CITY OF PALO ALTO
UTILITIES

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2010
URBAN WATER MANAGEMENT PLAN

JUNE 2011

City of Palo Alto Utilities

2010
Urban Water Management Plan

June 2011

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Printed on recycled paper

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List of Acronyms

AF	Acre Feet
ABAG	Association of Bay Area Governments
AF/Y	Acre Feet per Year
BAWAC	Bay Area Water Agencies Coalition
BAWSCA	Bay Area Water Supply and Conservation Agency
BCA	Baseline Consumption Allowance
BMP	Best Management Practices
CAFR	City Audited Financial Report
CALTRANS	California Department of Transportation
ccf	Centi Cubic Feet (hundred cubic feet)
CCSF	City and County of San Francisco
CEE	Consortium for Energy Efficiency
CEQA	California Environmental Quality Act
CIMIS	California Irrigation Management Information System
COM	Commercial
CPAU	City of Palo Alto Utilities
CUWCC	California Urban Water Conservation Council
DHS	Department of Health Services
DSM	Demand Side Management
DMM	Demand Management Measures
DSS	Demand Side Management Least Cost Planning Decision Support System
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
ET	Evapotranspiration
ETO	Reference Evapotranspiration
FEMA	Federal Emergency Management Agency
FY	Fiscal Year

gpm	Gallons per minute
HET	High Efficiency Toilets
ICI	Industrial Commercial and Institutional
WIRP	Integrated Resource Plan
IRWMP	Integrated Regional Water Management Plan
IT	Information Technology
IWSAP	Interim Water Shortage Allocation Plan
MF	Multi-family
mg/L	Milligrams per liter
MGD	Million Gallons per Day
MOU	Memorandum of Understanding
O&M	Operations and Maintenance
OES	Office of Emergency Services
RWQCP	Palo Alto Regional Water Quality Control Plant
PEIR	Program Environmental Impact Report
RWS	Regional Water System
SCVWD	Santa Clara Valley Water District
SF	Single-family
SFPUC	San Francisco Public Utilities Commission
SFWD	San Francisco Water Department
TAC	Technical Advisory Committee
TDS	Total Dissolved Solids
TRC	Total Resource Cost
UAC	Utilities Advisory Commission
UER	Utilities Emergency Response
ULF	Ultra Low Flow
ULFT	Ultra Low Flow Toilet
URS	United Research Services, Consultant Firm
UWMP	Urban Water Management Plan
WIRP	Water Integrated Resource Plan
WPL	West Pipeline
WSIP	Water System Improvement Program
WSMP	Water Supply Master Plan

City of Palo Alto Utilities
2010 Urban Water Management Plan
Contact Sheet

Date plan submitted to the Department of Water Resources: July 12, 2011

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Utility services provided by the City include: **electric, natural gas, commercial fiber, refuse, recycled water, storm drain, wastewater collection, treatment and disposal.**

Is This Agency a Bureau of Reclamation Contractor? **No**

Is This Agency a State Water Project Contractor? **No**

Section 1 – Plan Development and Adoption

Plan Structure

The City of Palo Alto (City) has not experienced significant changes in the water supply distribution system and reliability since the preparation of the 2005 Urban Water Management Plan (UWMP) and has determined the 2005 UWMP provided sufficient guidance to meet the City's needs during the 2005 UWMP cycle. For the 2010 UWMP update, the City has updated the 2005 UWMP and addressed any changes to the UWMP Act since 2005 as outlined in Section B of the Department of Water Resources (DWR) UWMP Guidebook.

Plan Adoption

The City began preparing this update of its Urban Water Management Plan in winter 2010. The updated plan will be considered by City Council before June 30, 2011 and submitted to the California Department of Water Resources within 30 days of Council adoption. This plan includes all information necessary to meet the requirements of California Water Code Division 6, Part 2.6 (Urban Water Management Planning) as well as requirements of the California Water Code Division 6, Part 2.55 (Water Conservation Bill of 2009).

Public Participation

The City actively encourages community participation in its urban water management planning efforts. The City held a public participation meeting on March 24, 2011 to seek input on the 2010 UWMP in addition to public hearings before the Utilities Advisory Commission (UAC) and City Council prior to adoption. An UWMP webpage (www.cityofpaloalto.org/UWMP) was created to educate the public about the UWMP process, provide outreach for public meetings and opportunities to participate, as well as to make available background materials on the City's urban water management planning activities.

Table 1: Calendar for Adoption

Date	Meeting/Activity	Topic
March 24, 2011	Public Meeting; 7 to 9 p.m. Palo Alto Art Center Auditorium	Review and Discussion on UWMP
		Review and Discussion on SBx7-7 Reduction Targets
May 4, 2011	Utilities Advisory Commission (UAC)	Review and Recommendation on UWMP
May 30, 2011	Published Notice of Public Hearing	Newspaper (Council meeting) on UWMP
		Newspaper (Council meeting) on SBx7-7 Reductions
June 13, 2011	City Council	Review and Discussion on SBx7-7 Reduction Targets
		Review and Adoption of UWMP
July 12, 2011	Final UWMP and Council Resolution	Copy to DWR and Stakeholder Agencies
July 12, 2011	Final UWMP and Council Resolution	Available to the Public

Appendix B contains the public participation notices. The Notices will be added to the Final Draft UWMP that will be presented to Council for approval.

The City's Utilities Advisory Commission (UAC) provides advice to the City Council on acquisition and development of electric, gas and water resources; joint action projects with other public or private entities which involve electric, gas or water resources; wastewater collection and fiber optic issues; environmental implications of electric, gas or water utility projects, as well as conservation and demand management. The UAC meets once per month and reviews the activities of the various utility services. One of the primary tasks of the UAC is to assist with the review and development of long-term plans for the City's utilities. The UAC meetings are open to the public and agendas are posted for public review prior to each meeting. The draft schedule for approval of the 2010 UWMP provides the opportunity for the UAC to review and comment on the Draft UWMP prior to submittal to the City Council for final approval.

In addition to the review of the UWMP, the UAC has been very active in the review of several other water supply and water management documents. Since the adoption of the 2005 UWMP, this review during public meetings has included discussion and presentations on the following:

- Annual Public Benefits Plan Update (January 2005)
- Recycled Water Market Survey Proposal (August 2005)
- Recycled Water Market Survey Results (October 2006)
- Recycled Water Facility Plan (June 2008)

- San Francisco Public Utilities Commission (SFPUC) Water System Improvement Program (2005-2009)
- Stanford Medical Center Water Supply Assessment (March 2009)
- Water Supply Agreement and Individual Water Supply Contract with the City and County of San Francisco (May 2009)
- Updated Water Efficient Landscape Ordinance (January 2010)
- Report on Ways to Reduce Potable Water Use in Palo Alto 20% by 2020 (April 2010)
- Recommendation to Integrate Water Efficient Landscape, Recycled Water, and Energy Efficiency Ordinances into the California Green Building Code (September 2010)

Agency Coordination

Law

> California Water Code section 10620[1] (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).
>
> (d) (1) An urban water supplier may satisfy the requirement of this part by participation in area wide regional, watershed, or basis wide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.
>
> (2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.
>
> (f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

Coordination Within the City

Many members of City staff met to coordinate development of this plan, including representatives from all divisions of the City of Palo Alto Utilities Department (CPAU) and other City departments, including the Planning and Community Environment Department; the City Manager's Office; the City Attorney's Office; and the Public Works Department (Palo Alto Regional Water Quality Control Plant). The UWMP is coordinated with other City planning and policy level documents to ensure the water policy direction in the UWMP informs future decisions within the City of Palo Alto, including the Urban Forest Master Plan and the Comprehensive Plan Update.

[1] Unless noted, all statutory references herein are to the California Water Code.

Since completion of the 2005 UWMP, CPAU has completed several important water supply and planning milestones, including:

- **Recycled Water Facility Plan (March 2009) –** This study defined the recycled water alternatives and identified a recommended project alignment. The study also provided a funding strategy and an implementation plan for the recommended project.
- **City of Palo Alto Emergency Water Supply & Storage Project Final Environmental Impact Report (February 2007)** – The City certified the Environmental Impact Report (EIR) to locate a site and construct a 2.5 million gallon underground water reservoir and pump station in Palo Alto to meet emergency water supply and storage needs. In addition to this water reservoir, the project includes the siting and construction of several emergency supply wells and the upgrade of five existing wells and the existing Mayfield Pump Station. The City is currently in the construction phase for the project.
- **Water Supply Assessment for the Stanford University Medical Center (March 2009)** – SB 610 requires a nexus between regional land use planning and an assessment of whether water supplies are sufficient to serve demand generated by a projection. The City performed a Water Supply Assessment (WSA) for the project during the EIR process and used information from the 2005 UWMP to guide normal and dry year supply assessment.
- **Water Supply Agreement and Individual Water Supply Contract (May 2009)** – The Palo Alto City Council approved the new Water Supply Agreement and Individual Water Sales Contract with the City and County of San Francisco. The new contract specifies the contractual relationship with the City's primary wholesale water supplier, the San Francisco Public Utilities Commission, and addresses the terms of service for the City. The new contract has a 25 year term and expires in 2034.
- **The Water Shortage Implementation Plan (January 2010) –** The Palo Alto City Council approved a new Water Shortage Implementation plan that allocates water from the SFPUC regional system between the Bay Area Water Supply and Conservation Agency (BAWSCA) members.

The completion of the plans and agreements listed above required the cooperation of all divisions within the CPAU and several other departments within the City. Data and information from these reports was used in this document.

Interagency Coordination

The City is an active member of the California water community and is particularly active in the following organizations:

- The City is a very active member of the Bay Area Water Supply and Conservation Agency (BAWSCA). The BAWSCA members, including the City, receive water from the City and County of San Francisco through a contract that is administered by the SFPUC.

- The City is represented on the Santa Clara Valley Water District (SCVWD) Commission, the SCVWD Water Retailers Group, the SCVWD Recycled Water Subcommittee, and the SCVWD Water Conservation Subcommittee group.
- The City has actively participated on several initiatives in relation to the SFPUC, including:
    - Preparation of the SFPUC's Program EIR for its Water System Improvement Program (WSIP)
    - The Interim Supply limitation established by the SFPUC during adoption of the WSIP to limit deliveries from the regional system until 2018.
- Through BAWSCA, the City is represented in the Bay Area Water Agencies Coalition (BAWAC), a group of the seven largest water agencies in the Bay Area. BAWAC was established to develop regional water planning objectives, coordinate projects and programs that would meet the regional objectives to improve water supply reliability and water quality, and document, coordinate and communicate existing and planned programs and activities being implemented in the Bay Area region in the areas of water use efficiency and water treatment.
- The City has been a signatory to the Memorandum of Understanding Regarding Urban Water Conservation with the California Urban Water Conservation Council since 1992.
- The City is a member of the Bay Area Water Conservation Coordinators group, a consortium of water conservation professionals formed to discuss and share policy and program implementation strategies and research.
- The City is a member of the WateReuse Association, an organization of governmental, non-profit and private sector entities working together to encourage increased recycled water use in California.
- The City is a member of the Consortium for Energy Efficiency (CEE), through which water and power agencies strive to evaluate and promote water and energy efficient appliances and technologies.
- The City is a member of the Alliance for Water Efficiency.
- The City is a Partner in the Environmental Protection Agency's (EPA) WaterSense program, which promotes water efficient products and assists utilities in marketing its programs for water use efficiency.
- The City Council adopted the Ahwahnee Water Principles for Resource Efficient Land Use on October 17, 2005.[2] These principles were developed by the Local Government Commission, a nonprofit, nonpartisan organization working to create healthy, walkable, and resource-efficient communities.

The City continually coordinates water-planning activities with neighboring communities and water agencies.

[2] CMR 367:05

The Water Supply Master Plan - One early example of interagency coordination and planning was the development of the Water Supply Master Plan (WSMP). From 1996 through 1999, the BAWSCA agencies and the SFPUC worked cooperatively to develop a WSMP. A representative from Palo Alto was on the steering committee for this project. The WSMP is intended to address the future water supply needs of the water agencies and 2.3 million people, who are served via the SFPUC water system. On April 25, 2000 the SFPUC formally adopted the WSMP including the implementation schedule for identified, selected projects.

Water Integrated Resource Plan (WIRP) - The City has evaluated all its water supply alternatives in an effort to determine what long-term direction the City should take for water resource planning. In 2000, this effort resulted in the publication of a document describing in detail all the identified alternatives. Besides BAWSCA, the agencies that have received this document include: the City of Mountain View, Alameda County Water District, Stanford University, the City of San Jose, California Water Company, the City of Redwood City, the City of Daly City, the Purissima Hills Water District, the City of Santa Clara, the City of Milpitas and the City of Sunnyvale. In addition, the City continuously interacts with the 26 other BAWSCA agencies in the development of water efficiency programs to be implemented regionally, as well as the regional evaluation of water supply alternatives.

Integrated Regional Water Management Plan – The Association of Bay Area Government (ABAG) convened a broad-based group of stakeholders to develop an Integrated Regional Water Management Plan (IRWMP) for the Bay Area. The Bay Area IRWMP will facilitate regional cooperation on issues of water supply, quality and reliability, water recycling and conservation, stormwater and flood water management, wetlands and habitat restoration and creation, recreation and access. The plan was finalized in November 2006.

The City was involved in the development of the Bay Area IRWMP on the water supply and reliability areas through BAWSCA's representation in BAWAC. In addition, the City also coordinates water recycling and wastewater for the IRWMP implementation through the City's membership in the Bay Area Clean Water Agencies (BACWA).

BAWSCA Long Term Water Reliable Water Supply Strategy - The BAWSCA agencies have identified a need for normal and dry year supplies to meet future demands. The study will identify cost-effective regional and local projects that will meet individual BAWSCA member needs. At this time, the City has submitted two local and regional projects for consideration in the study: The Phase III recycled water project to serve the Stanford Research Park and a broad regional recycled water program to distribute recycled water from the Palo Alto Regional Water Quality Control Plant.

Palo Alto Regional Water Quality Control Plant Long Range Facilities Plan - Palo Alto's Regional Water Quality Control Plant (RWQCP) has been in operation since 1934 and now serves the six communities of Palo Alto, East Palo Alto, Mountain View, Stanford, Los Altos and Los Altos Hills. Aging equipment, new regulatory requirements, and the movement to full sustainability will require rehabilitation, replacement and new processes. The Long Range Facilities Plan will map

out these changes and focus on biosolids treatment and disposal, waste-to-energy technologies, energy use, major pipeline repairs, recycled water treatment, carbon footprint impacts, and the best alternatives for rehabilitation, replacement or improvement.

Santa Clara Valley Water District Water Supply and Infrastructure Master Plan - The City is participating with other stakeholders in the preparation of a Master Plan to address long range water supply and reliability needs in Santa Clara County. The Water Master Plan will include an implementation program that schedules projects based on finances, risk, and water supply and infrastructure needs.

The City coordinated the 2010 update of the Urban Water Management Plan with the following agencies:

Table 2: Coordination with Appropriate Agencies

AGENCIES	Participated in Plan development	Sent notice of Plan preparation	Commented on the draft	Attended public meetings	Contacted for assistance	Received copy of draft	Sent notice of public hearing	Not involved / No information
SFPUC	X	X					X	
BAWSCA	X	X					X	
SCVWD	X	X					X	
City of East Palo Alto		X					X	
City of Mountain View		X					X	
City of Menlo Park		X					X	
Purissima Hills		X					X	
City of Redwood City		X					X	
Stanford University		X					X	
All other BAWSCA agencies							X	
County of Santa Clara		X					X	

Section 2 – Service Area

Law

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> (a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available….

Demographics

Palo Alto is located in northern Santa Clara County approximately 35 miles south of the City of San Francisco. The City's population in 2010 was approximately 64,403[3]. The City is roughly 26 square miles in area and is a part of the San Francisco Bay metropolitan area. The City is one of the area's most desirable residential communities with approximately 28,291[4] housing units. The City's desirability is partly due to the excellent public schools, comprehensive municipal services, shopping, restaurants and the community's aesthetics.

The City is considered the birthplace of the high technology industry and the Silicon Valley. Located directly adjacent to the City is Stanford University, which attracts major corporations from around the world. The City's 630-acre Stanford Research Park includes among its tenants such prestigious and innovative high-tech leaders as Hewlett-Packard, Lockheed, Varian, Tesla Motors, TIBCO and Genencor. The City has 27.3 million square feet of commercial and industrial floor-space, 36 parks and preserves (comprising 157 acres of urban parks and 3,744 acres of open space), tennis courts (51), community centers (4), theaters (3), swimming pools (1), nature centers (3), athletic centers (4), a golf course, an art center, and a junior museum and zoo (2010)[5].

Table 3 shows the population and employment projections for the City from 2010 to 2030 based on actual 2010 Census data and Association of Bay Area Governments (ABAG) 2009 projections. The City relied on ABAG population and employment projections for the 2005 UWMP and several recent water supply and demand forecasts and continues to primarily rely on ABAG projections in this plan[6]. According to these projections, total expected growth in

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[3] 2010 Census
[4] City of Palo Alto 2009-2010 Comprehensive Annual Financial Report (CAFR).
[5] City of Palo Alto 2009-2010 Comprehensive Annual Financial Report (CAFR).
[6] The City is in the process of updating the City's Comprehensive Plan and will publish revised population and

population from 2010 to 2035 is about 30.4 %, or 1.22% per year on average. From 2001 to 2005, the City experienced significant "dot com" related job losses that has resulted in lower than anticipated employment numbers. In addition, the recent economic slowdown may result in further losses, though there is no data available on the extent of any impact at this time. The job situation is expected to improve albeit at a modest rate. Total growth in employment from 2010 to 2035 is expected to be 7.43%, or 0.30% per year on average.

Table 3: Population - Current and Projected						
	2010[7]	**2015**	**2020**	**2025**	**2030**	**2035**
Service Area Population	64,403	66,200	70,400	73,400	80,400	84,000
Five year - Percent increase		2.79%	6.34%	4.26%	9.54%	4.48%
Total Employment	76,480	76,740	77,010	78,550	80,320	82,160
Five year - Percent increase		0.34%	0.35%	2.00%	2.25%	2.29%

Climate Characteristics

The City enjoys a mild climate surrounded by the San Francisco Bay on the east, and coastal mountains on the west. The monthly average temperature, rainfall and ETo (Reference Evapotranspiration) for the area are presented in Table 4 below.

Table 4: Climate			
	Standard Monthly Average ETO [8]	**Average Rainfall (inches) [9]**	**Average Temperature (Fahrenheit) [10]**
Jan	1.4	3.2	48.0
Feb	1.9	2.9	51.3
Mar	3.5	2.2	53.6

employment data in late 2011 or early 2012. In the interim, the City's Planning Dept. has issued preliminary population and employment forecasts (City Manager's Report 152:10, http://www.cityofpaloalto.org/civica/filebank/blobdload.asp?BlobID=18918). The forecast provides a mid-growth and high-growth population projection, with the high growth scenario based on ABAG 2009. In consideration of the complexities and challenges of forecasting future water use, the 2010 UWMP demand projections are based on ABAG 2009 projections. The City has adjusted the ABAG 2009 forecasts to account for the Census 2010 results.

[7] The City is using 2010 population data from the recent Census. At the time of publication of this document, the Census employment results were not available.

[8] Average ETO data for closest active station (San Jose) reported by CIMIS website http://wwwcimis.water.ca.gov/cimis/welcome.jsp

[9] Average rainfall and temperature data for Palo Alto reported by NOAA website http://www.wrcc.dri.edu/CLIMATEDATA.html

[10] Average temperature data for Palo Alto reported by NOAA website http://www.wrcc.dri.edu/CLIMATEDATA.html

Table 4: Climate			
	Standard Monthly Average ETO [8]	**Average Rainfall (inches) [9]**	**Average Temperature (Fahrenheit) [10]**
Apr	5.0	1.0	56.6
May	5.9	0.4	60.7
June	6.7	0.1	65.0
July	7.1	0.0	66.5
Aug	6.3	0.1	66.6
Sept	4.8	0.2	65.5
Oct	3.6	0.7	60.6
Nov	1.8	1.8	53.5
Dec	1.4	2.7	48.0

Section 3 – System Supplies

Law

> 10631. (b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five year increments described in subdivision (a)…..

Historical Background

The water utility was established on May 9, 1896, two years after the City was incorporated. Local water companies were bought out at that time with a $40,000 bond approved by the voters of the 750-person community. These private water companies operated one or more shallow wells to serve the nearby residents. The City grew and the well system expanded until nine wells were in operation in 1932.

In December 1937, the City signed a 20-year contract with the City and County of San Francisco, administered by the San Francisco Water Department (SFWD), for water deliveries from the newly constructed pipeline bringing Hetch Hetchy water from Yosemite to the Bay Area. Water deliveries from San Francisco commenced in 1938 and well production declined to less than half of the total citywide water demand.

A 1950 engineering report noted, "the capricious alternation of well waters and the SFWD water . . . has made satisfactory service to the average consumer practically impossible." However, groundwater production increased in the 1950s, leading to lower groundwater tables and water quality concerns. In 1962, a survey of water softening costs to City customers determined that the City should purchase 100% of its water supply needs from the SFWD. A 20-year contract was signed with San Francisco, and the City's wells were placed in a standby condition. The SFWD later became known as the SFPUC. Since 1962 (except for some very short periods) the City's entire supply of potable water has come from the SFPUC.

BAWSCA coordinates most of the collective activities of the SFPUC's suburban customers. BAWSCA comprises SFPUC's 26 suburban customers. The City largely works through BAWSCA to manage its SFPUC contract and to interact with the SFPUC.

In 1993, the City completed a water Integrated Resources Plan (IRP). This IRP was completed because the City was facing a decision regarding participation in a recycled water project. In the 1993 IRP, the City calculated the value of recycled water for water supply. At that time, the City decided not to participate in the recycled water project because the costs exceeded the benefits of the project.

In 1999, the City began to prepare a new Water Integrated Resources Plan (WIRP). As a first step, staff completed a high level overview of each of the City's water resource options and helped identify the most promising alternatives to be further analyzed in subsequent phases. The second phase in the WIRP process was the development and evaluation of water supply portfolios so policy makers can determine the proper balance between cost, quality, reliability, and environmental factors. At the conclusion of the second phase of the WIRP in 2003, several pieces of missing information were identified that needed to be further developed in order to further analyze the City's water resource options and alternatives.

The WIRP work has been coordinated with infrastructure work by the City to increase the distribution system reliability. Under a contract with the City, Carollo Engineers completed several studies of the water distribution system. These studies are discussed in Section 3, "System Supplies," under the heading "Groundwater."

The City and other Santa Clara County water retailers coordinated with the SCVWD to examine extending the SCVWD West Pipeline (WPL) that currently ends at Miramonte Road and Foothills Expressway to a point in Palo Alto to serve the City and other neighboring water agencies. In addition, the study examined creating an intertie between the WPL and the SFPUC's Bay Division Pipelines at Page Mill Road. The SCVWD West Pipeline Conceptual Evaluation, completed in March 2003, concluded that the conceptual projects were constructible, but that no decisions could be made until SCVWD concluded additional studies. These ongoing studies include the SCVWD project to evaluate its system reliability, asset management program, and Water Treatment Plant Master Plan Project. These studies, completed in the fall of 2004, concluded that extending the WPL to serve the City could not be justified from a county-wide reliability aspect when evaluated against more cost-effective alternatives.

The information obtained from the studies completed on the groundwater and SCVWD's conceptual study on the WPL Extension was used to characterize the supply options examined in the WIRP.

In mid-2003, the WIRP concluded, based on available information, that supplies from the SFPUC are adequate in normal years, but additional supplies are needed in drought years to avoid shortages. Additionally, the WIRP contained a recommendation not to seek additional supplies for use on a continuous basis unless there is another benefit that can be identified. As a result, the City did not pursue a connection to the SCVWD's treated water line for ongoing water needs nor evaluate further the use the wells on a continuous basis. The WIRP noted that expanded use of water efficiency programs and recycled water might be worthwhile for the environmental benefits and to reduce the drought-time deficit.

Based on the WIRP analysis, the City Council adopted a set of WIRP guidelines in December 2003. The WIRP guidelines include:

1. Preserve and enhance SFPUC supplies: With respect to the City's primary water supply source, the SFPUC, continue to actively participate in the BAWSCA to assist in achieving BAWSCA's stated goal: "A reliable supply of water, with high quality, and at a fair price."
2. Advocate for an interconnection between SFPUC and the SCVWD: Work with SCVWD and the SFPUC to pursue the extension of the SCVWD's West Pipeline to an interconnection with the SFPUC Bay Division Pipelines 3&4. Continue to reevaluate the attractiveness of a connection to an extension of the SCVWD's West Pipeline.
3. Actively participate in development of cost-effective regional recycled water plans: Re-initiate discussions with the owners of the Palo Alto RWQCP on recycled water development. In concert with the RWQCP owners, conduct a new feasibility study for recycled water development. Since the feasibility of a recycled water system depends upon sufficient end-user interest, determine how much water Stanford University and the Stanford Research Park would take.
4. Focus on water DSM programs to comply with BMPs: Continue implementation of water efficiency programs with the primary focus to achieve compliance with the Best Management Practices (BMPs) promoted by the California Urban Water Conservation Council.
5. Maintain emergency water conservation measures to be activated in case of droughts: Review, retain, and prioritize CPAU's emergency water conservation measures that would be put into place in a drought emergency.
6. Retain groundwater supply options in case of changed future conditions: Using groundwater on a continuous basis does not appear to be attractive at this time due to the availability of adequate, high quality supplies from the SFPUC in normal years. However, SFPUC supplies are not adequate in drought years and circumstances could change in the future such that groundwater supplies could become an attractive, cost-effective option. Examples of changing circumstances could be that the amount of water available from the SFPUC system is reduced due to regulatory or other actions. CPAU should retain the option of using groundwater in amounts that would not result in land surface subsidence, saltwater intrusion, or migration of contaminated plumes.
7. Survey community to determine its preferences regarding the best water resource portfolio: Seek feedback from all classes of water customers on the question of whether to use groundwater during drought to improve drought year supply reliability. At the same time, seek feedback on the appropriate level of water treatment for groundwater if it is to be used during drought. Survey all classes of water customers to determine their preferences as to the appropriate balance between cost, quality, reliability, and environmental impact.

Since the major conclusion reached in the WIRP was that SFPUC supplies are adequate except in drought years, the focus turned to the options to reduce the supply deficit during droughts. These options include using groundwater, connecting to the SCVWD's treated water pipeline, developing recycled water, and expanding water efficiency programs. The goal was to find the proper balance between the key factors of cost, availability in a drought, water quality, and environmental impacts in determining the best portfolio for the community.

Following Council's adoption of the WIRP Guidelines, and to gain insight into the question of whether to use groundwater as supplemental supply in droughts, the City surveyed its residential customers. Respondents were asked to rank three options for water supply in a drought:

A. Blend Groundwater – Blend the groundwater with water from SFPUC in droughts. Water customers would still need to cut back water usage by 10% in droughts.
B. No Groundwater – Use no groundwater during droughts. Instead, community is subjected to larger water usage cutbacks in droughts (20% cutback).
C. Treat Groundwater – Highly treat the groundwater (reverse osmosis treatment) before introducing it into distribution system. Water customers would still need to cut back water usage by 10% in droughts.

Survey respondents generally preferred Options B (no groundwater) and C (treat groundwater), but Option A (blend groundwater) was not soundly rejected. Based on the survey, any of the three options would probably be accepted by the City's water customers under drought conditions.

Based on the WIRP and the results of the community survey, staff made the following conclusions and recommendations in June 2004:

1. Do not install advanced treatment systems for the groundwater at this time. This option is simply too expensive, both in capital and in operating costs.
2. Blending at an SFPUC turnout is the best way to use groundwater as a supplemental drought time supply while maintaining good water quality.
3. Staff should await the conclusion of the environmental review process for selecting any new emergency well sites before developing a recommendation on whether to use groundwater in droughts. In the selection process for new well sites, the costs for blending with SFPUC water in droughts should be considered. The least expensive location is a well at El Camino Park due to its proximity to an SFPUC turnout.
4. Actively participate in the development of long-term drought supply plans with SFPUC and BAWSCA.
5. Continue in the efforts identified in the Council-approved WIRP Guidelines:
    a. Evaluate a range of demand-side management (DSM) options for their ability to reduce long-term water demands;
    b. Evaluate feasibility of expanding the use of recycled water; and
    c. Maintain emergency water conservation measures to be activated in case of droughts.

At this time, no decision has been made regarding whether or not to use groundwater as a supplemental supply in droughts, though the City is proceeding with the Emergency Water Supply and Storage project which will provide the City the flexibility to rely on groundwater during a drought if necessary.

Table 5 below shows the current and planned water supply sources for the City for normal years.

Table 5: Current and Planned Water Supply Sources					
Water Supply Sources in AFY	**2010 (actual)**	**2015**	**2020**	**2025**	**2030**
SFPUC[11]	12,263	14,253	14,157	14,353	14,971
Local Groundwater	0	0	0	0	0
Local Surface Water	0	0	0	0	0
Recycled Water	802	850	850	850	850
Transfers in or out	0	0	0	0	0
Exchanges in or out	0	0	0	0	0
Desalination	0	0	0	0	0
Other Sources	0	0	0	0	0
Total	13,065	15,103	15,007	15,203	15,821

SFPUC Supply

Description of SFPUC Regional Water System

Palo Alto receives water from the City and County of San Francisco's Regional Water System (RWS), operated by the SFPUC. This supply is predominantly from the Sierra Nevada, delivered through the Hetch Hetchy aqueducts, but also includes treated water produced by the SFPUC from its local watersheds and facilities in Alameda and San Mateo Counties.

The amount of imported water available to the SFPUC's retail and wholesale customers is constrained by hydrology, physical facilities and the institutional limitations that allocate the water supply of the Tuolumne River. Due to these constraints, the SFPUC is very dependent on reservoir storage to ensure water supply availability in dry years.

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

[11] Data from end use model, except for 2010 actual usage data, as indicated.

Water System Improvement Program

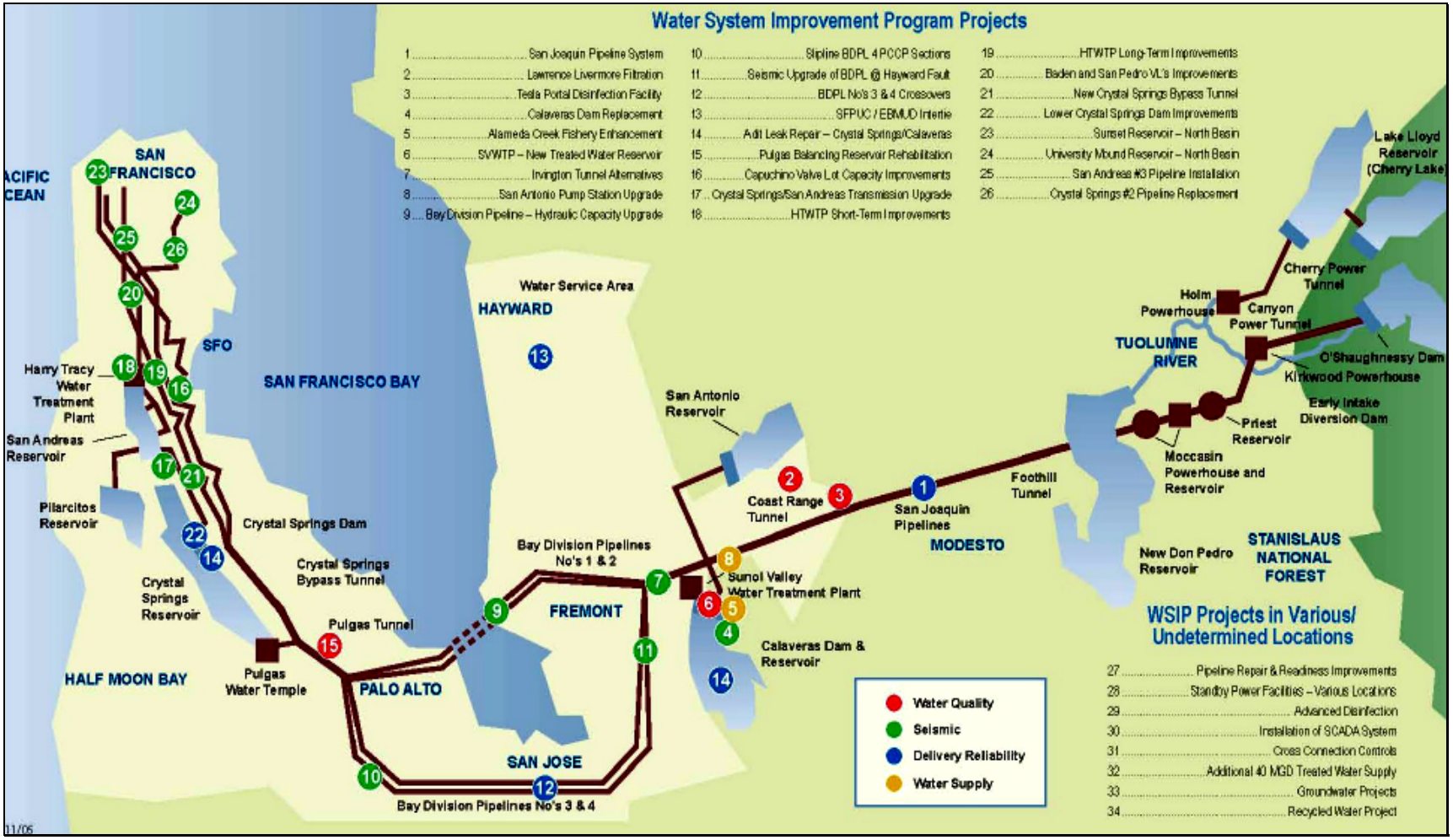
In order to enhance the ability of the RWS to meet identified level of service goals for water quality, seismic reliability, delivery reliability and water supply, the SFPUC has undertaken the WSIP, which was approved October 31, 2008. The WSIP will deliver capital improvements aimed at enhancing the 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.

The approved WSIP includes 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 overall WSIP was 27% complete while the planning and design work was more than 90% complete. The WSIP is scheduled to be completed in December 2015 (Figure 1).

Figure 1: Water System Improvement Program[58]



Source: SFPUC

[58] For more information on individual WSIP projects, please visit the SFPUC website at www.sfwater.org.

2009 Water Supply Agreement

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

In terms of water supply, the WSA provides for a "Supply Assurance" to the SFPUC's wholesale customers of 184 million gallons per day (MGD, expressed on an annual average basis), 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, or Individual Supply Guarantee (ISG), set forth on Attachment C to the WSA. Palo Alto's ISG is 17.07 MGD (or approximately 19,118 acre feet per year). The Supply Assurance survives termination or expiration of the WSA and Palo Alto'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 includes a Tier 2 Shortage Plan, which would allocate the available water from the SFPUC system among the wholesale customers.

In August 2010, the BAWSCA agencies reached agreement on a new Tier 2 Shortage Plan to recommend to their respective governing bodies. On February 7th, 2011, the Palo Alto City Council approved the new Tier 2 Water Shortage Implementation Plan[13] (Appendix E). As of early April 2011, all the BAWSCA agencies have approved the new Tier 2 plan. The new Tier 2 plan provides the framework for allocating the wholesale Tier 1 water allocation between the different BAWSCA agencies. The new Tier 2 Water Shortage Implementation Plan is in effect until 2018.

[13] City of Palo Alto Staff Report, Drought Implementation Plan, ID # 1308

Interim Supply Allocation

When it adopted the WSIP and certified the PEIR on October 30, 2008, the SFPUC approved a water delivery limitation from the SFPUC system of 265 MGD until 2018. This 265 MGD Interim Supply Limitation (ISL) for the system allocated 184 MGD to the BAWSCA agencies and 81 MGD to San Francisco. The ISL does not impact the seismic, public health and deliverability level of service goals that were identified in the WSIP. The intent of the ISL was to establish an interim water supply planning horizon that defers decisions on long term water supply issues until after 2018, when more current information will be available. The penalty mechanism in the ISL, which provides for a substantial "Environmental Enhancement Surcharge," is only triggered if the SFPUC and the BAWSCA agencies collectively exceed the 265 MGD limitation.

In December 2010, the SFPUC finalized the distribution of the 184 MGD BAWSCA ISL allocation to the individual BAWSCA members. Palo Alto's Interim Supply Allocation (ISA) is 14.70 MGD. During the pending FY 2012 rate setting process, the SFPUC will finalize the rates that will be charged to those agencies that exceed their ISA if the 265 MGD limitation is exceeded. Section 4 of this 2010 UWMP includes updated demand projections. Based on these projections, the City does not anticipate exceeding the 14.70 MGD ISA during the ISL period ending in 2018.

The ISA is distinct from the ISG. The ISG is a perpetual entitlement for water delivered from the SFPUC system that survives the expiration of the current water delivery contract. The ISA is an interim water delivery limitation intended to accomplish the goals outlined in the adopted WSIP, and it automatically expires in 2018 (see SFPUC Resolution 10-0213, adopted 12/14/2010).

BAWSCA and Its Role

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

BAWSCA directly represents the needs of the cities, water districts and private utilities that depend on the regional water system. BAWSCA provides these customers with an ability to work with SFPUC on an equal basis to ensure reliable operation of the regional system and collectively and efficiently meet local responsibilities.

BAWSCA has the mandate 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 is within the jurisdiction of 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 between the multiple documents being developed and to ensure overall consistency with the WSIP and the associated environmental documents.

As a member of BAWSCA, the City is formally represented on the BAWSCA Board of Directors on matters involving decision-making, policy setting and issues of interest to the BAWSCA members. On the staff level, the City participates on several advisory and policy committees, including the Water Quality Committee and the Technical Advisory Committee. Staff also represents the City with the other BAWSCA members on other issues that may arise from time to time.

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 PEIR for the WSIP. At that time, over 32 water conservation measures were evaluated. 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 MGD Interim Supply Limitation.

Based on the WCIP development and analysis process, BAWSCA and its member agencies identified five additional 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.

The City actively manages its conservation program to adjust to customer needs and provide a mechanism for the utility to achieve the greatest water savings possible at the lowest cost. The City has made several adjustments to the programs that were identified in 2004 and the 5 new measures that were identified in the WCIP. For example, starting in FY 2011, the City has reduced the emphasis on high efficiency toilet and washing machine rebates in favor of several new measures that will achieve substantially the same level of savings. Some of these programs focus on outdoor water savings while others incentivize innovative water efficiency projects in the community. The new measures are discussed in more detail in Section 5 – Demand Management Measures.

Regional Coordination for Demand Management

BAWSCA and its member agencies look for opportunities to work with other water agencies including the SFPUC and the 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 2007.

More recently, as part of the Bay Area Integrated Regional Water Management Plan, BAWSCA and other major Bay Area water utilities, including the SCVWD 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.

The SCVWD is the primary wholesale water agency in Santa Clara County. Since Palo Alto is located in Santa Clara County, CPAU partners with the SCVWD for conservation program implementation and does not participate in the programs offered by BAWSCA at this time. CPAU and SCVWD mutually benefit from a cost-sharing agreement for administration of residential and commercial conservation programs in Palo Alto. BAWSCA and its member agencies will continue to look for ways 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.

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 BAWCSA 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.

The City is participating in the Strategy and has submitted several potential projects for review. The City anticipates these projects will be evaluated during subsequent project phases, but also as part of several other regional efforts that are simultaneously underway. These efforts include the Palo Alto RWQCP Long Range Facilities Plan and the SCVWD Water Supply and Infrastructure Master Plan. The City is actively participating on all of these efforts in conjunction with the BAWSCA study.

Groundwater

The City is located in Santa Clara County. SCVWD is the groundwater management agency in Santa Clara County as authorized by the California legislature under the SCVWD Act, California Water Code Appendix, Chapter 60[14]. Groundwater conditions throughout the County are generally very good, as SCVWD efforts to prevent groundwater basin overdraft, curb land surface subsidence, and protect water quality have been largely successful. Groundwater elevations have generally recovered from overdraft conditions throughout the basin, inelastic land subsidence has been curtailed, and groundwater quality supports beneficial uses. The groundwater basin is not adjudicated.

[14] SCVWD Groundwater Management Plan, July 2001.

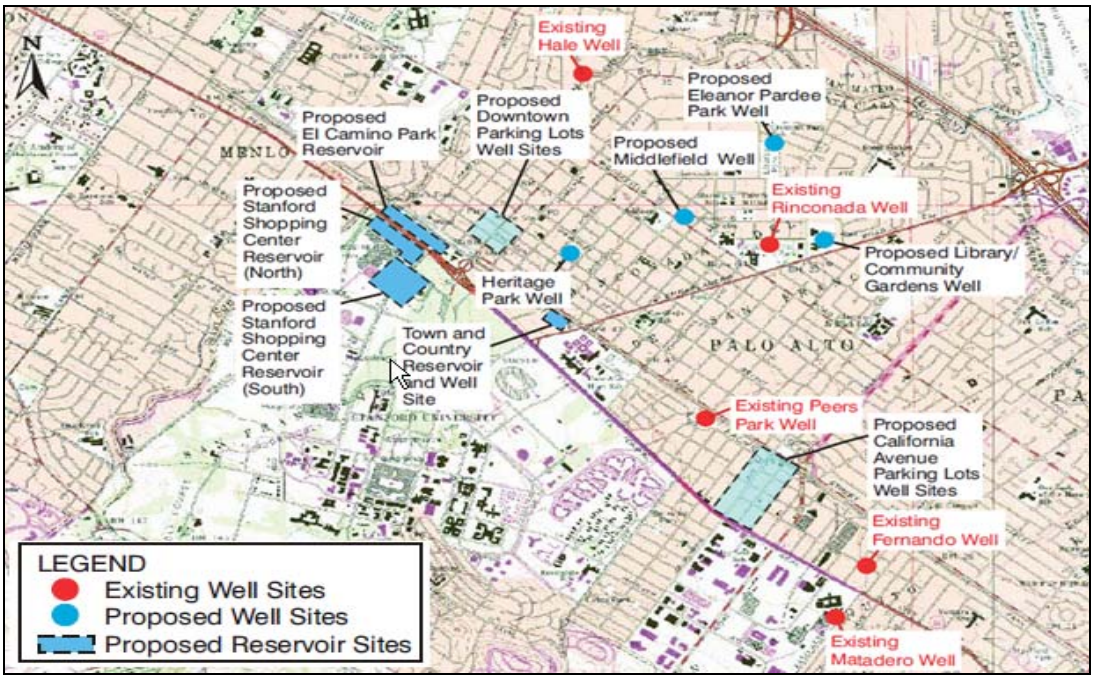
The City's existing water well system consists of five wells (Hale, Rinconada, Peers Park, Fernando, and Matadero) with a combined total rated capacity of 4,300 gpm. These wells were constructed in the mid-1950s and were operated continuously until 1962. In 1988, the wells were operated to provide supplemental supplies as SFPUC implemented mandatory rationing. Two of the wells were operated for about a month and a half in 1991 when it appeared that the City was facing a severe (45%) cutback requirement. Besides normal annual operational testing, the wells have not been used since 1991.

From 1999 to 2003, the City completed numerous studies that provided significant analysis of City-owned wells and the local distribution system. The analysis is discussed in detail in the 2005 UWMP. The results of the studies provided a significant amount of information regarding the costs and operational issues of wells for emergency use, drought-only supply and full-time operation.

Recent Analysis

Since the publication of the 2005 UWMP, the City completed the environmental review and permitting process for the Emergency Water Supply and Storage Project. The project consists of the repair and rehabilitation of the five existing wells, construction of three new wells, potentially equipping one well for use as a supplemental water supply, construction of a new 2.5 million gallon storage reservoir and associated pump station, and other upgrades to the system (Figure 2). The groundwater quality of the City's wells is considered fair to good quality, though significantly less desirable in comparison to the imported SFPUC supply. The groundwater is approximately six times higher in total dissolved solids (TDS) and hardness. The Emergency Water Supply and Storage Project's primary goal is to correct the deficiency in the City's emergency water supply. The project would support a minimum of eight hours of normal water use at the maximum day demand level and four hours of fire suppression at the design fire duration level. The groundwater system may also be used to a limited extent for water supply during drought conditions (up to 1,500 acre feet per year), and would be capable of providing normal wintertime supply needs during extended shutdowns of the SFPUC system. The proposed project would provide up to 11,000 gpm of reliable well capacity and 2.5 million gallons (MG) of water storage for emergency use.

Figure 2: Emergency Water Supply and Storage Project Facilities



Source: Emergency Water Supply and Storage Project EIR, 2007

In March 2007, the City Council certified the Final EIR and authorized staff to proceed with the Emergency Water Supply and Storage Project. The Notice to Proceed for the project was issued in October 2009.

In April 2010, the California Department of Public Health[15] (CDPH) approved a permit amendment to add the new Library/Community Center Well and the Eleanor Pardee Park Wells to the City's existing water supply permit. As part of the permit process, both wells were tested for primary and secondary water quality standards. The results of the test indicate both wells currently meet primary and secondary water quality standards, but the potential remains for exceedance of secondary standards for manganese, iron and TDS. However the wells will remain standby sources for the foreseeable future and as such no additional treatment to ensure compliance with secondary standards is required at this point.

In an emergency situation, the City can provide emergency chlorination treatment at several of the new and existing Well sites, including the Library/Community well, Eleanor Pardee well, Hale Well, Peers Well, and Rinconada well.

The City has identified the wells as a potential supply source for use during a prolonged drought. As specified in the EIR for the Emergency Water Supply and Storage Project, concern

[15] CDPH issues and has the authority to revise domestic water supply permits pursuant to Health and Safety Code section 116525 (City of Palo Alto permit # 4310009).

over prolonged groundwater pumping in the area resulted in a maximum production limitation of 1,500 AFY during a drought[16]. If the wells were to be used as a dry year supply option, the City would need to coordinate with CDPH to ensure the necessary treatment was in place to meet regulatory standards for this purpose. In addition, several other issues will need to be addressed prior to the use of the wells during a drought, including the capital costs of any treatment or blending upgrades that may need to occur, water quality issues compared to the City's SFPUC source, customer acceptance, SCVWD groundwater production costs, and the exact mechanism for how groundwater production would form a part of any drought response portfolio. At this time, the City has no plans to use groundwater during a drought. Once the Emergency Water Storage and Supply Project is complete, the City will re-evaluate the feasibility of using groundwater as a supplemental supply during a drought.

Transfer or Exchange Opportunities

Law

> 10631 (d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

Because the existing San Francisco regional water system does not have sufficient supplies in dry years, dry-year water transfers are potentially an important part of future water supplies. The City has undertaken three activities to support such transfers:

1) From 1996 to 2000, the City participated in the development of the SFPUC-BAWSCA Water Supply Master Plan (WSMP) which identified dry-year purchases as an important part of the future water supply. The discussion in the WSMP includes purchasing additional Tuolumne River water and water from willing sellers located geographically south of the Delta who possess water rights or contractual entitlements to water diverted from the Delta. In addition, the WSMP identifies potential opportunities for water purchases from willing sellers upstream of the Delta along the Sacramento, Feather, Yuba, American, and San Joaquin Rivers and their tributaries.[17] The WSMP was formally adopted by the SFPUC and implementation of the WSMP (including investigating dry-year transfers) is ongoing.

2) In January 2011, the Palo Alto City Council approved a new Water Shortage Implementation Plan to allocate water between the BAWSCA members. This plan includes the ability to transfer water allocated to the BAWSCA agencies between BAWSCA members during drought periods. As of April 2011, all the BAWSCA agencies have unanimously adopted the plan.

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[16] Final Environmental Impact Report, City of Palo Alto Emergency Water Supply and Storage Project, SCH # 2006022038

[17] Draft SFPUC 2005 UWMP 100507, Section 5, Page 34

3) The City is monitoring the development of a water transfer market in California, including a mechanism for BAWSCA members to transfer contractual entitlements on the SFPUC system. The City supports SFPUC's efforts to pursue cost-effective dry-year water transfers as part of the overall water supply for the SFPUC system. BAWSCA has the ability to pursue water transfers on its own as long as a wheeling arrangement can be negotiated with the SFPUC.

Water Recycling

Law

> 10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:
>
> 10633 (a) A description of the wastewater collection and treatment systems in the supplier's service area…

The City operates the Regional Water Quality Control Plant (RWQCP), a wastewater treatment plant, for the East Palo Alto Sanitary District, Los Altos, Los Altos Hills, Mountain View, Palo Alto, and Stanford University. Wastewater from these communities is treated by the RWQCP prior to discharge to the Bay. Approximately 220,000 people live in the RWQCP service area. Of the wastewater flow to the RWQCP, about 60 percent is estimated to come from residences, 10 percent from industries, and 30 percent from commercial businesses and institutions. The RWQCP uses physical, biological, and chemical treatment to remove about 99 percent of the solids and organic materials from influent wastewater.

In 1992, the City and the other RWQCP partners completed a Water Reclamation Master Plan (Master Plan). This Master Plan identified a five-year, three-stage implementation for recycled water development in the service area of the RWQCP.

In 1995, City Council certified the final PEIR for the Master Plan projects. At the same time, the City decided not to pursue any of the recommended expansion stages of a water recycling system as the cost of the projects could not be justified. In addition, Council adopted a Water Recycling Policy, which includes continuation of the existing recycled water program and monitoring of the conditions that would trigger an evaluation of the Master Plan projects studied in the Program EIR. The Water Recycling Policy described five conditions that would trigger evaluation of the Master Plan projects:

1. Changes in the RWQCP discharge requirements;
2. Increased mass loading to the RWQCP;
3. Requests from partner agencies or other local agencies;

4. Availability of federal or other funds; and
5. Water supply issues – Issues which may lead to an increase in the value of recycled water from a water supply perspective include:
    a. Water supply availability shortages;
    b. Regulatory or legislative initiative; or
    c. Advanced treatment for potable reuse.

Participation in Regional Recycled Water Planning

The City has participated in various regional recycled water planning initiatives:

- The City completed the Water Reclamation Master Plan (1992) for the service territory of the RWQCP.

- The City is a stakeholder in the ABAG-led effort to secure grant funding for a Bay Area Integrated Regional Water Management Plan (IRWMP) and for projects identified in that IRWMP.

- CPAU and the partners of the RWQCP committed to assist in the funding of a project to build a new recycled water pipeline from the RWQCP to Mountain View. This project will not have new connections to end uses in the City, but the pipeline is sized to accommodate future expansion of recycled water use in the City. The project was completed in summer 2009.

- The City is a member of the California WateReuse Association, which helps promote and implement water recycling in California.

- The City is a member of the Bay Area Recycled Water Coalition, a group of regional recycled water project proponents that advocate for and seek funding from the Federal Bureau of Reclamation under Title 16.

- The City actively participates on the SCVWD recycled Water Sub-Committee. The Committee is a group of recycled water retailers and wholesalers that meets bimonthly to discuss issues and challenges surrounding the use and promotion of recycled water.

Wastewater Collection and Treatment in Palo Alto

The City's wastewater flows to the RWQCP. The RWQCP is an EPA award winning Class V tertiary treatment facility featuring primary treatment (bar screening and primary sedimentation), secondary treatment (fixed film reactors, conventional activated sludge, clarification and filtration), and tertiary treatment (filtration through a sand and coal filter and UV disinfection). Through these treatments, 99% of ammonia, organic pollutants, and solid pollutants are removed. While the plant was not designed to remove metals, the treatment

process through optimization has reduced the quantity of mercury, silver, and lead by 90%. The removal rates for other heavy metals range from 20 to 85%.

The plant's discharge meets very high standards that are among the most stringent discharge standards in the nation[18]. The quality of the water leaving the plant approaches the standards for drinking water. In fact, the heavy metal content in the plant's discharge is low enough that the water would be appropriate for reuse with only one additional disinfection step. Table 6 provides some data on the RWQCP. A full description of the treatment facility is included in the 1992 Water Reclamation Master Plan and is not reproduced here.

Table 6: Wastewater Treatment

Treatment Plant Name	Location (City)	Average Daily (2010)	Maximum Daily (2009)	Year of Planned Build-out	Planned Maximum Daily Volume
RWQCP	City of Palo Alto	21.5 MGD	68 MGD	Plant built out	80 MGD = Maximum Design Daily Flow 39 MGD = Average Design Daily Flow (Dry weather capacity)

Wastewater Generation, Collection & Treatment

Law

> 10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:
>
> 10633 (a) A […] quantification of the amount of wastewater collected and treated…

Palo Alto Regional Water Quality Control Plant (RWQCP)

The RWQCP has an average dry weather flow design capacity of 39 MGD with full tertiary treatment, and a peak wet weather flow capacity of 80 MGD with full secondary treatment. Current average flows are approximately 22 MGD. The plant capacity is sufficient for current dry and wet weather loads and for future load projections. There are no plans for expansion or to “build-out” the plant.

All of the wastewater treated at the RWQCP can be recycled. The plant already has some capability to produce recycled water that meets the Title 22 unrestricted use standard (approximately 4.5 MGD of capacity of which 4.5 MGD is presently available). In September

[18] City of Palo Alto’s National Pollutant Discharge Elimination System (NPDES) permit No: CA 0037834

2010, the RWQCP completed installation of a new ultraviolet disinfection facility which will allow a gradual increase in the amount of recycled water that meets the Title 22 unrestricted use standard (Table 7). The remaining treated wastewater meets the restricted use standard and can also be recycled.

Table 7: Wastewater Collected and Treated – MGD					
	2010	2015	2020	2025	2030
Wastewater Collected and Treated	22.3	23.5	24.6	25.8	27.4
Quantity that meets recycled water "restricted use" standard	18.3	17	16.6	17.8	19.4
Quantity that meets recycled water "unrestricted use" (Title 22) standard	4	6.5	8	8	8

Wastewater Disposal and Recycled Water Uses

Law

> 10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:
>
> 10633 (a) A description of the […] methods of wastewater disposal.
>
> 10633 (b) A description of the recycled water currently being used in the supplier's service area, including but not limited to, the type, place and quantity of use.
>
> 10633 (c) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.
>
> 10633 (d) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years

Disposal of Wastewater

The City of Palo RWQCP currently discharges treated wastewater to the San Francisco Bay (Table 8).

Table 8: Disposal of Wastewater (non-recycled) – MGD						
Method of Disposal	Treatment Level	2010	2015	2020	2025	2030
Discharge to San Francisco Bay	Tertiary (restricted use standard)	19.4	19.8	20.9	22.1	23.7
Discharge to Bay after going through Emily Renzel Marsh	Tertiary (restricted use standard)	1.2	1.2	1.2	1.2	1.2
	Total	20.6	21.0	22.1	23.3	24.9

Recycled Water Currently Being Used

The recycled water produced by the RWQCP is currently being used for the following:

- Irrigation water for Greer Park in Palo Alto (87 AFY[19])
- Irrigation water for the Palo Alto Municipal Golf Course (109 AFY [20])
- Various uses at the Palo Alto Municipal Service Center, including use in street sweepers, dust control at construction sites, vehicle washing, and for irrigating road median strips
- A new pipeline to serve Shoreline Park and other customers in Mountain View was completed in Summer 2009. The new pipeline delivered approximately 391 AFY of recycled water in 2010 and is projected to deliver approximately 1,500 AFY at peak production[21].
- Water for enhancements at the Emily Renzel Marsh in Palo Alto. The RWQCP pumps from 1.0 to 1.5 MGD of water into the 14-acre freshwater marsh. This water does not get the full, recycled water treatment, just the standard tertiary treatment from the plant (restricted use standard). The recycled water used in the marsh enhancement project does not replace potable water (average of 1.2 MGD, or 1,344 AFY).
- Water for the Duck Pond in Palo Alto (36.83 AFY[22])
- Water for irrigation in and around the RWQCP and in processes at the plant itself. The amount of recycled water that replaces potable water for this use is about 0.5 MGD, or 560 AF/Y. That usage can be broken down as about 0.2 MGD for landscape irrigation and about 0.3 MGD for mechanical seals and cooling water for the oil cooler on the blowers. An additional 1 MGD (1,120 AFY) of recycled water is used at the RWQCP as stack scrubber water, but this use does not replace potable water.
- Water that can be collected by trucks at the plant to be used for dust control at construction projects, for irrigation, and in street sweepers. The quantities of this use vary, but can be up to 5,000 gallons per day[23].

[19] Greer park usage from metered data for calendar year 2010.
[20] Golf Course usage from metered data for calendar year 2010.
[21] Since the City of Mountain View provides potable water service within Mountain View, the recycled water deliveries for the Mountain View project are not included in the Palo Alto UWMP.
[22] Duck Pond usage from metered data for calendar year 2010.
[23] Current uses include service road dust suppression at the Palo Alto landfill (ending July 2011); East Palo Alto

- Irrigation water for CALTRANS, which may use up to 50,000 gallons per day in the summer for irrigating (by truck) the median strips on local highways.

Potential Uses of Recycled Water

After finalizing the 2005 UWMP, the City completed several new studies on potential uses for recycled water and updated recycled water demand estimates accordingly. Based on these studies, the City has updated the recycled water projections previously included in the 2005 UWMP. The potential uses in Palo Alto for recycled water are shown in Table 9 below. The table shows current use continuing for 2010 and the potential for expansion is shown in the totals for 2015 and beyond.

Table 9: Potential Future Use of Recycled Water - Potential AFY

Treatment Level	Type of Use	2010 (Actual)	2015	2020	2025	2030
Tertiary treatment plus additional disinfection (Title 22 unrestricted use standard)	Agriculture	0	0	0	0	0
	Landscape	421	1321	1321	1321	1321
	Industrial	336	336	336	336	336
	Groundwater Recharge	0	0	0	0	0
	Palo Alto Duck Pond	36	24	24	24	24
	Trucked uses for dust control and/or landscape irrigation	10	3	3	3	3
	Total	803	1,684	1,684	1,684	1,684
Tertiary treatment (restricted use standard)	Wildlife Habitat/Wetlands Enhancement (Emily Renzel Marsh)	1,344	1,344	1,344	1,344	1,344
	Industrial	1,120	1,120	1,120	1,120	1,120
	Total	2,464	2,464	2,464	2,464	2,464
	Grand Total	3,267	4,148	4,148	4,148	4,148

Recycled Water Market Survey

Since the Council adopted the Water Recycling Policy in 1995, several things have occurred that prompt a review of the feasibility of recycled water use in the City, including the following:

1. The SFPUC has begun implementing the WSIP to repair and improve the regional water system's infrastructure. This $4.6 billion program has resulted in steadily increasing wholesale water rates. Wholesale water rates are projected to double from the current (FY 2011) rates of $848/AF to over $1850/AF in FY 2016. In addition, the recent

Sanitary District sewer main flushing; and Caltrans median and shoulder irrigation during water shortages.

economic downturn and conservation efforts have negatively impacted water sales that may result in additional upward revisions on supply costs. At these prices, and considering the local benefits of a recycled water supply source, recycled water is increasingly competitive with the cost of SFPUC water.

2. The RWQCP completed a project to replace an existing deteriorating pipeline to Shoreline Golf Course in Mountain View and to extend the pipeline to the Mountain View-Moffett area. The pipeline replacement restored the golf course connection and will provide recycled water services to the Shoreline community. CPAU paid $1 million of the cost for this pipeline to ensure the pipeline will be sized to meet possible future needs in the City. In addition, CPAU has committed to pay another $1 million if and when it taps into the new pipeline.
3. There are potential partners for expanding the use of recycled water in the City. Since there is a regional benefit to maximizing local sources, neighboring communities and the Bay Area at large may wish to participate financially in an expansion of recycled water use in the City, especially if there are no feasible sites in their own communities.

Since enough has changed and because it has been over 13 years since the 1992 Water Reclamation Master Plan was complete, the City engaged a consultant to complete a Recycled Water Market Survey (Market Survey). The Recycled Water Market Survey began in July 2005 and was completed in 2006. The objectives of the study were to review and update the list of potential recycled water users identified in the 1992 Master Plan and to update the estimated recycled water use potential and the cost estimates for the delivery of recycled water. The Market Survey included site investigations, market analysis, conceptual project design, and preparation of a preliminary financing and revenue plan.

Recycled Water Facility Plan

Following completion of the recycled Water Market Survey, the City applied for and secured grant funding for the project planning from the SWRCB through the Regional Water Recycling Facilities Planning Grant Program. The grant provided a 50% cost share with the City for up to $75,000 to fund the preparation of a Facilities Plan for the recycled water project. The purpose of the facility plan was fourfold:

1. Define recycled water alternatives (i.e. reuse sites and demands, distribution alignment, sizing, construction alternatives, etc) and identify a Recommended Project;
2. Develop a realistic funding strategy for the Recommended Project;
3. Develop an implementation strategy for the Recommended Project; and
4. Provide the basis for any future State and Federal grant requests for the Recommended Project.

The City engaged a consultant in April 2007 to assist in preparing the Facility Plan. Based on the analysis in the Facility Plan, the report identified a Recommended Project to serve customers in the Stanford Research Park area and potentially offset the need to import approximately 900 AFY of potable water. Figure 3 below illustrates the areas currently being provided recycled

water (Phases 1&2) and the future potential Phase 3 project to serve the Stanford Research Park.

Figure 3: Phase III Recycled Water Project

The Facility plan provided a comprehensive analysis of the Stanford Research Park project, including detailed costs estimates. The Facility Plan identified a gross project cost of approximately $2700/AF, as compared to a current SFPUC projection in 2016 of approximately $1850/AF. The City is in the process of pursuing potential grant and low cost financing opportunities and anticipates the cost to the City for the project will decrease, depending on the alternative funding sources and amounts.

In December 2008, the Facility Plan was deemed complete by the State Water Resources Control Board. Since completion of the Facility Plan, the City has been evaluating the Phase 3 extension of the existing recycled water delivery system to serve the Stanford Research Park. The City began preparing a Mitigated Negative Declaration for the Phase 3 project in May 2009. During preparation of the MND, elevated salinity levels in the recycled water were identified as an area of concern to stakeholders. Based on subsequent discussions on the salinity issue, the

City decided to prepare an EIR for the project. The City anticipates releasing a draft EIR in September 2011 and seeking City Council approval in late 2011. Following this, the City will continue to pursue grant and others funding sources and will seek City Council approval of the project once the business plan and project financing are complete.

Encouraging Recycled Water Use

Law

> 10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:
>
> 10633 (e) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

The City encourages Recycled Water usage in the following ways:

- Participating in the Integrated Regional Water Management Plan process
- Encouraging businesses and City departments to utilize the existing recycled water capability within the City
- Participating as an active member of the WateReuse Association, including hosting meetings of the Northern California Chapter of the Association
- Offering recycled water for free to users willing to pick it up at the RWQCP by truck
- Adoption of the Recycled water Mandatory Use Ordinance
- Adoption of the Salinity Reduction Policy

Current and Proposed Actions to Encourage Use of Recycled Water

Since completion of the 2005 UWMP, the City has pursued several approaches to encourage recycled water use.

The City Council adopted the Ahwahnee Water Principles for Resource Efficient Land Use on October 17, 2005. One of those principles is that new construction should be plumbed with purple pipe to facilitate the use of non-potable water for outdoor irrigation, toilet flushing, and commercial and industrial processes in anticipation of the future availability of recycled water.

The City approved a Mandatory Use Ordinance[24] to require customers to prepare for recycled water delivery in the future[25]. For most new construction and some renovations that meet

[24] City of Palo Alto Municipal Code, Title 16, Chapter 16.12

[25] The Ordinance applies to non-residential customers. The City has no plans to provide recycled water to

certain criteria, the applicant must install dual-plumbing and prepare the site for irrigation with recycled water. Compliance with the new ordinance is administered through the permit process with the Building Department. The CPAU provides plan review services of landscape and irrigation design plans, in order to ensure compliance with outdoor water efficiency and recycled water requirements.

The City Council approved a Salinity Reduction Policy[26]in January 2010 to address the elevated salinity levels in the recycled water. The policy identified inflow and infiltration as a likely contributor to the elevated salinity levels, and provided a target salinity level based on minimum inflow and infiltration into the wastewater collection system. The approved policy outlined several future implementation steps to lower the TDS levels in the recycled water towards the goal of increased customer acceptance of the use of recycled water.

- The RWQCP will continue to monitor potential saltwater intrusion "hotspots" and communicate the results to the RWQCP partners;
- The RWQCP will develop a database to track salinity data and perform other investigative work to support the effort;
- CPAU will coordinate implementation of the recently approved Sanitary Sewer Management Plan to manage the Palo Alto wastewater collection system and identify inflow and infiltration reduction actions; and
- The RWQCP will develop a groundwater management plan to coordinate salinity reduction activities with the RWQCP partners and prepare for expanded recycled water application. This groundwater management plan[27] will be coordinated with the SCVWD, which has jurisdiction over the groundwater basins in Santa Clara County.

Though no decision has been made at this time regarding retail recycled water pricing, the City may implement financial incentives and other mechanisms to encourage the use of recycled water. One common method to promote recycled water is to provide recycled water at a discount to potable water.

Recycled Water Optimization Plan

Law

> 10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:

---

residential customers

[26] City Council Resolution 9035.

[27] The SCVWD is in the process of updating its existing groundwater management plan.

> 10633 (f) 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 and to promote recirculating uses.

The City continues to examine methods to expand the use of recycled water. Completion of the Recycled Water Market Survey and Facility Plan is a step in that direction. The City expects that the costs of implementing expanded recycled water use can be reduced through a combination of regional coordination and state and federal matching funds.

BAWSCA Long Term Reliable Water Supply Strategy

Palo Alto is a participating agency on the BAWSCA Long Term Reliable Water Supply Strategy. The Long Term Reliable Water Supply Strategy will evaluate potential new supply sources to meet normal and dry year BAWSCA member needs. Palo Alto has submitted for inclusion in the strategy the Phase 3 project and a regional recycled water program with the recycled water supply from the RWQCP. These projects will be evaluated during subsequent phases of the BAWSCA effort.

RWQCP Long Range Facilities Plan

The City of Palo Alto Public Works Department is in the process of preparing a Long Range Facilities Plan for the Palo Alto RWQCP. Aging equipment, new regulatory requirements, and the movement to full sustainability will require rehabilitation, replacement and new processes. The Long Range Facilities Plan will map out these changes and focus on biosolids treatment and disposal, waste-to-energy technologies, energy use, major pipeline repairs, recycled water treatment, carbon footprint impacts, and the best alternatives for rehabilitation, replacement or improvement.

Indirect Potable Reuse

The City has no plans at present to evaluate Indirect Potable Reuse (IPR) to meet future demands. Since the SCVWD is the principle agency responsible for the groundwater in Santa Clara County, any IPR analysis will most likely be managed by the SCVWD, in close coordination with the water retailers in the County. The City anticipates that the SCVWD's Water Supply and Infrastructure Master Plan will evaluate IPR as part of any future supply portfolio. This evaluation may identify the RWQCP as a potential future IPR supply source.

Desalinated Water

The City has no plans for development of desalinated water at this time. It is possible a desalination facility may be part of a preferred supply portfolio identified in the BAWSCA Long Term Reliable Water Supply Strategy. The City is currently aware of one regional collaborative

effort between different water agencies to evaluate a large scale Bay Area desalination project, The Bay Area Regional Desalination Project. The Bay Area Regional Desalination Project is a collaboration between the East Bay Municipal Utility District, SCVWD, the SFPUC, Contra Costa Water District, and Zone 7 Water Agency to jointly explore developing the feasibility of a regional desalination facility that could directly or indirectly benefit 5.4 million San Francisco Bay Area residents and businesses served by these agencies.

Section 4 – Water Demand

Law

> 10631 (e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:
>
> (A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; and (I) Agricultural.
>
> (2) The water use projections shall be in the same 5-year increments to 20 years or as far as data is available.
>
> 10631.1 (a) include projected water use for single-family and multi-family residential housing 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.
>
> 10608.2 Provide baseline daily per capita water use target, interim urban water use target, and compliance daily per capita water use, along with the basis for determining those estimates.

Historical Water Usage

The two drought periods since 1975 have had a profound effect on City and customer attitudes as well as how water is used. Substantial capital investments were made in 1977 toward more water-efficient equipment in the commercial and industrial sectors. New construction in every sector is subject to increasingly stringent regulations regarding water-using appliances and fixtures.

Overall water use per account decreased by 27% during the last nine years (from 332 hundred cubic feet (ccf) in 2000 to 242 ccf in 2010). In fact, all customer classes showed a significant reduction in annual water use per account. During this period, water use per account decreased by 46% for industrial customers, by 32% for commercial customers, by 12% for public facilities, and by 35% for City facilities. Single-family residential water use decreased by 22% and multi-family residential water use decreased by 34%.

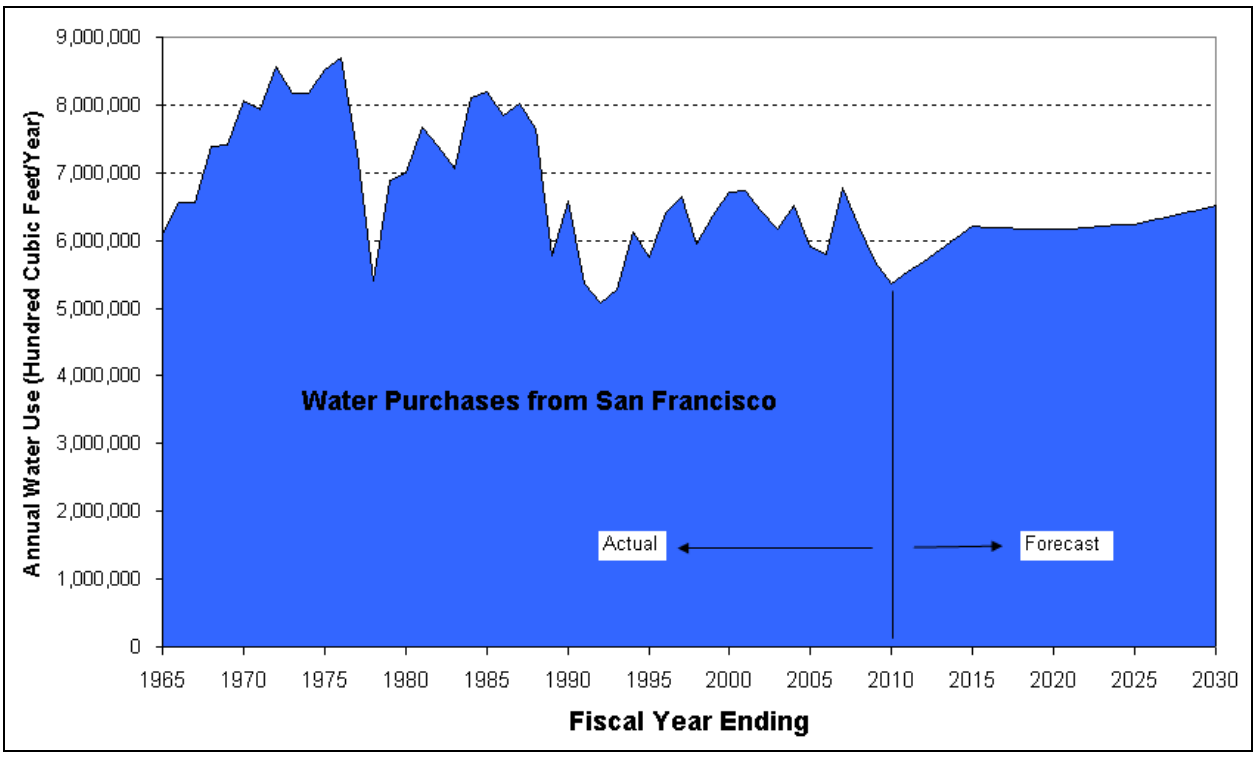
The relative share of the total water usage made up by the residential customers has continued to grow since the late 1980s. The residential single-family customer class increased its share from 41% to 47%. Including multi-family residential and multi-family commercial accounts, water consumption in the residential sector in total increased its share from 50% to 62% of

total citywide consumption. The commercial sector share increased slightly from 20% to 21%, while the industrial sector share dropped significantly from 20% to 8%. Public facilities share 4% of total consumption. This is unchanged since the late 1980s, although the percent of total use dropped to 2% in 2004, then rose again in subsequent years. City facilities' share of consumption decreased slightly from 6% to 5%.

Current Water Usage

Figure 4 below shows the City's potable water use since 1965 and a projection of water supplies until the year 2030. Present water consumption is higher than FY 1993 (a drought year), but significantly lower than the 1987 (pre-drought) usage, and even lower in 2010 as a result of the drier than normal conditions from 2006 to 2009, increased water conservation, and concurrent economic recession. The reduction in present water consumption, compared to pre-drought levels, appears to be the result of several factors, including permanent water conservation measures implemented during the past 25 years.

Figure 4: Historical Water Supplies – Actual and Forecast



In June 2008, in response to deteriorating water supply conditions, customers of the SFPUC system were asked to voluntarily reduce water use by 10%. City of Palo Alto water use decreased 16% from 2007 to 2010. The City's water consumption is forecast to remain

relatively stable in the future, with a slight increase due to a rebound in the economy and continued, albeit gradual, increase in population and employment numbers. Future projections are uncertain, but large increases in consumption are unlikely. The following discussion explains water use trends.

Water Sales

Total water sales decreased by 22%, from 14,335 AF to 11,236 AF per year between 2000 and 2010. For the forecast period, Table 10 shows demand projections by customer type before incorporating the impact of planned DMMs discussed in Section 5 – Demand Management Measures. Total demand projections after netting out the impact of DMMs are shown at the bottom of Table 10.

Table 10: Past, Current and Projected Water Sales (Before DMMs)

Segment	Actual Sales Data				Forecast			
	2000	2005	2010	'00-'10 Change	2015	2020	2025	2030
Single-family								
Accounts	14,737	14,941	15,458	5%	16,237	17,268	18,003	19,720
Units (AFY)	6,494	5,927	5,334	-18%	7,106	7,429	7,640	8,269
Multiple-family								
Accounts	1,919	1,947	2,248	15%	2,110	2,244	2,339	2,563
Units (AFY)	2,469	1,986	1,806	-27%	2,374	2,459	2,510	2,699
Commercial								
Accounts	1,621	1,755	1,870	13%	1,476	1,481	1,511	1,545
Units (AFY)	2,933	2,465	2,311	-21%	2,367	2,321	2,319	2,331
Industrial								
Accounts	245	254	251	3%	224	225	229	234
Units (AFY)	1,518	1,007	847	-44%	1,262	1,264	1,287	1,313
City Facilities								
Accounts	232	299	322	28%	319	340	354	388
Units (AFY)	607	564	544	-11%	679	723	753	830
Public Facilities								
Accounts	62	85	89	30%	71	76	79	86
Units (AFY)	314	268	395	26%	413	441	461	507
Total Retail Sales								
Accounts	18,815	19,281	20,238	7%	20,438	21,633	22,516	24,536
Units (AFY)	14,335	12,217	11,236	-22%	14,201	14,970	14,970	15,949
Future Planned Demand Management Measure Impact								
Units (AFY)	Included				1,083	1,651	1,810	2,247
Net Water Sales: Projected Water Sales After Subtracting Planned DMM Impacts								
Units (AFY)					13,118	12,986	13,160	13,702

Demand Projection Development

The water demand projections for this 2010 UWMP were developed with the same "end use" model that was used to develop the projections in the 2005 UWMP. Two main steps are involved in developing an end use model: (1) Establishing base-year water demand at the end-use level (such as toilets, showers) and calibrating the model to initial conditions; and (2) Forecasting future water demand based on future demands of existing water service accounts and future growth in the number of water service accounts.

Establishing the base-year water demand at the end-use level is accomplished by breaking down total historical water use for each type of water service account (single-family, multi-family, commercial, irrigation, etc.) to specific end uses (such as toilets, faucets, showers, and irrigation). Forecasting future water demand is accomplished by determining the growth in the number of water service accounts in a wholesale customer service area. Once these rates of change were determined, they were input into the model and applied to those accounts and their end water uses.

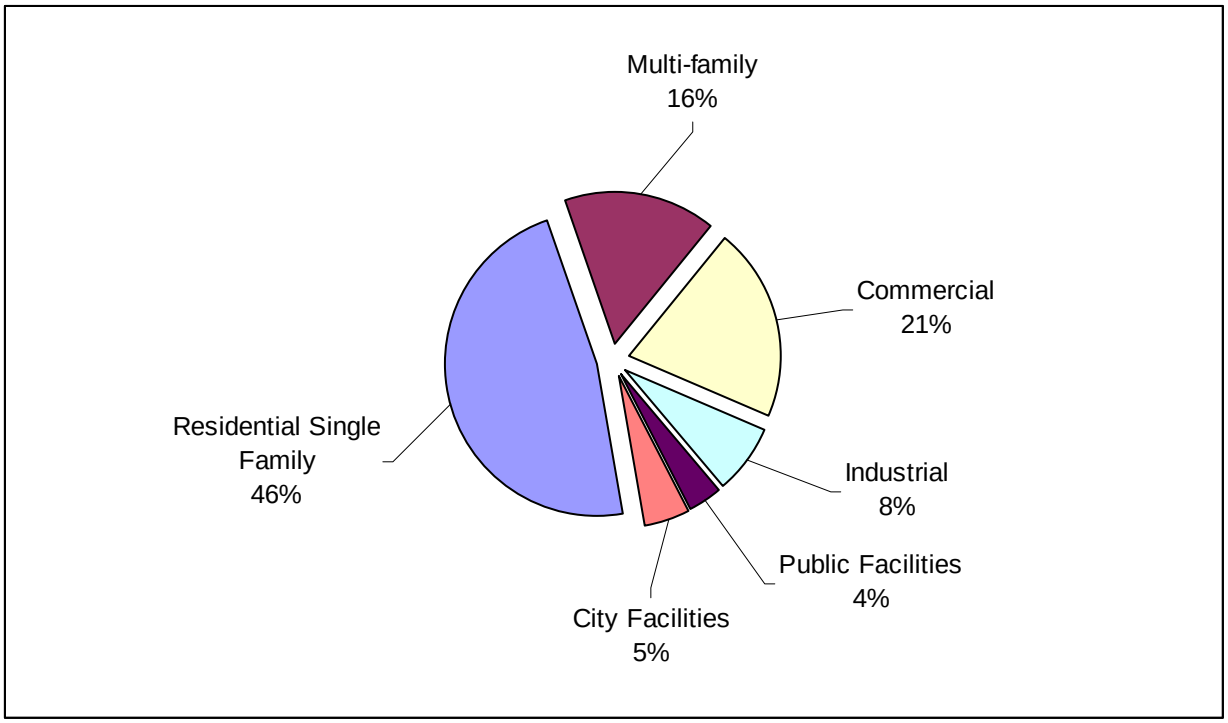
The end use model (also known as the Demand Side Management Least Cost Planning Decision Support System, or DSS model) also incorporates the effects of the plumbing codes on fixtures and appliances including toilets, showerheads, and clothes washers on existing and future accounts. The water sales projections presented in Table 10 were developed without the impact of planned DMM programs. These programs are discussed in detail in Section 5 of this report. At the bottom of Table 10 the projected water sales after netting out the impact of the DMMs is shown.

Using baseline projections, it is expected that total water consumption in the City will remain somewhat constant, and without the DMMs increase by about 29% from its current level of 11,236 AF per year in 2010 to 15,949 AF per year by the end of 2030. This forecast includes an expected 17% increase in total number of accounts. This baseline projection includes anticipated effects of the plumbing code on overall water use as well as expected ongoing conservation efforts among customers. After incorporating the impact of DMMs, total sales are expected to increase by 17% from the period 2010 to 2030.

Share of Total Consumption by Customer Type

Examination of 2010 consumption levels reveals that the residential sector (single- and multi-family residential and commercial multi-family dwellings) is responsible for 62% of total water consumption in the City. The business sectors including commercial and industrial customers consume 29%, while public and City facilities consume the remaining 9%. Figure 5 below shows the breakdown of 2010 consumption by customer type.

Figure 5: 2010 Water Use by Customer Class



Residential Sector

Water use in the residential sector (residential single-family, residential multi-family, and commercial multi-family) has decreased by 20% in total volume and percentage of overall usage between 2000 and 2010, despite a considerable increase in total number of accounts. This anomaly is particularly noticeable in the multi-family accounts, where during the period of 2000 to 2010 the total number of accounts increased 15%, but water use decreased 27%. The reduction in water use has many potential sources, including increased conservation, the recent economic downturn and weather-related impacts.

Commercial Sector

Water use per account in the commercial sector has declined dramatically despite a slight increase in the total number of accounts from 2000 to 2010. This reduction in water use is primarily attributed to water conservation efforts and enforcement of water efficient landscape designs for new construction and renovation projects in the non-residential sector.

Industrial Sector

Between 2000 and 2010, water use in the industrial sector decreased in percentage of overall usage and in total water volume. During this period, the total number of accounts increased by 3%, while water use decreased by 44%. The City provided significant support for water efficiency measures at several industrial facilities, including efficiency improvements in process water use and landscape design, which is a contributing factor for this dramatic decline in water use. In addition, the RWQCP has an active pretreatment program that has been in place since

the early 1980s to identify and reduce pollutant loading to the RWQCP. The pretreatment program has resulted in additional water efficiency gains.

City Facilities

Between 2000 and 2010, water use at City facilities has decreased in total overall volume by 11%. This is despite a 28% increase in number of accounts. The City has engaged in several water conservation projects throughout its facilities to reduce its overall consumption.

Public Facilities

Between 2000 and 2010, overall water use and consumption per account decreased at public facilities, although the total share of water sales among the customer classes remained the same since 2000.

Sales to Other Agencies

The City does not plan on selling water supplies to other agencies.

Additional Water Uses - Recycled Water Use

Recycled water use is discussed in Section 3, "System Supplies," under the heading "Water Recycling." Past use and future recycled water use projections are presented in Table 11 below. The City has not made a commitment to expand the use of recycled water in the City and, therefore, the table reflects no increase in the use of recycled water in the future.

Table 11: Recycled Water Use (AFY)

	2000 (actual)	2010 (actual)	2030 (forecast)
Water Trucks	7	10	3
Greer Park	28	87	76
Golf Course	23	109	187
Duck Pond	0	36	24
RWQCP	560	560	560
Total	618	802	850

Non-Revenue Water

Non-Revenue water, or unaccounted-for water, is the difference between the amount of water purchased and the amount sold to customers. Non-revenue water typically amounts to about 7% of total purchases. From CY 2005 to 2008, the City's non-revenue water volumes significantly increased, with a peak in CY 2006 of 12.45%. In response, the City initiated a comprehensive leak detection, meter locating and meter calibration program. As of 2009, the non-revenue water volumes have returned to expected levels. Table 12 presents the historical and projected non-revenue volumes for the City's water system.

Table 12: Non-Revenue Water							
	2005	**2009**	**2010**	**2015**	**2020**	**2025**	**2030**
Non-Revenue Water (AFY)	1,320	910	1,027	1,135	1,170	1,192	1,269

Total Water Use

Table 13 shows total water use in the City.

Table 13: Total Water Use (AFY)					
	2010	**2015**	**2020**	**2025**	**2030**
Retail Sales	11,236	13,118	12,986	13,160	13,702
Non-Revenue Water	1,027	1,135	1,170	1,192	1,269
Recycled Water Use	802	850	850	850	850
Total Water Use	13,065	15,103	15,007	15,203	15,821

Projected Low to Moderate Income Water Use

Palo Alto was one of the first jurisdictions in California to establish an official low to moderate income housing requirement in 1974. The Below Market Rate (BMR)[28] program now requires developers of projects with five or more units to comply with the City's BMR requirements. The BMR program objective is to obtain actual housing units or buildable parcels within each development rather than off-site units or in-lieu payments. At least 15% of the housing units developed in a project involving fewer than five acres of land must be provided as BMR units. Projects involving the development of five or more acres must provide at least 20% of all units developed as BMR units. (Projects that cause the loss of existing rental housing may need to provide a 25 percent BMR component). The BMR units must be comparable to other units in the development.

Due to the BMR requirements and the cost of housing in Palo Alto, the City has few single-family BMR units and does not anticipate this will change in the future. Approximately 1,945 units in the City meet lower income levels as defined in Section 50079.5 of the California Health and Safety code[29]. Of these, 433 rental and ownership units, or 1.7% of the total housing units

[28] City of Palo Alto Comprehensive Plan, Chapter 4 – Housing Element

[29] The difference between the total BMR units and the units that meet the requirements in the UWMP Act is due to the inclusion of additional units that meet 81% to 120% of the Average Median Income in Santa Clara County. The City provides these additional units in recognition of high cost of housing in Palo Alto.

meet the BMR requirements. The remaining 1,512 units, or 5.8% of total housing units, are subsidized housing.[30]

The City is the only city in California that provides natural gas, water, wastewater, and electric services to businesses and residents in the City. Through the electric and natural gas utilities, the city provides a 25% rate reduction as assistance to those entities that meet income requirements and other financial conditions[31]. As of February 2011, the City had approximately 1,000 electric accounts and 612 natural gas accounts receiving discounts under the program. The discrepancy between the electric and gas accounts that receive financial assistance and the BMR housing units is primarily related to different qualifying income limits.

For purposes of the current lower income projections, the 2010 UWMP has the following assumptions:

- 1,512 units out of the total housing stock are considered for affordable housing as determined by the classification of lower to moderate incomes.
- These units are categorized as multi-family.
- The forecast model assumes an average of 1.96[32] individuals per multi-family unit, or approximately 2,971, individuals. This corresponds to 4.82 % of the total population
- The forecast model indicates multi-family usage in Palo Alto averages 96 GPCD
- Current projections for housing stock growth will continue to be heavily weighted toward higher density, multi-family housing.
- Water consumption by low-income customers should decrease due to higher retail costs by elimination of the 25% utility discount provided on water rates.

Table 14: Projected Lower Income Water Demands (AFY)

	2015	2020	2025	2030
Single-family residential	0	0	0	0
Multi-family residential	328	349	364	399
Total	328	349	364	399

The City anticipates the current low income BMR program will remain in effect in its current form for the foreseeable future. Future housing and population projections inherently assume that increases in housing stock will include growth in lower income households through the BMR program. Based on future projected demand forecasts, the City expects to have ample water supplies to meet all customers' demands during a normal year. During a drought, the City will follow the steps outlined in Section 8 (Water Shortage Contingency Plan). The Water

[30] Current figures provided by the City of Palo Alto Planning Department.
[31] Eligibility for rate assistance is based on qualifying income limits as specified in HUD Program Income Limits (Section 8, Section 221(d)(3) BMIR, Section 235 and Section 236)
[32] U.S. Census Bureau, 2010, assumes an average of 2.43 persons per multi-family dwelling unit.

Shortage Contingency Plan addresses the City's response depending on the severity of the drought. The City will implement measures to maximize potential savings while at the same time minimizing the impact to the well being of the citizens and businesses in Palo Alto. As part of this process, the City Council will have an opportunity to balance the needs of different customer classes with the need to achieve meaningful reductions[33].

Water Conservation Bill of 2009

The Water Conservation Bill of 2009 (SBx7-7) was enacted in November 2009. It requires water suppliers to reduce the statewide average per capita daily water consumption by 20% by December 31, 2020. To monitor the progress towards achieving the 20% by 2020 target, the bill also requires urban retail water providers to reduce per capita water consumption 10% by 2015. Water agencies that are not in compliance with the provisions of the bill could be ineligible for State grants and/or a low cost financing program.

Water suppliers have some flexibility in setting and revising water use targets leading up to the 2020 compliance period, including:

- A water supplier may set its water use target and comply individually, or as part of a regional[34] alliance. The City is in discussions with BAWSCA and SCVWD regarding a potential future alliance with other water agencies.
- A water supplier may revise its water use target in its 2015 or 2020 urban water management plan or in an amended plan.
- A water supplier may change the method it uses to set its water use target and report through an amendment to the 2010 plan or in its 2015 urban water management plan. Urban water suppliers are not permitted to change target methods after they have submitted their 2015 urban water management plan.

SBx7-7 provided four potential compliance methods that are summarized below:

1. 80% of the urban water user's baseline gallons per capita per day (GPCD) water use;
2. The per capita daily water use that is estimated using several performance measures, subdivided between different customer classes;
3. Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009); or

[33] Water Utilities typically do not possess income information for their customers and are limited in their ability to offer differential rate treatment for low income customers due to Proposition 218 restrictions. During a drought, it is more common for water utilities to differentiate between customers in a Class based on water usage patterns and relative efficiency. For example, accounts with extremely low water use could be exempted from penalty rate treatment.

[34] SBx7-7 allows entities to comply individually or as a group. The intent of this provision is to ensure there is equity among small agencies and large water agencies or districts that serve large areas that may span different socioeconomic and evapotranspiration zones.

4. A method that was identified and developed by the department, through a public process, and released on February 18, 2011. The fourth method uses a combination of metered sales data and achieved water use reductions across the different customer classes.

The City is providing a draft methodology to ensure compliance with the requirements of SBx7-7. However, the City may adjust both the methodology and the compliance target in its 2015 UWMP. City staff evaluated the four potential options based on several criteria, including, ease of implementation, community compatibility, benefits/costs, and consistency with the City's own water efficiency goals and policies.

Based on this evaluation, the City is adopting a preliminary compliance methodology based on the first option, or 80% of an urban water user's baseline GPCD. Under this methodology, the City is required to prepare the following calculations for compliance purposes:

- *Baseline daily per capita water use* — The City must determine for baseline purposes how much water is used within an urban water supplier's distribution system area on a per capita basis. It is determined using water use and population estimates from a defined range of years. For the City, the range selected is from calendar year 1994 to 2004 (Table 15).
- *Urban water use target* — This value is equal to 80% of the baseline daily per capita water use value.
- *Interim urban water use target* — The planned daily per capita water use in 2015 is halfway between the baseline daily per capita water use and the urban water use target.
- *Compliance daily per capita water use* - The gross water use during the final year of the reporting period, reported in gallons per capita per day. This value will be adjusted during the 2015 and 2020 compliance period based on actual usage data.

Table 15 illustrates the methodology to calculate the 10-year average baseline per capita water use.

Table 15: Baseline daily per capita water use — 10 year Range			
Calendar Year	**Distribution System Population[35]**	**Daily system gross water use (MG)**	**Annual daily per capita water use (GPCD)**
1995	57,249	4,376	210
1996	57,519	4,522	216
1997	57,789	4,737	226
1998	58,058	4,999	237
1999	58,328	4,491	212
2000	58,598	4,870	229
2001	58,898	5,021	235
2002	59,459	4,937	230
2003	60,019	4,838	223
2004	60,579	4,576	209
		Base Daily Per Capita Water Use	223.3

Based on future water use and population growth projections, Table 16 summarizes Palo Alto's 2010 UWMP SBx7-7 target and compliance goals.

Table 16: 2010 UWMP SBx7-7 Performance Metrics (GPCD)		
	2015	**2020**
SBx7-7 2015 Interim and Final Targets		
Baseline Daily per capita water use	223	223
Interim Target (10% reduction from Baseline)	200.6	N/A
Final Target (20% reduction from Baseline)	N/A	178.4
City of Palo Alto		
Projected Compliance Daily per capita water use	191.9	179.3

SBx7-7 requires UWMP preparers to meet both the interim 2015 and 2020 targets. As stated previously in this section, an urban water retailer has the flexibility to adjust the compliance target and to adjust the methodology in 2015. After 2015, the urban water supplier may not adjust the methodology, but there is the potential to adjust the compliance target as more current water use data becomes available. In addition, an agency that is at risk of non-compliance may, under limited circumstances[36], seek to adjust its compliance daily per capita water use. Eligible circumstances include:

- Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period;

[35] ABAG 2009
[36] CA Water Code; Section 10608.24 (d) (1)

- Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period; and
- Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.

Measures, Programs and Policies to Achieve SBx7-7 Water Targets

Table 16 provides a preliminary analysis of the City's SBx7-7 metrics. The City will continue to monitor progress towards the goal, and make program adjustments during the 2015 UWMP cycle. Potential adjustment to meet any shortfall could include the following:

- The City is currently evaluating an extension of the current recycled water system to serve customers in the Stanford Research Park area. This project was discussed in Section 3, but has not been included in the long-term water use projection identified in the 2010 UWMP, largely due to the uncertainties surrounding project feasibility. Full build-out of the project would result in an anticipated yield of approximately 900 AFY[37]
- The City is currently operating or is in the process of launching several new conservation programs with particular emphasis on outdoor irrigation efficiency including high water use landscape conversion, and improved efficiency measures for the commercial, industrial, and institutional sectors. Additionally, the use of graywater reuse, rainwater harvesting systems, and other water efficiency measures may be evaluated further for conservation potential leading up to the 2015 UWMP. The City is committed to promoting all cost-effective conservation programs that meet both the City's water reduction goals and community interest. Palo Alto shifts emphasis between different conservation programs depending on various factors, including community acceptance. Over time, the program mixture may change, though the overall savings goals will remain constant.
- BAWSCA recently completed for its members an evaluation of different regional compliance structures. There are several scenarios which would enable Palo Alto to enter into beneficial relationships that could minimize any identified shortfall by adjusting the baseline use and future target water uses. In the event a shortfall appears, the City will evaluate potential relationships in the period leading up to the 2015 UWMP.

Economic Impacts of SBx7-7 Compliance

There are no incremental economic impacts associated with SBx7-7 compliance at this time. The decision to implement additional conservation measures in the future will not necessarily depend on the need to comply with SBx7-7; Palo Alto typically evaluates all measures that are

[37] City of Palo Alto Recycled Water Facility Plan, June 2008

cost-effective compared to the incremental cost of purchasing additional water supplies from the SFPUC system[38] .

The schedule for the recycled water project could be accelerated in response to a deficiency identified during the 2015 UWMP cycle. The City will evaluate the cost and benefits of the recycled water project with consideration for all legal and regulatory compliance benefits it may provide.

For a regional alliance, the City does not know the cost of any partnership that may allow it to comply with SBx7-7. However, the City will continue to evaluate a regional alliance and provide additional information during the 2015 UWMP cycle.

[38] These measures are discussed in detail beginning on page 72.

Section 5 – Demand Management Measures

Law

> 10631 (f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:
>
> (1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following: (the law then lists the fourteen demand management measures).

A Demand Management Measure (DMM)[39] is a specific action taken by a water supplier to reduce water demand in support of its water conservation efforts. The Urban Water Management Planning Act identifies 14 DMMs that are to be evaluated in each Urban Water Management Plan (Water Code § 10631(f). The DMMs identified in the statute include:

A. Water Survey Programs for Single-Family and Multi-Family Residential Customers
B. Residential Plumbing Retrofit
C. System Water Audits, Leak Detection, and Repair
D. Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections
E. Large Landscape Conservation Programs and Incentives
F. High-Efficiency Washing Machine Rebate Programs
G. Public Information Programs
H. School Education Programs
I. Conservation Programs for Commercial, Industrial, and Institutional Accounts
J. Wholesale Agency Assistance Programs
K. Conservation Pricing
L. Water Conservation Coordinator
M. Water Waste Prohibition
N. Residential Ultra-Low-Flush Toilet Replacement Programs

Measures to Comply with SBx7-7

The following sections provide general information on the measures the City plans to implement to meet its urban water use target. The estimated water savings from these

[39] Although the industry commonly uses the terminology Demand Side Management (DSM) programs, the Urban Water Management Planning Act in the California Water Code specifically references these as Demand Management Measures (DMM). This language is used throughout this section to describe the City's conservation measures, but may be referred to in other sections as Demand Side Management programs.

measures, when available, have been incorporated into the City's assessment of future water demand. The DMMs described below have been evaluated and selected both for cost-effectiveness and potential to reduce water use to a level that will allow the City to meet its interim and final per capita water reduction targets. These targets are identified in Section 4, "Water Demand," under the heading "Water Conservation Bill of 2009."

Documenting Demand Management Measure Implementation

Law

> 10631.5(e) The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities. In addition, for urban water suppliers that are signatories to the Memorandum of Understanding Regarding Urban Water Conservation in California and submit annual reports to the California Urban Water Conservation Council in accordance with the memorandum, the department may use these reports to assist in tracking the implementation of water demand management measures.

An urban water supplier's UWMP must document implementation of its DMMs by either providing the required information for each DMM or submitting a copy of its 2009-2010 approved California Urban Water Conservation Council (CUWCC) Best Management Practices (BMP) report, if the supplier is a signatory to the CUWCC Memorandum of Understanding (MOU) regarding urban water conservation in California. The City has been a signatory to the MOU with the CUWCC since 1991. Since becoming a signatory to the MOU and member of the CUWCC, the City has saved more than 4,135 acre-feet (AF) of water through conservation programs. The City will strive to continue to implement programs that meet or exceed the current BMPs as directed in the MOU.

Appendix C includes the City's reports to the CUWCC for the last two years regarding the implementation of the BMPs. The reports list the foundational BMPs a signatory water supplier is required to report on, as well as documentation of compliance with the BMP water savings goals. Compliance can be accomplished in one of three ways, including: accomplishing specific measures, or programmatic BMPs; accomplishing a set of measures which achieves equal or greater water savings, referred to as a "flex track" approach; and accomplishing set water savings goals as measured in GPCD consumption. Agencies which choose the GPCD compliance approach will count overall water savings of the quantifiable measures from the BMP programmatic list or flex track option, plus additional savings achieved through implementation of the foundational BMPs. The City has elected to pursue the GPCD approach as it aligns with the City's identified SBx7-7 interim and final target for water reduction goals. The City also provides a detailed explanation in this 2010 UWMP of each DMM included in the Urban Water

Management Planning Act applicable to urban retail water suppliers. The CUWCC recently restructured the organization of the BMPs to group them according to type. Appendix D demonstrates how the DMMs correlate to the BMPs.

Methods Used to Evaluate Effectiveness of Demand Management Measures

It is the goal of the City to continue to look for opportunities, innovative technologies, and cost-effective programs that best utilize the water conservation budget. The City has been working with other BAWSCA agencies, SCVWD, and other water agencies in the Bay Area to investigate methods for regional implementation of certain BMPs. In 2002, the City entered into an agreement with SCVWD to cost-share the development and implementation of water conservation programs. Prior to 2002, the City offered several of the conservation programs in-house, or encouraged residents and businesses to participate in the conservation programs offered county-wide by SCVWD. As part of the overall water conservation efforts to comply with the CUWCC BMPs, the City and SCVWD have partnered over the last nine years to promote and cost-share water conservation programs for Palo Alto customers. The City also continues to evaluate opportunities for program partnership opportunities with BAWSCA and other regional alliances.

To achieve its goals for cost-effective water management, in 2004 BAWSCA, working with its member agencies, developed a Water Conservation Implementation Plan (WCIP) that analyzed over 32 different measures[40] using the same end-use model developed for calculating the long-term water demand forecast. The City selected programs most likely to achieve the greatest water savings, while still being cost-effective for the utility and community as a whole. These programs were reflected in the 2005 UWMP. These measures include audits and financial incentives designed to achieve “active” water conservation savings, beyond the “passive” water conservation savings achieved through enforcement of current and proposed plumbing codes. The measures that were found to be cost-effective and chosen by the City to be implemented in future years included the following:

- Residential Water Surveys
- Residential Retrofit
- Washing Machine Rebates
- Public Information
- Evapotranspiration (ET) Controller Rebates
- Low-Flow Restaurant Spray Nozzles
- Large Landscape Conservation Audits
- Rebates for Dual-Flush Toilets
- Water Audits Hotels-Motels

[40] SFPUC Wholesale Customer Water Conservation Potential Technical Report, December 2004.

- Commercial Water Audits
- Industrial/Commercial/Institutional Ultra-Low Flush (ULF) Toilet Rebate
- Incentives for Replacement of Coin Operated Washers
- Award Program for Commercial Water Savings

Since 2004, the City revised some of the DMMs originally evaluated and selected for the WCIP. Following the 2005 UWMP, the City continued to implement a number of the selected measures while others were discontinued and several new measures were introduced. Program changes are the result of increased State and City water reduction goals, updates to correspond with the BMPs, changes in technology for water using fixtures, and changes in county-wide program offerings by SCVWD, including those that the City cost-shares with SCVWD. Based upon these changes, the City has identified the following DMMs that are currently implemented or are planned for future implementation following adoption of the 2010 UWMP:

A. Water Survey Programs for Single-Family and Multi-Family Residential Customers
B. Residential Plumbing Retrofit
C. System Water Audits, Leak Detection, and Repair
D. Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections
E. Large Landscape Conservation Programs and Incentives
    1. Landscape Survey Program for Commercial, Industrial, Institutional Customers
    2. Weather-Based (Evapotranspiration) Irrigation Controller Rebates
    3. Large Landscape Turf Replacement
    4. Residential Turf Replacement
    5. Landscape Rebates for Irrigation Hardware Upgrades
F. High-Efficiency Washing Machine Rebate Programs
    1. Residential High Efficiency Clothes Washer Incentives
    2. Commercial and Multi-Family High Efficiency Clothes Washer Incentives
G. Public Information Programs
H. School Education Programs
I. Conservation Programs for Commercial, Industrial, and Institutional (CII) Accounts
    1. Commercial Water Audits
    2. Water Efficiency Direct Installation Program
    3. Water Efficient Technologies Rebate Program
    4. CII High Efficiency Toilet Direct Installation Program
J. Conservation Pricing
K. Water Conservation Coordinator
L. Water Waste Prohibition
M. Residential Ultra-Low-Flush Toilet Replacement
N. New Development Indoor and Outdoor Regulations
O. Irrigation Classes for Homeowners
P. Rainwater Harvesting Incentives
Q. Residential Graywater Reuse

These DMMs were evaluated as a group for effectiveness towards achieving the water reduction goals necessary for compliance with SBx7-7. Table 17 below shows the total water and wastewater savings for DMMs for 2010 and every 5 years until 2030. Utility implementation costs include per unit and administrative costs to CPAU and any of its cost-sharing partners.

Table 17: DMM Water Savings Summary					
	2010	**2015**	**2020**	**2025**	**2030**
Total Water Savings (MGD)	0.37	0.97	1.47	1.62	2.02
Total Wastewater Savings (MGD)	0.21	0.57	0.85	0.91	1.05
Total Outdoor Savings (MGD)	0.16	0.40	0.62	0.71	0.97
Savings as a Percent of Water Demand	2%	7%	10%	11%	13%
Utility Implementation Cost ($2010)	$580,160	$754,058	$370,843	$364,762	$387,604

Utility implementation costs are expected to decline over time as the number of new participants in current conservation programs decreases. Participation is expected to decrease with market saturation of efficient devices that will become the standard option for consumers. Plus, state and local building and plumbing codes continue to mandate increased efficiency standards for indoor and outdoor water use in new construction and renovated properties. For these reasons, a number of conservation incentives will either become unnecessary or will no longer be cost-effective to implement. While participation in the DMMs listed above is expected to decline over time, the City will continually evaluate its conservation program offerings, including the introduction of new measures that will assist in meeting State and City water reduction goals.

Marketing of Demand Management Measures

Through an operating agreement with the SCVWD that is updated annually, a variety of water audits, landscape and irrigation rebates and incentives for appliances, toilets/urinals, and operational reductions are provided to all customers. The City actively markets all its efficiency programs to residents and businesses in the community through use of bill inserts, utility bill envelope messaging, community announcements on utility bills, quarterly newsletters for the community, efficiency programs brochures, print advertisements, website information, facility manager and community meetings, and public outreach events. The City also leverages the

aggressive county-wide conservation marketing campaigns administered by the SCVWD. In addition to the SCVWD partnership with water retailers for bill messaging, the SCVWD also promotes its conservation programs through use of television and radio ads, bus and billboard signage, program literature, website information, and public outreach events. Although programs are actively marketed year-round, the City strives for timely, season-appropriate messaging. For example, during the spring and summer months, outdoor landscape irrigation efficiency is a key focus for bill inserts and community announcements. During the winter months, indoor water conservation programs are highlighted in public outreach.

Demand Management Measures

The following sections discuss each DMM in detail. These measures correlate to the current BMPs identified by the CUWCC. The DMMs listed below are organized in the order as identified in the Urban Water Management Planning Act (Water Code § 10631(f)). For each program, the benefit/cost ratio from the Total Resource Cost (TRC) perspective is shown. The TRC cost-effectiveness test compares the total cost of implementing a measure, regardless of who pays. The costs, therefore, include the cost of the device, any installation cost and the implementation cost (e.g. advertising, tracking, performance monitoring, rebate processing, etc.) of the program. The benefits include the avoided cost of additional water purchases. In addition, the cost to CPAU, the "program cost," is shown for each measure. This is the cost that CPAU would incur to implement the program and may include rebate costs as well as any other administrative costs borne by CPAU or its cost-sharing partner(s) to conduct the program.

Demand Management Measure A - Water Survey Programs for Single-Family and Multi-Family Residential Customers

Implementation Status: Implementation of this measure began in 1998. The program is currently active and expected to continue indefinitely.

Description of Measure: Program provides free site surveys ($110 value) to residential customers in both single-family and multi-family dwellings. The survey includes a review of customer water use history, water meter check for leak detection assistance, and thorough evaluation of indoor and outdoor water use. A technician provides each customer with free low-flow showerheads, faucet aerators, toilet dye tablets, and/or toilet flappers when needed. The landscape survey includes an evaluation of the entire irrigation system, catch-can test for distribution uniformity, and site-specific recommendations including changes to the irrigation schedule. The program is actively marketed to residents by CPAU and the SCVWD.

Program Goals: This program targets the requirements of DMM A of the UWMP Act, as well as both BMP 3.1 – Residential Assistance Program, and BMP 3.2 – Landscape Water Survey. CPAU plans to complete approximately 300 audits a year, for a market penetration of 2.55% per year of current single and multi-family accounts. SCVWD administers the program, collects participant data to determine usage and water savings, and provides participation tracking results to CPAU on a quarterly basis.

Cost Effectiveness: The measure has a benefit/cost ratio of 3.07 under the Total Resource Cost Test. Program costs include unit cost to CPAU and SCVWD, as well as any administrative costs borne by CPAU and SCVWD.

Estimate of Conservation Savings: It is estimated that through this program the City's residents will save 0.06 million gallons of water per day (MGD) or 21.90 million gallons of water annually. This is based on the assumption that on a per unit basis, the measure saves 5% of indoor and 10% of outdoor water use.

Table 18: Residential Water Surveys

	2010	2011	2012	2015	2020	2025	2030
Program Participation Target (# of accounts)	278 SF 62 MF	328 SF 37 MF	328 SF 37 MF	323 SF 37 MF	329 SF 37 MF	330 SF 37 MF	351 SF 40 MF
Program Costs	$41,400	$46,166	$46,009	$45,552	$46,372	$46,552	$49,474

SF: Single-family residential
MF: Multi-family residential

Demand Management Measure B - Residential Plumbing Retrofit

Implementation Status: Implementation of this measure began in 1992. The program is currently active. This program is expected to continue indefinitely, although requests for devices outside of the residential water survey program are expected to decline significantly after 2010 due to market saturation and advancements in the plumbing code.

Description of Measure: The program consists of free distribution of water saving devices ($15 to $30 value) to residents, consisting primarily of showerheads, faucet aerators, toilet flappers and toilet leak dye tablets through the residential water surveys. Other means of distribution are through SCVWD and CPAU public outreach events or through direct request by residents. The program is actively marketed by CPAU and the SCVWD.

Program Goals: This program targets the requirements of DMM B of the UWMP Act as well as BMP 3.1 – Residential Assistance Program. SCVWD administers the distribution through the residential water survey program and direct requests from residents, collects participant data and provides participation tracking results to CPAU on a quarterly basis.

Cost Effectiveness: The measure has a benefit/cost ratio of 7.39 under the Total Resource Cost Test. Program costs include unit cost to CPAU and SCVWD, as well as any administrative costs borne by CPAU and SCVWD.

Estimate of Conservation Savings: It is estimated that through this program the City's residents will save 0.01 MGD or 3.65 million gallons of water per year. This is based on the assumption that on a per unit basis, the measure reduces water use of 21% in showers and 2% in faucets and toilets.

Table 19: Residential Plumbing Retrofit

	2010	2011	2012	2015	2020	2025	2030
Program Participation Target (# of accounts)	276 SF/MF	-	-	-	-	-	-
Program Costs	$6,280	-	-	-	-	-	-

SF: Single-family residential
MF: Multi-family residential

Demand Management Measure C - System Water Audits, Leak Detection, and Repair

Implementation Status: Implementation of this measure was required to commence before July 1, 2009, in accordance with the CUWCC BMP implementation schedule. The program is currently active and is expected to be continued indefinitely.

Description of Measure: This program targets the requirements of DMM C of the UWMP Act, as well as BMP 1.2 – Water Loss Control – which requires water agencies to quantify their current volume of apparent and real water loss, their causes by quantity and type, cost impact of these losses on utility operations, and reduce real losses to the extent cost-effective. A component analysis to support the economic selection of intervention tools, and validated data set for water audits and balances using the AWWA Water Loss software is also required. Customers are advised whenever it appears possible that leaks exist on the customer side of the meter.

Program Goals: CPAU will compile the standard water audit and balance worksheets annually, demonstrate continued progress in water loss control performance, keep and maintain records of audit results, methodologies, and component analyses of losses and their economic value. CPAU will prepare a yearly summary of this information for submission to the CUWCC during years two through five of implementation, unless extended by the CUWCC.

Cost Effectiveness: Analysis is not currently available.

Estimate of Conservation Savings: Water savings assumptions are unavailable, as the City has not yet completed a benchmark period to compare and track progress toward improving performance in water loss control.

Demand Management Measure D - Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections

Implementation Status: CPAU has always metered water service connections in its service territory. The practice is expected to be continued indefinitely.

Description of Measure: This program targets the requirements of DMM D of the UWMP Act, as well as BMP 1.3 – Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections. The City installs meters for all new service connections; has an established program for retrofitting existing unmetered service connections; reads meters and bills customers by volume of use; and has prepared a written plan, policy or program that includes:

- a census of all meters by size, type, year installed, customer class served and manufacturer's warranty accuracy when new;
- a currently approved schedule of meter testing and repair by size, type, and customer class; and
- a currently approved schedule of meter replacement by size, type, and customer class.

In the future, the City may conduct a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters and identify intra and inter-agency disincentives or barriers to retrofitting mixed-use commercial accounts with dedicated landscape meters.

Program Goals: In its BMP report, CPAU provides detailed testing criteria and practices, repair, maintenance, and replacement criteria, and use of automatic metering technology. Documentation consists of: confirmation that all new service connections are metered and billed by volume of use; number of metered accounts; number of metered accounts read; number of metered accounts billed by volume of use; frequency of billing; number of estimated bills per year by type of metered customer versus actual meter readings; number of unmetered accounts in the service area and minimum annual retrofit requirement; number of unmetered service connections retrofitted during the reporting period; estimated number of CII accounts with mixed-use meters; and number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during the reporting period.

Target Compliance: Since CPAU signed the MOU prior to December 31, 1997, the target date for "on track" compliance with BMP 1.3 is 100% of unmetered accounts retrofitted by July 1, 2009. CPAU met the deadline to remain on track for compliance with this DMM and BMP.

Estimate of Conservation Savings: It is estimated that meter retrofits and volumetric rates combined will result in a 20% reduction in demand for metered accounts. The City has not performed an analysis of water use between metered versus unmetered accounts, therefore past savings estimates for this measure are unavailable.

Demand Management Measure E - Large Landscape Conservation Programs and Incentives

E-1. Landscape Survey Program for Commercial, Industrial, Institutional Customers

Implementation Status: Implementation of this measure began in 1995 and is currently active.

Description of Measure: The program offers free site-specific technical irrigation assistance through full landscape surveys ($650 to $800 value) and free weather-based irrigation controller surveys ($340 value) to evaluate water use and improve irrigation efficiency. The program is targeted to large landscapes of 5,000 square feet or greater at commercial and multi-family properties within the City. Irrigation auditors evaluate the entire water delivery system for inefficiencies, including precipitation rates, distribution uniformity, hardware condition, and irrigation schedule, to help a site manager understand system performance and efficient irrigation scheduling strategies. Site managers are provided with an ETo-based water budget and comparison of actual water use to budgeted water use, with an estimate of water and cost savings for efficiency improvements. The program is actively marketed by CPAU and the SCVWD. Effective in 2011, SCVWD expects to launch a database-backed website to deliver real time water budget information to landscape and property managers via the internet.

Program Goals: This program targets the requirements of DMM E of the UWMP Act, as well as BMP 5 – Landscape - that requires water service providers to provide non-residential customers with support and incentives to improve their landscape water use efficiency. SCVWD administers the program, collects participant data to determine usage and water savings, and provides participation tracking results to CPAU.

Cost Effectiveness: The measure has a benefit/cost ratio of 2.42 under the Total Resource Cost Test. Program costs include unit cost to CPAU and SCVWD, as well as any administrative costs.

Estimate of Conservation Savings: It is estimated that through this program the City will save 0.03 MGD or 10.95 million gallons annually. This is based on the assumption that the measure will result in a 15% to 20% reduction in demand for landscape irrigation by affected accounts.

Table 20: Landscape Survey Program

	2010	2011	2012	2015	2020	2025	2030
Program Participation Target (# of accounts)	18 CII/MF	19 CII/MF	19 CII/MF	19 CII/MF	19 CII/MF	20 CII/MF	20 CII/MF
Program Costs	$15,960	$23,752	$23,752	$23,752	$23,752	$23,752	$23,752

MF: Multi-family residential
CII: Commercial/Industrial/Institutional

E-2. Weather-Based (Evapotranspiration) Irrigation Controller Rebates

Implementation Status: Implementation of this measure began in 2006. The program is currently active, but is expected to end in 2023 with the assumption that at that time all or most irrigation controllers manufactured will use weather-based technology.

Description of Measure: The weather-based irrigation controller rebate program provides rebates ($300 to $1,000 value) for upgrading existing conventional irrigation controllers to qualifying weather-based (evapotranspiration or ET) controllers with rain sensor technology. Rebates are available for residential, commercial, industrial, and institutional account customers. Applicants must participate in a landscape survey prior to receiving approval for the rebate. The program is actively marketed by CPAU and SCVWD.

Program Goals: This program targets the requirements of DMM E of the UWMP Act, as well as BMP 5 – Landscape - that requires water service providers to implement and maintain programs for improving landscape water use efficiency such as through offering technical assistance and financial incentives for irrigation equipment retrofits. SCVWD administers the program, collects participant data to determine usage and water savings, and provides participation tracking results to CPAU on a quarterly basis.

Cost Effectiveness: The measure has a benefit/cost ratio of 1.77 under the Total Resource Cost Test. Program costs include unit cost to CPAU and SCVWD, as well as any administrative costs borne by CPAU and SCVWD.

Estimate of Conservation Savings: It is estimated that through this program the City will save 0.003 MGD or 1.10 million gallons annually. This is based on the assumption that on a per unit basis, the measure will result in up to an average 6% to 15% reduction in exterior water use[41].

Table 21: Weather-Based (ET) Controller Rebates

	2010	2011	2012	2015	2020	2025	2030
Program Participation Target (# of accounts)	7 SF 3 MF/CII	8 SF 1 MF/CII	8 SF 2 MF/CII	8 SF 2 MF/CII	8 SF 1 MF/CII	-	-
Program Costs	$2,336	$2,387	$3,002	$3,048	$3,226	-	-

SF : Single-family residential
MF: Multi-family residential
CII: Commercial/Industrial/Institutional

[41] Mayer, Peter, et al. Evaluation of California Weather-Based "Smart" Irrigation Controller Programs. 2009. Presented to the California Department of Water Resources.

E-3. Large Landscape Turf Replacement

Implementation Status: Implementation of this measure began in 2006. The program is currently active. In 2009, SCVWD combined all landscape incentive programs into one, the Landscape Rebate Program. This new program offers rebates for both high-efficiency landscape conversion and installation of efficient irrigation equipment.

Description of Measure: The large landscape conversion program provides rebates to business owners for replacing irrigated turf grass with a low water use landscape design, including use of approved plants, mulch and other ground covers, and permeable hardscape. Applicants must participate in a landscape survey prior to receiving approval to proceed with a re-landscaping project for this rebate. Rebates are offered based on area of turf grass removed and replaced with qualifying plants or materials. SCVWD offers a rebate of $75 per 100 square feet, which CPAU matches for a combined rebate to Palo Alto customers of up to $150 per 100 square feet. Businesses and other non-residential facilities are eligible to receive up to $30,000, not to exceed project costs. If used, irrigation systems within the converted area must be high-efficiency (low volume) in good working order with no overspray or runoff. The program is actively marketed by CPAU and the SCVWD to large landscape customers.

Program Goals: This program targets the requirements of DMM E of the UWMP Act, as well as BMP 5 – Landscape - that requires that water service providers implement and maintain customer incentive programs to promote landscape water efficiency. SCVWD administers the program, collects participant data to determine usage and water savings, and provides participation tracking results to CPAU on a quarterly basis.

Cost Effectiveness: Program costs include unit cost to CPAU and SCVWD, as well as any administrative costs borne by CPAU and SCVWD. The measure has a benefit/cost ratio of 6.21 under the Total Resource Cost Test.

Estimate of Conservation Savings: It is estimated that through this program the City will save 0.14 MGD or 51 million gallons of water annually.

Table 22: Large Landscape Turf Replacement

	2010	2011	2012	2015	2020	2025	2030
Program Participation Target (# of accounts)	8 MF/CII	3 MF/CII	4 MF/CII	4 MF/CII	3 MF/CII	3 MF/CII	3 MF/CII
Program Costs	$41,400	$15,015	$20,030	$20,060	$15,083	$15,120	$15,158

MF: Multi-family residential
CII: Commercial/ Industrial/Institutional

E-4. Residential Turf Replacement

Implementation Status: Implementation of this measure began in 2006. The program is currently active. In 2009, SCVWD combined all landscape incentive programs into one, the Landscape Rebate Program. This new program offers rebates for both high-efficiency landscape conversion and installation of efficient irrigation equipment.

Description of Measure: The residential landscape conversion program provides rebates to residents for replacing irrigated turf grass with a low water use landscape design, including use of approved plants, mulch and other ground covers, and permeable hardscape. Applicants must participate in a landscape survey prior to receiving approval to proceed with a re-landscaping project for this rebate. Rebates are offered based on area of turf that has been removed and replaced with qualifying plants or materials. The SCVWD offers a rebate of $75 per 100 square feet, which CPAU matches for a combined rebate to Palo Alto residents and businesses of up to $150 per 100 square feet. Residents can receive a maximum of up to $3,000, not to exceed project costs. If used, irrigation systems within the converted area must be high-efficiency (low volume) in good working order with no overspray or runoff. The program is actively marketed by CPAU and SCVWD to appropriate customers.

Program Goals: This program targets the requirements of DMM E of the UWMP Act, as well as BMP 5 – Landscape - that requires that water service providers implement and maintain customer incentive programs for landscape water efficiency. SCVWD administers the program, collects participant data to determine usage and water savings, and provides participation tracking results to CPAU on a quarterly basis.

Cost Effectiveness: Program costs include unit cost to CPAU and SCVWD, as well as any administrative costs borne by CPAU and SCVWD. The measure has a benefit/cost ratio of 1.96 under the Total Resource Cost Test.

Estimate of Conservation Savings: It is estimated that through this program the City will save 0.05 MGD or 18 million gallons of water annually.

Table 23: Residential Turf Replacement

	2010	2011	2012	2015	2020	2025	2030
Program Participation Target (# of accounts)	61 SF	50 SF	50 SF	50 SF	50 SF	50 SF	50 SF
Program Costs	$30,515	$25,025	$25,038	$25,075	$25,138	$25,201	$25,264

SF: Single-family residential

E-5. Financial Incentives for Irrigation Hardware Upgrades

Implementation Status: Implementation of this measure began in 2006. The program is currently active. In 2009, SCVWD combined all landscape incentive programs into one, the Landscape Rebate Program. This new program offers rebates for both high-efficiency landscape conversion and installation of efficient irrigation equipment.

Description of Measure: This program provides rebates for replacement of inefficient or defective irrigation hardware. Rebates are issued for replacement with approved high-efficiency irrigation hardware components. To qualify for the rebate, applicants must participate in a landscape survey prior to receiving approval to replace irrigation hardware. Rebates vary based upon project scope and hardware costs. The program is actively marketed by CPAU and the SCVWD.

Program Goals: This program assists in meeting the requirements of DMM E of the UWMP Act, Large Landscape Conservation Programs and Incentives, as well as BMP 5 – Landscape - that requires water service providers to implement and maintain customer incentive programs to improve landscape water use efficiency. SCVWD administers the program, collects participant data to determine usage and water savings, and provides participation tracking results to CPAU on a quarterly basis.

Cost Effectiveness: The measure has a benefit/cost ratio of 1.80 under the Total Resource Cost Test. Program costs include unit cost to CPAU and SCVWD, as well as any administrative costs borne by CPAU and SCVWD.

Estimate of Conservation Savings: It is estimated that this measure will save 0.001 MGD or 0.365 million gallons of water annually. This is based on the assumption that on a per unit basis, the measure will result in a 30% water reduction during peak irrigation months.

Table 24: Irrigation Hardware Rebate

	2010	2011	2012	2015	2020	2025	2030
Program Participation Target (# of accounts)	1 MF 0 CII	1 MF 0 CII	1 MF 1 CII	1 MF 1 CII	1 MF 1 CII	1 MF 1 CII	1 MF 1 CII
Program Costs	$183	$109	$583	$574	$582	$580	$560

MF: Multi-family residential
CII: Commercial/ Industrial/Institutional

Demand Management Measure F – High Efficiency Washing Machine Rebate Programs

F-1. Residential High Efficiency Clothes Washer Incentives

Implementation Status: Implementation of this measure began in 1995. The program is currently active. It is expected to be continued until 2018 when it is assumed the rebate will no longer be necessary as most clothes washers will be high efficiency.

Description of Measure: This program targets the requirements of DMM F of the UWMP Act, as well as BMP 3.3 – High Efficiency Clothes Washers - that requires water agencies to provide financial incentives for the purchase of high efficiency clothes washers that meet a minimum average water factor value of 5.0. Based on criteria from Energy Star® and the Consortium for Energy Efficiency (CEE), CPAU offers a rebate ($125 value) based on the modified energy factor and water factor as set by the CEE Residential Clothes Washer Initiative. Currently, the City offers incentives for the purchase of clothes washers that meet a water factor of 4.5 or less and modified energy factor of 2.2 and greater. CPAU cost-shares the water efficiency portion of the rebate with SCVWD and provides the energy efficiency portion of the rebate through the CPAU Smart Energy Rebate Program. This program is actively marketed by CPAU and SCVWD to single-family residents.

Program Goals: CPAU targets a market penetration rate of 35% per year of residential customers for this program. CPAU administers the program, collects participant data to determine usage and water savings, and provides participation tracking results to SCVWD on a quarterly basis.

Cost Effectiveness: The measure has a benefit/cost ratio of 2.12 under the Total Resource Cost Test. Program costs include unit cost to CPAU and SCVWD, as well as any administrative costs borne by CPAU and SCVWD.

Estimate of Conservation Savings: It is estimated that through this program the City's residents will save 0.05 MGD or 18.25 million gallons of water per year. This is based on the assumption that on a per unit basis, the measure reduces laundry water use by 35%.

Table 25: Residential High Efficiency Clothes Washer Incentives

	2010	2011	2012	2015	2020	2025	2030
Program Participation Target (# of accounts)	514 SF	618 SF	621 SF	631 SF	-	-	-
Program Costs	$64,250	$84,939	$85,411	$86,825	-	-	-

SF: Single-family residential

F-2. Commercial and Multi-Family High Efficiency Clothes Washer Incentives

Implementation Status: Implementation of this measure began in 2000. The program is currently active. It is expected to be continued until 2018 when it is assumed the rebate will no longer be necessary as most clothes washers will be high efficiency.

Description of Measure: The program currently offers rebates ($400 value) towards installation of large commercial high efficiency clothes washers in laundromats and common area laundry rooms. This program targets the requirements of DMM F of the UWMP Act, as well as BMP 3.3 – High Efficiency Clothes Washers - that requires water agencies to provide financial incentives for the purchase of high efficiency clothes washers that meet a minimum average water factor value of 5.0. This program may also meet the qualifications of BMP 4 –Commercial, Industrial, and Institutional (CII) – that requires agencies to provide measures to CII customers to meet water savings goals. Based on criteria from Energy Star® and the Consortium for Energy Efficiency (CEE), Inc., CPAU offers a rebate based on the modified energy factor and water factor as set by the CEE Commercial Clothes Washer Initiative. Currently, the City and SCVWD offer incentives for the purchase of clothes washers that meet a water factor of 4.5 or less and modified energy factor of 2.2 and greater. This program is actively marketed by CPAU and SCVWD to commercial and multi-family property managers.

Program Goals: CPAU targets a market penetration rate of 15% per year of commercial and multi-family customers for this program. SCVWD administers the program, collects participant data to determine usage and water savings, and provides participation tracking results to CPAU on a quarterly basis.

Cost Effectiveness: The measure has a benefit/cost ratio of 1.72 under the Total Resource Cost Test. Program costs include unit cost to CPAU and SCVWD, as well as any administrative costs borne by CPAU and SCVWD.

Estimate of Conservation Savings: It is estimated that through this program the City will save 0.01 MGD or 3.65 million gallons of water annually. This is based on the assumption that on a per unit basis, the measure will result in a 35% reduction in washing machine water use.

Table 26: Commercial and Multi-Family High Efficiency Clothes Washer Incentives

	2010	2011	2012	2015	2020	2025	2030
Program Participation Target (# of accounts)	24 MF/CII	34 MF/CII	35 MF/CII	35 MF/CII	-	-	-
Program Costs	$9,600	$14,449	$14,529	$14,770	-	-	-

MF: Multi-family residential
CII: Commercial/Industrial/Institutional

Demand Management Measure G – Public Information Programs

Implementation Status: Implementation of this measure started in 1991. The program is currently active.

Description of Measure: This program targets the requirements of DMM G of the UWMP Act, as well as BMP 2.1 – Public Information Programs - that requires agencies to maintain an active public information program to promote and educate customers about water conservation. Through various types of outreach events, multiple media outlets, and marketing pieces, CPAU strives to inform residents and business owners of the value of conserving water and encourage participation in efficiency programs.

Program Goals: The City has contact with the public and media at least four times per year, actively maintains its website which is updated regularly, and provides an annual budget for public outreach programs. The goal of this program is for CPAU to attend multiple local events throughout the year such as environmental fairs at local businesses and schools, farmers markets, community events and professional speaking engagements. Staff coordinates an average of up to ten workshops on residential efficiency throughout the year, regularly updates the website with new water supply and conservation program information, and provides timely press releases to the media with information on current activities. CPAU administers the program and collects participant data to estimate water savings. SCVWD also conducts county-wide public outreach for seasonal and general water conservation campaigns via the use of television, radio and print advertisements, and website messaging.

Cost Effectiveness: The measure has a benefit/cost ratio of 4.35 under the Total Resource Cost Test. Program costs include unit and administrative costs to CPAU.

Estimate of Conservation Savings: It is estimated that through this program the City's residents will save 0.04 MGD or 14.6 million gallons of water annually. This is based on the assumption that on a per unit basis, the measure will result in a 1% water use reduction per participant.

Table 27: Public Information

	2010	2011	2012	2015	2020	2025	2030
Program Participation Target (# of accounts)	4,485	5,957	5,990	6,089	6,475	6,751	7,395
Program Costs	$17,942	$23,827	$23,959	$174,356	$175,301	$177,005	$179,580

Demand Management Measure H – School Education Programs

Implementation Status: Implementation of this measure started in 1991. The program is currently active.

Description of Measure: This program targets the requirements of DMM H of the UWMP Act, as well as BMP 2.2 – School Education Programs - that requires agencies to implement a school education program to promote water conservation and water conservation-related benefits. The program includes working with school districts and private schools to provide instructional assistance, educational materials, and classroom presentations that identify urban, agricultural, and environmental issues and conditions in the local watershed. Educational materials are designed to be grade-appropriate and correspond to state education framework requirements. CPAU works with the SCVWD to offer in-classroom presentations, large group assemblies, tabling at festivals and events, teacher training workshops, field trips to water treatment facilities, and water conservation art contests. SCVWD has offered these programs to the community since 1991. The presentations and materials provided are appropriate for grades kindergarten through college. SCVWD administers the countywide educational program, collects participation data, and provides tracking results to CPAU. CPAU also has a designated representative on the local school district sustainability committee. This committee strives to promote resource efficiency throughout all schools in the district.

Program Goals: This program has a goal of providing educational opportunities to all schools in the City and continuing to work with school administrators to coordinate integration of the in-classroom presentations, contests, and/or field trips into curriculum.

Cost Effectiveness: This measure has yet to be evaluated using a Total Resource Cost test, as savings estimates have not been quantified.

Estimate of Conservation Savings: Water savings assumptions are not quantified for this measure, as it is difficult to monitor changes in behavior and activities that affect water use. Impacts from school education programs may extend beyond initial contact with students to the families and neighbors in the community.

Demand Management Measure I – Conservation Programs for Commercial, Industrial, and Institutional (CII) Accounts

I-1. Commercial Water Audits

Implementation Status: Implementation of this measure began in 2005. It is currently active.

Description of Measure: The program offers free site visits (up to $5,500 value) to commercial, industrial, and institutional facilities to evaluate potential water savings, recommend a series of site-specific water efficiency measures, and calculate potential savings in water, sewer, and energy charges as a result of implementing the measures. A thorough analysis of all indoor water use on-site, as well as a brief assessment of the landscape is conducted at each facility. Facility managers are provided with a full report with recommendations and information on other free programs or financial incentives available to assist with the efficiency measures. This program was formerly administered by SCVWD and cost-shared with CPAU, but is now offered solely by CPAU in the Palo Alto service area. The program is actively marketed by CPAU to appropriate customers.

Program Goals: This program targets the requirements of DMM I of the UWMP Act, as well as BMP 4 –Commercial, Industrial, and Institutional - that requires water service providers to implement measures to achieve water savings for CII accounts. This program assists CPAU customers in identifying eligible equipment upgrades and facility process changes, including unique conservation measures to achieve water saving goals, and contributes to the goal of reducing overall CII water use. CPAU administers the program and collects participant data to determine usage and water savings.

Cost Effectiveness: The measure has a benefit/cost ratio of 1.00 under the Total Resource Cost Test. Program costs include unit and administrative costs to CPAU.

Estimate of Conservation Savings: It is estimated that through this program the City will save 0.02 MGD or 6 million gallons of water annually. This is based on the assumption that on a per unit basis, the measure will result in a 12% reduction in water use.

Table 28: Commercial Water Audits

	2010	2011	2012	2015	2020	2025	2030
Program Participation Target (# of accounts)	22 CII	15 CII	15 CII	15 CII	15 CII	15 CII	15 CII
Program Costs	$41,400	$43,000	$43,000	$43,000	$54,723	$55,108	$58,059

CII: Commercial/ Industrial/Institutional

I-2. Water Efficiency Direct Installation Program

Implementation Status: Implementation of this measure began in 2011. It is expected to continue through 2012.

Description of Measure: This program offers free direct installation of low-flow pre-rinse spray valves, low-flow faucet aerators, and low-flow rotating showerheads in food service establishments and at other eligible commercial sites. The City has contracted with a third party consultant to provide the "direct install" approach, which involves going door-to-door asking owners and managers of commercial locations if they are interested in receiving efficient devices that save both water and energy. The consultant will then install the devices free of charge (up to $188 value). The devices replace existing fixtures and are more efficient than what is mandated through existing baseline plumbing and building codes. The program is actively marketed by CPAU and third party consultant to appropriate customers.

Program Goals: This program targets the requirements of DMM I of the UWMP Act, as well as BMP 4 –Commercial, Industrial, and Institutional - that requires water service providers to implement measures to achieve water savings for CII accounts. This program is estimated to install 100 low-flow pre-rinse spray valves, 1,000 low-flow faucet aerators, and 400 low-flow rotating showerheads, and assists CPAU customers and the City with the goal of reducing overall CII water use. CPAU administers the program and with the assistance of the third party consultant, collects participant data to determine usage and water savings.

Cost Effectiveness: The measure has a benefit/cost ratio of 1.44 under the Total Resource Cost Test. Program costs include unit and administrative costs to CPAU.

Estimate of Conservation Savings: It is estimated that through this program the City will save 0.002 MGD or 1 million gallons of water annually.

Table 29: Water Efficiency Direct Installation Program

	2010	2011	2012	2015	2020	2025	2030
Program Participation Target (# of accounts)	0 CII	300 CII	-	-	-	-	-
Program Costs	$0	$41,025	-	-	-	-	-

CII: Commercial/ Industrial/Institutional

I-3. Water Efficient Technologies Rebate Program

Implementation Status: Implementation of this measure began in 2002. The program is currently active and is expected to be continued indefinitely.

Description of Measure: This program provides performance-based incentives for water efficiency improvements in the CII sector, and is designed to encourage innovative water efficiency projects among the local business community. Rebates are offered for custom projects not currently offered through the City's prescriptive programs, when measurable water savings can be identified for equipment retrofits or upgrades and/or facility process changes. Eligible water efficiency projects need to save a minimum of 100 hundred cubic feet (ccf) per year to qualify for participation in this program. The SCVWD offers a rebate of $4 per ccf saved for eligible projects. Effective in FY 2011, CPAU agreed to match this rebate amount through the cost-sharing agreement with SCVWD for a total rebate to customers of $8 per ccf saved. Through this program, facility managers can implement efficiency projects appropriate for the water use operations on-site.

Program Goals: This program targets the requirements of DMM I of the UWMP Act, as well as BMP 4 –Commercial, Industrial, and Institutional - that requires water service providers to implement measures to achieve water savings for CII accounts This program assists CPAU customers with performance-based water efficiency improvements, and contributes to the goal of reducing overall CII water use. SCVWD administers the program, collects participant data to determine usage and water savings, and provides participation tracking results to CPAU on a quarterly basis.

Cost Effectiveness: The measure has a benefit/cost ratio of 11.21 under the Total Resource Cost Test. Program costs include unit as well as administrative costs to CPAU and SCVWD.

Estimate of Conservation Savings: It is estimated that through this program the City will save 0.23 MGD or 85 million gallons of water annually. This is based on the assumption that on a per unit basis, the measure will result in a 15% reduction in process water use for participating facilities.

Table 30: Water Efficient Technologies Rebate

	2010	2011	2012	2015	2020	2025	2030
Program Participation Target (# of accounts)	2 CII	2 CII	2 CII	2 CII	2 CII	2 CII	2 CII
Program Costs	$10,005	$10,010	$10,015	$10,030	$10,055	$10,080	$10,106

CII: Commercial/ Industrial/Institutional

I-4. CII High Efficiency Toilet and Urinal Direct Installation Program

Implementation Status: Implementation of this measure began in 2000. This program is currently active and is expected to continue until 2019 at which time it is assumed that most toilets manufactured will be high efficiency. Prior to direct installation, the SCVWD offered an ultra low flush toilet (ULFT) rebate program county-wide from 1992 to 1999. The program changed to direct installation in 2000, and beginning in 2005 SCVWD began installing only high efficiency toilets (HETs).

Description of Measure: The program provides full service toilet replacement ($300 value) to commercial, industrial, institutional, and multi-family facilities. High volume, non-ULFT toilets flushing at 3.5 or greater gallons per flush (gpf) are replaced with high efficiency toilets that flush at 1.28 or less gpf. Since 2007, this program has also offered free high efficiency flush valve retrofit kits (0.5 gpf) to replace flush valves in high volume urinals that flush at greater than 1.0 gpf. Free installation is included in this service for both toilets and urinals. The program is actively marketed by CPAU and SCVWD.

Program Goals: This program targets the requirements of DMM I of the UWMP Act, as well as BMP 4 –Commercial, Industrial, and Institutional - that requires water service providers to implement measures to achieve water savings for CII accounts This program assists CPAU customers with high volume water using fixture replacement, and contributes to the goal of reducing overall CII water use. SCVWD administers the program, collects participant data to determine usage and water savings, and provides participation tracking results to CPAU on a quarterly basis.

Cost Effectiveness: The measure has a benefit/cost ratio of 1.47 under the Total Resource Cost Test. Program costs include unit cost to CPAU and SCVWD, as well as any administrative costs borne by CPAU and SCVWD.

Estimate of Conservation Savings: It is estimated that through this program the City will save 0.04 MGD or 14.60 million gallons of water annually. This is based on the assumption that on a per unit basis, the measure will result in a 60% reduction in water use.

Table 31: Commercial High Efficiency Toilet and Urinal Direct Installation

	2010	2011	2012	2015	2020	2025	2030
Program Participation Target (# of accounts)	26 MF/CII	26 MF/CII	26 MF/CII	26 MF/CII	-	-	-
Program Costs	$57,900	$36,008	$36,008	$36,008	-	-	-

MF: Multi-family residential
CII: Commercial/ Industrial/Institutional

Demand Management Measure J – Conservation Pricing

Implementation Status: The City has implemented conservation-based pricing for water rates since 1990. Conservation pricing is expected to be continued indefinitely.

Description of Measure: This program targets the requirements of DMM K of the UWMP Act, as well as BMP 1.4 – Retail Conservation Pricing - that requires water agencies to provide economic incentives (price signal) to customers to use water efficiently, by using a minimum percentage of water sales revenue from volumetric rates to recover the maximum amount of water sales revenue that is consistent with utility costs, financial stability, revenue sufficiency, and customer equity. The City implements a retail water rate structure through tiered rates in which the volumetric rate increases as the quantity used increases. The allocation for rates effective FY 2011 is 6% recovered through the fixed charge and 94% revenue recovery from the volumetric charge.

Program Goals: The City strives to encourage conservation while recovering cost of service and ensuring customer equity through its water pricing structure. City staff will continually evaluate the effectiveness of its rate structure and ability to recover cost of service each fiscal year, and change the water rates for customer classes as necessary.

Estimate of Conservation Savings: Water savings assumptions have not yet been quantified for this measure. In the future, the City may conduct an analysis of changes in water demand over time in relation to differing rate structures, in order to estimate potential water savings resulting from conservation pricing.

Demand Management Measure K – Water Conservation Coordinator

Implementation Status: The City has employed a designated Conservation Coordinator for close to 20 years, and expects to continue to do so indefinitely.

Description of Measure: This program targets the requirements of DMM L of the UWMP Act, as well as BMP 1.1.1 – Conservation Coordinator - that requires water agencies to designate a person as the agency's responsible conservation coordinator for program management, tracking, planning, and reporting on BMP implementation. The City currently retains one full-time equivalent employee to perform these necessary duties. This employee is responsible for water conservation program development, implementation, evaluation, outreach, and reporting activities.

Program Goals: The City will staff and maintain the position of a trained conservation coordinator, and/or equivalent consulting support, and provide that function with the necessary resources to implement the BMPs.

Conservation Coordinator Contact Information:
Catherine Elvert
Utility Account Representative
City of Palo Alto
Catherine.Elvert@CityofPaloAlto.org
(650) 329-2417

Estimate of Conservation Savings: Water savings assumptions are not quantified for this measure. The City attributes some portion of savings from its water conservation programs to the employment of a conservation coordinator dedicated to program development and deployment.

Demand Management Measure L – Water Waste Prohibition

Implementation Status: Implementation of water waste prohibition has been in effect since 1989. This practice is expected to continue indefinitely.

Description of Measure: This program targets the requirements of DMM M of the UWMP Act, as well as BMP 1.1.2 – Water Waste Prevention - that requires water agencies to enact and enforce an ordinance or establish terms of service that prohibit water waste such as, but not limited to: single-pass cooling systems; conveyor and in-bay vehicle wash and commercial laundry systems which do not reuse water; non-recirculating decorative water fountains; irrigation, landscape, industrial, commercial, and other design inefficiencies or misuse of water. Implementation also includes enforcement of water shortage response measures and permit requirements for water efficiency design in new development.

Program Goals: The City has had a water waste ordinance in effect since 1989 (Palo Alto Municipal Code Chapter 12.32). Enforcement includes written warning notices to violators and may result in installation of a flow restrictor on the service connection of the customer or purchaser of water whose service connection was used in the violations observed or established, and bill the costs of such installation to said customer or purchaser. The City has developed water shortage response measures, which are discussed within this UWMP. Additionally, in 2010, the City adopted the new State Green Building Standards Code (CALGreen), which sets permit requirements for water efficiency design, including irrigation systems, in new development.

Cost Effectiveness: This measure has yet to be evaluated using a Total Resource Cost test, as savings are not quantified for this measure.

Estimate of Conservation Savings: No formal analysis has been conducted to quantify water savings resulting from implementation of this measure.

Demand Management Measure M - Residential Ultra Low Flush Toilet Replacement Programs

Implementation Status: Implementation of this measure started in 1992. This program is currently active and is expected to continue until 2019 at which time it is assumed that most toilets manufactured will be high efficiency.

Description of Measure: The residential program provides rebates ($125 value) to single and multi-family customers for replacement of high volume toilets flushing at 3.5 or greater gallons per flush (gpf) with approved High Efficiency Toilets (HET) that flush no more than 1.28 gpf. Approved HET models are certified by the EPA WaterSense Specification label. Pre-approval is required prior to replacing the toilet for the rebate. The program is actively marketed by CPAU and the SCVWD.

Program Goals: This program targets the requirements of DMM N of the UWMP Act, as well as BMP 3.4- WaterSense Specification (WSS) Toilets - that requires water agencies to provide incentives or ordinances requiring the replacement of existing toilets using 3.5 or more gpf with a toilet meeting the WaterSense specification. This program has a goal of replacing toilets at or above the level achieved through a retrofit on resale ordinance, or a market saturation of 75% is demonstrated, whichever is sooner.

Cost Effectiveness: The measure has a benefit/cost ratio of 1.00 under the Total Resource Cost Test. Program costs include unit cost to CPAU and SCVWD, as well as any administrative costs borne by CPAU and SCVWD.

Estimate of Conservation Savings: It is estimated that through this program the City's residents will save 0.09 MGD or 32.85 million gallons of water annually. This is based on the assumption that on a per unit basis, the measure will result in a 60% reduction in water use per toilet.

Table 32: Rebates for High Efficiency Toilets

	2010	2011	2012	2015	2020	2025	2030
Program Participation Target (# of accounts)	229 SF	571 SF	571 SF	571 SF	-	-	-
Program Costs	$39,388	$193,592	$193,592	$193,592	-	-	-

SF: Single-family residential

Demand Management Measure N – New Development Indoor and Outdoor Regulations

Implementation Status: Implementation of this measure began in January 2011. Enforcement of the regulations is expected to continue indefinitely.

Description of Measure: The City adopted the State Green Building Standards Code (CALGreen) in 2010, which went into effect in 2011. This code sets permit requirements for water efficient design in residential and non-residential new developments for both indoor and outdoor water use. New construction and renovation projects must adhere to the water efficiency and conservation regulations. Indoor regulations include prescriptive measures requiring water using fixtures meet or exceed the plumbing standard minimum or document performance based water conservation measures. Outdoor regulations include establishment of a reference evapotranspiration (ETo) based water budget with a low water use landscape design, low volume irrigation, separate water meters, weather-based irrigation controllers for automatic systems and other low water use landscape design measures.

Program Goals: The regulations are designed to reduce indoor water use by at least 20%. Landscapes must be designed to reduce the use of potable water to a quantity that does not exceed between 55% to 70% of ETo for the landscape area. All new construction and renovation projects required to apply for a building permit are subject to these requirements.

Cost Effectiveness: This measure has a benefit/cost ratio of 3.65 under the Total Resource Cost Test.

Estimate of Conservation Savings: The assumption is that on a per unit basis, the regulations save 20% of indoor water use. Water use reductions for landscape projects will vary.

Demand Management Measure O – Water Efficiency Classes for Homeowners

Implementation Status: Implementation of this measure began in 2006. The program is currently active.

Description of Measure: This program targets the requirements of DMM G of the UWMP Act, as well as BMP 2.1 – Public Information Programs - that requires agencies to maintain an active public information program to promote and educate customers about water conservation. This program offers free indoor water conservation, landscape and irrigation design classes to residents, contractors, and landscape professionals in the community.

Program Goals: CPAU offers several residential efficiency workshops each year, coordinates landscape workshops through BAWSCA, Bay-Friendly, and SCVWD, and advertises other local water efficiency workshops to the community. SCVWD has offered water efficiency classes for homeowners in Santa Clara County for nearly 20 years. The City began coordinating workshops with BAWSCA in 2006. City staff partners with various agencies to coordinate an average of up to ten residential efficiency workshops throughout the year, and frequently presents information on water efficient practices at community events, conferences and professional seminars. Participation targets below reflect the number of new City accounts participating each year in water efficient landscape classes offered throughout the community. Homeowner accounts that participate more than once are not included in the totals below.

Cost Effectiveness: The measure has a benefit/cost ratio of 203.93 under the Total Resource Cost Test. Program costs include unit cost to CPAU and BAWSCA, as well as any administrative costs borne by CPAU and BAWSCA.

Estimate of Conservation Savings: It is estimated that through this program the City's residents will save 0.44 MGD or 160.6 million gallons of water annually.

Table 33: Water Efficiency Classes for Homeowners

	2010	2011	2012	2015	2020	2025	2030
Program Participation Target (# of accounts)	1,500	4,236	3,044	1,172	386	196	391
Program Costs	$3,450	$3,450	$3,450	$3,450	$3,450	$3,450	$3,450

Demand Management Measure P – Rainwater Harvesting Incentives

Implementation Status: Implementation of this measure began in 2008. The program is currently active.

Description of Measure: This program offers rebates to residents, businesses and institutions for installation of rain barrels and cisterns used to capture water for reuse in landscape irrigation. By storing and diverting rainfall runoff from roofs, these devices reduce the undesirable impacts of runoff that would otherwise flow swiftly into gutters and storm drains, thus contributing to flooding and erosion problems in creeks. Due to the relatively small volume, rain barrels are most commonly used as a secondary source of water for gardening in residential areas. If larger water storage volumes are desired, larger tanks called cisterns can be used to collect rooftop runoff. Rain barrels can be used to reduce the demand on the municipal water system, especially during the hot summer months.

Program Goals: The primary goal of this program is to implement measures that reduce the amount of runoff that flows into the storm drain system and improve the water quality of that runoff. This program also assists the City in meeting its water efficiency goals by providing a supplemental source of water for landscape irrigation, particularly when seasonal water demands are highest.

Cost Effectiveness: The program is funded with revenue from monthly storm drainage fees. This measure has yet to be evaluated using a Total Resource Cost test, as savings estimates have not been quantified.

Estimate of Conservation Savings: This is a relatively new program offered by water utilities, therefore savings assumptions cannot be quantified until pilot studies of actual installations can be analyzed to estimate potential savings.

Demand Management Measure Q – Residential Graywater Reuse

Implementation Status: Implementation of this measure began in 2009.

Description of Measure: Since the adoption of the State regulations in 2009 that permitted installation and use of residential graywater systems, the City has seen several graywater systems installed in its service area. Graywater includes water captured from bathroom sinks, showers, and clothes washers, which is reused to irrigate plants. It can be viewed as a beneficial tool for conservation since graywater provides a supplemental source of water for landscape irrigation, particularly when seasonal demands are highest. Currently the City does not offer any incentives for installation of a graywater system, but permits systems on a case-by-case basis.

Program Goals: This program may assist the City with meeting its water efficiency goals. The City is currently in the process of evaluating the graywater code and permitting processes for implementation in Palo Alto. As more graywater systems are installed, the City hopes to evaluate the water conservation savings potential from this measure.

Cost Effectiveness: This measure has yet to be evaluated using a Total Resource Cost test, as savings estimates have not been quantified.

Estimate of Conservation Savings: This is a relatively new program offered by water utilities, therefore savings assumptions cannot be quantified until pilot studies of actual installations can be analyzed to estimate potential savings.

Section 6 – Water Supply Reliability

Law

> 10631 (c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable.
>
> Provide data for each of the following:
>
> (1) An average water year, (2) A single dry water year, (3) Multiple dry wateryears.
>
> 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 replace that source with alternative sources or water demand management measures, to the extent practicable.
>
> 10632. (a) The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier:
>
> (2) 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.

Water Supply Reliability

The weather-related reliability of the City's water supply is very dependent upon the reliability of SFPUC's regional water supply system. The SFPUC defines reliability by the amount and frequency of water delivery reductions (deficiencies) required to balance customer demands with available supplies in droughts. The SFPUC plans its water deliveries anticipating that a drought worse than the worst drought yet experienced may occur. This section discusses these system-wide deficiencies.

The SFPUC's Hetch Hetchy supply is vulnerable to periodic, short-term outages. Due to the fact that Hetch Hetchy water is not filtered, it is subject to strict water quality standards set by the California Department of Public Health (CDPH). As a result of weather events, turbidity levels can exceed standards requiring the Hetch Hetchy supply to be shut off until levels drop to within standards. Hetch Hetchy supply outages can last a week or longer. During these periods, the entire SFPUC supply comes from the Sunol Valley Water Treatment Plant and the Harry Tracy Water Treatment Plant, both of which are supplied by local reservoirs.

The City, working in cooperation with SFPUC and BAWSCA, completed several studies and reports analyzing weather- and climate-related reliability of the water supply. Several of these are described in previous sections of this UWMP, including the following:

- **Water Wells, Regional Storage and Distribution System Study (1999)** – This study examined the ability of the City's water system to supply water during an 8-hour disruption of SFPUC supply. The study concluded the City should invest in certain capital projects. These projects became part of the City's Emergency Water Supply and Storage Project, which is currently under construction.

- **The Water Supply Master Plan (2000)** – The WSMP was a joint study by BAWSCA and the SFPUC to address the future water supply needs of the 30 agencies and 2.3 million people who are served via the SFPUC water system. The City was actively involved in the development of this plan, participating on the WSMP Steering Committee. This plan is further described below.

- **Alternative Emergency Water Supply Options Study (2001)** – This study examined the ability of the City's distribution system to supply water during various lengths of supply disruption (e.g., 1 day, 3-days, 30 days) and included an analysis of the vulnerability of the City's water distribution system. The study concluded that the capital projects in the Emergency Water Supply and Storage Project, specifically related to groundwater wells, would result in the ability to supply sufficient water in disruptions of SFPUC supply.

- **City of Palo Alto Emergency Water Supply & Storage Project Final Environmental Impact Report (2007**) – The City certified the EIR to locate a site and construct a 2.5 million gallon underground water reservoir and pump station in Palo Alto to meet emergency water supply and storage needs. In addition to this water reservoir, the project includes the siting and construction of several emergency supply wells and the upgrade of five existing wells and the existing Mayfield Pump Station. The City is currently in the construction phase for the project.

Frequency and Magnitude of Supply Deficiencies

The City experienced severe droughts during 1976-77 and 1987-93. In response to these droughts the City adopted a number of water conservation strategies. Full descriptions of the City's water conservation programs are included in Section 5, "Demand Management Measures," and in Appendix C, "CUWCC Best Management Practices (BMP) Reports."

The magnitude of future supply deficiencies is difficult to estimate. The total amount of water the SFPUC has available to deliver during a defined period of time is dependent on several factors which generally reduce to a comparison of 1) the amount of water that is available to the SFPUC system from natural runoff and reservoir storage and 2) the amount of that water that must be released from the SFPUC's system for commitments to purposes other than

customer deliveries (e.g., releases below Hetch Hetchy reservoirs to meet Raker Act and fishery purposes).

The 1987-93 drought profoundly highlighted the deficit between SFPUC's water supplies and the demands on the SFPUC system. Based on the 1987-93 drought experience, the SFPUC assumes its "firm" capability to be the amount the system can be expected to deliver during historically experienced drought periods. In estimating this firm capability, the SFPUC assumes the potential recurrence of a drought such as occurred during 1987-93, plus an additional 18 months of limited water availability. The SFPUC used this "design drought" to develop the level of service goals for the Water System Improvement Program of meeting at least 80% of customer demands during periods of water shortage.

Reliability of the Regional Water System

The WSIP is a program to address system deficiencies primarily related to seismic vulnerability. The SFPUC is currently in the construction phase for the regional WSIP and is on schedule to complete the program in 2015. The WSIP provides goals and objectives to improve the delivery reliability of the regional system, including water supply reliability. The goals and objectives of the WSIP related to water supply are included in Table 34 below.

Table 34: Goals and Objectives of WSIP

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

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

Water Supply – All Year Types

The SFPUC historically has met demand in its service area in all year types from the three watersheds that provide the source water for the SFPUC system:

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

In general, 85 percent of the supply comes from the Tuolumne River supplies stored in the 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.

Based on the adopted WSIP, the available supplies for the SFPUC system under normal and dry years is represented in Table 35.

Table 35: SFPUC System Water Availability – Year 2010 (AFY)

		Multiple Dry Water Years		
Average/Normal Water Year	**Single Dry Water Year**	**Year 1 2011**	**Year 2 2012**	**Year 3 2013**
296,800 100% of Normal	267,120 90% of Normal	267,120 90% of Normal	237,440 80% of Normal	237,440 80% of Normal

Projected SFPUC System Supply Reliability

The SFPUC has provided projected System Supply Reliability Based on Historical Hydrologic Period representing the projected system supply reliability (Appendix J).[42] This table assumes that the wholesale customers purchase 184 MGD from the system through 2030 and the SFPUC implements the dry-year water supply projects included in the WSIP. The numbers represent the wholesale share of available supply during historical year types per the Tier 1 Water Shortage Allocation Plan. This table does not reflect any potential yield impacts 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 a reduction in demand, an increase in rationing, or a supplemental supply. The following describes these actions.

Reduction in Demand

The current projections for total system purchases through 2018 remain at or below 265 MGD. In addition, in the last few years, SFPUC deliveries have been significantly below this level, as illustrated in Table 36 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.

[42] Projected System Supply Reliability Based on Historical Hydrologic Period (from 2/22/10 letter from P. Kehoe to Nicole Sandkulla, Senior Water Resources Engineer, BAWSCA).

Table 36: Water Deliveries in SFPUC Service Area					
	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 year period would require 10 percent rationing and 3 out of 8.5 years would require 20 percent rationing. 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 water shortage 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[43]
- Development of a desalination project

[43] 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.

Meeting the Level of Service Goal for Delivery Reliability

Through the level of service goals outlined in the WSIP, the SFPUC has assured its wholesale customers that it is committed to meeting its contractual obligation to them of 184 MGD and its delivery reliability goal of 265 MGD with no greater than 20 percent rationing in any one year of a drought. In Resolution No. 10-0175 adopted by the Commission on October 15, 2010, the Commission directed staff to provide information to the Commission and the public by March 31, 2011 on how the SFPUC has the capability to attain its water supply levels of service and contractual obligations. This directive was in response to concerns expressed by the Commission and the Wholesale Customers regarding the effect on water supply of the instream flow releases required as a result of the Lower Crystal Springs Dam Improvement Project and the Calaveras Dam Replacement Project. In summary, the SFPUC has a projected shortfall of available water supply to meet its Level of Service 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.

2018 Interim Supply Limitation

As part of its adoption of the WSIP in October 2008, the SFPUC adopted a water supply element, the Interim Supply Limitation (ISL), to limit sales from the SFPUC watersheds to an average annual of 265 MGD through 2018. See Section 3, "System Supplies," under "SFPUC Supply." The wholesale customers' collective allocation under the ISL is 184 MGD, and San Francisco's allocation is 81 MGD. The City's portion of the wholesale allocation is 14.70 MGD. Although the wholesale customers did not agree to the ISL, the WSA provides a framework for administering the ISL. The SFPUC is in the process of developing the methodology and amount of the volume-based charge if the ISL is exceeded. The Environmental Enhancement Surcharge will become effective beginning FY 2012.

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

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

Climate Change

The issue of climate change has become an important factor in water resources planning in the State, although the extent and precise effects of climate change remain uncertain. As described by the SFPUC in its October 2009 Final Water Supply Availability Study for the City

and County of San Francisco, there is evidence that increasing concentrations of greenhouse gasses have caused and will continue to cause a rise in temperatures around the world that could result in a wide range of changes in climate patterns. These changes are expected to have a direct effect on water resources in California. 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'S October 2009 study, 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 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.

Plans to Assure a Reliable Water Supply

The City has completed several studies regarding water reliability. These studies are described in previous sections. Of note, the City is in the construction phase of the Emergency Water Supply and Storage Project and is in the environmental review phase of the Palo Alto Phase 3 recycled water project

In addition, the City is continuing to evaluate other water supply alternatives as part of its ongoing Water Integrated Resource Plan (WIRP). This analysis will include the impact of long-term water supply shortage on the total water supply.

Section 7 – Water Shortage Contingency Plan

Law

> 10632. (a) The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier:
>
> (1) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions that are applicable to each stage.

Background

Except for recycled water, the City does not currently produce any of its own water supplies, but is dependent upon its suppliers. The City's primary supplier is the SFPUC. The SFPUC is the only supplier in normal years. The City's wells are in the process of being refurbished and the City is drilling three new wells, but the wells will remain standby wells for use during emergencies and potentially to supplement the SFPUC supply during a severe drought. The SCVWD manages the county's groundwater and levies a pump tax for all water produced by the wells. The City has also approved and signed a mutual aid agreement for emergency water supplies with California's Water Agency Response Network (Coastal group) that has over 75 signatories.

To meet the requirements of the Urban Water Management Planning Act and for the purposes of this document, a distinction will be made between a catastrophic interruption of water supplies and a water shortage due to drought. A catastrophic interruption of water supplies may occur due to natural disaster such as an earthquake or due to a sudden problem with water quality or because of sabotage or terrorism. A water shortage due to drought is the more likely occurrence. The City has experienced two drought water shortages in the past 35 years, in l976-77 and from l987 to l993.

Catastrophic Interruption of Supply

Law

> 10632. (a) The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier:

(3) 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.

Regional System Reliability

The City has been very active in working with the SFPUC to analyze the supply reliability needs of the SFPUC system and has begun to implement the most urgent reliability improvements. The City participated in San Francisco's Facility Reliability Study completed in 1999. This study was conducted by SFPUC to examine the vulnerability of its system to catastrophic events (e.g., earthquakes). The City was represented on the BAWSCA Facility Reliability Committee that was actively involved in the development of this study.

The City also participated in the development of the BAWSCA Local Resources Management Program. This project examined methods for developing local projects that increase supply and reliability within the SFPUC service territory.

The City was actively involved in the review of the SFPUC System Vulnerability Report. This study examined the vulnerability of the SFPUC system to catastrophic events (e.g., earthquakes). The study, released in January 2000, indicated that some areas in the regional system could be without water for up to 60 days.

To address these deficiencies, the SFPUC developed the WSIP to repair and upgrade the regional system. The program contains projects that will repair, replace and seismically upgrade the regional water system's aging pipelines and tunnels, reservoirs and dams. The City has been actively involved with BAWSCA in the review of the WSIP as it is developed, revised and approved.

Planning, Training and Exercise

Following San Francisco's experience with the 1989 Loma Prieta Earthquake, the SFPUC created a departmental *SFPUC Emergency Operations Plan (EOP).* The *SFPUC EOP*, originally released in 1992, has been updated on average every two years. The latest EOP update will be released in Spring 2011. The *EOP* addresses a broad range of potential emergency situations that may affect the SFPUC, and it supplements the City and County of San Francisco's EOP, which was prepared by the Department of Emergency Management and last updated in 2008. Specifically, the purpose of the *SFPUC EOP* is to describe the SFPUC's emergency management organization, roles and responsibilities and establish emergency policies and procedures.

In addition, SFPUC divisions and bureaus have their own EOPs that are in alignment with the SFPUC EOP and describe their respective emergency management organization, roles and responsibilities and emergency policies and procedures. The SFPUC tests its emergency plans on a regular basis by conducting emergency exercises. Through these exercises the SFPUC learns how well the plans will or will not work in response to an emergency. Plan

improvements are based on exercise and sometime real world event response and evaluation. Also, the SFPUC has an emergency response training plan that is based on federal, state and local standards and exercise and incident improvement plans. SFPUC employees have emergency training requirements that are based on their individual emergency response roles.

Emergency Drinking Water Planning

In February 2005, the SFPUC Water Quality Bureau published a *City Emergency Drinking Water Alternatives* report. The purpose of this project was to develop a plan for supplying emergency drinking water in the City after damage and/or contamination of the SFPUC raw and/or treated water systems resulting from a major disaster. The report addresses immediate response after a major disaster. Since the publication of this report, the SFPUC has implemented a number of projects to increase its capability to support the provision of emergency drinking water during an emergency. These projects include:

- Public Information and materials for home and business
- Designation and identification of 67 emergency drinking water hydrants throughout San Francisco
- Purchase of emergency related equipment including water bladders and water bagging machines to help with distribution post disaster
- Coordinated planning with City Departments, neighboring jurisdictions and other public and private partners to maximize resources and supplies for emergency response

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

The SFPUC has also prepared an *SFPUC-Suburban Customer Water Supply Emergency Operations and Notification Plan.* The plan was first prepared in 1996 and has been updated several times – most recently in July of 2010. The purpose of this plan is to provide contact information, procedures and guidelines to be implemented by the following entities when a potential or actual water supply problem arises: the SFPUC Water Supply and Treatment Division, Water Quality Bureau, SFPUC wholesale customers, BAWSCA, and City Distribution Division (considered to be a customer for the purposes of this plan). For the purposes of this plan, water quality issues are treated as potential or actual supply problems.

Power Outage Preparedness and Response

SFPUC's water transmission system is primarily gravity fed, from the Hetch Hetchy Reservoir to the City and County of San Francisco. Within San Francisco's in-city distribution system, the key

pump stations have generators in place and all others have connections in place that would allow portable generators to be used.

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

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

Capital Projects for Seismic Reliability and Overall System Reliability

The SFPUC is undertaking the WSIP 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. As illustrated previously in Figure 1, the WSIP include several projects located in San Francisco to improve the seismic reliability of the in-city distribution system, as well as many projects related to the SFPUC RWS to address both seismic reliability and overall system reliability. All WSIP projects are expected to be completed by 2016. In addition to the improvements that will come from the WSIP, San Francisco has already constructed the following system interties for use during catastrophic emergencies, short-term facility maintenance and upgrade activities, and in times of water shortages:

- A 40 MGD system intertie between the SFPUC and the SCVWD (Milpitas Intertie); and
- One permanent and one temporary intertie to the South Bay Aqueduct, which would enable the SFPUC to receive State Water Project water.

The WSIP includes intertie projects, such as the East Bay Municipal Utility District (EBMUD)-Hayward-SFPUC Intertie. The SFPUC and EBMUD have completed construction of this 30 MGD intertie between their two systems in the City of Hayward, as part of the WSIP.

The WSIP also includes projects related to standby power facilities at various locations. These projects will provide for standby electrical power at six critical facilities to allow these facilities to remain in operation during power outages and other emergency situations. Permanent engine generators will be provided at four locations (San Pedro Valve Lot, Millbrae Facility, Alameda West, and Harry Tracy Water Treatment Plant), while hookups for portable engine generators will be provided at two locations (San Antonio Reservoir and Calaveras Reservoir).

Local Distribution System Reliability

Given the vulnerabilities of the regional water system managed by the SFPUC, the City has examined how it would fare if the system sustained damage due to a catastrophic emergency such as a large earthquake. The City has completed several studies to identify any vulnerability in its local distribution system and to identify solutions to reduce or eliminate those vulnerabilities. Those studies are described above in the "Groundwater" section of Section 3, "System Supplies."

These studies identified a deficiency in the ability of the City's local system to meet water demands during a temporary shutoff of water from the regional water system operated by the SFPUC. The California Department of Health Services issued a recommendation that local systems be capable of providing water supplies to meet the system's water demands for an 8-hour period in addition to having enough water in storage to meet fire suppression demands. The City's system only has the ability to meet 2.5 hours of the City's water demands while maintaining sufficient reserve for fire flows.

The City Council has approved a capital improvement program consisting of several improvements related to addressing the City's emergency water supply deficiency including rehabilitating the five existing wells, drilling up to three new wells, and building an additional water storage reservoir. The City is in the process of implementing those improvements and is currently in the construction stage of siting a new reservoir and new groundwater wells.

The City also maintains several critical interconnections with neighboring water utilities as shown in Table 37. These interties can be activated during critical events to ensure water supplies are not impacted and also to provide mutual aid to neighboring communities

Table 37: Interties with other Agencies

Name	Number	Diameter (inches)
East Palo Alto	1	6
Mountain	2	6
Stanford	2	8
Purissima Hills WD	2	8,12

Emergency Response Plan

Response to a catastrophic interruption of supply is handled through a series of interconnected plans. All Disaster or Act of War Plans, from the state to local levels, use the Federal Civil Defense and Emergency Planning systems as role models with additions that take into consideration any unique conditions or situations that may exist within their jurisdictions.

At the national level, the Federal Emergency Management Agency (FEMA) controls all functions of Civil Defense or Emergency Planning for the Federal Government. FEMA will not assume

control of an emergency until the President declares a State of Emergency or an Act of War occurs. At that point FEMA will assume control through the State of California Office of Emergency Services (State OES) and make available all of its resources.

At the state level, the State OES will control any disaster within the state and make its resources available after a State of Disaster has been declared by the governor. The State OES further controls the Master Mutual Aid Agreement that can also be used in a local disaster (the City is a member of California's Water Agency Response Network, Region 2, a mutual aid system for water utilities, in accordance with State requirements).

At the county level, the Santa Clara County OES will control the unincorporated areas of the County. It will coordinate mutual aid within the County and act as an intermediary between local governments or utilities and the State mutual aid office.

On the city level, the City will control all emergencies according to its Emergency Response Plan. The Mayor, City Council or City Manager may declare an emergency at which time representatives of all City departments will report to the Emergency Operations Center.

The City's Emergency Response Plan incorporates the CPAU Water, Gas and Wastewater Operations Emergency Response Plan (the UER Plan), which covers any emergency curtailment of water supplies. The UER Plan is a detailed outline of actions to be taken and procedures to be followed by utility personnel in event of a water emergency. This plan is maintained in the office of Water, Gas and Wastewater Operations and must be updated every 12 months.

The UER Plan is designed as both an outline and a procedures manual. It covers the following primary functions:

1) Notification Procedures
2) Water Mutual Aid Agreement
3) Radio/Telephone /Communications
4) Water Receiving Station and Reservoir Check List
5) Boil Water Notifications
6) Highest Water Use Customer Load Reduction List
7) Water Interconnect Locations
8) Disinfecting of Water Mains

All CPAU personnel whose duties include work on the system through maintenance or construction operations, or as Utilities Dispatchers, are highly trained and experienced in performing their normal or "common emergency" duties. If a disaster or Act of War were to occur, the City's construction standards may have to be lowered to make temporary repairs to expedite the restoration of the system, but the procedures and safety rules by which the work would be accomplished will not change. These temporary repairs would be upgraded and made permanent or replaced, as necessary, at a later date. The City's primary concern is the safety of the general public and all City personnel.

To that end, CPAU is in the process of acquiring diesel emergency power generation equipment in order to enhance the water system response reliability during a catastrophic seismic event causing severance from the City's primary supply source. Lease acquisition of these emergency generators will fulfill this reliability goal for the medium and the long-term. At the same time, given the uncertainty of the future, acquisition through lease agreements for these emergency gen sets will reduce the City's risk of generator inoperability.

Potential Applicable Scenarios for the use of the emergency generators:

1. Supply issue - Hetch Hetchy complete shutdown; no water supply source other than City wells and reservoirs.
2. Transmission issue – Complete power grid failure; no way to deliver water to Foothills.

Water Shortage Contingency Analysis

Law

> 10632. (a) The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier:
>
> (4) 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.
>
> (5) 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.
>
> (6) Penalties or charges for excessive use, where applicable.

Palo Alto's Experience with Drought Management

The City has had considerable experience implementing action plans during a period of water shortage, such as a drought. The City has always been able to comply with any rationing requirement imposed by SFPUC. During the 1976 to 1977 drought period, the City achieved reductions in citywide consumption of 16% in FY 1976-77 and 37% in FY 1977-78 compared to consumption in FY 1975-76. In the 1987-1993 drought period, the City's consumption was lower than consumption in 1987, the year just before SFPUC instituted mandatory rationing, by from 19% (in FY 1988-89) to over 35% (in FY 1991-92). In response to the voluntary 10% call for rationing in 2008-2009, the City responded with reductions of approximately 18% relative to 2004 consumption.

During these periods of water shortage, the community has responded exceedingly well to requests to use water in the most efficient way possible. As a result of experiencing these

drought-time water supply shortages, many residents and businesses have implemented permanent improvements in water use efficiency.

During a water shortage period, the Director of Utilities is responsible for executing the Water Shortage Contingency Plan. Representatives from appropriate City Departments and Utilities Divisions would need to be involved to oversee outreach and monitoring efforts. Additional resources will need to be dedicated to this effort both for internal and external execution of the plan.

A key element to developing water shortage contingency plans for the City is close coordination and cooperation with SFPUC, BAWSCA, and the SCVWD. It is critical to develop a coherent and coordinated regional response to water shortages in order to provide a consistent message to customers.

Regional Interim Water Shortage Allocation Plan

Tier 1 Drought Allocations

In July 2009, as part of 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 1 Plan")[44]. The Tier 1 Plan 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 1 Plan, which allocates water between San Francisco and the wholesale customers collectively, distributes water based on the level of shortage:

Table 38: SFPUC and Wholesale Customer Share of Available Water

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

The Tier 1 Plan will expire at the end of the term of the WSA on June 30th, 2034, unless extended by San Francisco and the wholesale customers.

[44] The previous water shortage allocation plan expired in 2009 with the termination of the previous Water Supply Agreement with the SFPUC. Details of the previous allocation plan are provided in the 2005 UWMP.

Tier 2 Drought Allocations

The wholesale customers have negotiated and adopted the "Tier 2 Plan", which allocates the collective wholesale customer share among each of the 26 wholesale customers. This Tier 2 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.

Under the Tier 2 Plan, the wholesale customers' shares will be allocated among them in proportion to each wholesale customer's Allocation Basis, which is the weighted average of two components. The first component is the wholesale customer's Individual Supply Guarantee 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 1 Plan, by the wholesale customer's Allocation Factor.

The Tier 2 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, the City is using the value identified in the Tier 2 Plan adopted by the City Council, as calculated for FY 2009. Table 39 below illustrates how much water would be available to Palo Alto from the regional system under different reduction scenario's using actual water demand from FY 2009.

Table 39: Palo Alto Share of Available Water – AFY					
	Demand (FY 2009)	One Critical Dry Year	Current Deliveries During Multiple Years		
			Year 1	Year 2	Year 3
System-wide Shortage	0%	10%	10%	20%	20%
BAWSCA Allocation	182,885	164,596	164,596	133,796	133,796
City of Palo Alto	13,026	11,723	11,723	10,021	10,021
Percent of Normal	100%	90.00%	90.00%	76.94%	76.94%

The Tier 2 Plan will expire in 2018 unless extended by the wholesale customers.

Palo Alto's Water Shortage Contingency Planning

The City's primary response to a water supply shortage will be to reduce consumption. The City's Water Shortage Contingency Plan describes the response at four water supply shortage stages. (Water use restrictions discussed in these stages can be found in Appendix H)

- Stage I (5% to 10% supply reductions) calls for a low level of informational outreach and enforcement of the permanent water use ordinances.

- In Stage II (10% to 20%) there will be a stepped up outreach effort and the adoption of some additional water use restrictions. Drought rate schedules will be implemented.

- Stage III (20% to 35%) calls for increased outreach activities and additional emergency water use restrictions. Drought rates in each block would increase from those in Stage II. Fines and penalties would be applied to users in violation of water usage restrictions. In some cases, water flow restriction devices would be installed on customers' meters.

- Stage IV (35% to 50%) requires very close management of the available water supplies. Allocations of water for each customer will be introduced. Informational outreach activities would be operating at a very high level. Severe water use restrictions and a restrictive penalty schedule would be implemented.

Water Shortage Mitigation Options

Water shortage mitigation options can be classified under two categories: Supply Side Options and Demand Side Options. This section provides descriptions of many different actions and activities that are possible in reaction to a water supply shortage situation. The City's response to drought-time shortages depends upon the severity of the shortage. Following this section, specific actions are outlined for the various stages of a potential shortage.

Supply Side Options

The City's options to increase its short-term water supply are limited. The City's long-term supply options are discussed in Section 3, "System Supplies." The section below discusses short-term alternatives to increase supply in the event of a water supply shortage.

City Wells

The status of the City's emergency wells is discussed in the Groundwater area of Section 3, "System Supplies." During a drought period, it would be possible to use some water from the existing or new wells to supplement the supply from the SFPUC. However, no decision has been made to use the groundwater for this purpose.

Recycled Water

During a drought or a short-term water emergency, recycled water would be available to the City, however, a wide distribution of recycled water would require substantial infrastructure that would be difficult to construct in a short period of time. The City itself or private companies with tanker trucks can obtain permits to utilize recycled water from the RWQCP. These companies can pick up recycled water and deliver it to customers who will pay for this service. Public awareness could be enhanced by greater publicity of the availability of this alternative to customers. At the same time, the availability of recycled water will be balanced with the need to comply with all regulations and laws surrounding the use of recycled water.

This recycled water would be available except in a catastrophic disaster (severe earthquake) that severs all sources of water (SFPUC, wells and storage) to the system thereby eliminating the source of water to the RWQCP. However, in the event of a severe earthquake the delivery of recycled water would be a low priority.

Water Purchases from Other Suppliers

The City could conceivably purchase water from a new supplier in an extreme water supply shortage situation. However, any such purchase would have to be consistent with the requirements specified in the WSA[45] and be coordinated with all other jurisdictions between the source and the City to ensure the supply meets deliverability requirements. The SFPUC has made such purchases of water from various suppliers in times of water shortages. The City and all other BAWSCA member agencies have received this water through the SFPUC delivery systems. It is unlikely that the City could negotiate a better deal than the SFPUC or BAWSCA in these extremely complicated arrangements, and therefore it is unlikely that the City would seek to purchase water on its own. The City is a participant in several regional efforts to evaluate and develop new supply sources, including purchasing water from other sources. The SFPUC system has several interties with adjacent water agencies, including EBMUD and the SCVWD.

[45] WSA, Section 3.12

These interties could be used to “wheel” water that is purchased from other sources or agencies.

Demand Side Options

In droughts, the City expects to achieve significant amounts of demand reduction through its use of demand side options, or DMMs, as that term is used in the California Water Code. (See, for example, §§ 371, 10631.) These options include a combination of information outreach programs, drought rate schedules, demand side programs and water use restrictions.

Demand Side Management Programs:

Demand side management programs can be offered using many different program design options and delivery mechanisms. Some examples are listed below.

Information Outreach Programs

When customers are asked to reduce their water consumption, they will be provided information on ways to achieve the reduction. Informational outreach efforts address this need by communicating to the customers how best to prioritize their water use needs and implement alternative ways to receive the same level of service while using less water.

Information and public outreach programs include utility bill inserts, information on CPAU’s website, local print media campaigns, commercial targeted mailings, workshops and demonstrations, fact sheets on conservation technologies and practices, and coordination with product manufacturers and suppliers.

Incentive-based Demand Side Management Programs

In a persistent water shortage, most customers will take the “quick and easy” actions early on. More complex and expensive incentive programs to provide demand side management would be needed to achieve additional results. Although incentive programs require time to develop and promote, they can result in significant water savings. Depending upon current market saturations, some programs such as delivery of relatively inexpensive hardware (e.g. low-flow faucet aerators and showerheads) and services such as leak detection and irrigation system audits can offer quick drought-time savings. Other programs may include a toilet rebate program or incentives to replace high water use landscapes with water efficient landscape designs and installation of efficient irrigation hardware.

Customer Water Use Audit Programs

Water audits are provided as an informational service to customers and typically include an individualized, one-on-one analysis and site-specific recommendations for both indoor and outdoor water efficiency improvements. Audits can be enhanced by the delivery of relevant, action-oriented information the customer can use to change behavioral practices or participate in additional audit or rebate programs. In a water emergency or shortage, additional staff would be needed to provide water audits, rebate program administration, and outreach

assistance to residential and commercial customers. These personnel could be temporary or contract employees.

Drought Rate Schedules

Pricing is one of the most powerful tools that a utility can use to promote its conservation goals. Certain rate structures as well as water allotment plans can be developed to encourage conservation. Criteria to consider include those listed in Appendix G, "Criteria to Evaluate Water Shortage Response Plan." These criteria have different weights depending on the water reduction goals. While each criterion relates to an important objective, certain criteria need to be balanced against one another. For example, the ability to meet the "water usage reduction" criterion is impacted by the "cost minimizing" criterion with respect to enforcement and administrative staffing costs. Similarly, the "equity" criterion may involve the use of individual historical data or square footage or census data that may be unavailable except at great expense. Thus any rate structure or water allotment plan can be viewed as a balance between partly conflicting objectives in order to deal with the diversity of water needs and consumption patterns by Palo Alto residents and businesses.

Rate-based incentives have proved both efficient and effective during past water shortage periods. Based on the amount of reduction required by the SFPUC and the capabilities and limitations of the City's computerized billing system, strategies will be determined for each customer class.

In determining drought rate structures, the most likely division is of single-family residential customers as one basic group and all other customer classes in another. The number of tiers in the schedules, the increase in cost per unit and the amount of a "penalty" rate would be set according to the required amount of water reduction.

Customer Class Targets

Customer class targets will mirror the required indoor/outdoor water reduction goals that may be established during a drought. However, whether there will be different rate schedules for each customer class or different rate increase percentages applied to existing customer rate classes will be determined by: (a) the severity of the water shortage, and (b) the capabilities and limitations of the utility billing system. Experience has shown that separating the single-family residential customers – which are more homogeneous than any other customer group – from all other customer groups is generally the only distinction needed[46].

Allocation/Allotment Methods

Any allocation/allotment plan or rate incentive plan would take into consideration the criteria listed in Appendix G. These criteria will be a guide to selecting the most efficient and effective water use reduction method under the particular circumstances of a specific drought situation.

[46] The City will design rates and Class targets to achieve the highest possible water savings. Any changes will be consistent with "cost of service" principles and satisfy Proposition 218 requirements.

Allocations Based on Percentage of Past Use

Plans that base a customer's allotment on a percentage of past use are sometimes perceived as fair and easy to administer. However, these plans have three significant shortcomings. First, selection of a base year is problematic. There have been two water shortage periods in the City since l976. It would be difficult to pick a base year unaffected by shortage year programs on the one hand, or gradually increasing water use after a drought (the "rebound effect") on the other. The second problem is that each year the turnover of new accounts is approximately 20 to 30% (mostly multi-family residents). In addition, many businesses have changed their practices to some extent over the years. Therefore to use this plan in 2010 and beyond would mean that a large percentage of water customers would have an allotment based on a previous occupant's usage, a previous operation, or some alternative situation. Handling the large volume of such cases can create administrative difficulties and perceptions of inequities as revised or new allocations are assigned to these customers. The third major flaw in the "percent of past use" concept is that, regardless of base year selected, historically conservation-minded customers may feel penalized for their past efforts while profligate users may have too large an allocation.

Equal Allotment for Each Home (for single-family residential)

This plan would set an identical allotment for each home designed to meet the target reduction for the class. The first tier in the rate structure would be set at this target amount. The second tier would be a "buffer" tier designed to accommodate seasonal water needs. The third and last tier would be a penalty rate block price considerably higher than the first two tiers.

Since all homes would be treated the same, this plan suggests equity and fairness. In addition, it would be inexpensive to administer and easy to understand and implement. However, it could be perceived as unfair by relatively large families or customers with large lots.

Under this plan, hardship exemptions would be limited to those who require more water for health or safety reasons. No additional allowances would be provided for the number of persons living in the household or the landscaping requirements of the particular size lot. Enforcement of this plan would involve installing a flow restrictor on those customers who continue to exceed the allotment beyond a two-month period.

Complete Per Capita Allotment Plan (for single-family residential)

Under this plan each person would be allotted a certain amount of water per month. In addition, each household would be allotted a certain amount of water per month for other essential needs including a base minimum amount for outdoor watering of shrubs and trees. Per capita information would be based on information supplied by the customers through a special mailing. The strength of this plan is that it would probably be more acceptable to the community than the equal allotment per household plan because it takes into account the relationship between water usage and the number of persons living in a household. Its weaknesses are the inability of the Utilities Customer Information System to record or manage "per capita" data and verification of per capita information.

Default Per Capita Allotment Plan (for single-family residential)

Under this plan each household would receive an allotment that would be sufficient for families of a default size. For households over that size, an additional amount would be allotted per month for the number of people over the default size. This plan is easier to administer than a complete per capita plan since the number of data entries is significantly reduced. Based on year 2000 population estimates, of the approximately 15,000 single-family residential accounts, about 10,000 accounts have households of three persons or fewer. Therefore, if the default size were three persons, only about 5,000 accounts would need additional allotments. Thus the plan has the advantage of reduced implementation cost and is administratively more feasible than the complete per capita allotment. The plan's weakness is its lack of detail or fine-tuning for households under the default size, which may be perceived as unfair by larger households.

Mandatory Water Rationing Plans Applicable to Multi-Family Accounts, Business, and City Departments

Due to the differences between customer classes, it is difficult to construct rationing plans that meet all the criteria listed in Appendix G. During the 1987-1993 drought period, the City introduced Baseline Consumption Allowances (BCAs) for all customer classes except single-family residential accounts. This includes multi-family residential, commercial, industrial, institutional, and city facilities accounts. The BCA was intended to represent the indoor consumption of each customer.

It is important for any allocation plan to take into account the specific needs of these customer classes because of their diversity and unique requirements. The BCA does this. Rate structures using the BCAs can be constructed as appropriate to meet the reduction targets required and to provide the economic incentive necessary to prompt customer action. And, the targets and the associated rate block prices could be changed as the reduction requirement changes. Weaknesses of this method are that it may not accurately represent indoor water use. For example, exemptions would have to be considered for customers with cooling towers, since lack of water for cooling towers would effectively end the customers' ability to cool their building interiors, resulting in possible health and safety impacts of employees. Another alternative in extreme cases (Stage 3 or higher) could be an allocation per fixture plus a cooling tower credit, which is similar to the per capita method for residences.

Excessive Use Penalties

Penalties for excessive use are expected to vary according to the customer class. For single-family residential customers exceeding percent-of-past-use, equal-allotment-per-home, or per capita water use, the penalty could be installation of a flow restrictor when usage continued to exceed the allotment beyond a 2-month period or specifically-designed punitive drought rates. Enforcement of this penalty would only occur after customers had been notified and any reasonable appeals had been processed.

For customers under a BCA allotment (all classes except single family residential), the primary penalty and enforcement mechanism is in the rate structure itself. At six to ten times the basic per unit cost, excessive use results in an immediate financial penalty to the customer.

Water Use Prohibitions, Mandatory Restrictions

Adopting water use restrictions is another way to manage how customers use a limited resource. Restrictions can be classified as those preventing water waste, those "setting a tone", and those that prohibit low priority use in times of severe shortages.

Again, close coordination with SFPUC is necessary. One of the considerations for selecting which water use restriction ordinances to adopt is what our suppliers recommend for the region. Both the SFPUC and SCVWD provide recommendations, and the City will attempt to follow those recommendations so that regional consistency is achieved.

The City's ability to enforce restrictions is also a critical variable in the selection of water use regulations. For restrictions to be credible and obeyed, they must be enforceable and the City must be willing to enforce them. Therefore certain restrictions, such as limits on indoor uses such as showering, are not practical.

Water use restrictions are achieved by using the methods, prohibitions and penalties described in the sections below. Appendix H lists permanent water use restrictions that the City currently has in place and those that could be adopted on an emergency basis in times of water shortage[47].

Stages of Action

Actions to be taken in response to a water shortage depend on the severity of the shortage. The staged responses (Stage I to Stage IV) depend to some extent upon the local conditions and the length of time that customers have had to focus their attention on the water shortage. For each stage noted below, activity levels in several key areas are described. Reduction targets referred to below would use the most recent non-drought year as the base year. If a different base year were to be selected, the programs might require modification. In all stages, action will be taken to ensure City facility water use is reduced by the appropriate amount.
Some factors which influence the effectiveness of any water management plan include: (1) the customer's behavior and perception of the need to conserve; (2) weather variables; (3) the length of the drought; (4) the customer's economic situation; (5) the extent to which the City

[47] Section 12.32.015 of the Palo Alto Municipal Code, pertaining to emergency water use regulations, previously codified and containing portions of Ordinance Nos. 3960, 3984 and 4038, was suspended, but specifically not repealed, by Ordinance No. 4150, § 2. In pertinent part, Section 2 of Ordinance No. 4150 states that Section 12.32.015 is "suspended until such time as water shortage emergency conditions shall be subsequently found, determined, and declared by the Council to exist."

achieves its utility revenue targets; (6) the percentage of exemptions or variances granted; (7) the role of the media; and (8) the customer's acceptance of the need for the program.

One lesson learned from the 1987-93 drought is that the longer the water shortage, the greater the water use reduction achieved. This is likely due to a combination of factors including: (1) acknowledgement by the community that the situation is serious since it seems to be lasting; (2) realization that maintaining green lawns or other relatively unimportant landscaping is costly and not necessarily in the community's interest; (3) time for more people to get the message, a culture change over time; (4) increasing availability of conservation devices in local stores; (5) increasing examples of successful water conservation methods; and (6) more sophisticated response from the City as experience is gained.

Therefore, there is a need for some flexibility in selecting the exact strategy to be used to respond to a particular water shortage situation. Even with the same reduction target, the strategy in the first year of a drought would be different than that recommended for an additional year of a long running drought. It is very important early in a drought period to determine outreach messages and policy directions using a longer-term perspective. In this way, communications with customers throughout the drought period will be consistent and appropriate.

STAGE I: Minimum Water Shortage – 5% to 10% target water savings

The SFPUC requested voluntary reductions in this range in 1987, and again in 2009, which the City was able to achieve. In those years, SFPUC did not impose rationing.

Information Outreach and Audit Programs

The City provides ongoing informational outreach and audit programs. At this water shortage stage, the focus of these programs would be on water saving information. A low level media information campaign would begin with the emphasis on reducing waste. As water consumption is monitored, the level of emphasis would be adjusted in order to meet the reduction goal.

The City has permanent ordinances in place that prohibit the waste of water. These ordinances are sufficient for this stage of water shortage. Enforcement would be on an "as reported" basis and mostly via reminder notices.

Incentive-based Demand Side Management Programs

Programs designed to assist customers in demand side management would be continued and augmented, to the extent necessary to provide the savings required by the City's water supplier. These programs may include a toilet rebate program or incentives to remove lawn turf for less water-thirsty landscaping or to install advanced irrigation controllers. The City would continue to monitor programs being developed by other utilities in order to take advantage of regional momentum and shorten internal development time.

Drought Rate Structures

No special drought rate structure is needed at this water shortage stage. The City's standard single-family rate structure already encourages conservation by having a relatively small fixed charge and increasing block rates based on water consumption.

STAGE II: Moderate Water Shortage – 10% to 20% target water savings

The City was able to achieve this level of water reduction (19.1%) when rationing was imposed by the SFPUC in FY 1989. The program used at that time is basically the one outlined below.

Information Outreach and Audit Programs

The frequency of advertising and events comprising the information campaign would be increased. Water kits with low-cost conservation devices will be available to customers.

Incentive-based Demand Side Management Programs

Programs designed to assist customers in demand side management would be continued and augmented, to the extent necessary to provide the savings required by the City's water supplier. These programs may include incentives for replacing high water using fixtures such as toilets, clothes washers, and irrigation devices, as well as incentives to retrofit landscapes for a low water use, drought tolerant design. The City would continue to monitor programs being developed by other utilities in order to take advantage of regional momentum and shorten internal development time.

Drought Rate Structures

In response to previous water shortage conditions due to drought, the City established separate drought rate schedules for single-family residential and all other customers and increased the price difference between lower and higher consumption tiers. For all customers except single-family residential customers, the consumption tiers were based on a Baseline Consumption Allowance (BCA) concept. This concept is described in the section, Water Shortage Mitigation Options, as applicable to multi-family, commercial, industrial, public facilities and City facilities accounts. These strategies have worked effectively in the past and will be the basis for developing future strategies.

Water Use Restrictions

The City would be more vigilant in enforcing the water use restrictions. A system of warning citations leading to possible installation of a flow restrictor would be followed. A small number of emergency water use restrictions would be added. (See Appendix H)

STAGE III: Severe Water Shortage – 20% to 35% target water savings

The City achieved consumption reductions of 31.5%, 35.4%, and 32.7% in FY 1991, FY 1992, and FY 1993, respectively, when the SFPUC instituted rationing. The water conservation program implemented at that time included the following major components:

Information Outreach and Audit Programs

All activities from Stage II would continue at escalated levels. In addition, emphasis would be put on targeted outreach to high water users and special categories of water users (e.g., car washes, restaurants, etc.).

Incentive-based Demand Side Management Programs

Existing demand side management programs would be continued. Staff would continue to closely monitor overall water savings in order to determine if additional levels of rebate amounts would provide additional savings, or whether other programs would be necessary.

Drought Rate Structures

This plan does not include rationing or customer allocations. Instead, inverted rates can provide the incentive to achieve the desired results along with an extensive information outreach effort. As in Stage II, rate schedules are likely to be separate for single-family residential customers and all others. Rateblocks would be structured to fit the overall water usage reduction requirement. Price signals within the rate structure would serve to alert customers of their reduction target.

For other than single-family residential customers, the rate schedule could relate to the BCAs assigned to each customer if the BCA strategy were to be used. Prices for each of the rate tiers would increase at a greater rate than in Stage II in order to provide an incentive and rate signal. In addition, the tiers themselves would decrease in size providing for customer targets reflective of the increased reduction requirement. The exact pricing mechanism would be developed according to the capabilities and limitations of the utility billing system.

The exact rates and rate blocks would be established upon receipt of the actual information from the SFPUC regarding both the reduction requirement and applicable penalties and based on the utility's overall revenue requirements.

Water Use Restrictions

Additional "emergency" water use restrictions would be added to the existing permanent ordinances as provided in Appendix H. The amount of staff time dedicated to enforcement would be increased.

STAGE IV: Critical Water Shortage – 35% to 50% target water savings

A program to meet this level of water use reduction has not yet been implemented in the City. However, in the spring of 1991, the SFPUC adopted a program calling for reductions in this range. Although ultimately replaced with a less restrictive program, the City discussed what actions would be taken to meet the critical reduction targets. The program below outlines the major components of the plan to meet such a target.

Information Outreach and Audit Programs

All activities from Stage III would continue at further escalated levels. A greater focus will be placed on survival strategies and prioritization assistance for all customer classes.

Incentive-based Demand Side Management Programs

Depending on what programs have been implemented prior to this stage, or current market saturations for certain devices, a selected number of indoor conservation incentives will be offered. These may include rebates for and/or free distribution of showerheads and faucet aerators, toilet modifications or retrofits, process water use modifications and use of recycled water.

Drought Rate Structures

At this level of reduction, an allotment method would be considered for each customer. The allotments would be sufficient for the most critical, high priority uses of water and the availability of water for outside use would be dramatically reduced. As in Stage III, rate schedules are likely to be separate for single-family residential and all other customer classes. Various allotment methods are discussed in the previous section, Allocation/Allotment Methods.

For non single-family residential customer classes, the size of the rate blocks would decrease from Stage III as appropriate to meet the reduction goal.

Water Use Restrictions

Severe “emergency” water use restrictions, many of which will supersede less stringent restrictions imposed in a less critical phase, will be added. Enforcement will be more rigorous in terms of hours of enforcement, number of staff involved, and the speed with which penalties are applied. (See Appendix H.)

Recycled Water Use

Recycled water offers an alternative source of water to those customers with valuable landscaping. The availability of contractors who can haul recycled water will be advertised. In addition, the City will rent tanker trucks to irrigate valuable City landscaping and street trees that will undoubtedly be stressed by a long-term drought, the likely precursor to this stage of a water shortage.

Groundwater

In the event of a water shortage emergency, the City will evaluate the use of groundwater to meet any SFPUC supply deficiency. The City is limited in the amount of water that can be withdrawn from the local aquifer, so any decision to rely on groundwater will include consideration for operational limitations.

Revenue and Expenditure Impacts and Measures to Overcome Impacts

Law

> 10632. (a) The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> …(7) An analysis of the impacts of each of the actions and conditions described in paragraphs (1) to (6), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

Impact on Expenditures

Water utility expenditures can be generally categorized as fixed or variable expenses. The variable costs are almost entirely related to the costs of purchasing water supplies. Although the SFPUC supply costs are expressed as a variable commodity rate, the SFPUC system, like many water delivery systems, is almost exclusively a fixed cost conveyance and treatment system. As a retail provider, the City's fixed costs primarily relate to the cost of operating and maintaining the City's distribution system.

As consumption falls, the fixed expenses must be spread over fewer units sold which can trigger a rate increase (see below). In addition, costs for the informational outreach programs during a water shortage increase. During a Stage I shortage, the costs for voluntary demand-side management programs may only increase slightly on a per-unit basis with an anticipated rise in program participation levels. Estimates for those costs are relatively small for voluntary programs – $30,000 for Stage I and $55,000 for Stage II. For mandatory programs, enforcement and advertising efforts are escalated and the costs rise. Estimates are $100,000 for Stage III and $150,000 for Stage IV. The net effect is an increase in the expenses per unit of water sold.

Impact on Revenues

From a utility perspective, there is a downside to water conservation – the erosion of sales revenue. As consumers reduce their usage in response to the drought, the utility will experience a decline in sales. This decline in sales revenue will necessarily be greater than the associated decline in fixed expenses due to the volumetric retail rate structure. The impact of

decreased revenues on operations can be mitigated to some extent by drawing upon cash reserve balances or enacting a rate increase.

An approach for short-term revenue shortfalls is to draw upon the utility's cash reserves, if they are sufficient, to cover the financial obligations of the utility. One longer-term approach is to establish a reserve for this purpose and to earmark penalty surcharge revenue (applicable for usage above allotment or target levels) as a funding source for this reserve. Other options include short term borrowing or financing long-term capital projects through revenue bonds rather than through current rates. Each of these approaches has its advantages and disadvantages. The appropriate response depends upon the specific circumstances facing the utility at that moment and other factors.

Reduction Measuring Mechanism

Law

> 10632. (a) The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier:
>
> …(9) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

Under normal water supply conditions, the amount of water coming into the City from the SFPUC regional supply line is metered at the Arastradero, California, Page Mill, Sand Hill and Lytton turnouts. The daily meter readings are maintained at the Utility Control Center. Totals are reported monthly to CPAU's Resource Management Division for comparison to the billing amounts from the SFPUC.

In water shortage periods, the Director of Utilities would form an ad hoc Water Committee with representatives of all divisions to oversee outreach and monitoring efforts. During curtailment stages in a water shortage, supply figures are reported to the Utilities Resource Management Division on a daily basis with copies to the Utility Marketing Services office. The Water Committee would provide timely reports to the City Council on the shortage and success of measures taken.

If curtailment reaches Stage III or Stage IV, daily supply figures are reported to the Director of Utilities in addition to the Resource Management Division with copies to Utility Marketing Services and the Water Committee. The Water Committee would report monthly to City Council or as frequently as information is requested by the City Council.

Water Shortage Contingency Ordinance/Resolution

Law

> 10632. (a) The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier:
>
> …(8) A draft water shortage contingency resolution or ordinance.

The City has experienced two instances of water shortage due to drought in the last 35 years. A shorter duration drought occurred in l976-77, and a longer water supply deficit occurred between l987 and l993. Appendix F provides a draft model Ordinance that could be implemented during a water shortage emergency.

Section 8 – Supply and Demand Comparison Provisions

Law

> 10635 (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from the state, regional, or local agency population projections within the service area of the urban water supplier.

Supply and Demand Comparison

Since the City's primary water supply is the SFPUC, it is useful to examine the supply-demand comparison for the entire SFPUC system.

Table 40 Illustrates total system deliveries for both the retail and wholesale SFPUC customers. It indicates that during normal precipitation years, the SFPUC has adequate supplies to meet its contractual obligation to the wholesale customers of 184 MGD.

Table 40: SFPUC System Supply and Demand Comparison[48]

	2010	2015	2020	2025	2030
Wholesale Supply Total	184	184	184	184	184
SFPUC Retail Supply	81	81	81	81	81
System Supply Totals	265	265	265	265	265
Unit of Measure: MGD					

In adopting the WSIP, the SFPUC approved a water supply plan that provides for an Interim Supply Allocation with an automatic sunset in 2018. For the period up to the sunset of the ISL in 2018, Palo Alto's Interim Supply Allocation is 14.70 MGD[49]. The SFPUC has deferred consideration of several supply issues until 2018 pending additional studies and analysis of the

[48] Letter from Paula Kehoe, SFPUC Director of Water Resources, to Nicole Sandkulla, BAWSCA, dated February 22, 2010

[49] As stated in earlier sections, the SFPUC unilaterally imposed the ISL on the BAWSCA agencies without prior agreement or discussion. The legality of the ISL is a potential future issue if deliveries from the regional system exceed the 265 MGD threshold for the ISL. Palo Alto's ISG is a perpetual entitlement that can only be reduced pursuant to the terms outlined in the WSA. For planning purposes the City relies solely on the ISG.

SFPUC system. For purposes of the 2010 UWMP, the SFPUC has provided a supply commitment of 184 MGD for the wholesale agencies through 2030. The City has an ISG of 17.07 MGD (or 19,118 AFY) and projects demands will remain below the City's ISG through the 2010 UWMP planning horizon. Table 41 represents the City's Supply and Demand balance for the 2010 planning Horizon based on the City's contractual entitlement with the SFPUC.

Table 41: City of Palo Alto Supply/Demand Balance (AFY)				
	2015	**2020**	**2025**	**2030**
Projected SFPUC demand	14,253	14,157	14,353	14,971
Individual Supply Guarantee	19,118	19,118	19,118	19,118
Difference	4,866	4,962	4,766	4,148

As previously discussed, projects as described in the WSIP will be required to meet demands during multiple dry years. The new water sources assumed to be available, with implementation dates, are summarized in Table 42.

Table 42: SFPUC Water Supply Options for Years 2010 through 2030 (AFY)					
Water Supply Option	2010	2015	2020	2025	2030
Crystal Springs Reservoir Storage Recovered to 22.28 billion gallons	x	√	√	√	√
Westside Basin Groundwater	x	8,100	8,100	8,100	8,100
Calaveras Reservoir Storage Recovered to. 31.5 billion gallons	x	√	√	√	√
Water Transfer	2240	2240	2240	2240	2240

Given the additional supplies assumed to be available, Appendix I Illustrates the level of single and multi year water delivery shortages that can be expected in the future based on historical hydrologic periods and assuming the Wholesale customer normal year demand remains at 184 MGD.

Appendix J depicts anticipated SFPUC shortages on a system-wide basis. The impact on the City will depend on how the shortage is applied to the City. For water shortages up to 20%, the Tier 1 water shortage plan will be applied. The formula included in the Tier 1 plan indicates that the cutback for the City will be similar to the system-wide cutback, but less than the average BAWSCA cutback. For system-wide shortages greater than 20%, the SFPUC will follow the Tier 1 plan up to the 20% reduction, and meet and discuss incremental reductions above the Tier 1 plan with the wholesale customers. The SFPUC has the authority to make final allocation

decision for the portion above 20%, though the wholesale customers have the contractual right to challenge the proposed approach.[50]

During a severe drought the City could utilize groundwater to supplement SFPUC supplies, but the City anticipates that even in dire circumstances only a small amount of groundwater would be served (e.g. < 10% of overall demand). In response to a severe drought the City would work with residents and businesses to significantly reduce water use, and groundwater from City wells would be considered a supplemental resource. Additional information on the City's drought response is included in Section 7, "Water Shortage Contingency Plan."

[50] WSA, Section 3.11 (c)(3)

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APPENDIX A - Resolution Adopting UWMP

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RESOLUTION NO. 9174

Resolution of the Council of the City of Palo Alto Adopting the 2010 Urban Water Management Plan to be Submitted to the California Department Of Resources and Approving the use of Method One To Determine the City's 2020 Urban Water Use Target and 2015 Interim Urban Water Use Target In Compliance With the Water Conservation Act of 2009

WHEREAS, the California Legislature has enacted the Urban Water Management Planning Act, California Water Code Sections 10610 – 10656, as amended, which requires every urban water supplier providing water to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to prepare an urban water management plan ("Plan") that has as its primary objective the conservation and efficient use of water; and

WHEREAS, the City of Palo Alto ("City"), a municipal utility and chartered city, is an urban water supplier providing water to a population over 60,000; and

WHEREAS, the Plan must be reviewed at least once every five years by the City, which must amend the Plan, as necessary, after it has conducted a review; and

WHEREAS, the preparation of the updated Plan has been coordinated with other public agencies to the extent practicable, and staff has encouraged the active involvement of diverse social, cultural and economic sectors of the population within the City's retail water service area during preparation of the Plan; and

WHEREAS, the Plan must be adopted by July 1, 2011, after it is first made available for public inspection and a public hearing is noticed and held, and it must be filed with the California Department of Water Resources within thirty days of adoption; and

WHEREAS, the California Legislature enacted the Water Conservation Act of 2009 (SBX7-7), which requires each urban retail water supplier to develop an urban water use target for the year 2020 and an interim urban water use target for the year 2015; and

WHEREAS, the City as an urban retail water supplier must adopt one of four methods outlined in California Water Code 10608.20(b) for determining urban and interim urban water targets; and

WHEREAS, the City has considered each of the four methods for calculating its urban and interim urban water targets; and

WHEREAS, "Method One" is outlined in California Water Code Section 10608.20(b)(1), and is based on eighty percent of the urban water user's baseline gallons per capita per day water use; and

WHEREAS, after reviewing a draft Plan at their meeting of May 4, 2011, the Utilities Advisory Commission recommended that the Council adopt the Plan as presented; and

WHEREAS, a noticed public hearing on the revised draft Plan and the adoption of the SBX7-7 methodology was held by the City Council on June 13, 2011, at which time public comments were heard and considered.

NOW, THEREFORE, the Council of the City of Palo Alto does RESOLVE as follows:

SECTION 1. The Council hereby adopts the 2010 Urban Water Management Plan of the City of Palo Alto, which shall be filed with the City Clerk. The City Manager is hereby authorized and directed to file the 2010 Urban Water Management Plan of the City of Palo Alto with the California Department of Water Resources and the State Library.

SECTION 2. The Council hereby adopts Method One as outlined in California Water Code Section 10608.20(b)(1) to determine the City's urban water use target;

SECTION 3. The Council authorizes the urban water use target determined by Method One for use in the City's 2010 Urban Water Management Plan; and

SECTION 4. The Council finds and determines that, under the California Water Code Section 10652, the adoption of the Plan and this resolution does not constitute a project under the California Environmental Quality Act, and no environmental assessment is required.

INTRODUCED AND PASSED: JUNE 13, 2011

AYES: BURT, ESPINOSA, HOLMAN, KLEIN, PRICE, SCHARFF, SCHMID, SHEPHERD, YEH

NOES:

ABSENT:

ABSTENTIONS:

ATTEST:

City Clerk

APPROVED AS TO FORM:

Acting Deputy City Attorney

APPROVED:

Mayor

City Manager

Director of Utilities

Director of Administrative Services

110506 dm 83600155

APPENDIX B – Public Participation Notices

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CITY OF PALO ALTO

NOTICE OF PUBLIC HEARINGS ON URBAN WATER MANAGEMENT PLAN AND URBAN WATER USE TARGETS

NOTICE IS HEREBY GIVEN that the Palo Alto City Council will hold a public hearing at the regularly scheduled meeting on Monday, June 13, 2011 at 7:00 p.m. or as near thereafter as possible, in the Council Chambers, 250 Hamilton Avenue, Palo Alto for the following purposes:

1. To consider the City of Palo Alto (City) adoption of the draft 2010 Urban Water Management Plan (Draft 2010 Plan) in compliance with the California Urban Water Management Planning Act; and
2. To allow community input regarding the City's implementation plan for compliance with the California Water Conservation Act of 2009 (SBx7-7), consider the economic impacts of its implementation, and adopt a method for determining the City's urban water use target as required under SBx7-7.

The California Urban Water Management Planning Act requires the City to review and update its Urban Water Management Plan every five years. The City's Draft 2010 Plan includes an evaluation of methods to comply with the requirements of SBx7-7. The Draft 2010 Plan is available for public review and comment through the end of the public hearing described above. The Draft 2010 Plan is available online for public review at www.cityofpaloalto.org/uwmp, in print at the City libraries, and in the Council Chambers of City Hall.

DONNA J. GRIDER, MMC
City Clerk

Publish on Friday, May 27, 2011 and Friday, June 3, 2011
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CITY OF PALO ALTO

NOTICE OF PUBLIC HEARINGS ON URBAN WATER MANAGEMENT PLAN AND URBAN WATER USE TARGETS

NOTICE IS HEREBY GIVEN that the Palo Alto City Council will hold a public hearing at the special scheduled meeting on Monday, June 13, 2011 at 6:00 p.m. or as near thereafter as possible, in the Council Chambers, 250 Hamilton Avenue, Palo Alto for the following purposes:

1. To consider the City of Palo Alto (City) adoption of the draft 2010 Urban Water Management Plan (Draft 2010 Plan) in compliance with the California Urban Water Management Planning Act; and
2. To allow community input regarding the City's implementation plan for compliance with the California Water Conservation Act of 2009 (SBx7-7), consider the economic impacts of its implementation, and adopt a method for determining the City's urban water use target as required under SBx7-7.

The California Urban Water Management Planning Act requires the City to review and update its Urban Water Management Plan every five years. The City's Draft 2010 Plan includes an evaluation of methods to comply with the requirements of SBx7-7. The Draft 2010 Plan is available for public review and comment through the end of the public hearing described above. The Draft 2010 Plan is available online for public review at www.cityofpaloalto.org/uwmp, in print at the City libraries, and in the Council Chambers of City Hall.

DONNA J. GRIDER, MMC
City Clerk

MOVIE TIMES

42nd Street (1933)	**Stanford Theatre:** Wed. & Thu. at 7:30 p.m.
Babes in Arms (1939)	**Stanford Theatre:** Wed. & Thu. at 5:45 & 9:10 p.m.
Bridesmaids (R) ★★★1/2	**Century 16:** 1:25, 4:20, 7:40 & 10:40 p.m.; Fri.-Mon. also at 10:30 a.m. **Century 20:** 11 a.m.; 12:35, 1:55, 3:35, 4:55, 6:30, 7:50, 9:25 & 10:45 p.m.
Cave of Forgotten Dreams (G) (Not Reviewed)	**Century 16:** In 3D at 11:20 a.m.; 1:40, 4:05, 7:20 & 10:15 p.m. **Century 20:** In 3D at 12:05, 2:20, 4:35, 7 & 9:15 p.m.
The Conspirator (PG-13) (Not Reviewed)	**Palo Alto Square:** Fri.-Tue. & Thu. at 4:30 p.m.; Fri.-Sun. also at 9:45 p.m.
The Double Hour (Not Rated) (Not Reviewed)	**Aquarius Theatre:** 2, 4:30, 7 & 9:30 p.m.
Everything Must Go (R) (Not Reviewed)	**Palo Alto Square:** 2 p.m.; Fri.-Tue. & Thu. also at 7:20 p.m.
Fast Five (PG-13) (Not Reviewed)	**Century 16:** 11 a.m.; 1:55, 4:50, 7:45 & 10:40 p.m. **Century 20:** 10:40 a.m.; 1:45, 4:40, 7:40 & 10:35 p.m.
The First Grader (PG-13) (Not Reviewed)	**Palo Alto Square:** 2:15, 4:45 & 7:15 p.m.; Fri.-Sun. also at 9:50 p.m.
The Hangover Part II (R) (Not Reviewed)	**Century 16:** 11:30 a.m.; noon, 12:30, 1:30, 2, 2:30, 3, 4, 4:30, 5:10, 5:30, 7, 7:30, 8, 8:40, 9:40, 10:20 & 11:10 p.m.; Fri.-Sun. also at 10 & 10:50 a.m. & 11:10 p.m.; Mon. also at 10 & 10:50 a.m.; Tue.-Thu. also at 11 a.m. **Century 20:** Fri.-Mon. at 10:50 a.m.; 12:10, 12:45, 1:30, 2:10, 2:45, 3:30, 4:05, 4:40, 5:20, 6, 6:45, 7:25, 8, 8:40, 9:20, 9:45, 10:05, 10:40 & 10:50 p.m.; Fri. also at 10:20 p.m.; Tue. at 12:10, 2:45, 5:20, 8 & 10:40 p.m.
Incendies (R) (Not Reviewed)	**Aquarius Theatre:** 2:30, 5:30 & 8:30 p.m.
Kung Fu Panda 2 (PG) (Not Reviewed)	**Century 16:** 11 a.m.; 1:25, 3:05, 4, 6:30, 8 & 9 p.m.; Fri.-Mon. also at 10 a.m.; In 3D at 11:40 a.m.; 12:30, 2:10, 4:40, 5:30, 7:10, 9:40 & 10:30 p.m. **Century 20:** Fri.-Mon. at 10:30, 11:20 & 11:50 a.m.; 12:55, 3:20, 4:50, 5:40, 8:05, 9:40 & 10:25 p.m.; Tue. at 10:30 a.m.; 12:55, 3:20, 5:40, 8:05 & 10:25 p.m.; In 3D Fri.-Mon. at 11 a.m.; 1:25, 2:15, 3:50, 6:10, 7:15 & 8:30 p.m. Sat 10:30, 11:20 & 11:50 a.m.; In 3D Tue. 11 a.m. & 1:25, 3:50, 6:10, 8:30 & 10:50 p.m.
Maytime (1937)	**Stanford Theatre:** Fri. at 7:30 p.m.
The Metropolitan Opera: Die Walküre (Not Rated) (Not Reviewed)	**Century 20:** Wed. at 6:30 p.m. **Palo Alto Square:** Wed. at 6:30 p.m.
Midnight in Paris (PG-13) (Not Reviewed)	**Guild Theatre:** 2:30, 5, 7:15 & 9:30 p.m.; Fri.-Mon. also at noon.
The Pirate (1948)	**Stanford Theatre:** Sat.-Mon. at 5:35 & 9:25 p.m.
Pirates of the Caribbean: On Stranger Tides (PG-13) ★★1/2	**Century 16:** Noon, 1:10, 3:10, 4:40, 6:40, 8:30 & 10 p.m.; Fri.-Mon. also at 10 a.m.; In 3D at 11 a.m.; 12:40, 2:10, 3:50, 5:40, 7:30, 9 & 10:35 p.m. **Century 20:** 11:40 a.m.; 12:20, 1:40, 3, 3:40, 5, 6:15, 6:50, 8:15, 9:35 & 10 p.m.; In 3D at 11:10 a.m.; 12:50, 2:30, 4:10, 5:50, 7:30, 9 & 10:35 p.m.
Priest (PG-13) (Not Reviewed)	**Century 20:** 2 & 7 p.m.; In 3D at 11:55 a.m. & 4:50 p.m.
Rio (PG) ★★	**Century 16:** Fri.-Wed. at 1:20 & 7 p.m.; In 3D Fri.-Thu. at 3:55 & 9:55 p.m.; Also in 3D Fri.-Mon. at 10:45 a.m. **Century 20:** 11:35 a.m. & 4:25 p.m.; In 3D at 2:15 & 7:20 p.m.
Singin' in the Rain (1952)	**Stanford Theatre:** Sat.-Mon. at 7:30 p.m.; Sat. & Sun. also at 3:40 p.m.
Something Borrowed (PG-13) ★1/2	**Century 16:** 10:30 p.m. **Century 20:** 11:35 a.m.
Thor (PG-13) ★★★	**Century 16:** 4:10 & 9:55 p.m.; Fri.-Mon. also at 10:40 a.m.; In 3D at 1:15 & 7:05 p.m. **Century 20:** 11:45 a.m.; 2:35, 5:15, 7:55 & 10:40 p.m.; In 3D at 10:45 a.m.; 1:35, 4:15, 6:55 & 9:45 p.m.
The Vagabond King (1930)	**Stanford Theatre:** Fri. at 5:35 & 9:50 p.m.
X-Men: First Class (PG-13) (Not Reviewed)	**Century 16:** Thu. at 12:01 a.m. **Century 20:** Thu. at 12:01 a.m.

★ Skip it ★★ Some redeeming qualities ★★★ A good bet ★★★★ Outstanding

Internet address: For show times, plot synopses, theater addresses, trailers and more information about films playing, go to PaloAltoOnline.com.

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(continued from previous page)

sensation in 2009. The principal cast — led by hunk du jour Bradley Cooper, "Office" standout Ed Helms and oddball funnyman Zach Galifianakis — returns for this comical romp through the streets of Bangkok, Thailand.

And while Cooper, Helms, Galifianakis and Ken Jeong (reprising his role from the first film) serve up terrific performances and plenty of humor, "Hangover Part II" is so similar to its predecessor — right down to the "hurry up and get to the wedding" climax — that the story feels stale after about the first 30 minutes. Director Todd Phillips and his filmmaking team could have taken a lesson from anyone who has ever experienced an actual hangover: One is enough.

Phil (Cooper), Stu (Helms), Doug (Justin Bartha) and Alan (Galifianakis) — the "wolf pack" from the first flick — reunite for Stu's wedding to Thai beauty Lauren (Jamie Chung of "Sucker Punch"). Stu is somewhat of a square, ridiculed by his condescending soon-to-be father-in-law and determined to avoid the same kind of bachelor-party antics that led him to lose a tooth in the first "Hangover." So the gang — joined by Lauren's younger brother

City of Palo Alto
Utilities Department

May 26, 2011

Paula Kehoe
San Francisco Public Utilities Commission
1145 Market Street, 4th Floor
San Francisco, CA 94103

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Dear Ms. Kehoe,

Re: City of Palo Alto Public Hearing to Consider Adoption of the Urban Water Management Plan and SBx7-7 Compliance Strategy

This is to notify you that the City of Palo Alto City Council will hold a public hearing at the regularly scheduled meeting on Monday, June 13, 2011 at 7:00 p.m. or as near thereafter as possible, in the Council Chambers, 250 Hamilton Avenue, Palo Alto, to Consider Adoption of the 2010 Urban Water Management Plan. California law requires that the City review and update the Urban Water Management Plan (UWMP) every five years.

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Questions and comments can be directed to Catherine Elvert at (650) 329-2417 or Nicolas Procos at (650) 329-2214.

Sincerely,

City of Palo Alto Utilities

P.O. Box 10250
Palo Alto, CA 94303

City of Palo Alto
Utilities Department

May 26, 2011

Jody Hall Esser
County of Santa Clara
Planning and Development Department
70 West Hedding
San Jose, CA 95110

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Dear Ms. Jody Hall Esser,

Re: City of Palo Alto Public Hearing to Consider Adoption of the Urban Water Management Plan and SBx7-7 Compliance Strategy

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Sincerely,

City of Palo Alto Utilities

P.O. Box 10250
Palo Alto, CA 94303

City of Palo Alto
Utilities Department

May 26, 2011

Sandy Oblonsky
Santa Clara Valley Water District
5750 Almaden Expwy
San Jose, CA 95118

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Dear Ms. Oblonsky,

Re: City of Palo Alto Public Hearing to Consider Adoption of the Urban Water Management Plan and SBx7-7 Compliance Strategy

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Sincerely,

City of Palo Alto Utilities

P.O. Box 10250
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City of Palo Alto
Utilities Department

May 26, 2011

Art Jensen
BAWSCA
155 Bovet Road, Suite 302
San Mateo, CA 94402

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Dear Mr. Jensen,

Re: City of Palo Alto Public Hearing to Consider Adoption of the Urban Water Management Plan and SBx7-7 Compliance Strategy

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Sincerely,

City of Palo Alto Utilities

P.O. Box 10250
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City of Palo Alto
Utilities Department

May 26, 2011

Margaret Laporte
Stanford University
Utilities for Water Resources & Environmental Quality
327 Bonair Siding
Stanford, CA 94305

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Dear Ms. Laporte,

Re: City of Palo Alto Public Hearing to Consider Adoption of the Urban Water Management Plan and SBx7-7 Compliance Strategy

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Sincerely,

City of Palo Alto Utilities

P.O. Box 10250
Palo Alto, CA 94303

City of Palo Alto
Utilities Department

May 26, 2011

James Allen
City of Palo Alto RWQCP
2501 Embarcadero Way
Palo Alto, CA 94303

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Dear Mr. Allen,

Re: City of Palo Alto Public Hearing to Consider Adoption of the Urban Water Management Plan and SBx7-7 Compliance Strategy

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Sincerely,

City of Palo Alto Utilities

P.O. Box 10250
Palo Alto, CA 94303

City of Palo Alto
Utilities Department

May 26, 2011

Justin S. Ezell
City of Redwood City
1400 Broadway
Redwood City, CA 94063

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Dear Mr. Ezell,

Re: City of Palo Alto Public Hearing to Consider Adoption of the Urban Water Management Plan and SBx7-7 Compliance Strategy

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Sincerely,

City of Palo Alto Utilities

P.O. Box 10250
Palo Alto, CA 94303

City of Palo Alto
Utilities Department

May 26, 2011

Patrick Walter
Purissima Hills Water District
26375 Fremont Road
Los Altos Hills, CA 94022

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Dear Mr. Walter,

Re: City of Palo Alto Public Hearing to Consider Adoption of the Urban Water Management Plan and SBx7-7 Compliance Strategy

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Sincerely,

City of Palo Alto Utilities

P.O. Box 10250
Palo Alto, CA 94303

City of Palo Alto
Utilities Department

May 26, 2011

Elizabeth Flegel
City of Mountain View
500 Castro Street
Mountain View, CA 94041

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Water-Gas-Wastewater
650.496.6982
650.496.6924 fax

Dear Ms. Flegel,

Re: City of Palo Alto Public Hearing to Consider Adoption of the Urban Water Management Plan and SBx7-7 Compliance Strategy

This is to notify you that the City of Palo Alto City Council will hold a public hearing at the regularly scheduled meeting on Monday, June 13, 2011 at 7:00 p.m. or as near thereafter as possible, in the Council Chambers, 250 Hamilton Avenue, Palo Alto, to Consider Adoption of the 2010 Urban Water Management Plan. California law requires that the City review and update the Urban Water Management Plan (UWMP) every five years.

At this public hearing, the City Council will also consider adoption of a method for determining the City's urban water use target as directed for compliance with the Water Conservation Act of 2009 (SBx7-7). As part of the 2010 UWMP, the City of Palo Alto must develop an urban water use target for the year 2020. California law requires that in conjunction with the City's update to the UWMP, the community be given an opportunity to provide input on the City's strategy for adopting an urban water use target. The urban water use target, any impacts to the local economy, and the City's method of determining its urban water use target are addressed in the City's update to the UWMP.

The Palo Alto City Council will accept public comments at this hearing to review and adopt the 2010 UWMP and SBx7-7 compliance strategy.

The draft update to the Plan is available online for public review and comments at www.cityofpaloalto.org/uwmp and in print in the Council Chambers of Palo Alto City Hall.

Questions and comments can be directed to Catherine Elvert at (650) 329-2417 or Nicolas Procos at (650) 329-2214.

Sincerely,

City of Palo Alto Utilities

P.O. Box 10250
Palo Alto, CA 94303

City of Palo Alto
Utilities Department

May 26, 2011

Rebecca Fotu
City of Menlo Park
701 Laurel Street
Menlo Park, CA 94025

Divisions

Administration

Director's Office
650.329.2277
650.321.0651 fax

Public Relations
650.329.2656
650.321.0651 fax

Customer Support Services

Customer Service Center
650.329.2161
650.617.3142 fax

Credit and Collection
650.329.2333
650.617.3142 fax

Utility Marketing Services
650.329.2241
650.617.3140 fax

Fiber Optics
650.329.2241
650.617.3140 fax

Engineering

Electric
650.566.4500
650.566.4536 fax

Water-Gas-Wastewater
650.566.4501
650.566.4536 fax

Resource Management

650.329.2689
650.326.1507 fax

Operations

Electric
650.496.6934
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Water-Gas-Wastewater
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Sincerely,

City of Palo Alto Utilities

P.O. Box 10250
Palo Alto, CA 94303

City of Palo Alto
Utilities Department

May 26, 2011

Anthony Docto, Jr.
City of East Palo Alto
1960 Tate Street
East Palo Alto, CA 94303

Divisions

Administration

Director's Office
650.329.2277
650.321.0651 fax

Public Relations
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Dear Mr. Docto, Jr.,

Re: City of Palo Alto Public Hearing to Consider Adoption of the Urban Water Management Plan and SBx7-7 Compliance Strategy

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Questions and comments can be directed to Catherine Elvert at (650) 329-2417 or Nicolas Procos at (650) 329-2214.

Sincerely,

City of Palo Alto Utilities

P.O. Box 10250
Palo Alto, CA 94303

City of Palo Alto
Utilities Department

May 26, 2011

Catherine Martineau
Canopy
3921 East Bayshore Road
Palo Alto, CA 94303

Divisions

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650.321.0651 fax

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Dear Ms. Martineau,

Re: City of Palo Alto Public Hearing to Consider Adoption of the Urban Water Management Plan and SBx7-7 Compliance Strategy

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Questions and comments can be directed to Catherine Elvert at (650) 329-2417 or Nicolas Procos at (650) 329-2214.

Sincerely,

City of Palo Alto Utilities

P.O. Box 10250
Palo Alto, CA 94303

APPENDIX C - CUWCC Best Management Practices Reports

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CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

Agency: City of Palo Alto **District Name:** City of Palo Alto **CUWCC Unit #:** 71
Retail

Primary Contact Catherine Elvert **Telephone** (650) 329-2417 **Email:** catherine.elvert@cityofpaloalto.org

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

GPCD in 2010	**171**
GPCD Target for 2018	179

Year	Report	Target		Highest Acceptable Bound	
		% Base	GPCD	% Base	GPCD
2010	1	96.4%	210	100%	218
2012	2	92.8%	202	96%	210
2014	3	89.2%	194	93%	202
2016	4	85.6%	186	89%	194
2018	5	82.0%	179	82%	179

Not on Track if 2010 GPCD is > than target

GPCD in 2010	171
Highest Acceptable GPCD for 2010	218

On Track

Agency: City of Palo Alto **District Name:** City of Palo Alto **CUWCC Unit #:** 71
Retail

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

Foundational BMPs

BMP 1.1 Operational Practices

		2009	2010	
1.Conservation Coordinator provided with necessary resources to implement BMPs?	Name	Amanda Cox	Catherine Elvert	Conservation Coordinator provided with necessary resources to implement BMPs?
	Title	Utility Account Representative	Utility Account Representative	
	Email		catherine.elvert@	
		On Track	**On Track**	

2. Water waste prevention documentation	Descriptive File	Water Shortage Contingency		On Track if any one of the 6 ordinance actions done, plus documentation or links provided
	Descriptive File 2010		Water Shortage Contingency Plan Draft Ordinance, Water Shortage Contingency Plan Evaluation Criteria, and Water Shortage Contingency	
	URL	Chapter 12.32 of the Palo Alto Municipal Code (PAMC)		
	URL 2010		http://www.cityofpaloalto.org/depts/clk/municipal_code.asp	
	Describe Ordinance Terms	Chapter 12.32 of the Palo Alto Municipal Code (PAMC)		
	Describe Ordinance Terms 2010		Chapter 12.32 of the Palo Alto Municipal Code (PAMC) establishes water use regulations prohibiting water waste. This ordinance is	
		On Track	**On Track**	

Agency: City of Palo Alto **District Name:** City of Palo Alto **CUWCC Unit #:** 71
Retail

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

BMP 1.2 Water Loss Control

	2009		
Complete a prescreening Audit	no	Not on Track	On Track if Yes
Metered Sales	11,377		
Verifiable Other Uses	0		
Total Supply	13,040		
(Metered Sales + System uses)/ Total Supply >0.89	0.87	Not on Track	On Track if =>.89, Not on Track if No
If ratio is less than 0.9, complete a full scale Audit in 2009?	no		
Verify Data with Records on File?	no	Not on Track	On Track if Yes
Operate a system Leak Detection Program?	no	Not on Track	On Track if Yes

	2010		
Compile Standard Water Audit using AWWA Software?	No	Not on Track	On Track if Yes, Not on Track if No
AWWA file provided to CUWCC?	0	Not on Track	On Track if Yes, Not on Track if No
AWWA Water Audit Validity Score?	0		Info only until 2012
Completed Training in AWWA Audit Method?	no		
Completed Training in Component Analysis Process?	No		Info only until 2012
Complete Component Analysis?	No		Info only until 2012
Repaired all leaks and breaks to the extent cost effective?	Yes	On Track	On Track if Yes, Not on Track if No
Locate and repair unreported leaks to the extent cost effective.	Yes	On Track	On Track if Yes, Not on Track if No
Maintain a record-keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair.			Info only until 2012

Provided 7 types of Water Loss Control Info — Info only until 2012

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

Agency: City of Palo Alto **District Name:** City of Palo Alto **CUWCC Unit #:** 71
Retail

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

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

		2009		2010		
Exemption or 'At least as Effective As' accepted by CUWCC						If signed MOU prior to 31 Dec 1997, On Track if all connections metered; If signed after 31 Dec 1997, complete meter installations by 1 July 2012 or within 6 yrs of signing and 20% biannual reduction of unmetered connections.
Numbered Unmetered Accounts	2008	0	On Track	0	On Track	On Track if no unmetered accounts
Metered Accounts billed by volume of use		Yes	On Track	Yes	On Track	Volumetric billing required for all connections on same schedule as metering
Number of CII accounts with Mixed Use meters		0		0		Info only
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?		No	On Track	No	On Track	Due in 2011, next reporting period
Feasibility Study provided to CUWCC?		Yes	On Track	No	On Track	On Track if Yes, Not on Track if No
Completed a written plan, policy or program to test, repair and replace meters		Yes	On Track	Yes	On Track	On Track if Yes, Not on Track if No

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

Agency: City of Palo Alto **District Name:** City of Palo Alto **CUWCC Unit #:** 71
Retail

Primary Contact Catherine Elvert **Email:** catherine.elvert@cityofpaloalto.org

1.4 Retail Conservation Pricing

Metered Water Rate Structure

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

Customer Class	2009 Rate Type	Conserving Rate?	Customer Class	2010 Rate Type	Conserving Rate?
Single-Family	Increasing Block	Yes	Single-Family	Increasing Block	Yes
Multi-Family	Uniform	Yes	Multi-Family	Uniform	Yes
Commercial	Uniform	Yes	Commercial	Uniform	Yes
Institutional	Uniform	Yes	Institutional	Uniform	Yes
Industrial	Uniform	Yes	Industrial	Uniform	Yes
	On Track			On Track	

Year Volumetric Rates began for Agencies with some Unmetered Accounts

Info only

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

Agency: City of Palo Alto
Retail

District Name: City of Palo Alto

CUWCC Unit #: 71

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

Adequacy of Volumetric Rates) for Agencies with No Unmetered Accounts

Customer Class	2009 Rate Type	2009 Volumetric Revenues $1000s	2010 Rate Type	2010 Volumetric Revenues $1000s
Single-Family	Increasing Block	$ 11,413	Increasing Block	$ 11,242
Multi-Family	Uniform	$ 3,600	Uniform	$ 3,578
Commercial	Uniform	$ 4,108	Uniform	$ 4,148
Institutional	Uniform	$ 1,566	Uniform	$ 1,404
Industrial	Uniform	$ 1,560	Uniform	$ 1,512
Dedicated Irrigation	Uniform	$ 2,661	Uniform	$ 2,160
Fire Lines	Uniform	$ 60	Uniform	$ 30
Total Revenue Commodity Charges (V):		$ 24,969		$ 24,073
Total Revenue Fixed Charges (M):		$ 1,717		$ 1,798
Calculate: V / (V + M):		94%		93%
		On Track		On Track

Canadian Water & Wastewater Rate Design Model Used and Provided to CUWCC: 2009 **No**; 2010 **No**

If Canadian Model is used, was 1 year or 3 year period applied?

Agency Choices for rates:

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

B) Use Canadian model.

Agencies signing MOU after 13June2007, implementation starts July 1 of year following signing.

Agency: City of Palo Alto **District Name:** City of Palo Alto **CUWCC Unit #:** 71
Retail

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

Wastewater Rates

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

Customer Class	2009 Rate Type	Conserving Rate?	Customer Class	2010 Rate Type	Conserving Rate?
Single-Family	Non-Volumetric Flat Rate	No	Single-Family	Non-Volumetric Flat Rate	No
Multi-Family	Non-Volumetric Flat Rate	No	Multi-Family	Non-Volumetric Flat Rate	No
Commercial	Uniform	Yes	Commercial	Uniform	Yes
Institutional	Uniform	Yes	Institutional	Uniform	Yes
Industrial	Uniform	yes	Industrial	Uniform	Yes
		Not on Track			Not on Track

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

Comments: The City of Palo Alto assesses a wastewater charge to its residential customers based upon an analysis of average winter baseline consumption. The fixed rate is therefore assessed with an analysis of volumetric use as a contributing factor. There is the possibility that the City will consider a different rate structure for this customer class in the future, but there are a number of technical and legal challenges to our agency implementing a volumetric rate for our residential customers.

Comments: The City of Palo Alto assesses a wastewater charge to its residential customers based upon an analysis of average winter baseline consumption. The fixed rate is therefore assessed with an analysis of volumetric use as a contributing factor. There is the possibility that the City will consider a different rate structure for this customer class in the future, but there are a number of technical and legal challenges to our agency implementing a volumetric rate for our residential customers.

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

Agency: City of Palo Alto **District Name:** City of Palo Alto **CUWCC Unit #:** 71

Coverage Report Date: May 19, 2011

Primary Contact Catherine Elvert **Telephone** #N/A **Email:** catherine.elvert@cityofpaloalto.org

BMP 2. EDUCATION PROGRAMS

BMP 2.1 Public Outreach Actions Implemented and Reported to CUWCC

	2009	2010
1) Contacts with the public (minimum = 4 times per year)	10	14
2) Water supplier contacts with media (minimum = 4 times per year, i.e., at least quarterly).	4	4
3) An actively maintained website that is updated regularly (minimum = 4 times per year, i.e., at least quarterly).	Yes	yes
4) Description of materials used to meet minimum requirement.	Newsletter articles on conservation General water conservation information Website Email Messages Articles or stories resulting from outreach News releases Newspaper contacts Editorial board visits	Newsletter articles on conservation Newsletter articles on conservation General water conservation information Website Articles or stories resulting from outreach Editorial board visits News releases Written editorials
5) Annual budget for public outreach program.	$ 8,000	$ 4,985
6) Description of all other outreach programs	Description is too large for text area. Data will be stored in the BMP Reporting database when online.	
	OnTrackfor 6 Actions	**OnTrack for 6 Actions**

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

Agency: City of Palo Alto **District Name:** City of Palo Alto **CUWCC Unit #:** 71

Coverage Report Date: May 19, 2011

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

2.2 School Education Programs Implemented and Reported to CUWCC

	2009	2010	
Does a wholesale agency implement School Education Programs for this unility's benefit?	Yes	Yes	
Name of Wholesale Supplier?	Santa Clara Valley Water District	Santa Clara Valley Water District	
1) Curriculum materials developed and/or provided by agency	Water resources education, water supply and conservation education. Materials include water awareness kits, interactive software, field trips, reading materials.	Water-Wise curriculum	Yes/ No
2) Materials meet state education framework requirements and are grade-level appropriate?	Yes	Yes	All 5 actions types implemented and reported to CUWCC to be 'On Track'
3) Materials Distributed to K-6?	yes	Yes	
Describe K-6 Materials	Water awareness kits, interactive software, field trip resources, reading materials, videos.	Conservation lessons grades 1-5, flood lesson, water walk game, watershed geography activity with hands-on learning tools and games, solar drinking fountain, water awareness kits, reading materials, videos.	Describe materials to meet minimum requirements
Materials distributed to 7-12 students?	No	No	Info Only
4) Annual budget for school education program.	$ 5,613	$ 50,000	
5) Description of all other water supplier education programs		Canoe in the Slough, in-classroom presentations, Green Touch Screen Project	
	See Wholesale Report 0 On Track	See Wholesale Report 1 On Track	

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APPENDIX D - CUWCC BMPs and Corresponding DMMs

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

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

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APPENDIX E – City of Palo Alto Resolution Approving Water Shortage Implementation Plan (w/attachments)

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Resolution No. 9141

Resolution of the Council of the City of Palo Alto Approving a New Water Shortage Allocation Plan Pursuant to Section 3.11(C) of the 2009 Water Supply Agreement with San Francisco

WHEREAS, the City of Palo Alto 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.

WHEREAS, 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 Attachment H to the Agreement (Tier 1 Plan).

WHEREAS, Section 3.11(C) authorizes the Wholesale Customers to adopt an additional Water Shortage 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.

WHEREAS, 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.

WHEREAS, the Tier 2 Plan, attached to this resolution as Exhibit A, 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.

WHEREAS, 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, the Council of the City of Palo Alto does hereby RESOLVE as follows:

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

SECTION 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.

SECTION 3. 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 this Council.

SECTION 4. The Council finds that adoption of this resolution is categorically exempt from the California Environmental Quality Act as an action taken by a regulatory agency for the protection of natural resources (CEQA Guidelines Section 15307), and an as action taken by a regulatory agency for protection of the environment (CEQA Guidelines Section 15308).

INTRODUCED AND PASSED: February 7, 2011

AYES: BURT, ESPINOSA, HOLMAN, KLEIN, PRICE, SCHARFF, SCHMID, SHEPHERD, YEH

NOES:

ABSENT:

ABSTENTIONS:

ATTEST:

City Clerk

Mayor

APPROVED AS TO FORM:

Acting ~~Senior~~ Deputy City Attorney

APPROVED:

City Manager

Director of Utilities

Director of Administrative Services

110119 dm 6051514

EXHIBIT A

TIER II DROUGHT IMPLEMENTATION PLAN AMONG WHOLESALE CUSTOMERS

This Tier II 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 I 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 I Plan.

The Tier I 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 I 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 II Plan. It is intended to be integrated with the Tier I 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 I 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 <u>Step Two: First Adjustment for San Jose and Santa Clara</u>. 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 <u>Step Three: Determination of Weighted Purchase Cutback For Each Wholesale Customer</u>. 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 <u>Step Four: Second Adjustment for San Jose and Santa Clara</u>. 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 <u>Step Five: Adjustment for Minimum and Maximum Cutbacks.</u> 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 <u>Step Six: Adjustment to Provide Sufficient Supply for East Palo Alto</u>. 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

Wholesale Customer	Fixed Component
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

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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	2,517,062	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

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

	(1) July	(2) August	(3) September	(4) October	(5) November	(6) December	(7) January	(8) February	(9) March	(10) April	(11) May	(12) June	(13) Total Production	(14) Base Component	(15) Seasonal Component	(16) Base/Seasonal Allocation	(17) 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	68,263	46,840	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%
Millbrae	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 CUTBACK 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/Seas 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

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)
	Agency Information		Initial Allocations Based on Weighted Fixed (ISG) and Variable (Base/Seasonal) Components Adjusting for SJ/SC													Adjustment for Minimum and Maximum Cutbacks								Adjustment for East Palo Alto						
			Base/Seasonal Allocations				1st SJ/SC Adjustment		Weighted Allocation				2nd SJ/SC Adjustment			Minimum Cutback Adj.		Maximum Cutback Adjustment												
Wholesale Customers	FY 08-09 SFPUC Purchases	Fixed Comp.	Lesser of Purchase or ISG	Base/ Seasonal Allocation Cutback	Base/ Seasonal Allocation	Base/ Seasonal Purchase Cutback	Subtotal Allocation Factors	Adjusted Base/Seasonal Allocation	Weighted ISG-Base/ Seasonal Avg	Allocation Factors	Weighted Shortage Allocation	Weighted Purchase Cutback	Subtotal Allocation Factors	Adjusted Weighted Shortage Allocation	Adjusted Weighted Purchase Cutback	Adjusted for 10.00% Minimum Cutback	Add'l Cutback for Hardship Bank	Adjusted for 46.84% Maximum Cutback	Cutback Over Cap	Allocations Adjusted For Cap	Agencies To Which Cutback Over Cap Is Redistributed	Min/Max Adjusted Allocation	Adj. Min/Max Purchase Cutbacks	FY 08-09 Residential Per Capita	Agencies To Which EPA Adjustment Applies	Share of EPA Adjustment	Allocations With EPA Adjustments	Final Purchase Cutback		Final Allocation Factor
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%
Brisbane/GVMID	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%		-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	3.90	2.70%	3.22	-24.70%	2.80%	3.24	-24.13%	-24.13%		-24.13%		3.24	3.24	3.23	-24.43%	89.50	3.23	-0.007	3.224	-1.052	-24.60%	2.70%
Coastside	1.97	2.18	1.97	-25.29%	1.47	-25.29%	1.28%	1.49	1.72	1.19%	1.42	-27.83%	1.23%	1.43	-27.29%	-27.29%		-27.29%		1.43	1.43	1.42	-27.58%	68.30	1.42	-0.003	1.421	-0.545	-27.74%	1.19%
CWS Total	35.84	35.68	35.68	-29.00%	25.33	-29.31%	22.15%	25.73	29.01	20.05%	23.95	-33.17%	20.79%	24.13	-32.67%	-32.67%		-32.67%		24.13	24.13	24.03	-32.94%	107.12	24.03	-0.054	23.977	-11.858	-33.09%	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%		-22.32%		3.19	3.19	3.18	-22.63%	50.00			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%		-28.02%		1.38	1.38	1.375	-28.30%	45.30		0.241	1.660	-0.257	-13.42%	1.39%
Estero	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%		-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%		-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%		-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%		-25.69%		2.48	2.48	2.47	-25.99%	104.60	2.47	-0.006	2.468	-0.874	-26.16%	2.07%
Mid Pen WD	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%		-25.08%		2.37	2.37	2.36	-25.38%	83.90	2.36	-0.005	2.354	-0.808	-25.55%	1.97%
Millbrae	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%		-21.06%		1.89	1.89	1.88	-21.38%	75.70	1.88	-0.004	1.878	-0.516	-21.55%	1.57%
Milpitas	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%		-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%		-21.61%		7.69	7.69	7.66	-21.92%	78.80	7.66	-0.017	7.646	-2.169	-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%		-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	-34.49%	7.62	-34.49%	6.66%	7.74	10.82	7.48%	8.93	-23.23%	7.75%	9.00	-22.65%	-22.65%		-22.65%		9.00	9.00	8.96	-22.96%	107.00	8.96	-0.020	8.943	-2.691	-23.13%	7.49%
Purissima Hills	2.01	1.62	1.62	-42.43%	0.94	-53.47%	0.82%	0.95	1.17	0.81%	0.97	-51.85%	0.84%	0.98	-51.49%	-51.49%		-46.84%	-0.094	1.07		1.07	-46.84%	302.70			1.069	-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%		-30.63%		7.18	7.18	7.15	-30.91%	85.40	7.15	-0.016	7.132	-3.214	-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	-10.00%		1.75		1.75	-10.00%	66.20			1.748	-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%		-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	-25.20%	7.94	-25.20%	6.95%	8.07	9.56	6.60%	7.89	-25.72%	6.85%	7.95	-25.16%	-25.16%		-25.16%		7.95	7.95	7.92	-25.46%	89.20	7.92	-0.018	7.898	-2.721	-25.62%	6.61%
Westborough	0.95	1.32	0.95	-13.97%	0.82	-13.97%	0.72%	0.83	0.99	0.69%	0.82	-13.86%	0.71%	0.82	-13.21%	-13.21%		-13.21%		0.82	0.82	0.82	-13.56%	48.50			0.822	-0.129	-13.56%	0.69%
Subtotal	156.19		156.19	-26.18%	114.37	-26.78%	100.00%	116.16	139.55		115.18	-26.26%	100.00%	116.05	-25.70%	-25.70%		-25.70%		116.09	113.28	115.65	-25.96%		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%		-46.84%	-0.223	2.37		2.37	-46.84%	63.20			2.370	-2.088	-46.84%	1.98%
Santa Clara	2.64	4.50	2.64	-23.65%	2.01	-23.65%		1.23	2.31	1.59%	1.90	-27.78%		1.27	-51.85%	-51.85%		-46.84%	-0.132	1.40		1.40	-46.84%	85.80			1.401	-1.235	-46.84%	1.17%
Total	163.29		163.29	-26.33%	119.46	-26.84%		119.46	144.73	100.00%	119.46	-26.84%		119.46	-26.84%	-26.84%	-0.044	-26.84%	-0.449	119.87	113.28	119.42	-26.87%		107.46	0.000	119.461	-43.826	-26.84%	100.00%

First SJ/SC Adjustment

1.	Largest permanent customer cutback	-53.47%	
2a.	Adjusted SC allocation:	1.23	(Applying largest permanent customer cutback)
2b.	Santa Clara adjustment:	-0.79	(Difference between initial and adjusted alloc.)
3a.	Adjusted SJ allocation:	2.07	(Applying largest permanent customer cutback)
3b.	San José adjustment:	-1.01	(Difference between initial and adjusted alloc.)
4.	Total Adjustment:	-1.80	(2b + 3b)

Second SJ/SC Adjustment

1.	Largest permanent customer cutba	-51.85%
2a.	Adjusted SC allocation:	1.27
2b.	Santa Clara adjustment:	-0.63
3a.	Adjusted SJ allocation:	2.15
3b.	San José adjustment:	-0.23
4.	Total Adjustment:	-0.86

****All values in MGD 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 mgd 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 Cutback: From Tab 3, column (17).
(5) Base/Seasonal Allocation: column (3) reduced by the Base/Seasonal cutback in column (4).
(6) Base/Seasonal Purchase Cutback: 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 José's cutbacks are at least as great as the highest cutback 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 SJ/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 Cutback: 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 José's cutbacks are at least as great as the highest cutback by the permanent customers.
(13) Subtotal Allocation Factors: The ratio of each permanent agency's column (11) allocation to the column (11) subtotal.
(14) Adjusted Weighted Shortage Allocation: Redistributes "Second SJ/SC Adjustment" line 4 value among the permanent customers based on the proportionate shares in column (13).

Column Notes

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

Adjustment for Maximum Cutback: This adjustment is made so that the maximum cutback applied to any agency is equal to the Overall Average BAWSCA Reduction + 20%.
(18) Adjusted for Maximun Cutback: Caps the cutbacks in column (18) to no more than 20% more than the average cutback.
(19) Cutback 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 cutbacks in column (18).
(21) Agencies to Which Cutback 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 cutback in column (19) by the proportions in column (21) to agencies shown in column (21).
(23) Adjusted Minm/Max Purchase Cutbacks: 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. cutback .
(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). Indivdiual agency proportionate shares of EPA's adjus
(27) Allocation with EPA Adjustment: Column (22) plus column (26).

Final Allocations
(28) Final Purchase Cutback: Column (27) minus column (1) expressed as MGD
(29) Final Purchase Cutback: 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

APPENDIX F - Water Shortage Contingency Plan Draft Ordinance

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DRAFT ORDINANCE

WATER SHORTAGE CONTINGENCY PLAN

[Ordinances declaring water shortage emergencies were enacted in previous drought periods in the City, in 1976-78, and most recently in 1990 during the 1987-93 drought. When that drought ended, water shortage regulations were suspended, but not repealed, by Ordinance No. 4150. Declaration of a new water shortage under the Water Code will automatically reinstate the previous water shortage regulations unless the Council decides on another course of action at the time the declaration is made.]

ORDINANCE NO._____

ORDINANCE OF THE COUNCIL OF THE CITY OF PALO ALTO DECLARING A WATER SHORTAGE EMERGENCY [AND REINSTATING SECTION 12.32.030 OF THE PALO ALTO MUNICIPAL CODE ESTABLISHING MAXIMUM MONTHLY WATER USE]

WHEREAS, the City of Palo Alto is the distributor of a public water supply within its boundaries; and

WHEREAS, the City faces a depletion of in its water supply; and

WHEREAS, the City Council has held a public hearing on the proposed adoption of this ordinance, the City Clerk having first duly given notice of the hearing as required by Government Code Section 6061;

NOW, THEREFORE, the Council of the City of Palo Alto does ORDAIN as follows:

SECTION 1. The City Council of the City of Palo Alto finds and determines that:

1. Due to the lack of adequate precipitation, there is a significant shortage of water reserves.

2. The wholesale supplier for the City of Palo Alto has cut the annual deliveries of water for the period from to _____ by _____percent.

3. Ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the City to the extent that there would be insufficient water for human consumption, sanitation and fire protection.

4. A. water shortage emergency condition exists in the City of Palo Alto and its distribution area.

5. In addition to water use restrictions already in effect, it is necessary to prohibit certain uses of available water during such emergency, to the end that conservation is emphasized and sufficient water will be available for human consumption, sanitation, fire protection, and commercial and industrial uses both this year and in the future, in the even the drought continues.

6. Certain uses constitute the wastage of water and should be prohibited pursuant to the Section 350 and following of the California Water Code.

SECTION 2. [Optional] Section 12.32.015 of the Palo Alto Municipal Code, suspended by Ordinance No. 4150, is hereby reinstated, reading as follows:

Section 12.32.015 Water Use Regulations. The following emergency regulations of the use of water are effective in the City of Palo Alto:

(a) Except for drip irrigation systems, soaker hose irrigation systems, and hand-watering, landscape irrigation shall not be allowed between 10:00 a.m. and 6:00 p.m. Irrigation at all times must conform with Section 12.32.010.

(b) Potable water other than when used from containers of five (5) gallons or less, shall not be used to clean sidewalks, walkways, driveways, patios, parking lots, and other hard surfaced areas or building structures.

(c) Potable water shall not be used to operate, clean, fill or maintain levels in decorative fountains or ponds, unless the fountain or pond supports water fowl or aquatic life. Potable water may be used in reasonable quantifies for the purpose of priming and exercising internal mechanisms. If reclaimed water is in use in the fountain or pond, a sign so stating must be posted.

(d) Restaurants, banquet facilities, or other food service operations shall serve water to customers only upon request.

(e) Newly constructed pools, spas and hot tubs may not be filled with water supplied by the Palo Alto Water Utility or other water utilities which have water shortage emergencies in effect.

(f) Signs providing reasonable notice of the drought conditions and water shortage emergency shall be displayed in all public restrooms and restaurants, and in guest rooms in buildings defined as hotels by Section 2.33.010(b).

SECTION 3. [Optional] Section 12.32.030 of the Palo Alto Municipal Code, suspended by Ordinance No. 4150, is hereby reinstated, reading as follows:

Section 12.32.030 Maximum Monthly Water Use. No purchaser of water from the City of Palo Alto, nor any customers of the water utility of the City of Palo Alto, shall use, permit the use of, or take delivery of more potable water from the City or water utility than the monthly maximum use cap. For the purposes of this section, the "monthly maximum use cap" shall be as follows:

Residential Customers: Fifty (50) Units

All Other Customers: Five (5) times the Baseline Consumption Allowance A "unit" of water shall be equal to one hundred cubic feet (1 ccf) of water measured at the customer's meter. The Baseline Consumption Allowance shall be established for all other customers in accordance with the Palo Alto Utilities Rules and Regulations adopted by resolution of the Council pursuant to Section 12.20.010.

SECTION 4. [Council may adopt additional or alternative water conservation measures by ordinance, as more generally described in the Water Shortage Contingency Plan.]

SECTION 5. The Council finds that the enactment of this ordinance is exempt from the California Environmental Quality Act ("CEQA") because it is an immediate action necessary to prevent or mitigate an emergency, as described in Section 15269 (c) of the CEQA Guidelines.

SECTION 6. The Council finds and declares that, based upon the findings and declarations set forth above, the material furnished to the City Council by the City staff, and oral and documentary testimony at the Council meeting at which this matter was considered, the enactment of this ordinance is necessary as an emergency measure to preserve public health and safety and it shall be effective immediately upon adoption..

INTRODUCED AND PASSED:

AYES:

NOES:

ABSENT:

ABSTENTIONS:

ATTEST:

_____

City Clerk

APPROVED AS TO FORM:

_____

Senior Asst. City Attorney

APPROVED:

_____

Mayor

_____

City Manager

_____

Director of Utilities

_____

Director of Administrative Services

APPENDIX G - Water Shortage Contingency Plan Evaluation Criteria

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CRITERIA TO EVALUATE WATER SHORTAGE RESPONSE PLAN

This appendix lists criteria expected to guide the selection of allocation/allotment strategies whenever water use reductions are needed. Not all of them may be applicable to every strategy but customer perception of equity is important in achieving the necessary reductions.

1. Reduce overall City consumption by reduction target required – this is the effective goal of any plan. To accomplish this goal the percentage reduction for the various customer classes will necessarily vary because their ratios of indoor / outdoor use varies.

2. Sufficient water available for personal use – the most important use of water is for basic drinking, health, and sanitary uses, and therefore, this is given the highest priority of use. This prioritization will drive both rate schedules and water use restrictions. However, within allowed limits (i.e., water use restriction ordinances), customers will be able to choose how they use their allotment between indoor and outdoor uses.

3. Acceptance by the community – many people tend to evaluate or accept a particular water-rationing plan in terms of how it would directly affect them. It is this aspect which makes it difficult to gain a popular consensus on any one plan. However, any plan must be generally accepted by the community to be successful. One important aspect of acceptance is the public's understanding of the program; thus, it is viewed as important to make the plan as uncomplicated as possible.

4. Minimize unemployment or business loss – water is extensively used in both commercial and industrial functions. If water is severely limited to these consumers, increased unemployment and business losses could result. Staff intends that, wherever possible, this should be avoided. Still, outside water use must be sacrificed greatly if only minimal indoor reductions are required. Cooling tower use for air conditioning must also be considered.

5. Landscaping investment losses – in cases of critical or severe shortage of water, it is expected that significant landscaping losses may arise. The use of recycled water should be encouraged for certain applications. In some cases, using the City's well system to augment the SFPUC supply will be an option to provide a minimum amount of water for landscaping. In this case, the goal should be to keep valuable and mature trees and plantings alive. Shrubs and lawns will be considered a lower priority.

6. Workable plan – the plan must be workable in order to accomplish its goal. It must take the following factors into account:

    a. Cost - the cost of any water plan to the public should be minimized.

b. Enforcement - enforcement is viewed as a key component of any plan. Those plans requiring fewer resources for enforcement would be preferable. However, the success of a plan is contingent upon effective enforcement and the utility must be provided the resources to meet the enforcement objective. The current staff can only absorb a certain level of additional responsibilities without unreasonably impacting service to the customer.

c. The plan must be practical and feasible from a data processing viewpoint and not subject to erroneous results due to incomplete or inaccurate databases. A realistic timeframe must be allowed to perform any necessary data entry or customer programming functions.

9. Flexibility – the water shortage is a dynamic situation and may get better or worse. Thus, it is necessary that any plan be adaptable to changes in targets or adjustable if original expectations are not being met.

10. Allowance for new services – some provision must be made in any plan to serve new establishments or those under construction.

12. Recover penalties applied by suppliers – revenue should be collected to the extent necessary to recover any penalties that may be charged by suppliers.

APPENDIX H - Water Shortage Contingency Plan Use Restrictions

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WATER USE RESTRICTIONS

This appendix lists the current long-term water use restrictions and additional restrictions that could be applied during a water supply shortage situation.

Existing Permanent Water use Regulations

1. Flooding or runoff of potable water is prohibited.
2. A shut-off valve is required for hoses used to wash vehicles, sidewalks, buildings, etc.
3. Potable water for construction uses is prohibited if recycled water is available.
4. Broken or defective plumbing and irrigation systems must be repaired or replaced within a reasonable period.

Additional Regulations for Emergency Water Shortage Situations

<u>Water Use restrictions added for Water Shortage Stage II:</u>

1. Landscape irrigation shall not be allowed between 10:00 a.m. and 6:00 p.m., except for drip irrigation, soaker hoses and hand watering.
2. Restaurants and other food service operations shall serve water to customers only upon request.

<u>Water Use Restrictions added for Water Shortage Stage III:</u>

All water use restrictions for Stage II above and the following:

1. Potable water other than when used from containers of five gallons or less, shall not be used to clean hard surfaced areas or building structures.
2. Potable water shall not be used to operate, clean, fill or maintain levels in decorative fountains or ponds.
3. Newly constructed pools, spas and hot tubs may not be filled.
4. Signs providing notice of water shortage emergency shall be displayed in all public restrooms and restaurants, and in hotel guestrooms.
5. Outdoor water use audits are required for those customers continuing to use more than target allotments for three months.
6. Commercial car washes must use recycled water systems, if economically feasible.
7. Verified water waste will serve as prima facie evidence that the allocation assigned to the water account is excessive and subject to reduction.
8. The use of potable water on golf courses is limited to putting greens and tees.
9. The use of potable water for street sweepers/washers is prohibited.

<u>Water Use Restrictions added for Water Shortage Stage IV:</u>

1. No new water service hookups unless customer pays for sufficient conservation elsewhere to offset anticipated water use.

3. No new landscaping installed at new construction sites. Bonds to be posted for landscaping after water shortage emergency is lifted.
4. Turf irrigation prohibited.
5. Owners/operators of private wells must adhere to the same water use restrictions as other residents and businesses dependent upon the City's potable supply.
6. Once-through cooling systems must be converted to recycling systems.
7. The washing of all vehicles is prohibited outside of a commercial washing facility that recycles its water.
8. Irrigation by sprinklers is prohibited at all times

APPENDIX I – Single and Multi Year Delivery Shortages

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	Wholesale Demand				
	184 MGD				
Delivery For Fiscal Year	2010	2015	2020	2025	2030
1920	184	184	184	184	184
1921	184	184	184	184	184
1922	184	184	184	184	184
1923	184	184	184	184	184
1924	184	184	184	184	184
1925	154.6	184	184	184	184
1926	184	184	184	184	184
1927	184	184	184	184	184
1928	184	184	184	184	184
1929	184	184	184	184	184
1930	184	184	184	184	184
1931	184	184	184	184	184
1932	132.5	152.6	152.6	152.6	152.6
1933	184	184	184	184	184
1934	184	184	184	184	184
1935	154.6	184	184	184	184
1936	184	184	184	184	184
1937	184	184	184	184	184
1938	184	184	184	184	184
1939	184	184	184	184	184
1940	184	184	184	184	184
1941	184	184	184	184	184
1942	184	184	184	184	184
1943	184	184	184	184	184
1944	184	184	184	184	184
1945	184	184	184	184	184
1946	184	184	184	184	184
1947	184	184	184	184	184
1948	184	184	184	184	184
1949	184	184	184	184	184
1950	184	184	184	184	184
1951	184	184	184	184	184
1952	184	184	184	184	184
1953	184	184	184	184	184
1954	184	184	184	184	184
1955	184	184	184	184	184
1956	184	184	184	184	184
1957	184	184	184	184	184
1958	184	184	184	184	184

	Wholesale Demand				
	184 MGD				
Delivery For Fiscal Year	2010	2015	2020	2025	2030
1959	184	184	184	184	184
1960	184	184	184	184	184
1961	152.6	184	184	184	184
1962	132.5	152.6	152.6	152.6	152.6
1963	184	184	184	184	184
1964	184	184	184	184	184
1965	184	184	184	184	184
1966	184	184	184	184	184
1967	184	184	184	184	184
1968	184	184	184	184	184
1969	184	184	184	184	184
1970	184	184	184	184	184
1971	184	184	184	184	184
1972	184	184	184	184	184
1973	184	184	184	184	184
1974	184	184	184	184	184
1975	184	184	184	184	184
1976	184	184	184	184	184
1977	152.6	184	184	184	184
1978	136.2	152.6	152.6	152.6	152.6
1979	184	184	184	184	184
1980	184	184	184	184	184
1981	184	184	184	184	184
1982	184	184	184	184	184
1983	184	184	184	184	184
1984	184	184	184	184	184
1985	184	184	184	184	184
1986	184	184	184	184	184
1987	184	184	184	184	184
1988	152.6	184	184	184	184
1989	132.5	152.6	152.6	152.6	152.6
1990	132.5	152.6	152.6	152.6	152.6
1991	132.5	132.5	132.5	132.5	132.5
1992	132.5	152.6	152.6	152.6	152.6
1993	136.2	132.5	132.5	132.5	132.5
1994	184	184	184	184	184
1995	154.6	184	184	184	184
1996	184	184	184	184	184
1997	184	184	184	184	184
1998	184	184	184	184	184

	Wholesale Demand				
	184 MGD				
Delivery For Fiscal Year	2010	2015	2020	2025	2030
1999	184	184	184	184	184
2000	184	184	184	184	184
2001	184	184	184	184	184
2002	184	184	184	184	184