	3.62	83	3.57						
18	Palo Alto	0.76	0.76	225	15.39	224	15.99	209	14.27	204	14.57	205	14.02	198	14.17						
20	Redwood City	1.00	1.00	150	13.64	148	14.14	134	12.18	129	12.33	131	11.87	125	11.88						
21	San Bruno	0.00	0.00	100	4.57	102	4.82	92	4.20	90	4.29	90	4.08	86	4.10						
22	San Jose (b)	1.13	1.13	391	7.60	278	9.08	290	5.63	221	7.21	284	5.53	209	6.81						
23	Santa Clara	3.73	3.73	234	29.38	236	31.12	224	28.06	222	29.30	220	27.60	217	28.56						
25	Sunnyvale	1.49	1.49	183	25.93	184	27.04	172	24.28	169	24.75	169	23.89	164	24.11						
26	Westborough WD	0.00	0.00	99	1.07	99	1.08	91	0.98	88	0.96	89	0.96	86	0.93						
Total		10.54	10.54	--	129.60	--	137.99	--	119.57	--	125.28	--	117.23	--	121.31	--	0.00	--	0.00		

Abbreviations:

- "gpcd" = gallons per capita per day
- "MGD" = million gallons per day
- "PEIR" = San Francisco Public Utilities Commission Programmatic Environmental Impact Report
- "SB7" = Senate Bill 7
- "WCIP" = BAWSCA Water Conservation Implementation Plan

Notes:

- (a) The demand projections for total demand (including recycled water) and recycled water use were provided by BAWSCA in the Strategy Phase I Report and related tables. The projected recycled water use for 2015 and 2020 are assigned values projected for 2018.
- (b) The portion of San Jose that receives water from the San Francisco Public Utilities Commission is included in calculations. This includes the North San Jose and Alviso services areas in the San Jose Municipal Water System.

Table 4a
Water Uses for BAWSCA Agencies

Interactive Spreadsheet for Preliminary Assessment of SB7x-7 Targets and Estimated Water Savings Requirements for BAWSCA Agencies on an Individual, Sub-Regional, and Regional Basis

Agency Number	BAWSCA Agency	Population in FY 2008-09	Highest 10/15-year Baseline Water Use (a) (gpcd)	Lowest 5-year Current Water Use (a) (gpcd)	Highest 5-year Current Water Use (a) (gpcd)
1	Alameda County WD	331,293	155	142	148
3	Burlingame	28,867	164	151	162
4a	CWS - Bear Gulch	57,078	212	226	229
4b	CWS - Mid-Peninsula	123,260	136	129	133
4c	CWS - South SF	56,210	153	142	148
5	Coastside County WD	19,221	140	124	142
6	Daly City	107,099	78	66	71
7	East Palo Alto	29,690	72	65	67
8	Estero Municipal WD	36,100	161	150	157
10	Hayward	150,878	135	123	128
11	Hillsborough	10,844	327	317	336
12	Menlo Park	14,139	354	303	359
13	Mid-Peninsula WD	26,050	130	119	126
14	Millbrae	21,387	121	116	121
15	Milpitas	70,817	175	150	161
16	Mountain View	74,762	169	156	166
17	North Coast County WD	40,000	84	79	81
18	Palo Alto	63,400	222	191	205
20	Redwood City	83,895	139	129	138
21	San Bruno	40,165	104	93	96
22	San Jose (c)	16,900	586	314	352
23	Santa Clara	117,200	231	180	195
25	Sunnyvale	137,538	168	146	154
26	Westborough WD	12,000	94	77	82
Group Calculation (b)		1,668,793	156	141	148

Abbreviations:

"gpcd" = gallons per capita per day

Notes:

- (a) The baseline water uses and current water uses are calculated in Tables 4b and 4c, respectively.
- (b) The values shown for the group calculation refer to the second group calculation technique for alliances.
- (c) The portion of San Jose that receives water from the San Francisco Public Utilities Commission is included in calculations. This includes the North San Jose and Alviso services areas in the San Jose Municipal Water System.

Table 4b

Estimation of 10- to 15-Year Period Baseline Water Uses

Interactive Spreadsheet for Preliminary Assessment of SB7x-7 Targets and Estimated Water Savings Requirements for BAWSCA Agencies on an Individual, Sub-Regional, and Regional Basis

Agency Number	BAWSCA Agency	2008 Recycled Water Use (a) (%)	Baseline GPCD Basis (15-year or 10-year)	Baseline GPCD: 15-Year Period Ending						Baseline GPCD: 10-Year Period Ending						Highest Baseline Water Use (gpcd)
				6/2005	6/2006	6/2007	6/2008	6/2009	6/2010	6/2005	6/2006	6/2007	6/2008	6/2009	6/2010	
				1	Alameda County WD	0.0%	10	151	151	152	152	151	151	155	154	
3	Burlingame	0.0%	10	156	157	159	161	161	159	164	163	162	162	161	157	164
4a	CWS - Bear Gulch	0.0%	10	172	177	184	192	197	200	187	191	197	206	211	212	212
4b	CWS - Mid-Peninsula	0.0%	10	129	132	133	134	134	134	136	136	135	135	134	133	136
4c	CWS - South SF	0.0%	10	144	146	148	149	149	150	153	153	152	152	150	148	153
5	Coastside County WD	0.0%	10	134	135	137	138	137	135	140	140	140	139	135	133	140
6	Daly City	0.2%	10	76	75	75	75	75	74	78	76	75	74	73	71	78
7	East Palo Alto	0.0%	10	73	71	71	72	71	70	72	72	69	68	67	65	72
8	Estero Municipal WD	0.0%	10	151	153	157	159	158	157	161	160	160	160	158	155	161
10	Hayward	0.0%	10	130	130	131	132	131	131	135	133	131	130	129	125	135
11	Hillsborough	0.0%	10	298	302	309	317	318	317	317	318	315	323	327	322	327
12	Menlo Park	0.0%	10	333	335	338	344	339	333	348	350	350	354	344	330	354
13	Mid-Peninsula WD	0.0%	10	124	124	126	127	127	127	130	130	130	130	129	126	130
14	Millbrae	0.0%	10	116	118	119	120	119	119	120	121	121	120	119	117	121
15	Milpitas	7.4%	10	168	169	170	170	169	167	175	172	169	166	163	159	175
16	Mountain View	0.0%	10	166	166	167	167	166	165	169	168	168	168	167	163	169
17	North Coast County WD	0.0%	10	81	81	82	83	83	82	84	84	83	83	83	82	84
18	Palo Alto	6.3%	10	213	213	215	216	214	212	222	218	216	215	211	204	222
20	Redwood City	1.9%	10	132	132	134	136	136	135	138	138	138	139	138	135	139
21	San Bruno	0.0%	10	101	101	102	102	101	100	104	103	101	101	100	97	104
22	San Jose (c)	10.5%	15	586	565	543	519	485	456	527	505	478	452	415	375	586
23	Santa Clara	11.4%	15	228	226	225	223	219	214	231	223	216	210	203	194	231
25	Sunnyvale	5.2%	10	168	167	166	165	163	161	168	166	163	162	158	154	168
26	Westborough WD	0.0%	10	92	91	91	90	90	88	94	93	91	90	88	84	94
Group Calculation (b)		2.6%	10	150	151	152	153	152	151	156	154	153	152	150	147	156

Abbreviations:

"gpcd" = gallons per capita per day

Notes:

- (a) Recycled water use in the year 2008 is the criterion for selecting a 15-year or 10-year baseline basis for gpcd.
- (b) The values shown for the group calculation refer to the second group calculation technique for alliances.
- (c) The portion of San Jose that receives water from the San Francisco Public Utilities Commission is included in calculations. This includes the North San Jose and Alviso services areas in the San Jose Municipal Water System.

Table 4c**Estimation of 5-Year Period Current Water Uses**

Interactive Spreadsheet for Preliminary Assessment of SB7x-7 Targets and Estimated Water Savings Requirements for BAWSCA Agencies on an Individual, Sub-Regional, and Regional Basis

Agency Number	BAWSCA Agency	Current Water Use (gpcd): 5-Year Period Ending			Lowest Current Water Use (gpcd)	Highest Current Water Use (gpcd)
		6/2008	6/2009	6/2010		
1	Alameda County WD	148	145	142	142	148
3	Burlingame	162	157	151	151	162
4a	CWS - Bear Gulch	226	229	227	226	229
4b	CWS - Mid-Peninsula	133	130	129	129	133
4c	CWS - South SF	148	145	142	142	148
5	Coastside County WD	142	132	124	124	142
6	Daly City	71	69	66	66	71
7	East Palo Alto	65	65	67	65	67
8	Estero Municipal WD	157	153	150	150	157
10	Hayward	128	126	123	123	128
11	Hillsborough	336	328	317	317	336
12	Menlo Park	359	328	303	303	359
13	Mid-Peninsula WD	126	123	119	119	126
14	Millbrae	121	118	116	116	121
15	Milpitas	161	155	150	150	161
16	Mountain View	166	162	156	156	166
17	North Coast County WD	81	81	79	79	81
18	Palo Alto	205	197	191	191	205
20	Redwood City	138	133	129	129	138
21	San Bruno	96	95	93	93	96
22	San Jose (b)	352	324	314	314	352
23	Santa Clara	195	189	180	180	195
25	Sunnyvale	154	151	146	146	154
26	Westborough WD	82	82	77	77	82
Group Calculation (a)		148	145	141	141	148

Abbreviations:

"gpcd" = gallons per capita per day

Notes:

- (a) The values shown for the group calculation refer to the second group calculation technique for alliances.
- (b) The portion of San Jose that receives water from the San Francisco Public Utilities Commission is included in calculations. This includes the North San Jose and Alviso services areas in the San Jose Municipal Water System.

Table 5
Abbreviations, Notes, and References for the
Following Tables 5-A1 through 5-A26

Interactive Spreadsheet for Preliminary Assessment of SB7x-7 Targets and Estimated Water Savings Requirements for BAWSCA Agencies on an Individual, Sub-Regional, and Regional Basis

Abbreviations:

"gpcd" = gallons per capita per day
"SB7" = Senate Bill 7

Notes:

- (a) The year ID is an arbitrary number assigned to make selecting data from Table 6 easier to enter into this Table 5.
- (b) The BAWSCA fiscal year was used for calculations involving the annual gross water use. The year ending date was used to identify periods allowed under SB7 requirements. See Note (e) for further discussion.
- (c) The service area population, recycled water use, and annual gross water use were provided as part of Reference 1. The recycled water use for the indicated fiscal year is expressed as a percentage of total supply. The annual gross water use was calculated by subtracting the recycled water use from the total water use. (Agricultural water use and industrial process use are not considered by BAWSCA to be substantial water uses.) The total water use was expressed in Reference 1 as hundred cubic feet ("ccf"). Please note that 1 ccf is approximately equal to 748 gallons.
- (d) The per capita water use for the indicated fiscal year is calculated in accordance with SB7 by dividing the annual gross water use (in gallons) by the population and then dividing by 365 days.
- (e) Three lengths of periods are used to calculate baseline water uses and current water uses under SB7: 15-year baseline, 10-year baseline, and 5-year current. The baseline water uses can be calculated for continuous periods that end no earlier than 31 December 2004 and no later than 31 December 2010. The current water uses can be calculated for continuous periods that end no earlier than 31 December 2007 and no later than 31 December 2010. The per capita water use over the course of each period is shown under the indicated duration (i.e., 15, 10 or 5 years) and the indicated period ending date (e.g., 6/2004). The average over the period is calculated at the bottom of the table, and this value is the calculated baseline or current water use.

References:

- 1. BAWSCA, October 2010. Email correspondence on 13 October 2010 from BAWSCA to EKI regarding "Data SB7X Project."

