CITY OF MOUNTAIN VIEW

2010 Urban Water Management Plan

June 14, 2011

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COMMONLY USED ABBREVIATIONS AND ACRONYMS

AB	Assembly Bill
af	acre-feet
afy	acre-feet per year
BAWSCA	Bay Area Water Supply and Conservation Agency
Bay	San Francisco Bay
BMP	Best Management Practice
BARDP	Bay Area Regional Desalination Project
Cal Water	California Water Company
CalGreen	California Green Building Code
CII	Commercial, Industrial and Institutional
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
DMM	Demand Management Measure
DPH	California Department of Public Health
dS/m	decisiemens per meter
DSS model	Demand Side Management Decision Support System model
DWR	California Department of Water Resources
EPA	U.S. Environmental Protection Agency
ET	evapotranspiration
F	degrees Fahrenheit
FY	fiscal year
ft bgs	feet below ground surface
ft	feet
gpcd	gallons per capita per day
gpf	gallons per flush
gpm	gallons per minute
HET	high-efficiency toilet
HGL	hydraulic gradient level
in	inches
in/mo	inches per month
mg	million gallons
mgd	million gallons per day
MOU	Memorandum of Understanding
MVGBC	Mountain View Green Building Code
ppm	parts per million
psi	pounds per square inch
RWQCP	Regional Water Quality Control Plant

COMMONLY USED ABBREVIATIONS AND ACRONYMS

SB	Senate Bill
SCVWD	Santa Clara Valley Water District
SFPUC	San Francisco Public Utilities Commission
sq ft	square feet
SWP	State Water Project
SWRCB	State Water Resources Control Board
TCE	trichloroethylene
Title 22	California Code of Regulations Title 22
UWMP	Urban Water Management Plan
VOC	volatile organic compound
Water Code	California Water Code
WET	water-efficient technology
WSIP	Water System Improvement Program

1 INTRODUCTION

1.1 Overview and Purpose

The Urban Water Management Plan (UWMP) is a long-term water blueprint for the City of Mountain View. The UWMP provides an analysis of the City's available water supply and compares it to current, historical and projected water demand. The UWMP is a link between land use planning and water supply planning developed to ensure that sufficient water is available to meet the needs of Mountain View's existing and future water customers.

The UWMP is also a foundational document for Water Supply Assessments and Verifications of Water Supply, which evaluate whether sufficient water is available to supply large development projects, prior to their approval and construction. Water Supply Assessments and Verifications of Water Supply are prepared on a project-by-project basis as part of the environmental review process for the projects.

Mountain View's 2010 UWMP includes the following topics:

- Section 1: Introduction – Overview, requirements and preparation of Mountain View's 2010 UWMP.
- Section 2: Service Area – Description of Mountain View's population, employment and land uses and a summary of local weather patterns.
- Section 3: Water System Overview – Overview of the water system facilities owned and operated by the City of Mountain View.
- Section 4: Water Demand – Review of current, historical and projected water demand within the City's water service area, and a blueprint for meeting Mountain View's 2020 urban water use target.
- Section 5: Water Supply – Description and quantification of the City's available water supply, on a current, historical and future basis.
- Section 6: Water Supply Reliability – Discussion of the reliability of Mountain View's water supplies and the ability to meet demand during dry years.
- Section 7: Water Conservation – Outline of conservation measures used to reduce Mountain View's water demand.
- Section 8: Water Shortage Contingency – Analysis of the expected availability of water during water shortages and a summary of Mountain View's plan for

reducing water consumption during drought, disaster or other scenarios resulting in a water shortage.

- Section 9: Catastrophic Supply Interruption – Mountain View's plan for addressing a catastrophic water supply interruption.
- Section 10: References – List of sources and supporting documentation used during the preparation of this UWMP.

1.2 Requirements and Checklists

10621. (a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

As an urban water supplier serving more than 3,000 customers, the City of Mountain View is required by Division 6, Part 2.6 of the California Water Code (Water Code) to update its UWMP every five years. Mountain View's prior UWMP update was completed in 2005 and the next update will be due in 2015. The 2010 UWMP was originally due in December 2010; however, this deadline was extended until July 2011 as part of the Water Conservation Act of 2009 (Water Code Division 6, Part 2.55), also known as "Senate Bill 7." The purpose of this extension was to allow water suppliers adequate time to incorporate new analyses into their 2010 UWMPs. A description of the new analyses introduced by the Water Conservation Act of 2009, as well as other changes to the UWMP requirements since 2005, are summarized below and listed in Attachment A.

The general requirements of the 2010 UWMP are similar to previous years—to describe an urban water supplier's current and future supply and demand. At the beginning of each section are italicized excerpts of the Water Code listing which particular elements are addressed in that section. The complete text of Water Code Division 6, Part 2.55 and Part 2.6, which outline the requirements of a UWMP, is included as Attachment B. A checklist cross-referencing information in Mountain View's 2010 UWMP to the UWMP requirements is provided in Attachment C.

1.2.1 UWMP Changes Since the Last Update

Since 2005 several State senate bills (SB) and assembly bills (AB) have been adopted which modify the required content of a UWMP. The most significant changes relate to water for lower-income households, potential uses of recycled water, and water conservation (also referred to as "demand management"). Key bills that have modified the UWMP requirements since 2005 are listed below in order of adoption:

- SB 1087: Housing Elements (Florez, 2005).

- AB 1420: Water Demand Management Measures (Laird, 2007).
- AB 1465: Urban Water Management Planning (Hill, 2009).
- SB 7: Water Conservation (Steinberg, 2009).

The following paragraphs briefly describe each of these four bills and their implications for urban water management planning.

SB 1087: Housing Elements

SB 1087 requires urban water suppliers to identify projected water use for single-family and multifamily residential lower-income households in their UWMP.[1] These water use projections are used to assist a water supplier in complying with Government Code Section 65589.7 to grant priority of water and sewer service to proposed developments that include housing units affordable to lower-income households.

AB 1420: Water Demand Management Measures

Effective January 2009, AB 1420 requires that the terms of, and eligibility for, any water management grant or loan made to an urban water supplier and awarded or administered by the California Department of Water Resources (DWR), State Water Board, or California Bay-Delta Authority, be conditioned on the implementation of the water demand management measures (DMMs) described in Water Code Section 10631(f). These DMMs include water conservation programs, such as outreach, water audits and rebates.

In order to be eligible for a water management grant or loan urban water suppliers must demonstrate implementation (or scheduled implementation) of all locally cost-effective DMMs, or implementation of alternative conservation approaches. Failure to implement DMMs and/or alternative conservation may result in a delay or loss of funds.

The provisions of AB 1420 sunset in 2015, when grant and loan eligibility becomes conditioned on compliance with an urban water supplier's interim urban water use target, as specified by SB 7 (discussed on the following page).

AB 1465: Urban Water Management Planning

Pursuant to AB 1465, urban water suppliers that are members of the California Urban Water Conservation Council (CUWCC) are deemed compliant with the requirements of Water Code Sections 10631(f) and 10631(g) by fulfilling the membership requirements of the CUWCC. These Water Code Sections refer to the following items:

[1] Lower-income households are defined by Health and Safety Code Section 50079.5.

- A description of the supplier's DMMs.
- A description of the methods used to evaluate the effectiveness of these DMMs.
- An estimate of conservation savings.
- An evaluation of DMMs that are not currently being implemented or scheduled for implementation.

In order to demonstrate compliance, agencies must attach a copy of their CUWCC reports to their respective 2010 UWMPs.

Although Mountain View has been a member of the CUWCC since 1991, the City has opted to include specific DMM information in the body of this UWMP instead of including the draft CUWCC report. This is in part because of current updates to the CUWCC's on-line reporting database. Mountain View will submit its BMP report to the CUWCC prior to the reporting deadline this August.

SB 7: Water Conservation

SB 7 (also referred to as the Water Conservation Bill of 2009) is one of four policy bills enacted as part of the 2009 Comprehensive Water Package. SB 7 provides the regulatory framework to support a statewide reduction in urban per capita water use of 20 percent by the year 2020. Based on analysis conducted by DWR in its *Draft 20x2020 Water Conservation Plan* (DWR, 2009a), California's target 2020 per capita water use is 154 gallons per capita per day (gpcd). The first step in meeting this statewide 2020 target is for each urban water supplier to determine its existing water use and 2020 target. This analysis is to be conducted and reported as part of the 2010 UWMP.

1.3 Relationship to Water Supply Assessments and Verifications of Water Supply

Passed in 2001, Senate Bill 610 (SB 610) and Senate Bill 221 (SB 221) require urban water suppliers and local land planning agencies to coordinate land use decisions with water supply availability. Both SB 610 and SB 221 are project-specific and apply to certain types of large development projects defined in the Water Code, such as residential developments of 500+ units, businesses with 500,000+ square feet (sq ft) of floor space, office buildings with 250,000+ sq ft of floor space, and industrial projects with 650,000+ sq ft of floor space.

As of January 2002, an urban water supplier must provide detailed water supply information to the local land planning agency prior to that agency approving a large

project. The intent of SB 610 and SB 221 is to ensure that sufficient water is available long-term to support a large project before construction begins.

A foundational document for compliance with SB 610 and SB 221 is the UWMP. Similar to the UWMP, SB 610 and SB 221 require water supply reliability information to be provided for the entire water service area in five-year increments over a 20-year planning horizon. The water supply reliability information in the UWMP can be used to help meet the SB 610 and SB 221 requirement if the following conditions are met:

- The projected water demand associated with the project was accounted for in the most recently adopted UWMP.
- The current UWMP provides at least 25 years of water supply reliability information and, therefore, contains the 20 years of information required for SB 610 and SB 221.

In order to simplify the future preparation of SB 610 and SB 221 documents, the City of Mountain View elected to consider a 25-year time horizon in this UWMP, instead of the required 20-year horizon. Projects proposed between now and 2015 that are accounted for in the 2010 UWMP and subject to SB 610 and SB 221 will be able to rely on the water supply and demand analysis presented herein for completion of a Water Supply Assessment or Verification of Supply.

1.4 Preparation and Adoption

1.4.1 Coordination with Other Agencies

10620. (d)(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.

10621. (b) Every urban water supplier required to prepare a plan … shall, at least 60 days prior to the public hearing on the plan … notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

10642. … The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies…

Mountain View coordinated with relevant agencies throughout the development of the 2010 UWMP. Details of these efforts are outlined below. A copy of the notifications sent to relevant agencies and a list of recipients are included in Attachment D.

Wholesale Water Suppliers Coordination

The City of Mountain View worked collaboratively with its two wholesale water suppliers, the San Francisco Public Utilities Commission (SFPUC) and the Santa Clara

Valley Water District (SCVWD), to exchange information needed to develop each agency's respective UWMP. Information exchanged included current and projected population, water use and water production estimates, as well as key water supply reliability information.

As a wholesale purchaser of SFPUC water, the City of Mountain View is a member of the Bay Area Water Supply and Conservation Agency (BAWSCA). City staff coordinated with BAWSCA and its member agencies on various matters related to the 2010 UWMP. To assist member agencies in the preparation of their UWMPs, BAWSCA also provided language for agencies to include in their 2010 UWMPs. This language is incorporated throughout Mountain View's 2010 UWMP.

Wastewater Agency Coordination

Wastewater and recycled water information, discussed in Section 5.4, was coordinated with the Palo Alto Regional Water Quality Control Plant (RWQCP) and its partner agencies. All of Mountain View's wastewater flows to this treatment facility, in addition to wastewater flows from the City of Palo Alto, East Palo Alto Sanitary District, the City of Los Altos, the Town of Los Altos Hills and Stanford University. Each of these partners received notification about the UWMP update process.

Neighboring Land Use and Water Agencies

Neighboring land use and water agencies, including the County of Santa Clara, City of Sunnyvale, City of Palo Alto, California Water Service Company (Cal Water), Town of Los Altos Hills, Purissima Hills Water District, and other BAWSCA member agencies were contacted to provide them with an opportunity to comment on Mountain View's 2010 UWMP.

1.4.2 Public Outreach and Plan Adoption

10608.26. (a) In complying with [the Water Conservation Act of 2009], an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:

(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.

(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.

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

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code… After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

Mountain View provided the public with a variety of opportunities to participate in updating the 2010 UWMP. These opportunities are described below.

Public Outreach

Prior to updating the UWMP, City staff provided telephone, e-mail, and mailing contact information to the public for submittal of comments and questions about the 2010 UWMP. To inform the public of the UWMP update process and the availability of these resources, the City placed advertisements in the *Mountain View Voice*, a local weekly newspaper. Notifications about the UWMP update process were also mailed to key community liaisons and community groups, including:

- Russian, Latino, Chinese, and Jewish community liaisons.
- Neighborhood Associations.
- The Chamber of Commerce.
- The Central Business Association.
- Various interested environmental groups.

Information about the UWMP update process was posted on the City's web site and in an article published in the spring 2011 edition of *The View*, a tri-annual newsletter distributed to all Mountain View residents. Copies of these communications are included in Attachment D.

Public Hearings and Plan Availability

The City of Mountain View held two public hearings associated with the 2010 UWMP. Public hearing notices were published in the *San Jose Post Record* prior to each meeting date. Notices were also posted on the City's web site and on the City Hall bulletin board. Copies of the Public Hearing notices are included in Attachment D.

The first public hearing was held on May 10, 2011 to adopt a methodology for determining Mountain View's 2020 urban water use target, allow community input on the implementation plan for achieving this target, and consider economic impacts of the implementation plan. The second hearing was held on June 14, 2011 to solicit public comment on and adopt the 2010 UWMP.

Copies of the draft 2010 UWMP were made available for public review and comment prior to the June 14, 2011 public hearing. Paper copies were available for review at the Mountain View Public Library and at Mountain View City Hall. An electronic copy of the UWMP was made available on the City's web site.

Plan Adoption

The City Council adopted the 2010 UWMP at the June 14, 2011 public hearing. A copy of the resolution adopting the UWMP is included as Attachment E. Following City Council approval of the 2010 UWMP, copies of the adopted UWMP were made available in the Mountain View Public Library and in Mountain View City Hall, and electronically on the City's web site.

The adopted 2010 UWMP will be provided to the DWR, the California State Library, the SFPUC, the SCVWD, BAWSCA and Santa Clara County.

2 SERVICE AREA

10631. (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.

2.1 Land Use

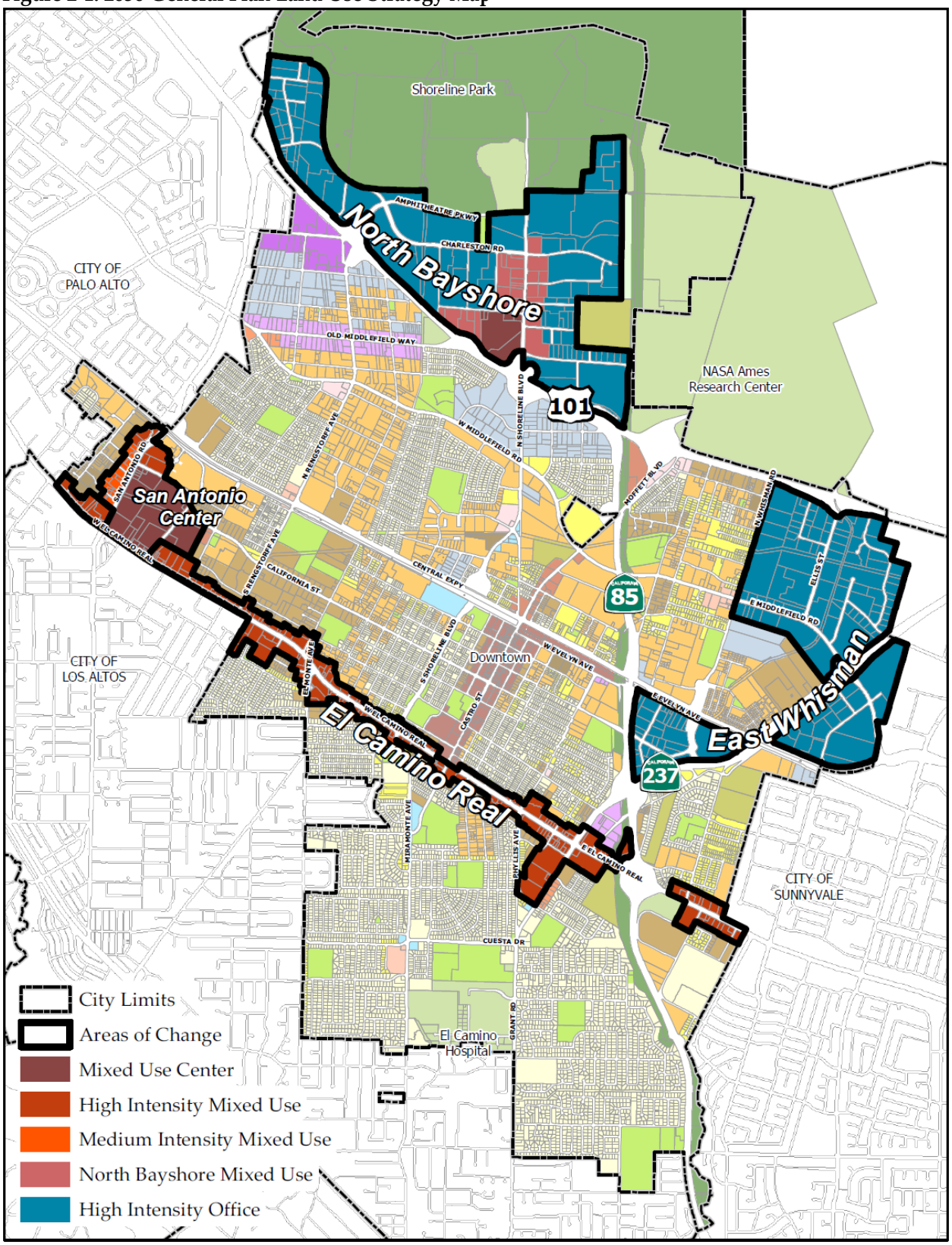
The City of Mountain View is approximately 12 square miles in area and is located about 10 miles north of San Jose and 35 miles south of San Francisco. Mountain View is situated between the Santa Cruz Mountains and the San Francisco Bay (Bay) and is considered the "gateway" to California's Silicon Valley. While Mountain View is predominantly a residential community, it is also home to several global high-tech companies, a large outdoor amphitheatre, a center for the performing arts, a golf course, a sailing lake, regional medical facilities and numerous local businesses that provide services to Mountain View and neighboring areas.

Changes to Mountain View's land uses occur pursuant to the City's General Plan, which is presently being updated to extend to the year 2030. This new General Plan identifies several "change areas" within which development will focus during the next several decades. Outside of these change areas, the General Plan aims to preserve the existing uses and intensities of the majority of Mountain View's neighborhoods. Below is a list of the major change areas identified in the General Plan Strategy (also shown in Figure 2-1), as of May 2011:

- North Bayshore
- East Whisman
- El Camino Real
- San Antonio

Future land uses in the change areas focus on innovative and sustainable growth strategies to accommodate a mix of commercial and residential uses. Select areas may include increased density for office buildings, "village centers" with retail, office, and residential uses, and a variety of other land uses, such as entertainment facilities, hotels and/or conference centers. Mountain View's 2030 General Plan is currently scheduled to be completed in the spring of 2012.

Figure 2-1: 2030 General Plan Land Use Strategy Map



2.2 Population and Employment

The total population served by Mountain View's municipal water system in 2010 was estimated at 74,286. Approximately 98 percent of the City's population receives water service from the City's municipal water system. The remaining 2 percent are customers of a neighboring water retail agency, Cal Water. The estimated current and projected future population of Mountain View's water service area is shown in Table 2-1.

Table 2-1: Current and Projected Future Population and Employment[2]

Parameter	2010	2015	2020	2025	2030	2035
Population	74,286	76,758	80,082	83,408	86,732	90,057
Employment	62,073	67,006	71,938	76,871	81,803	86,735

Future population was projected based on the City's 2030 General Plan Strategy, which was endorsed by the City Council in December 2010. Under this alternative, the 2030 General Plan may support as many as 86,732 residents within the municipal water system's existing service area in 2030. Extension of this growth trend through 2035 results in a projected population of 90,057.

Mountain View also supplies water to several commercial, institutional, and industrial (CII) customers, which were collectively estimated to provide 62,073 jobs within the City's water service area in 2010. Based on the 2030 General Plan Strategy, job growth is anticipated to grow to 81,803 in 2030. Extension of this trend to 2035 results in an estimated 86,735 jobs in 2035.

2.3 Climate

Mountain View's semi-arid climate is temperate year round. The average temperature is 58°F, with an average low of 47°F and an average high of 69°F (Table 2-2). The mean summer temperature (i.e., June through September) is 66°F.

Table 2-2: Average Climate Data[3]

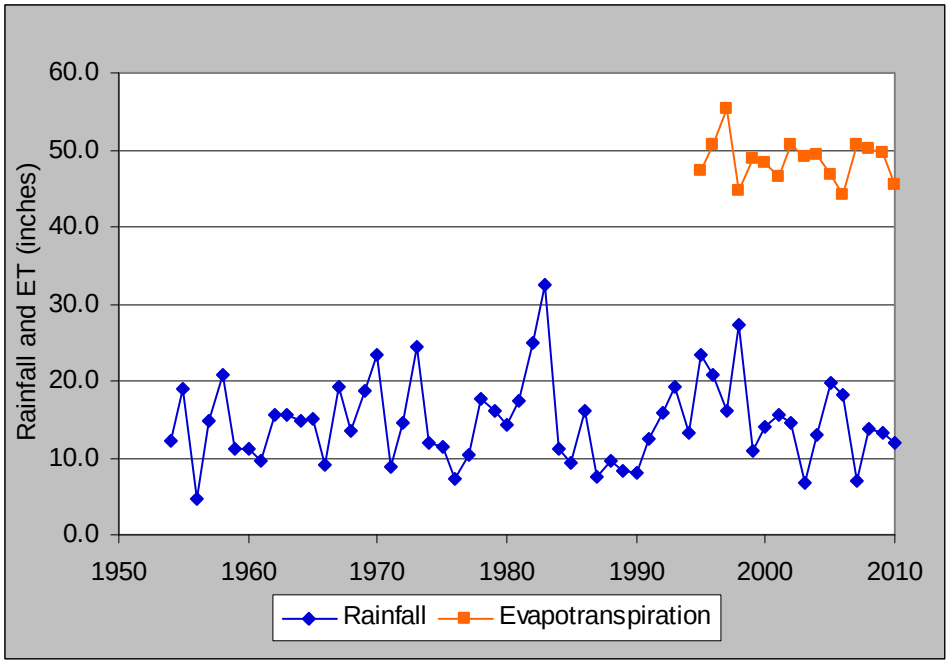
Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
$Temp_{Ave}$ (F)	48	51	54	57	61	65	67	67	65	61	54	48	**58**
$Temp_{Min}$ (F)	39	41	43	45	49	53	55	55	53	48	43	38	**47**
$Temp_{Max}$ (F)	57	61	64	68	73	77	78	79	78	73	64	58	**69**
Rainfall (in)	3.2	2.9	2.2	1.0	0.4	0.1	0.0	0.1	0.2	0.7	1.8	2.7	**15**
ET (in)	1.2	1.6	3.1	4.6	5.6	6.4	6.9	6.5	4.8	3.7	1.7	1.2	**47**

[2] Current population is based the California Department of Finance data. Future population was estimated based on the 2030 General Plan Strategy. Both population and employment figures subtract for land uses included in the 2030 General Plan Strategy that are outside of the City's water service area (such as Cal Water customers).
[3] Rainfall and temperature data are from the Western Regional Climate Center, Palo Alto station (1953 to 2010). ET data are from the California Irrigation Management Information System, San Benito station (1995 to 2010).

Rainfall in Mountain View averages 15 inches per year (in/yr) with most rainfall occurring between November and April. The lack of rainfall and high evapotranspiration during the warmer months contributes to a higher water demand in the summer. The term "evapotranspiration" (or "ET") is a combination of the words "evaporation" and "transpiration" that represents plant and soil water loss due to wind, heat, humidity and other factors. ET records indicate an average loss of 47 in/yr, with highs of over 6 inches per month (in/mo) in June, July and August, and lows of less than 2 in/mo in December and January.

While these averages are useful in describing the typical climate in Mountain View, they do not demonstrate the variability in weather experienced from one year to the next. This variation is illustrated in Figure 2-2, which plots annual rainfall between 1954 and 2010 and ET from 1995 to 2010.

Figure 2-2: Historical Annual Rainfall and Evapotranspiration



Significant shifts in rainfall and ET can directly affect the City's water demand as irrigation often increases during unusually hot or dry years, and decreases during years with excess rainfall.

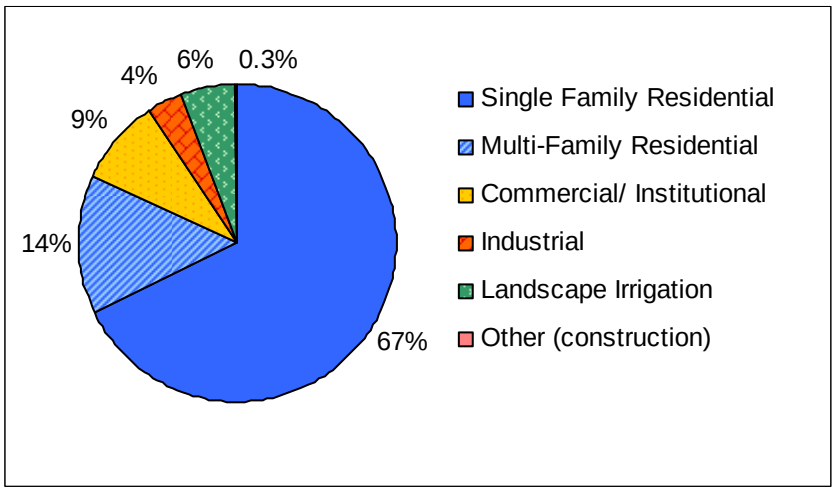
3 WATER SYSTEM OVERVIEW

The City of Mountain View owns, operates, and maintains a potable water distribution system that serves water throughout Mountain View. Several small pockets within the City are served water by Cal Water. The City's municipal water system services three pressure zones and consists of three wholesale water turnouts, four reservoirs, three pumping stations, seven active groundwater supply wells, and buried pipes of varying composition, ages and sizes. Details of the City's potable water supply systems are provided below, based on Mountain View's *Water Master Plan* (IEC, 2010a). Details of Cal Water's potable water supply system are documented independently by Cal Water.

3.1 Service Connections

Mountain View provides water service to all of its businesses and residents within the City limits except those in the Cal Water service areas. Mountain View currently serves 17,277 metered service connections. Single-family and multifamily homes account for approximately 81 percent of all connections, with the remaining connections distributed between CII, and landscape customers. Temporary construction meters account for less than 1 percent (Figure 3-1).

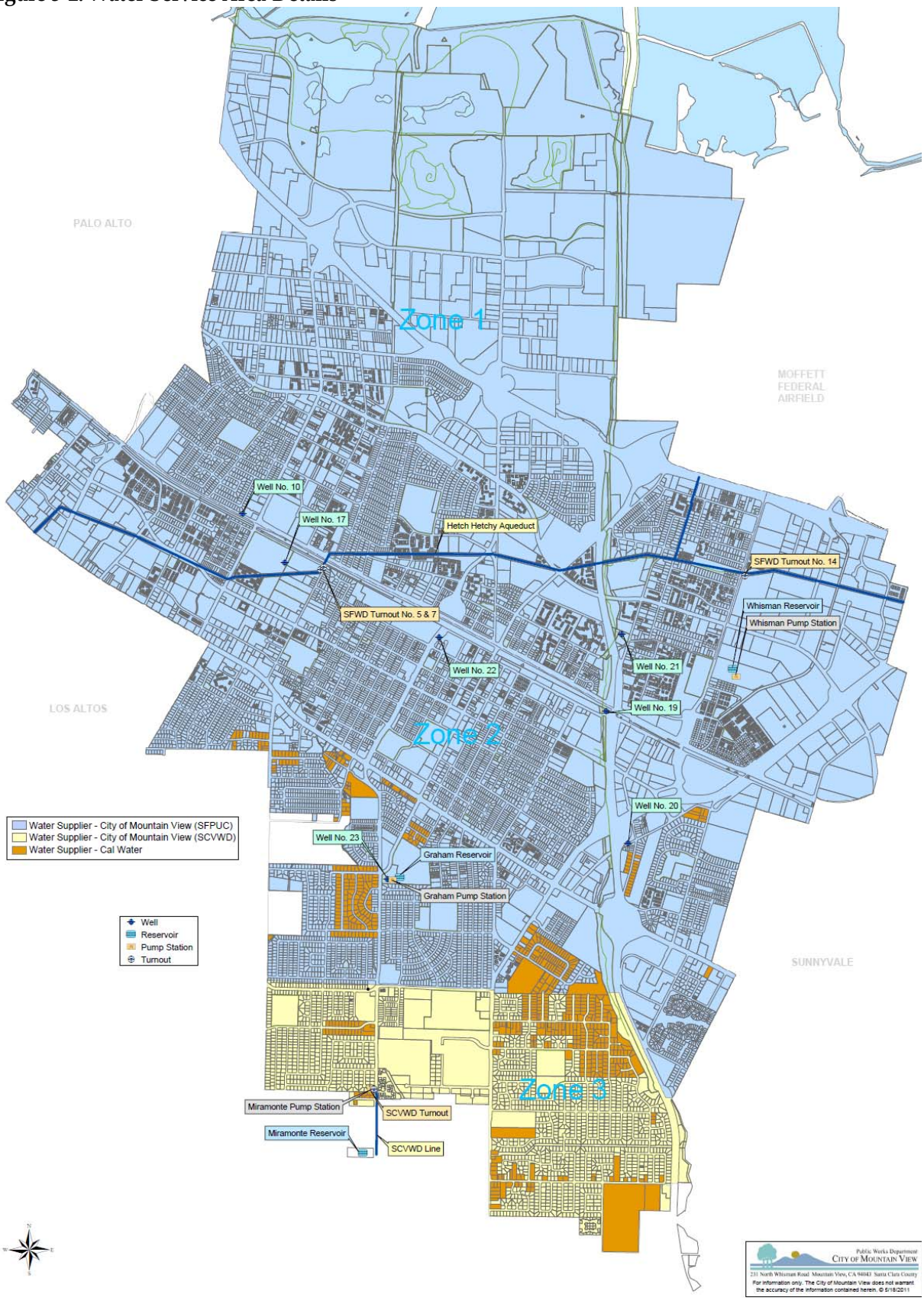
Figure 3-1: Water Service Connections



3.2 Turnouts

Mountain View purchases most of its water wholesale from the SFPUC and the SCVWD via three turnouts, with two points of connection for treated SFPUC water, and one point of connection for treated SCVWD water. Each turnout has one or more connection valves ranging in diameter from 8 to 14 inches, and ranging in pressure from 48 to 120 pounds per square inch (psi). Figure 3-2 shows the approximate location of each of the City's wholesale water supply turnouts.

Figure 3-2: Water Service Area Details



3.3 System Pressure

The topography in Mountain View slopes primarily downward from the hills to the Bay, with an approximate 180 foot decrease in elevation between the southern and northern City boundaries. The City's water distribution system requires three pressure zones to provide customers at varying elevations with water at a reasonable pressure. Zones 1 and 2 receive SFPUC water, supplemented by local groundwater, and Zone 3 receives treated water from the SCVWD.

The system includes over 172 miles of pipelines ranging in diameter up to 27 inches. The age of the pipes also varies, dating from before the 1940s to the present. Pressure zones are isolated by pressure reducing valves, pressure sustaining valves, and a number of normally closed interzonal valves.

3.4 Water Storage Facilities

Mountain View has four potable water storage reservoirs with an aggregate operating capacity of 14.3 million gallons (mg). The largest potable water storage facility, Graham Reservoir, was constructed in 2007 and holds a maximum of 8.0 mg. Graham Reservoir is installed beneath an artificial turf playing field at Graham Middle School. The City's smallest potable water storage facility, Miramonte Reservoir No. 1, was built in 1945 and has an operating capacity of 0.7 mg. Miramonte reservoirs (No. 1 and 2) serve Zone 1 and also act as back-up and emergency storage for Zone 3. Table 3-1 lists each reservoir's storage capacity, date built and service pressure zones.

Table 3-1: Water Storage Facilities[4]

Reservoir	Date Built	Maximum Capacity (mg)	Operational Capacity (mg)	Primary Service Area	Secondary Service Area
Miramonte 1	1945	1.0	0.7	Pressure Zone 1	Emergency & Back-up for Pressure Zone 3
Miramonte 2	2006	2.3	2.0	Pressure Zone 1	Emergency & Back-up for Pressure Zone 3
Whisman	1962	6.0	5.1	Pressure Zone 2	Pressure Zone 1
Graham	2007	8.0	6.5	Pressure Zone 2	Pressure Zone 1
Total	**-**	**17.3**	**14.3**	**-**	**-**

3.5 Pump Stations

Water enters Mountain View's reservoirs by gravity and is pumped to respective the designated service pressure zones by three pump stations. The Graham and Whisman reservoirs each have their own pump station, and one pump station is used for both of the Miramonte reservoirs to provide emergency (fire) supply to Zone 3 and back-up for

[4] From the *City of Mountain View Water Master Plan* (IEC, 2010a).

high demand. Each pump station valve, its pressure, flow rate, elevation, and hydraulic grade line (HGL) is listed in Table 3-2.

Table 3-2: Pump Stations[5]

Pump Stations	Pump	Design Head (psi)	Design Head (ft)	Design Flow Rate (gpm)	Ground Elevation (ft)	Total HGL (ft)
Graham Zone 1	Pump No. 1	32	75	2,800	125	200
	Pump No. 2	32	75	2,800	125	200
Graham Zone 2	Pump No. 1	101	234	2,700	125	359
	Pump No. 2	101	234	2,700	125	359
	Pump No. 3	101	234	2,700	125	359
Miramonte	Pump No. 1	52	120	870	171	291
	Pump No. 2	71	165	2,670	171	336
	Pump No. 3	71	165	2,670	171	336
	Pump No. 4	71	165	2,670	171	336
Whisman Zone 1	Pump No. 3	99	228	2,500	74	302
	Pump No. 4	99	228	2,500	74	302
Whisman Zone 2	Pump No. 1	55	128	3,000	74	202
	Pump No. 2	55	128	3,000	74	202

3.6 Groundwater Supply Wells

The City owns seven active potable groundwater supply wells distributed throughout the water service area. The wells range in depth from 520 to 692 feet below the ground surface (ft bgs), and the combined typical pumping rate for Mountain View's wells is 3,100 gallons per minute (gpm). Table 3-3 lists each potable well, its depth, year constructed, and production capacity.

Table 3-3: Groundwater Supply Well Information[6]

Groundwater Supply Well	Depth (ft bgs)	Date Installed	Static Water Level (ft bgs)	Individual Max Pumping Rate (gpm)	Simultaneous Max Day Pumping Rate (gpm)	Typical Pumping Rate (gpm)
Well 10	560	1956	Flowing	800	500	350
Well 17	568	1960	0	200	--	150
Well 19	686	1985	23.3	1,200	800	400
Well 20	692	1985	47.8	1,200	900	400
Well 21	680	1997	13.9	500	500	400
Well 22	565	2002	10.4	1,000	1,000	600
Well 23	520	2005	53.6	1,000	1,000	800
Total	**--**	**--**	**--**	**--**	**4,700**	**3,100**

[5] Ibid.
[6] Ibid.

4 WATER DEMAND

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.

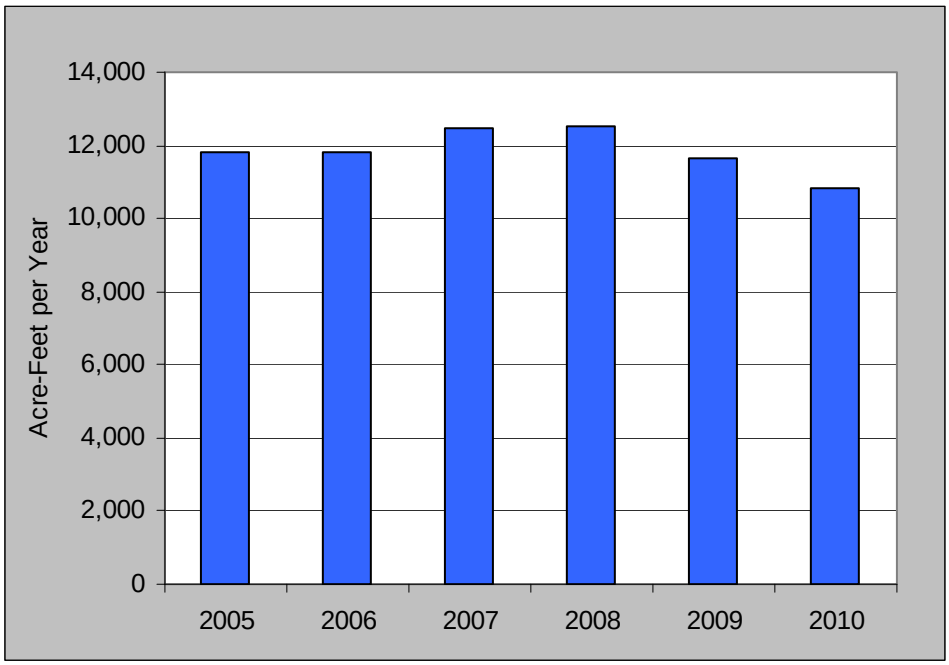
(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

4.1 Current and Historical Water Demand

Mountain View's recent water use is shown in Figure 4-1. Water use in 2010 was 9 percent lower than in 2005, and the lowest the City's water use has been since at least 2000. This decline is a result of several factors, some of which include the economy, weather patterns, and the success of conservation programs.

Figure 4-1: Historical Water Use



In 2010 residential customers accounted for approximately 57 percent of the City's total water use while landscape irrigation accounted for approximately 23 percent. The remaining 20 percent was split between CII uses – with construction meters accounting for less than one-tenth of 1 percent of the total use (Figure 4-2; Table 4-1).

Figure 4-2: 2010 Water Use by Customer Sector

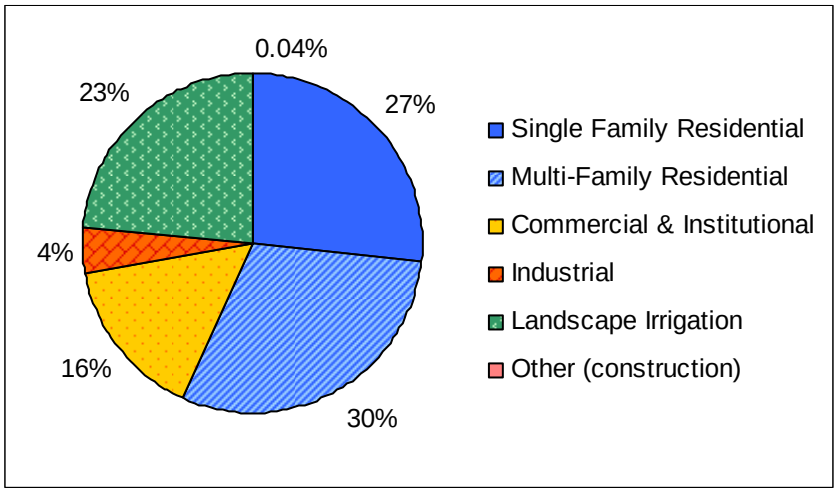


Table 4-1: Historical Water Use by Customer Sector

	Annual Water Use (acre-feet per year)					
Customer Sector	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Single Family Residential	3,162	3,160	3,269	3,290	3,000	2,885
Multifamily Residential	3,537	3,582	3,700	3,614	3,377	3,232
Commercial / Institutional	1,858	1,867	1,957	1,981	1,832	1,702
Industrial	554	564	579	562	508	449
Landscape Irrigation[7]	2,706	2,648	2,984	3,099	2,947	2,540
Other (Construction)	6	5	7	4	6	5
Total	**11,823**	**11,827**	**12,496**	**12,550**	**11,670**	**10,813**

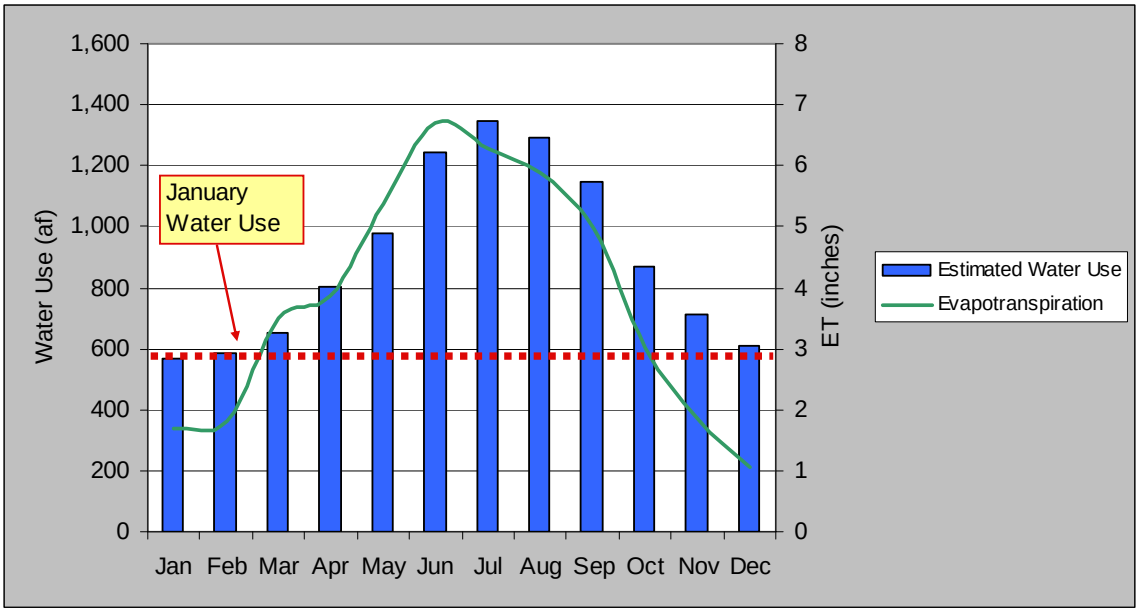
Although water use for all of Mountain View's customer sectors was low in 2010, water use in most sectors actually rose from 2005 to 2008, and subsequently dropped from 2008 to 2010. Between 2008 and 2010, water use in each customer sector fell by more than 10 percent, with the industrial sector experiencing more than a 20 percent decline.

4.1.1 Water Use Variability by Season

Water use in Mountain View varies significantly from month to month based on the local climate. Figure 4-3 compares local ET to water use for each month in 2010.

[7] Landscape irrigation in 2010 used a combination of potable water, blended water and recycled water.

Figure 4-3: 2010 Monthly Water Use[8]

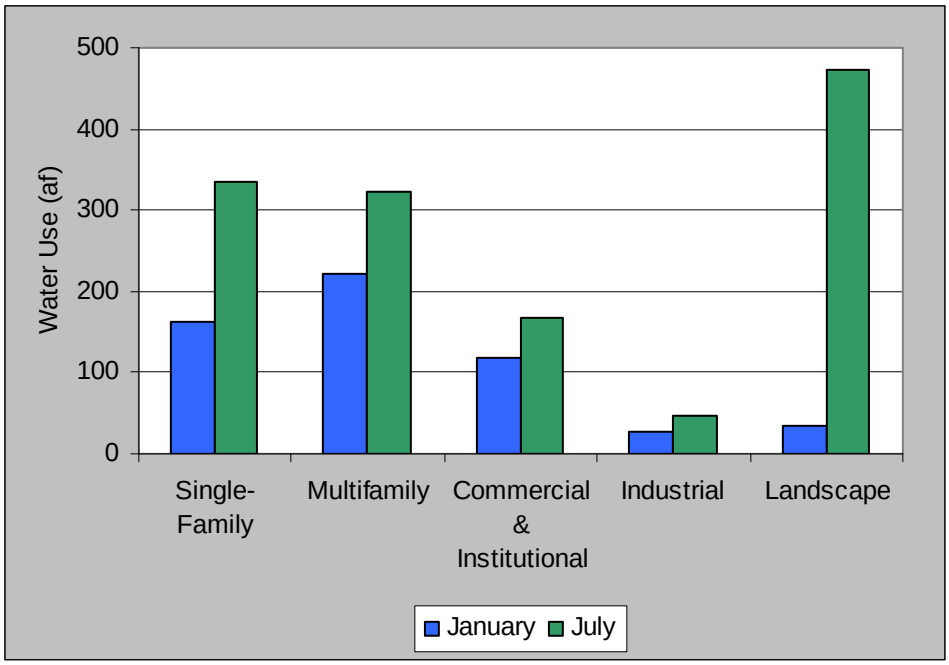


Most of the observed variation is due to landscape water needs, which increase during the hot, dry summer months, and decrease during cool, wet winter months. A portion of this variation may also be due to increased cooling demands and/or changes in process or other business activities throughout the year. The result is an average July water use of more than double the average January water use. As expected, this trend mimics monthly ET values from local weather stations, which reflect plant water needs.

Trends in monthly water use also vary by customer sector. Figure 4-4 compares January and July water use for each customer sector. As expected, the largest increase in water use between January and July is seen in the landscape sector which uses more than 13 times as much water in July than in January. Average July water use in other sectors ranges from 1.4 to 2 times the average January water use.

[8] Monthly water use shown above does not reflect actual billing sales but instead is averaged over a two-month period to account for different customer group billing cycles.

Figure 4-4: 2010 January and July Water Use by Customer Type[9]



4.2 Projected Future Water Demand

4.2.1 Basis for Water Demand Projections

Water demand projections were developed using Maddaus Water Management's Demand Side Management Decision Support System (DSS model). These projections were based on regional water demand and conservation modeling efforts completed over the past several years. Mountain View's DSS model was most recently revised as part of this UWMP to account for several changes, including recycled water use in the North Bayshore Area and updated population and employment projections based on the Council-endorsed strategy for the 2030 General Plan.

Two main steps were involved in developing the model: (1) establishing base-year water demand at the end-use level; and (2) forecasting future water demand based on existing water service accounts and future growth.

Establishing the base-year water demand at the end-use level was accomplished by breaking down total historical water use for each customer sector (single-family, multifamily, commercial, etc.) to specific end uses, such as toilets, faucets, showers and irrigation. Consistent with other neighboring water agencies, Mountain View's model used 2001 as its base year because 2001 is generally considered to represent normal rainfall and historic demand.

[9] See Footnote 8.

Forecasting future water demand was accomplished by applying estimated growth in the number of water service accounts in Mountain View's service area. These growth rates were entered into the model and applied to each customer sector and their water end-uses. Following this "base-case" projection, potential water savings due to increased efficiency in the end-use categories and recycled water use was estimated and subtracted from the base-case projection. In this manner, Mountain View's future water demand through 2035 was forecasted for the following scenarios:

- Using base-year water use trends.
- Incorporating water savings from plumbing code updates, which require the installation of water-efficient fixtures.
- Incorporating the use of recycled water throughout the North Bayshore Area.
- Incorporating the implementation of water conservation measures.

Water-efficient fixtures considered in the plumbing code updates included toilets, urinals, showers, and clothes washers. The estimated volume of water used by modern fixtures, compared to older fixtures, is listed in Table 4-2.

Table 4-2: Plumbing Fixture Water Use

Plumbing Fixture	Water Use for Older Fixture	Water Use for Modern Fixture
Toilet	1.6 to 3.5 gallons/flush	1.28 gallons/flush
Urinal	1 to 3 gallons/flush	0.5 gallons/flush
Shower	15 to 20 gallons per shower	12 gallons/shower
Clothes Washer	36 to 43 gallons/load	26 gallons/load

Projected uses of recycled water were based on a feasibility study performed in 2004, the details of which are discussed in Section 5.4.

Water conservation measures included in the DSS model are listed in Table 4-3 along with the total number of actions (e.g., surveys or rebates) projected to be implemented over the next 10 and 25 years. These numbers were chosen as part of a regional analysis on water demand, and achieving the targeted conservation depends on several factors – including the availability of funding and the willingness of customers to participate in the programs. Details about conservation measures implemented by Mountain View over the past five years are included in Section 7.

Table 4-3: DSS Model Conservation Assumptions

Conservation Measure	Actions		
	Completed (2005-2010)[10]	Assumed (2010-2020)	Assumed (2010-2035)
Residential water surveys	1,450 surveys	2,400 surveys	4,800 surveys
High efficiency clothes washers rebate	2,230 rebates	9,600 rebates	9,600 rebates
High efficiency toilet rebate (or installation)	2,500 rebates	6,500 rebates	6,500 rebates
Landscape water audit	40 audits	300 audits	640 audits
Commercial water audit	30 audits	50 audits	50 audits
Landscape education classes	470 attendees	1,700 attendees	3,250 attendees
Public Information[11]	35,000 contacts	65,000 contacts	130,000 contacts
Indoor Water Efficiency Regulations[12]	0 sites reviewed	1,600 sites reviewed	3,400 sites reviewed
Outdoor Water Efficiency Regulations	16 sites reviewed	1,000 sites reviewed	2,000 sites reviewed

The results of Mountain View's DSS model are presented in the following paragraphs.

4.2.2 Water Demand Modeling Results

Mountain View's updated DSS model results are shown in Table 4-4 in five-year increments through the year 2035. Results are shown for the base-case scenario, as well as for scenarios that incorporate water savings due to plumbing code updates, recycled water projects, and conservation measures.

Table 4-4: Water Model Results

Water Model Scenario (demand reduction method)	Total Water Demand (afy)				
	2015	2020	2025	2030	2035
Scenario A (Base-Case)	14,201	15,159	15,948	16,733	17,519
Scenario B (Plumbing Codes)	13,639	14,285	14,779	15,314	15,865
Scenario C (Plumbing Codes & Recycled Water)	12,613	12,675	13,169	13,704	14,255
Scenario D (Plumbing Codes & Conservation)	13,202	13,686	14,103	14,557	15,024
Scenario E (Codes, Recycled Water & Conservation)	12,176	12,076	12,493	12,947	13,414

Recent updates to the plumbing codes are expected to reduce Mountain View's water use by 4 percent in 2015, and up to 9 percent in 2035. Recycled water is expected to

[10] Implementation of some conservation measures began after 2005. Data for commercial water audits, landscape education classes, public information, and indoor and outdoor water efficiency regulations do not reflect a full five years of implementation.
[11] Includes billing inserts, bill messaging and direct contacts.
[12] Mountain View's Green Building Code will include indoor water efficiency regulations and is expected to be adopted by July 2011.

reduce potable water use by 7 percent in 2015 and 9 percent in 2035. The implementation of new conservation measures is projected to reduce water use by 3 percent in 2015 and 5 percent in 2035, from the base-case scenario.

Projected Water Use by Customer Type

Table 4-5 below presents projected demand on the City's water system by customer sector in five-year increments through 2035. These projections incorporate water savings from plumbing code updates, but do not subtract for conservation, the benefits of which are shown in Table 4-4. The landscape sector does include both potable and recycled demands.

Table 4-5: Projected Water Demand by Customer Sector

	Projected Water Demand (afy)				
Customer Sector	**2015**	**2020**	**2025**	**2030**	**2035**
Single-Family Residential	3,510	3,585	3,663	3,755	3,853
Multifamily Residential	3,864	3,916	3,973	4,051	4,136
Commercial & Institutional	1,748	1,825	1,909	1,998	2,089
Industrial	661	692	726	760	795
Landscape Irrigation	2,890	3,254	3,458	3,662	3,866
Other	13	14	14	15	16
Unaccounted for Water	953	999	1,036	1,073	1,111
Total Demand	**13,639**	**14,285**	**14,779**	**15,314**	**15,865**

4.2.3 Water Demand for Lower-Income Households

10631.1. (a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower-income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

Pursuant to Water Code Section 10631.1 (a), water use projections for lower-income households are included in this UWMP (Table 4-6). These projections assume that approximately 30 percent of households in Mountain View are lower-income, based on the City's 2010-2015 Consolidated Plan (BAE, 2010). Water demand for lower-income households is estimated to account for approximately 25 percent of the total residential water use in Mountain View, based on a mix of single-family and multifamily households.

Table 4-6: Estimated Water Use for Low-Income Households

	Projected Annual Water Use (afy)				
Customer	**2015**	**2020**	**2025**	**2030**	**2035**
Lower-Income Households	1,845	1,909	1,974	2,047	2,122

4.3 2020 Urban Water Use Target

10608.20 (e) An urban retail water supplier shall include in its urban water management plan required pursuant to Part 2.6 (commencing with Section 10610) due in 2010 the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.

The Water Conservation Act of 2009 requires each urban water retail supplier in California to develop a water use target for the year 2020 as part of a cooperative effort to help reduce California's State-wide per capita water use by 20 percent by the year 2010. Each retailer's 2020 urban water use target must be reported in its 2010 UWMP, along with its baseline daily water use, "interim" urban water use target (for 2015), and "compliance" daily water use (for 2010). While retailers must adopt an approach for calculating their 2020 target in the 2010 UWMP, they may modify their approach any time before the end of 2015, at which point eligibility for State water management funding becomes conditioned upon meeting the 2015 and 2020 targets. Retailers that do not meet the water use targets will not be eligible for water management grants or loans unless a viable implementation plan is approved by the funding agency.

Details regarding Mountain View's urban water use targets are discussed below.

4.3.1 Base Daily Water Use

The initial step in developing a 2020 water use target is establishing base consumption. Consistent with methodology outlined in the *Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan* (DWR, 2011), retailers may choose any 10 consecutive years between 1995 and 2010 for their base period. Based on Mountain View's historical population and water use, a base period of 1995 to 2004 was selected, resulting in a base daily per capita water use of 180 gpcd. Supporting data for the baseline calculation is presented in Table 4-7.

Table 4-7: Base Daily Water Use Calculations[13]

Year	Population	Gross Water Use (mgd)[14]	Per Capita Water Use (gpcd)
2010	74,286	9.78	132
2009	73,257	11.00	150
2008	72,097	11.97	166
2007	71,328	12.27	172
2006	70,433	11.47	163
2005	70,269	11.92	170
2004	70,394	12.48	177
2003	70,330	12.02	171
2002	69,916	12.46	178
2001	69,868	12.47	178
2000	69,207	12.68	183
1999	68,711	12.52	182
1998	68,774	11.85	172
1997	67,815	13.25	195
1996	67,338	12.47	185
1995	66,915	11.60	173
Base Daily Water Use (1995-2004)			**180**

4.3.2 Urban Water Use Target

There are four available methodologies for setting an urban water use target:

- Method 1: 80 percent of the base daily per capita water use.
- Method 2: Performance standards-based water budget.
- Method 3: 95 percent of a regional target, as defined by DWR.
- Method 4: Water savings estimates for the replacement of plumbing fixtures.

Mountain View staff calculated the City's potential urban water use target by applying three of the four available methods (Methods 1, 3, and 4). Since very specific landscape data is needed to calculate a target using Method 2, this method was unavailable to Mountain View. Below is a summary of how each potential target was calculated.

- Mountain View's Method 1 target was calculated as 80 percent of the base daily water use.

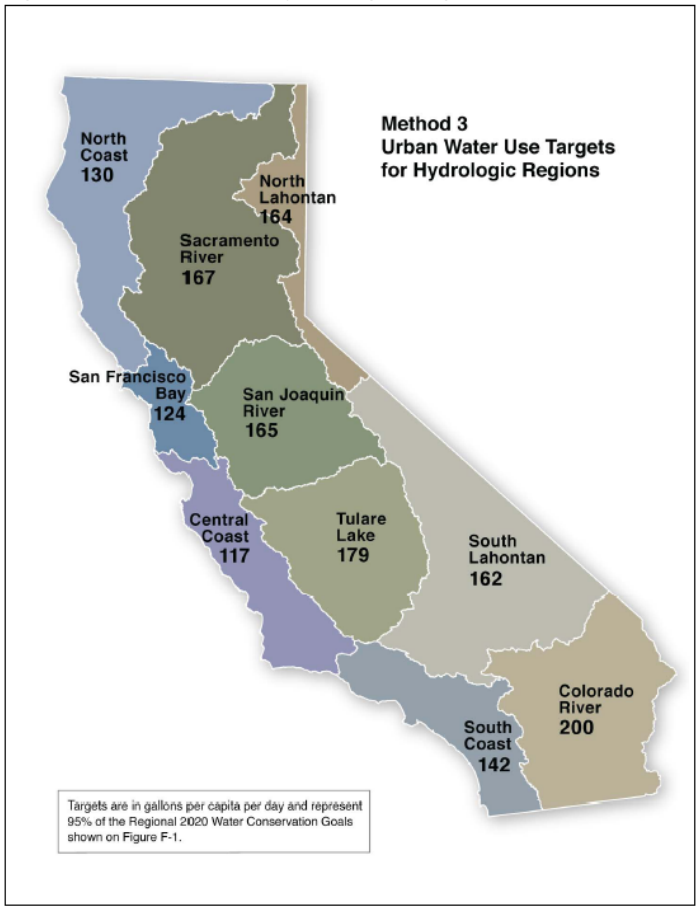
[13] "Gross water use," as defined by SB 7, is equivalent to the total potable water production described in Section 5 of this UWMP. Gross water use does not include recycled water or water served by other providers, such as Cal Water. Population is based on the California Department of Finance estimates (Tables E-8 and E-5), less an estimated 1,500 residents served by Cal Water.

[14] One mgd is equal to approximately 1,120 afy.

- Mountain View's Method 3 target was calculated as 95 percent of DWR's target for the San Francisco Bay Hydrologic Region, which was 131 gpcd. Figure 4-5 shows the Method 3 target for all of California's hydrologic regions.

- Method 4 is based on water savings anticipated in different customer sectors based on the installation of efficient fixtures – calculated using an Excel-based tool developed by DWR. A copy of Mountain View's completed Method 4 calculator is included as Attachment F.[15]

Figure 4-5: California Hydrologic Regions and Method 3 Water Use Targets[16]



The results from Mountain View's urban water use target analysis are presented in Table 4-8. In order to mark progress toward meeting this target, an "interim" urban

[15] Method 4 allows two options for estimating water savings: (1) using historical water conservation data back to 1991; or (2) using a "default" savings based on measured water savings from conservation programs throughout California. Given the incomplete record of local conservation data back to 1991, Mountain View opted for the default savings estimate of 15 gpcd.

[16] From the *Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan* (DWR, 2011).

water use target was calculated as the midpoint between the base daily per capita water use and the 2020 urban water use target.

Table 4-8: Urban Water Use Target Analysis Results

Target Method	Base Daily Water Use (gpcd)	2015 Interim Water Use Target (gpcd)	2020 Urban Water Use Target (gpcd)
Method 1 – 80% Baseline	180	162	144
Method 2 – Performance Standards	180	--	--
Method 3 – 95% Regional Target	180	152	124
Method 4 – Water Savings	180	163	146

Following a discussion of these results, presented at a public hearing on May 10, 2011, Method 4 was chosen as the best option for the City of Mountain View. A copy of the resolution adopting the use of Method 4 is included as Attachment G. Using Method 4, the urban water use target for Mountain View is 146 gpcd (approximately 13,133 acre-feet per year; afy). Mountain View's interim target, which must be met by the year 2015, is 163 gpcd (14,018 afy).

4.3.3 Compliance Daily Water Use

Mountain View's current water use in any given reporting year is considered a "compliance" water use and is used to mark progress toward meeting the 2015 and 2020 targets. Mountain View's 2010 compliance daily water use was 132 gpcd.[17]

Based on Mountain View's 2010 compliance daily water use, it might appear that Mountain View has already met its future targets. However, it is important to consider unique events during 2010 that may have temporarily decreased water use, and to understand how growth affects future per capita water use. For example:

- 2010 was the first wet year following a three-year drought and many customers temporarily reduced their water use in response to the drought.
- The slow economy is believed to have temporarily decreased water use in 2010, with residents and businesses cutting costs to save money.
- Since per capita water use is calculated as total water use divided by population, growth in nonresidential sectors will increase Mountain View's per capita water use because it increases water use but not population.

[17] Mountain View's compliance water use in 2015 and 2020 will be used to evaluate compliance with its 2015 and 2020 targets. Although there is no target for 2010, the City is still required to report its 2010 per capita water use which, for consistency, is also referred to as "compliance" water use.

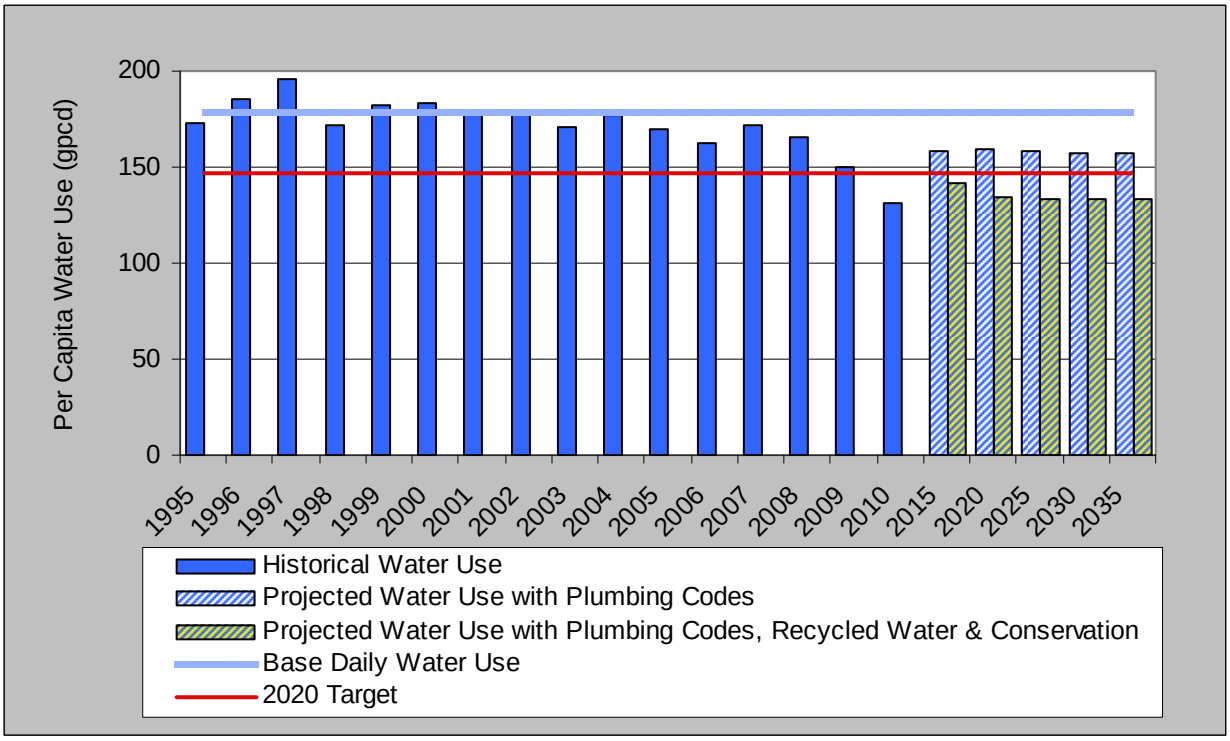
As rainfall and the economy return to normal, water use is expected to increase. Additionally, any unanticipated growth in the CII sectors could have significant impacts on Mountain View's compliance daily water use.

In order to meet Mountain View's water use targets, water savings from the plumbing code, recycled water system and conservation will be used. As a result of these actions, Mountain View's projected compliance water use in 2015 and 2020 is expected to be below its water use targets. The results from Mountain View's DSS model are presented in Table 4-9 and Figure 4-6 for all five scenarios.

Table 4-9: Projected Compliance Daily Water Use

	Per Capita Water Use (gpcd)	
Water Model Scenario (demand reduction measure)	**2015**	**2020**
Scenario A (Base-Case)	165	169
Scenario B (Plumbing Codes)	159	159
Scenario C (Plumbing Codes & Recycled Water)	147	141
Scenario D (Plumbing Codes & Conservation)	154	153
Scenario E (Plumbing Codes, Recycled Water & Conservation)	142	135
Water Use Targets	**163**	**146**

Figure 4-6: Urban Water Use Target Analysis



Plan for Meeting 2020 Urban Water Use Target

10608.26 (b) In complying with this part, an urban retail water supplier may meet its urban water use target through efficiency improvements in any combination among its customer sectors. An urban retail water supplier shall avoid placing a disproportionate burden on any customer sector.

Mountain View expects per capita water use to increase in future years due to growth, a recovering economy, and the return of normal regional rainfall. Despite this expected increase, the City can meet its water use targets by continuing three programs that are already in place:

- Continued enforcement of water-efficient regulations affecting new construction and renovations (such as the Water Conservation in Landscaping Regulations and pending Green Building Code).
- Continued conversion of irrigation customers in the North Bayshore Area from the potable water system to the recycled water system.
- Continued implementation of water conservation programs, including outreach, education and financial incentives.

As shown in Table 4-9, Mountain View's updated DSS model indicates the Mountain View will need to implement the measures listed above in order to meet its 2015 and 2020 water use targets.

It is important to note that to achieve the projected conservation savings, Mountain View must continue to have sufficient support and funding for its programs. At present, Mountain View's incentive programs are funded through wholesale water rates for the SCVWD, while funding for outreach and educational programs is provided by the SCVWD, the City and BAWSCA. Changes to these sources could alter the availability of future conservation programs.

4.3.4 Regional Alliance

10608.20 (a) (1) Each urban retail water supplier shall develop urban water use targets and an interim urban water use target by July 1, 2011. Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28, and may determine the targets on a fiscal year or calendar year basis.

Retailers may choose to meet their urban water use targets individually or through a regional alliance. Such an alliance, if pursued, may be entered into anytime before 2015. Retailers may form sub-groups within a regional alliance, but may not belong to multiple alliances. The regional approach provides a "back-up" to the individual approach because it includes two options for compliance: (1) if the region as a whole meets its targets; or (2) if the retailer meets its individual targets. This flexibility

provides a buffer against a rise in per capita water use due to unanticipated nonresidential water use, or other factors, as it spreads potential uncertainties out over a larger area.

In preparation for the 2010 UWMP, Mountain View investigated the possibility of creating a regional alliance with neighboring water agencies, including: (1) BAWSCA member agencies; or (2) fellow Santa Clara County retail water suppliers supplied by the SCVWD. A preliminary analysis was conducted by BAWSCA to assess the potential benefits of forming a regional alliance between the member agencies. Given the complexities of establishing a regional alliance, this analysis will not be finalized until after the completion of the 2010 UWMPs. Retail agencies in Santa Clara County will also investigate the possibility of an alliance following completion of the 2010 UWMPs.

5 WATER SUPPLY SOURCES

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)...

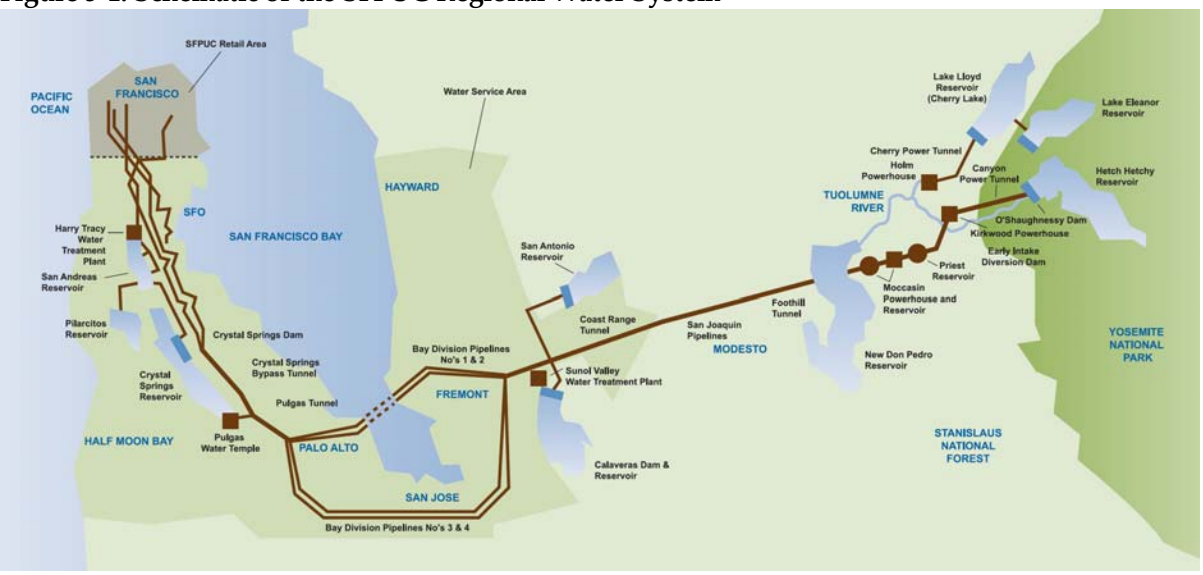
The City of Mountain View purchases the majority of its drinking water from the SFPUC and the SCVWD. These sources are supplemented by water pumped from seven active groundwater wells owned and operated by the City. Beginning in 2009, Mountain View also began receiving non-potable recycled water from the RWQCP to help meet irrigation needs, saving potable water for domestic use and offsetting groundwater pumped by a local irrigation well. In 2010, water supplies used by the City (both potable and non-potable) included 84 percent SFPUC water, 9 percent SCVWD treated water, 4 percent groundwater and 3 percent recycled water.

This section contains a description of these water supply sources, estimates of the maximum supply available to the City of Mountain View from each source, and projects the anticipated volume of water to be used from each source through 2035.

5.1 San Francisco Public Utilities Commission

The City of Mountain View receives water from the City and County of San Francisco's Regional Water System (Regional System), operated by the SFPUC. This supply originates 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. Figure 5-1 shows an illustrated schematic of the Regional System.

Figure 5-1: Schematic of the SFPUC Regional Water System[18]



[18] From the *Public Review Draft Urban Water Management Plan* (SFPUC, 2011).

Approximately 85 percent of the Regional System supply comes from the Tuolumne River through Hetch-Hetchy Reservoir. The remaining 15 percent comes from local watersheds through the San Antonio, Calaveras, Crystal Springs, Pilarcitos and San Andreas Reservoirs.

5.1.1 Water Supply Agreement

The business relationship between San Francisco and its wholesale customers (including Mountain View) 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* (Supply Agreement) entered into in July 2009. The Supply Agreement, which has a 25-year term, addresses water supply availability for the Regional System as well as the methodology used by the SFPUC in setting wholesale water rates. This agreement succeeds an earlier 25-year agreement signed in 1984.

The Supply Agreement provides 184 mgd to the wholesale customers during normal water years. This volume, referred to as the "Supply Assurance," is subject to reduction during periods of water shortage due to drought, emergencies or other scenarios resulting in a water shortage. Each wholesale customer's share of the 184 mgd is referred to as their Individual Supply Guarantee (Individual Guarantee). Mountain View's Individual Guarantee is 13.46 mgd (or approximately 15,077 afy). Although the Supply Agreement expires in 2034, the Supply Assurance and Individual Guarantees continue in perpetuity.

5.1.2 Bay Area Water Supply and Conservation Agency

BAWSCA was created in 2003 to represent the interests of the 26 agencies in Alameda, Santa Clara and San Mateo Counties that purchase water on a wholesale basis from the San Francisco Regional System. Collectively, the BAWSCA agencies are referred to as the "wholesale customers."

Through BAWSCA, the wholesale customers can work with the SFPUC on an equal basis to ensure rehabilitation and maintenance of the Regional System. In addition to representing the wholesale customers in interactions with the SFPUC, BAWSCA also has the authority to:

- Coordinate water conservation, supply and recycling activities for its agencies.
- Acquire water and make it available to other agencies on a wholesale basis.
- Finance projects, including improvements to the Regional System.

- Build facilities jointly with other local public agencies or on its own to carry out the agency's purposes.

Two of these efforts, the Water Conservation Implementation Plan (Regional Conservation Plan) and the Long Term Water Supply Plan (Long Term Supply Plan), are described in Section 7.2 and Section 6.1 of this UWMP, respectively.

5.2 Santa Clara Valley Water District

As the primary water resources agency for Santa Clara County, the SCVWD has several responsibilities, including water supply, flood protection and water resources stewardship. The SCVWD imports water through the Sacramento-San Joaquin Delta from the Sierra Nevada mountain range; manages, captures and stores local surface water in its reservoirs; and recharges local groundwater basins. Local and imported surface water is treated at SCVWD facilities and distributed to retail suppliers or used for groundwater recharge. Eleven (11) retailers and numerous private well owners rely on the groundwater pumped from the groundwater subbasins managed by the SCVWD. Seven of these retailers also receive surface water from the SCVWD's treated water distribution system. Three retailers within Santa Clara County participate in the SCVWD water management programs, even though they use alternative water supplies not managed directly by the SCVWD (i.e., the SFPUC Regional System).

5.2.1 Supply Management Strategy

The SCVWD's water supply programs store excess water during wet years so that it may be used during dry years. Below is a description of some of the SCVWD's key management techniques:

- Conjunctive Use: A major component of the SCVWD's supply management strategy is conjunctive use, which is the coordinated management of surface water and groundwater to maximize the yield of the overall water resource. The SCVWD actively recharges the local groundwater basins with local and imported surface water supplies.

- Carryover Water: To maximize its imported water supply, the SCVWD routinely opts to "carry over" a portion of its supplies, essentially leaving it in the State and Federal systems for retrieval in later years.

- Out-of-County Banking: Through the Semitropic Water Storage District's groundwater banking program, the SCVWD sends excess imported water to the out-of-County groundwater bank in wet years and withdraws this water when it is needed in dry years.

5.2.2 Water Supply Contract

Mountain View's treated water supply relationship with the SCVWD is governed by a 70-year water supply contract entered into in 1984. Pursuant to this agreement, Mountain View submits proposed delivery schedules to the SCVWD estimating the volume of treated water needed from the SCVWD in three-year periods. In addition to the estimated three-year delivery schedule, retailers also submit anticipated monthly deliveries for the coming year, as well as information needed in order for the SCVWD to project annual deliveries for the next five years. The SCVWD manages all of its water supplies in an effort to meet the requested treated water deliveries, while balancing other demands on the system – such as groundwater recharge and banking.

5.2.3 Sources of Supply

Imported Water

Imported water is delivered to the SCVWD by the State Water Project (SWP) and the Federal Central Valley Project (CVP). Water for both of these projects originates from Northern California watersheds and is conveyed through the Sacramento-San Joaquin Delta. The SCVWD holds contracts for 152,500 afy of water from the CVP and 100,000 afy from the SWP; however, the actual amount of water delivered is typically less than these contractual amounts and depends on hydrology, conveyance limitations and environmental regulations.

Local Surface Water

Ten (10) local reservoirs with a combined storage capacity of about 170,000 acre-feet (af) capture local runoff for treatment at the SCVWD's three water treatment plants or recharge of the groundwater basin. Most stored water is released in the spring to percolate into the groundwater or is sent to the SCVWD's water treatment plants. Several factors influence the SCVWD's reservoir operations, including supply reliability, habitat protection, recreation functions, flood protection and dam safety.

Local Groundwater

The SCVWD does not currently operate local groundwater supply wells, but instead may be thought of as indirectly supplying retailers and private well owners with groundwater by managing the basins through recharge activities

5.3 Local Groundwater

10631. (b) …If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

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

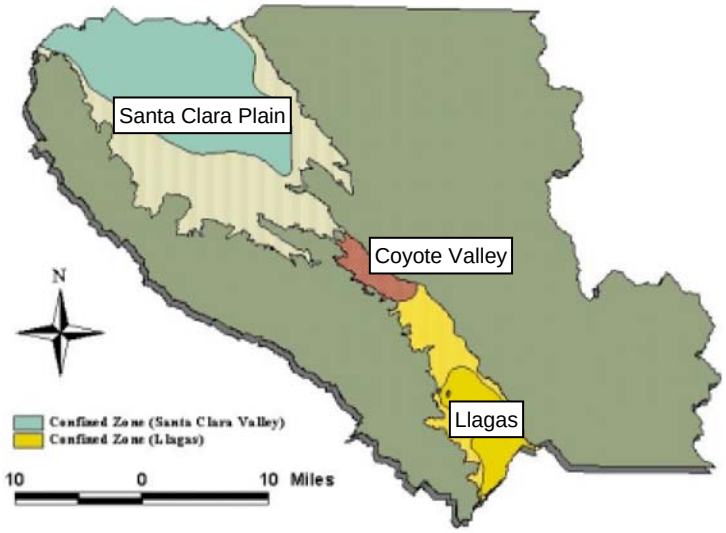
(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

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

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

Mountain View owns and operates water supply wells that extract groundwater from the Santa Clara Groundwater Basin's Santa Clara Subbasin. As the primary water resources agency for the county, the SCVWD is responsible for groundwater management throughout the Santa Clara Subbasin (DWR Subbasin 2-9.02) and also for the Llagas Subbasin (DWR Subbasin 3.301), which is located in southern Santa Clara County. In its water supply planning, the SCVWD frequently splits the Santa Clara Subbasin into two subareas: Santa Clara Plain and the Coyote Valley. Although part of the same subbasin, these two subareas have different groundwater management challenges and opportunities. Figure 5-2 shows the approximate boundaries of the groundwater subareas managed by the SCVWD. Mountain View's wells are located in the Santa Clara Plain subarea.

Figure 5-2: Santa Clara County Groundwater[19]



[19] Modified from the *Santa Clara Valley Water District Groundwater Management Plan* (SCVWD, 2001).

The following paragraphs describe Mountain View's groundwater supply, including groundwater management, water-bearing formations, water levels and water quality. Except where noted, information about the subbasin presented herein is based largely on *California's Groundwater – Bulletin 118* (DWR, 2003) and the *Santa Clara Valley Water District Groundwater Management Plan* (SCVWD, 2001). A complete copy of the groundwater management plan is included as Attachment H. The SCVWD is currently in the process of updating its groundwater management plan; however, a draft of the updated plan was not available at the time Mountain View's UWMP was prepared.

5.3.1 Groundwater Management

The SCVWD is responsible for recharge and management activities for the Santa Clara Subbasin. According to the SCVWD's Draft 2010 UWMP, groundwater pumping provides up to half of the County's water supply during normal years. Total groundwater pumping from the Santa Clara Subbasin in 2009 was approximately 113,000 af (SCVWD, 2011). Of this, Mountain View extracted approximately 436 af, less than 1 percent.

Several programs operate collectively to maintain a reliable groundwater supply for the County. Portions of the SCVWD's imported and local surface water supplies are used to recharge groundwater at in-stream and off-stream facilities throughout the County. Groundwater quality programs track and mitigate the levels of salt water intrusion and nitrate into the North and South County areas of the subbasin, respectively. The SCVWD also monitors groundwater elevation, extraction rates, and land subsidence, helping to prevent groundwater overdraft and its negative effects. A full description of these programs is included in the SCVWD's groundwater management plan (Attachment H).

5.3.2 Description

The Santa Clara Subbasin is bounded by the Diablo Range on the east and by the Santa Cruz Mountains on the west. The subbasin extends from the northern border of Santa Clara County to the groundwater divide near Morgan Hill, and has surface area of 240 square miles. The dominant geohydrologic feature is the Santa Clara Valley which drains northward to the San Francisco Bay by tributaries such as Coyote Creek, the Guadalupe River, and Los Gatos Creek. The two drainages running through Mountain View within the City's boundaries include Stevens Creek and Permanente Creek, which flow from the Santa Cruz Mountains to the Bay (DWR, 2003).

5.3.3 Geology

Water-bearing formations within the Santa Clara Subbasin include alluvium and the underlying Santa Clara Formation. The combined thickness of these two units is estimated to exceed 1,500 feet (DWR, 2003).

The alluvium is the most important water-bearing unit in the Santa Clara Subbasin. Alluvial deposits are at least 1,500 feet thick below central San Jose, and are generally comprised of unconsolidated gravel, sand, silt, and clay (USGS, 1984). Most large production wells in the subbasin pump water from this highly permeable alluvium. The alluvium in the northern portion of the Santa Clara Subbasin is overlain by a clay layer of low permeability while the southern portion of the subbasin is generally unconfined and contains no thick clay layers (DWR 2003).

The Santa Clara Formation underlies the water-bearing alluvium in the central part of the Santa Clara Valley, and is exposed on the west and east sides of the valley. Where exposed, the Santa Clara Formation is composed of deposits ranging in size from boulders to silt and yields only small to moderate quantities of water to wells (USGS, 1984). Permeability increases from west to east, and in the central part of the valley permeability and grain size decrease with depth (DWR, 2003). The Santa Clara Formation rests on the impermeable rocks of the Franciscan Formation which mark the bottom of the groundwater subbasin.

5.3.4 Recharge Areas

Natural groundwater recharge occurs principally as infiltration from streambeds within the drainage basin and from direct percolation of rainfall that falls on the basin floor.

Efforts to supplement natural recharge in the Santa Clara Valley began in the 1920s (SCVWD, 2001). Today, the SCVWD performs artificial recharge, releasing local surface water or imported water to a total of 18 in-stream and off-stream facilities. In-stream recharge accounts for about 65 percent of the artificial groundwater recharge at SCVWD facilities, respectively, and occurs along stream channels in the alluvial apron upstream of the confined zone (DWR, 2003). Spreader dams (creating temporary or permanent impoundments in the stream channel) are a key component of the in-stream recharge program, increasing recharge capacity by approximately 10 percent.

The remaining 35 percent of the recharge throughout the SCVWD's management areas is accomplished with off-stream recharge facilities including abandoned gravel pits and areas specifically excavated for recharge purposes (DWR, 2003).

5.3.5 Groundwater Level Trends

High volumes of groundwater production from the early 1900s through the mid-1960s reduced the groundwater level in some parts of the subbasin by more than 200 feet, leading to 13 feet of permanent land subsidence in some parts of the valley and saltwater intrusion into the aquifer adjacent to the Bay. Since 1965, land subsidence has slowed to less than 0.01 feet per year, and groundwater levels have rebounded as a result of greater reliance on imported surface water supplies, an increase in recharge, and decreases in pumping (DWR, 2003; SCVWD, 2001). Current hydrographs of index wells within the subbasin maintained by SCVWD support this trend.[20]

5.3.6 Groundwater Storage

The Santa Clara Subbasin's operational storage is assumed to be 375,000 af (350,000 af for the Santa Clara Plain and 25,000 af for the Coyote Valley). A maximum pumping limit of 200,000 afy is used for the Santa Clara Plain and it is assumed that subsidence would occur in the Santa Clara Plain if pumping were to exceed this maximum (SCVWD, 2011).

5.3.7 Groundwater Quality

Groundwater quality in the Santa Clara Subbasin is very good. Groundwater in the major producing aquifers within the subbasin is generally of a bicarbonate type, with sodium and calcium as the principal cations. Although hard, it is of good to excellent mineral composition and suitable for most uses. Drinking water standards are met at public supply wells without the use of treatment methods (DWR, 2003).

Areas with somewhat elevated mineral levels, perhaps associated with historical saltwater intrusion, have been observed in the northern subbasin. Some wells with elevated nitrate concentration have been identified in the southern portion of the subbasin (DWR, 2003). Groundwater from Mountain View's water supply wells meet all water quality standards, and detected levels of these minerals meet all applicable health and safety requirements (Mountain View, 2010).

As part of the California Department of Public Health's (DPH) Drinking Water Source Assessment Protection Program, Mountain View conducted an assessment of the potential hazards within the capture zone of each groundwater well. This assessment found that groundwater pumped by Mountain View's potable wells is potentially vulnerable to contamination. Although the vulnerabilities vary for each well site, some of the concerns included:

- Known contaminant plumes.

[20] *http://www.valleywater.org/Services/DepthToWaterIndexWellHydrographs.aspx*

- Leaking underground storage tanks.
- Automobile gas stations, repair shops and body shops.
- Transportation corridors (roadways and railroads).
- Sewer collection systems.
- Dry cleaners.
- High-density housing, office buildings, research labs, dental/medical clinics.
- Storm drain discharge points.

The DPH assessment found that potential impacts are likely to be confined to the upper aquifer, and that the physical barriers at the wells were highly effective in preventing migration into the lower aquifer, where the City's wells extract groundwater. Regular monitoring and cleanup activities at known contamination sites also help to protect Mountain View's potable groundwater supply.

5.3.8 Mountain View Groundwater Use

The City of Mountain View operates seven active potable groundwater wells to supplement imported water supplies. The City also owns one inactive irrigation well at Shoreline Regional Park for supplemental irrigation purposes. When previously in operation, water from the irrigation well did not enter the potable water system but, instead, was used directly for landscape irrigation. Since 2009 this non-potable irrigation supply has been replaced with recycled water from the RWQCP.

As shown in Table 5-1, Mountain View produced approximately 476 af of groundwater in 2010. Since 1990, Mountain View has produced an average of 599 afy, with a high of over 1,500 af in 1991. Most of this groundwater is pumped directly into the potable water distribution system or non-potable irrigation ponds; however, a portion of the water is also used for general operation and maintenance of the groundwater wells.

Table 5-1: Historical Groundwater Production

	Groundwater Production (afy)		
Year	Shoreline Well	Potable Wells	Total
2010	0	476	476
2009	0	436	436
2008	160	409	569
2007	228	323	551
2006	214	148	362
2005	188	149	336

Groundwater production in future years is anticipated to meet approximately 2 percent of the City's total water needs. Projected water supply availability for all of Mountain View's supplies are quantified in Section 5.6.

5.4 Recycled Water

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

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

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

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

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

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

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

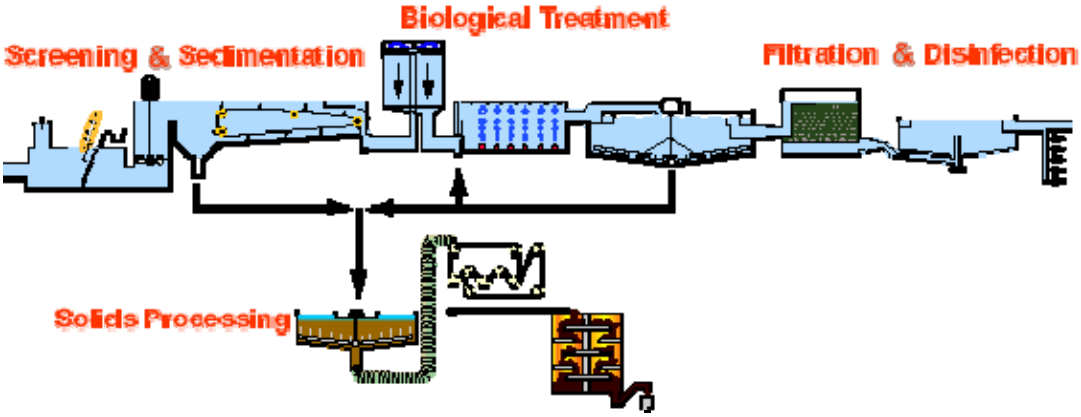
(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

The City of Mountain View uses recycled water from the Palo Alto RWQCP for irrigation of public and private landscapes in the North Bayshore Area. This section describes the City's recycled water program.

5.4.1 Wastewater Water Treatment Processes

The RWQCP is an advanced treatment facility with a designed average dry weather flow capacity of 39 mgd and a current average flow of about 22 mgd (Palo Alto, 2011). The RWQCP uses a multi-step process to filter, clean and disinfect wastewater so that it can safely be discharged to the Bay or used for irrigation and other approved non-potable uses. A schematic of the RWQCP treatment process is provided in Figure 5-3.

Figure 5-3: Schematic of Wastewater Treatment Process



The RWQCP treatment process includes:

- Primary treatment: Bar screening and primary sedimentation.
- Secondary treatment: Fixed film reactors, conventional activated sludge, clarification, and filtration.
- Tertiary treatment: Filtration through a sand and coal filter and UV disinfection.

All of the wastewater treated at the RWQCP meets the California Code of Regulations Title 22 tertiary standards for restricted reuse. In addition, the RWQCP has a 4.5 mgd reclamation facility that further filters and disinfects recycled water to meet the Title 22 tertiary standards for unrestricted reuse. In September 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.

5.4.2 Current and Projected Wastewater Generation

Table 5-2 lists the estimated wastewater flows for the City of Mountain View's sanitary sewer system in 2010, as well as the projected future wastewater generation.

Table 5-2: Historical and Projected Wastewater Generation[21]

	Wastewater Generation (afy)					
	2010	**2015**	**2020**	**2025**	**2030**	**2035**
Mountain View	8,853	10,490	12,131	12,299	12,467	12,635

Information about the other flows at the RWQCP (e.g., from other partner agencies) is included in the City of Palo Alto's UWMP (Palo Alto, 2011).

[21] Estimated sewer flow for 2010 reflects FY 2009-10. Future estimated wastewater generation is based on the *Sewer Master Plan* (IEC, 2010b) and include some flows from Moffett Field and the Town of Los Altos Hills, and some groundwater infiltration.

5.4.3 Development of the Recycled Water Program

The following paragraphs include a summary of Mountain View's recycled water program, presented in chronological order. Recycled water deliveries began in the early 1980s, experienced an eight-year hiatus between 2001 and 2009, and were recently restarted in July 2009. Additional details are provided below.

Recycled Water Use in the 1980s and 1990s

The RWQCP has been providing recycled water to the Cities of Palo Alto and Mountain View since the early 1980s. The main goals of the early RWQCP Water Reuse Program were to reduce demand on drinking water supplies, to reduce pollutant discharge to the Bay, and to improve the overall quality of the Bay.

Recycled water use at Mountain View's Shoreline Golf Course (Shoreline Golf Links) began in 1980 but was suspended in 2001 due to failure of the recycled water pipeline. Since the pipeline to Shoreline Golf Links ran directly through sensitive marshlands, it was neither practical nor cost-effective to repair the damaged pipeline (RMC, 2004).

Regional Water Reclamation Master Plan

In 1992 a *Water Reclamation Master Plan for the Regional Water Quality Control Plant* (Reclamation Master Plan) was prepared to outline a plan for expanding the use of recycled water within the RWQCP service area. The Reclamation Master Plan evaluated the feasibility of developing a regional water reuse system that could ultimately provide service to the entire RWQCP service area. Implementation of the Reclamation Master Plan recommendations was delayed due to lack of funding (RMC, 2004).

In 2003, funding opportunities from the State Water Resources Control Board (SWRCB) triggered the implementation of one of the five projects identified in the Reclamation Master Plan. The Mountain View/Moffett Field project was chosen based on an assessment of the reuse opportunities demonstrating that irrigation in the Mountain View Shoreline Area and at Moffett Field presented the best immediate and near-term opportunity for recycled water reuse (RMC, 2004).

Mountain View/Moffett Field Area Water Reuse Project

The primary goals of the Mountain View/Moffett Field Area Water Reuse Project were as follows:

- Improve water supply management and supply reliability by providing a dependable, locally controlled water source that reduces dependency on imported water.

- Establish a framework for a future regional recycled water system – including establishing a plan for connectivity with other recycled water producers and users in the region, such as the City of Sunnyvale.

The *Regional Water Recycling Facility Planning Study for the Mountain View/Moffett Field Area Water Reuse Project* (RMC, 2004) included a market assessment to estimate potential recycled water use within the project area (considered "near-term" customers) – and potential recycled water use in an expanded feasibility plan service area (considered "long-term" customers).

The market assessment estimated that 1,480 to 1,860 afy recycled water could be used within the Mountain View/Moffett Field area near-term, and that an additional 1,830 to 3,970 afy recycled water could be used in other areas of Mountain View, Palo Alto, East Palo Alto and Los Altos long-term.[22] The potential demand for the near-term uses within Mountain View's water service area represents approximately 10 percent of the City's total water demand.

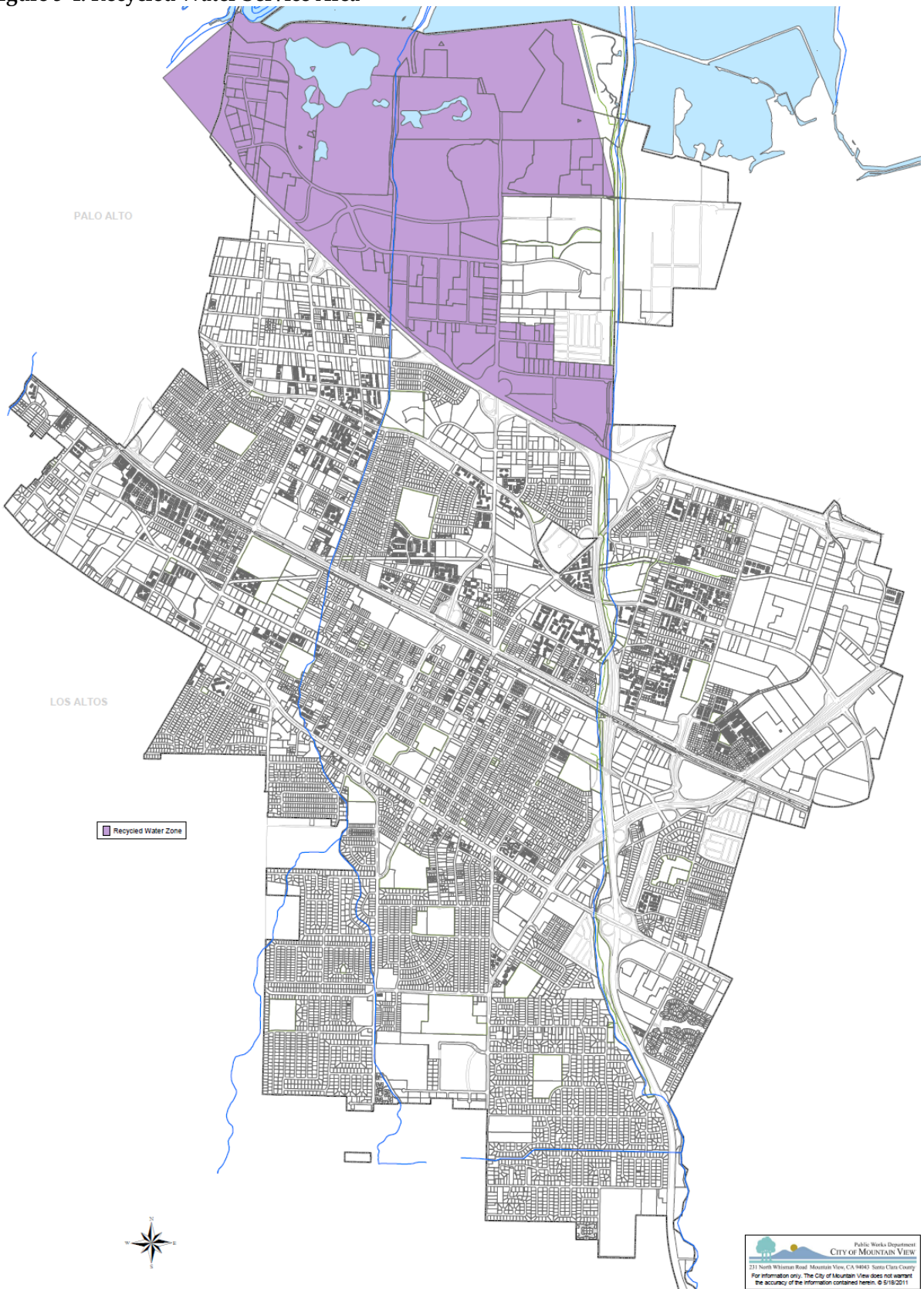
In 2005, Mountain View was awarded $3.8 million in State grant funding enabling the City to proceed with construction of the recycled water pipeline. Construction of the recycled water pipeline began in 2006, was completed in 2009 and deliveries began in July 2009.

5.4.4 Recycled Water Service Area

The approximate boundaries of Mountain View's recycled water service area are shown in Figure 5-4.

[22] Note that a portion of the near-term demand identified by RMC (2004) is outside of the City's water service area, and is, therefore, not included in recycled water use projections presented in Section 5.4.

Figure 5-4: Recycled Water Service Area



5.4.5 Encouraging the Use of Recycled Water

In 2004, Mountain View's City Council adopted Article V, Chapter 35 of the City Code related to the use of recycled water for irrigation. Pursuant to the City Code, retail, commercial and industrial customers within the North Bayshore Area must use recycled water for landscape irrigation. These requirements apply both to existing users and to future users. Penalties for noncompliance with the ordinance include discontinuance of potable water service and a 50 percent surcharge for the use of potable water. A copy of this ordinance is included in Attachment I.

To assist customers in converting to the recycled water system, the *Mountain View Water Reuse Rules and Regulations* were completed in 2010. This document outlines design and installation specifications, operation and maintenance responsibilities, and the process for connecting to Mountain View's recycled water system.

To further encourage the use of recycled water, customers receive the added benefit of reduced water rates. In 2010, recycled water was available at a 25 percent discount from potable water, and customers were charged a uniform rate instead of the increasing block rate used for the potable water system.

5.4.6 Recycled Water Quality

Although recycled water is successfully being used for irrigation in Palo Alto and Mountain View, the salt content of the recycled water is relatively high (approximately 900 parts per million; ppm). Because high salt content may harm some plants, including redwood trees, the RWQCP partner agencies are working together to develop and implement a long-term strategy to reduce the salt content in the wastewater stream – and, thus, in the recycled water.

Salinity Reduction Efforts

To mitigate concerns for landscape health and maximize the use of recycled water, the RWQCP partner agencies developed a Salinity Reduction Policy. To date, this policy has been adopted by Palo Alto, Mountain View and Los Altos. The Salinity Reduction Policy has several key elements, including to:

- Set a goal of reducing salinity in recycled water to 600 ppm.
- Determine salinity levels in the waste stream from each partner agency.
- Identify sources of salinity.
- Develop alternatives for reducing salinity.
- Identify actions that can be implemented to meet the salinity goal.

- Prepare a Salinity Reduction Plan.
- Monitor salinity and report progress semi-annually.

Mountain View's first effort to reduce wastewater salinity levels was to reroute the flow of high-salinity groundwater extracted from Shoreline Park to discharge to Permanente Creek and Stevens Creek instead of into the sanitary sewer. This effort failed to significantly reduce salinity levels of wastewater and a subsequent plan was developed to investigate the intrusion of groundwater into sewer pipes adjacent to the Bay. A series of salt monitors installed at key locations in the sewer collection system identified the presence of high-salinity sewage, prompting the City to televise the pipeline to identify the points where groundwater was infiltrating the sewer. The City is currently in the process of evaluating different techniques for repairing the damaged pipeline to prevent high-saline groundwater from entering the sanitary sewer system. Groundwater in this area is high in salinity because of its proximity to and interaction with the Bay.

Solutions Project Report

In 2003, the City of Mountain View participated in a cooperative investigation with the SCVWD and South Bay Water Recycling to assess impacts of recycled water use in Santa Clara County. This project, conducted by researchers at the University of California, aimed to identify soil and plant constraints for using recycled water within Santa Clara County, and to propose water quality and management practices that would enable the sustainable use of recycled water within the County. Below is a summary of key findings from the *Solutions Project Report* (Oster, 2010):

- Coastal redwood (*Sequoia sempervirens* 'Aptos Blue') is sensitive to soil-water salinity independent of the type of salt causing the salinity. Tree growth and leaf health were affected equally by sodium chloride, calcium chloride, sodium sulfate, and a mix of sodium and calcium chloride.
- Soil water salinities up to 1 decisiemen/meter (dS/m; approximately 640 ppm of salt) did not affect growth of the studied redwoods, whereas salinities of 3 dS/m (1,920 ppm of salt) resulted in leaf burn and reduced growth.
- Despite being sensitive to salinity, long-term sustainable irrigation of redwoods with recycled water may be possible provided that sufficient water is applied to prevent the buildup of excess salinity levels in soil-water. A soil-water salinity level between 1 and 2 dS/m should be targeted.

- Proper irrigation management depends on meeting target levels of water within the soil (referred to as "soil water content") that can prevent the buildup of soil-water salinity.
- Application of gypsum before the rainy season may be necessary to improve soil infiltration rates, an important component to reducing soil-water salinity.
- With even the best management, excess soil-water salinity may not be preventable. If this occurs, remaining options include: reduce salinity of the applied water or remove damaged plants.

Redwood Tree Monitoring

Beginning in 2009, the City of Palo Alto initiated a program to monitor the response of established redwood trees to irrigation with RWQCP recycled water. Six trees were chosen for the initial study, with an additional three trees being added in 2010. All nine of the test sites are located in Mountain View and six began receiving recycled water in early 2010. A nearby control site irrigated with potable water was chosen for comparison purposes.

As part of this monitoring program, soil moisture data is collected continuously at each site and soil and tree tissue sampling is performed triennially in conjunction with a visual assessment of each tree. During the sampling events, soil and foliage samples are collected and tested for pH and salinity and each tree is rated visually using a standard index of leaf health and canopy density. Findings from the monitoring program as of December 2010 indicated the following:

- Salinity was found in levels that are acceptable for redwood trees.
- Soil salinity was higher for the recycled water sites than for the control site, and had generally increased since the beginning of the monitoring program.
- Soil pH was the same or slightly lower in all samples except the control point.
- Seven of the 10 foliage samples were within the normal range for sodium and chloride, and similar to the control.
- Soil moisture conditions were highly variable among the sites.

Palo Alto's monitoring program will continue in 2011, providing additional insight into the sustainable management of recycled water irrigation at sites with redwood trees.

5.4.7 Current and Projected Recycled Water Uses

Mountain View's 2005 UWMP projected 600 af of recycled water would be used for irrigation within the North Bayshore Area in 2010. Actual recycled water use for 2010 was 441 af. [23]

Current and projected recycled water use within Mountain View's water service area is shown in Table 5-3. Projections are made over a 25-year time horizon based on anticipated conversion of potable users to the recycled water system. Since recycled water is often applied at a greater rate than potable water (to prevent salts from building up in the plant root zone), a 25 percent increase over the potable water offset was assumed for future years.

Table 5-3: Projected Recycled Water Use and Potable Water Offset

	2010	2015	2020	2025	2030	2035
Recycled Water Use	441	1,026	1,610	1,610	1,610	1,610
Potable Water Offset	441	866	1,290	1,290	1,290	1,290

5.4.8 Other Potential Uses of Recycled Water

10633. (d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

City Parks

A market assessment performed as part of the 2004 Mountain View/Moffett Field feasibility plan identified an additional 222 afy of potential recycled water demand at City parks outside of the current recycled water service area. In the future, Mountain View may assess the feasibility of extending the recycled water pipeline south of Highway 101 to provide access to parks and other potential users.

Indirect Potable Recycled Water Use

Mountain View has not evaluated the potential for indirect potable reuse within its service area. However, the SCVWD is currently investigating the feasibility of indirect potable reuse by studying the recharge of groundwater basins and augmentation of surface water reservoirs with highly treated recycled water. SCVWD's ongoing evaluation includes detailed analyses of the costs, benefits and public acceptance of each supply management alternative. Orange County Water District's Groundwater Replenishment Project's successful indirect potable reuse effort over a significant period

[23] Note that recycled water use for 2010 actually exceeded recycled water supplied by the RWQCP. This discrepancy is due to blending of multiple water sources in the irrigation ponds. In the future, customer billing data is expected to reflect solely recycled water use.

of time has provided a sound basis for considering a similar effort in Santa Clara County (SCVWD, 2011).

5.4.9 Recycled Water Optimization Plan

Mountain View has previously, or is currently implementing the following measures to optimize the use of recycled water in its service area:

- Adopted an ordinance that requires the use of recycled water for landscape irrigation in the North Bayshore Area (completed 2004).
- Developed rules and regulations to guide customers in connecting to the recycled water system (completed 2010).
- Offer recycled water at a discounted rate, compared to potable water (current).
- Work to reduce salinity levels in the recycled water (current).

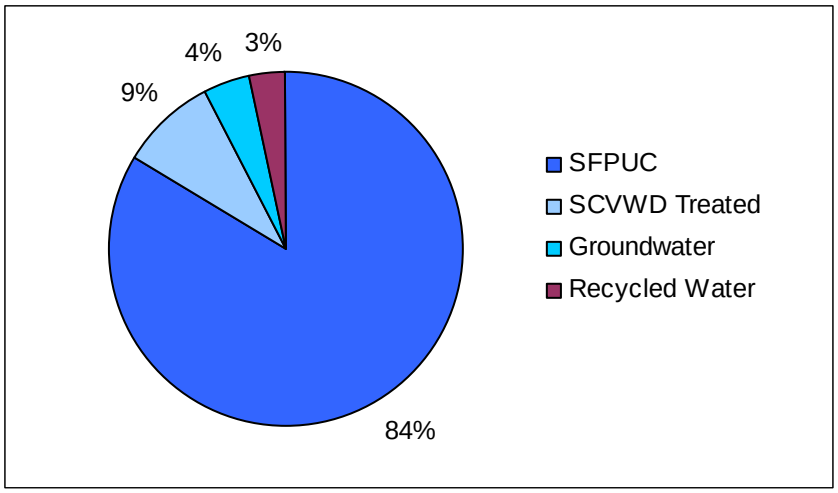
Mountain View will continue to pursue avenues for expanding the use of recycled water through these additional measures:

- Develop a strategy to convert existing customers onto the recycled water system.
- Develop a Recycled Water Master Plan.
- Study the feasibility of providing recycled water south of Highway 101.

5.5 Historical Water Supply Production

In 2010, approximately 84 percent of Mountain View's total water supply (both potable and non-potable) came from the SFPUC—9 percent was purchased from the SCVWD treated water system; 4 percent was produced at local groundwater wells; and 3 percent was delivered from the RWCQP for landscape irrigation (Figure 5-5).

Figure 5-5: 2010 Water Supply Production



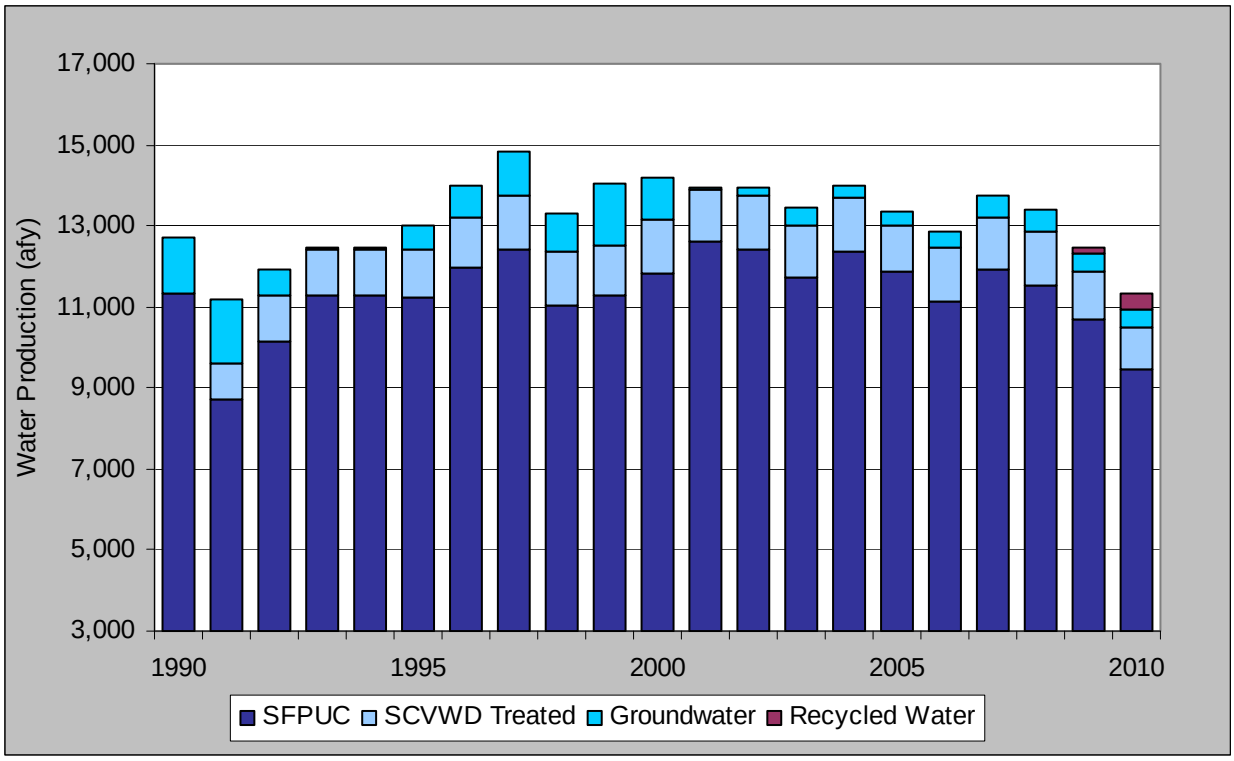
A complete view of Mountain View's water supply production over the past five years is provided in Table 5-4 and Figure 5-6. Although total supply production varies from year to year, the proportion of Mountain View's water supply that is purchased from each of its wholesale suppliers and pumped from groundwater wells has been relatively constant over time.

Table 5-4: Historical Water Supply Production

Year	Supply Source (afy)					
	SFPUC	SCVWD Treated	Total Imported	Ground-Water[24]	Recycled Water	Total
2010	9,476	1,007	10,484	476	389	**11,348**
2009	10,696	1,190	11,886	436	134	**12,456**
2008	11,505	1,330	12,835	569	0	**13,404**
2007	11,935	1,258	13,193	551	0	**13,744**
2006	11,138	1,351	12,489	362	0	**12,851**
2005	11,852	1,168	13,019	336	0	**13,356**
5-year average	**10,950**	**1,227**	**12,177**	**479**	**NA**	**12,656**
20-year average	**11,349**	**1,222**	**12,570**	**599**	**NA**	**13,169**

[24] Most groundwater produced is pumped directly into the potable water distribution system or non-potable irrigation ponds; however, a portion is used for general operation and maintenance of the groundwater wells.

Figure 5-6: Historical Water Supply Production[25]



5.6 Projected Water Supply Availability and Production

The availability of each of Mountain View's water supplies is presented in the following paragraphs. Mountain View does not presently anticipate the need to utilize all of its supplies to their maximum availability during the planning horizon of this UWMP. Demand on these supplies may change, however, based on the final adopted 2030 General Plan and other factors affecting water use, such as employment density. Table 5-5 identifies Mountain View's estimated maximum available water supplies, based on existing contracts with its wholesale suppliers and the RWQCP, and historical groundwater production.

Table 5-5: Estimated Maximum Available Water Supply

Supply Source	Estimated Maximum Available Supply (afy)	Basis
SFPUC	15,078	Individual Supply guarantee
SCVWD Treated	1,325	5-year projections
Groundwater	1,550	Historical maximum
Recycled Water	3,361	Capacity ownership

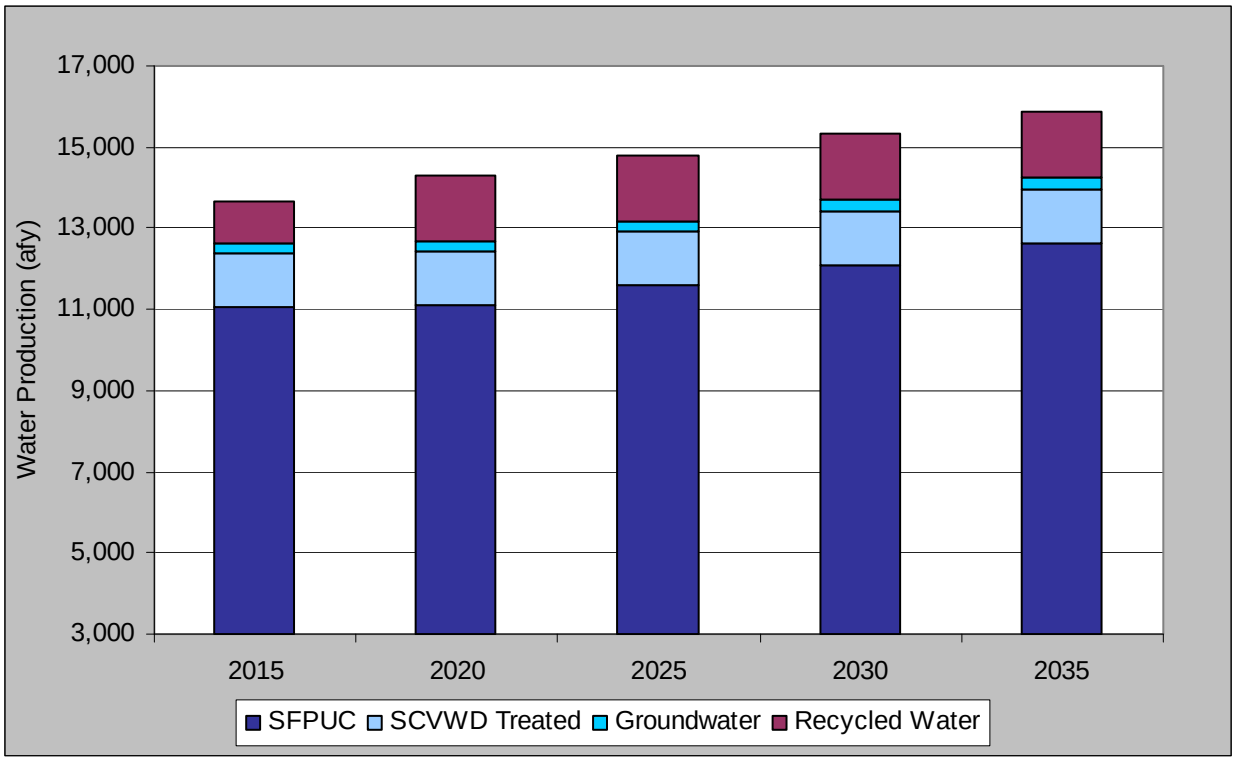
[25] Most groundwater produced is pumped directly into the potable water distribution system or non-potable irrigation ponds; however, a portion is used for general operation and maintenance of the groundwater wells.

In order to meet the projected water demand outlined in Section 4.2, Mountain View expects to utilize its water supplies in the approximate volumes presented in Table 5-6 and Figure 5-7. Actual use of each supply may increase or decrease depending on realized water demand in future years.

Table 5-6: Projected Water Supply Production

	Projected Water Supply Production (afy)				
Supply Source	**2015**	**2020**	**2025**	**2030**	**2035**
SFPUC	*11,036*	*11,097*	*11,581*	*12,105*	*12,645*
SCVWD Treated	*1,325*	*1,325*	*1,325*	*1,325*	*1,325*
Groundwater	*252*	*254*	*263*	*274*	*285*
Potable Supply	12,613	12,675	13,169	13,704	14,255
Recycled Supply	1,026	1,610	1,610	1,610	1,610
Total Supply	**13,639**	**14,285**	**14,779**	**15,314**	**15,865**

Figure 5-7: Projected Water Supply Production



6 WATER SUPPLY RELIABILITY

10631. (c) (1) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(A) An average water year.

(B) A single dry water year.

(C) Multiple dry water years.

(2) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

Water supply reliability information was provided by the City's two wholesale water suppliers: the SFPUC and the SCVWD. The information presented below includes a summary of projects and other events that may increase or decrease the ability of the SFPUC and the SCVWD to meet the needs of their retail suppliers (such as Mountain View). Also included is an evaluation of each wholesaler's ability to meet demands during normal years, single dry years and multiple dry year periods. In their dry year analyses, each wholesaler reviewed the hydrologic record and evaluated the ability of their system to deliver water if it were to experience a repeat of: (1) the driest single year on record ("single dry year"); and (2) the driest multiple dry year period on record ("multiple dry years"). Mountain View's analysis is based on a single dry year of 1978 and multiple dry years of 1987 to 1991.

6.1 Reliability of the SFPUC Regional Water System

Based on its Draft 2010 UWMP, the SFPUC expects to be able to meet the wholesale customers' collective demand on the Regional System during normal years through 2035. During dry years, the SFPUC anticipates that it will be able to meet between 100 percent and 80 percent of the Regional System demands (SFPUC, 2011).

The following paragraphs discuss the ability of the SFPUC Regional System to meet future demand, including plans for system improvements; reliability concerns; methods for allocating supply during dry years; and measures being undertaken by BAWSCA to ensure a reliable source of water for its member agencies.

6.1.1 Water System Improvement Plan

In order to enhance the ability of the SFPUC Regional System and meet its goals for water quality, seismic reliability, delivery reliability, and water supply, the SFPUC has undertaken a $4.6 billion Water System Improvement Program (WSIP). The WSIP, which was approved in 2008, includes capital improvements that enhance the SFPUC's ability to provide high-quality water in a reliable, affordable and environmentally sustainable manner.

Key water supply performance objectives of the WSIP are to:

- Meet water demands of 265 mgd during nondry years through 2018.
- Meet at least 80 percent of system-wide dry-year demands through 2018.
- Diversify water supply options during nondrought and drought periods.
- Improve the use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers.

As of July 2010, the WSIP was approximately 27 percent complete and is scheduled to be fully completed by the end of 2015.

6.1.2 Normal Year Supply Reliability

According to its Draft 2010 UWMP, the SFPUC expects to be able to meet normal year demands from the wholesale customers through 2035. This assumption is based on a maximum demand of 184 mgd in 2035.

As part of the WSIP, the SFPUC also adopted an Interim Limitation to cap sales from the Regional System to an average annual of 265 mgd through 2018. The wholesale customers' collective allocation under the Interim Limitation is 184 mgd and San Francisco's is 81 mgd.

Each individual wholesale customer's share of the Interim Limitation is referred to as the Interim Supply Allocations (Interim Allocation). In December 2010, the SFPUC established each agency's Interim Allocation through 2018, based on a combination of the projected Fiscal Year (FY) 2017-18 purchase projections and Individual Guarantees. The Interim Allocations are effective through December 31, 2018 and do not affect the Supply Assurance or the Individual Guarantees. Mountain View's Interim Allocation is 11.43 mgd.

The SFPUC established an Environmental Enhancement Surcharge concurrently with the budget-coordinated rate process. This surcharge will be unilaterally imposed by the SFPUC on individual wholesale customer and retail customers, when an agency's use exceeds their Interim Allocation and when sales of water to the wholesale customers and San Francisco retail customers, collectively, exceeds the Interim Limitation of 265 mgd. The Environmental Enhancement Surcharge will become effective beginning FY 2011-12.

6.1.3 Dry Year Supply Reliability

The SFPUC will not be able to meet 100 percent of the wholesale customer demands during dry year scenarios, and anticipates cutbacks ranging from 13 percent in 2015 to 17 percent in 2035 – based on a wholesale customer demand of 184 mgd (SFPUC, 2011). To achieve its target of limiting system-wide cutbacks to 20 percent during droughts, the SFPUC must successfully implement several dry-year water supply projects. These projects, which are part of the WSIP, include:

- Restoration of Calaveras Reservoir capacity.
- Restoration of Crystal Springs Reservoir capacity.
- Westside Basin Groundwater Conjunctive Use.
- Water Transfers with Modesto Irrigation District and Turlock Irrigation District.

Impact of Fishery Flows on Dry-Year Reliability

As part of two recently adopted projects (the Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements Project), the SFPUC committed to provides new fishery flows of approximately 7.4 mgd. These flows could potentially create a shortfall in meeting the Regional System demands and slightly increase the SFPUC's dry-year water supply needs, beginning in 2013.

As a result of these fishery flows the SFPUC may not be able to meet its water supply objectives between 2013 and 2018 without the following actions: (1) reducing demand; (2) increasing rationing; and (3) developing a supplemental supply.

6.1.4 Drought Allocation Plan

In July 2009, the SFPUC and wholesale customers adopted a Water Shortage Allocation Plan (Allocation Plan) to allocate water from the Regional System between the SFPUC and the wholesale customers during system-wide shortages. The first step in determining how much water will be available for each individual wholesale customer is to allocate water between the SFPUC and the wholesale agencies collectively. This step is referred to as the "Tier One Plan." The Tier One Plan allows for voluntary transfers of shortage allocations between all parties to the agreement, as well as "banking" and transfer of unused drought supplies.

Table 6-1 summarizes how the Tier One Plan distributes water between the SFPUC and the wholesale customers during a water shortage. Estimated Tier One allocations between 2010 and 2035 based on the hydrologic record are included in Attachment J.

Table 6-1: SFPUC Tier One Drought Allocations

System-Wide Reduction	Share of Available Water (percent of total)	
	SFPUC	Wholesale Customers
5 percent or less	35.5	64.5
6 to 10 percent	36.0	64.0
11 to 15 percent	37.0	63.0
16 to 20 percent	37.5	62.5

Unless extended by San Francisco and the wholesale customers, the Tier One Plan will expire at the end of the term of the Supply Agreement in 2034.

Allocation of the wholesale customers' Tier One Allocation is governed by the recently adopted "Tier Two Plan." Pursuant to the Tier Two Plan, the Tier One Allocation is divided between the wholesale customers based on each agency's Individual Guarantee and variation in seasonal water use (referred to as the "base/seasonal component"). The Individual Guarantee is a fixed component, and the base/seasonal component is variable – calculated using monthly water use for three consecutive years prior to the onset of the drought. Together, each agency's Individual Guarantee and base/seasonal component make up its "allocation factor," which is weighted one-third on the Individual Guarantee and two-thirds on the base/seasonal component. Following application of the allocation factors to the collective Tier One Allocation, minor adjustments are made to ensure a minimum cutback level, a maximum cutback level, and a sufficient supply for certain wholesale customers.

Given the variable nature of the base/seasonal component, Tier Two Allocations must be calculated each year in preparation for a potential water shortage emergency. As the wholesale customers change their water use characteristics (e.g., increase or decrease annual water use, monthly water use, or residential per capita water use), their allocations will also change. For the purpose of this UWMP, Mountain View used the allocation factor that was identified in the Tier Two Plan when adopted (6.4 percent of the wholesale customers' Tier One Allocation).

Unless extended by the wholesale customers, the Tier Two Plan will expire in 2018.

6.1.5 BAWSCA's 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 Supply Plan 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 Long Term Supply Plan is proceeding in three phases. Phase I was completed in 2010 and defined the magnitude of the anticipated water supply shortage and the scope of work for the Long Term Supply Plan. Phase II of the Long Term Supply Plan 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 Long Term Supply Plan 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, among 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 time frame to meet the identified needs. Project implementation may begin as early as 2013 and will continue throughout the Long Term Supply Plan planning horizon, in coordination with the timing and magnitude of the supply need.

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

6.2 Reliability of the SCVWD Water System

The SCVWD projects supply reliability for Santa Clara County using an integrated "Water Evaluation and Planning System Model." This model simulates the total management of current and future water resources within the County, including:

- SCVWD treated water supply (local and imported surface water).
- Local groundwater (Santa Clara Plain, Coyote Valley and Llagas subareas).
- SCVWD facilities (groundwater recharge, reservoirs, treatment, distribution and conveyance).
- SFPUC supply imported to the County.
- Recycled water.
- Local water developed by other agencies (such as San Jose Water Company).

Groundwater flow models are used to estimate groundwater storage, natural yield and basin losses and exchanges.

For the purpose of this UWMP, Mountain View has conservatively applied a worst-case scenario of 20 percent reduction to its SCVWD treated water supply during future dry years.

6.2.1 Increasing Supply Reliability

Capital Improvements Program

As part of its Water Utility Enterprise, the SCVWD completes capital improvement programs on a regular basis to maintain and upgrade its infrastructure and ensure that each facility functions as intended for its useful life. As part of the most recent 5-year capital improvements program, the SCVWD budgeted $490 million to complete 57 water supply projects - including water treatment plant upgrades, a recycled water advanced treatment facility and upgrades to the Pacheco pumping plant.

Water Master Plan

The SCVWD is currently in the process of developing a Water Master Plan to evaluate potential supply options that may be used to meet future water demands through 2035. Programs to be considered in the Master Plan will include increased recycled water use, increased conservation, additional imported supplies (including exchanges, transfers and options), desalination and new storage. The forthcoming Master Plan is anticipated to be adopted in 2012.

6.2.2 Threats to Supply Reliability

The SCVWD proactively identifies and addresses threats to its water supply sources and infrastructure. Key threats identified by the SCVWD included:

- Potential effects of climate change on water resources, in particular related to temperature, rainfall, snowpack and adverse effects on water quality in the Bay-Delta ecosystem.
- Effects of water supply operations on local fisheries, such as the recent Fish and Aquatic Habitat Collaborative Effort Settlement Agreement, to resolve a local water rights complaint.
- Damage from invasive species of mussels, which may impact water supply facilities or infrastructure (to date, no mussels have been documented in the SCVWD's system).

- Reduced supply availability due to an earthquake in Santa Clara County or the Sacramento-San Joaquin Delta area. Local and imported water supplies could be reduced due to a failure of local, State or Federal infrastructure, or to saltwater intrusion resulting from levee failure in the Delta islands.
- Effects of environmental regulations reducing Delta exports, such as the listing of Chinook salmon and Delta smelt as endangered species and subsequent restrictions on State and Federal Delta pumping.
- Potential impacts from reduced groundwater production charges, which provide funding for the SCVWD's conjunctive use programs.

Each of these threats is discussed in detail in the SCVWD's Draft 2010 UWMP. A discussion of the potential effects of climate change is included in Section 6.4.

6.2.3 Normal Year Supply Reliability

Modeling performed by the SCVWD indicates that the SCVWD will be able to meet treated water demands of its retail agencies during normal years through 2030, and 99 percent of the normal year demands through 2035. The identified shortfall could be met using carryover supply from the State and Federal systems; however, this supply is traditionally reserved for dry years. Other potential supplies that may be used to meet this shortfall in 2035 will be evaluated in the SCVWD's forthcoming Water Master Plan.

6.2.4 Dry Year Supply Reliability

The SCVWD aims to limit supply reductions for retail water agencies within the County to a maximum of 20 percent. For conservative planning purposes, Mountain View's 2010 UWMP assumes a worst-case scenario of 20 percent reduction in treated water deliveries during dry years, although it is likely that reductions will be significantly less than 20 percent.

6.3 Water Quality Impacts on Supply Reliability

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

The City of Mountain View provides high-quality water that meets all current State and Federal water quality standards. Staff from the SFPUC, the SCVWD and Mountain View regularly collect and test water samples from reservoirs, wells and designated sampling points to ensure that the water supplied to Mountain View customers meets or exceeds all applicable standards. Based on the results of drinking water source assessments prepared for each of the City's three potable water supply sources, no long-term water quality impacts are anticipated at this time. Additional information about

Mountain View's water quality is reported annually in the Consumer Confidence Report (Mountain View, 2010).

6.4 Effects of Climate Change on Supply Reliability

The issue of climate change has become an important factor in water resource planning in California. Although a discussion of climate change is not required for a UWMP, many water suppliers choose to include one. The summary below is based on information provided by the SFPUC and presented in the SCVWD's Draft 2010 UWMP.

Based on information presented by the SFPUC in its *Final Water Supply Availability Study* (PBS&J, 2009), climate change could result in the following types of water resource impacts:

- 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 incidences of wildfires that could affect water quality.
- Sea level rise and an increase in saltwater intrusion, potentially increasing salinity in the Delta and adversely impacting water quality and Bay-Delta ecosystems.
- Increased water temperatures with accompanying potential adverse effects on some fisheries and water quality.
- Increases in evaporation and corresponding irrigation need.
- Changes in urban and agricultural water demand.

Although the extent and precise effects of climate change on the State's water resources remain uncertain, the SFPUC and the SCVWD have included some level of analysis of climate change in their water supply modeling.

6.4.1 SFPUC Regional System

Initial climate change modeling completed by the SFPUC indicates that about 7 percent of runoff currently draining into Hetch-Hetchy Reservoir will shift from the spring and summer seasons to the fall and winter seasons 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, or the overall operation of, the Regional System 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 time frames being considered, the SFPUC is currently undertaking two additional studies. The first study 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 incorporate 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 Regional System as a whole. Both analyses will consider potential effects through the year 2100.

6.4.2 SCVWD Water System

Based on the State Water Project Delivery Reliability Report (DWR, 2009) and associated CALSIM II modeling results, the SCVWD's Delta imports would be reduced by 3 percent on average and 4 percent over the multiple dry year period compared to the analysis performed without climate change.

Under any climate change scenario, the SCVWD may need to consider additional treatment options to respond to water quality impacts associated with increased salinity in the Delta. The SCVWD may also need to consider additional storage to take advantage of more wet-season water, additional supplies to replace reduced water supply from existing sources, and additional water transfers.

Under the SCVWD's Quality and Environmental Management System program, continuous improvement of policies and processes are evaluated and refined to ensure the integration of adaptation strategies into SCVWD operations and capital projects. The program supports the development of additional strategies to reduce greenhouse gas emissions and to adapt to changing local and regional weather and precipitation patterns that may present water supply and ecosystem stewardship risks.

6.5 Potential Future Water Supply Projects

10631. (h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

No additional projects are currently being considered by Mountain View to meet the projected demand within its water service area. Projects specific to Mountain View's wholesale water suppliers (SFPUC and SCVWD) are discussed in their respective UWMPs.

6.5.1 Development of Desalinated Water

10631. (i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

Mountain View has not evaluated the potential for desalination. Desalination is being pursued, however, on a regional basis and by the City's two wholesale suppliers. Below is a summary of these efforts based on information provided in the SCVWD's Draft 2010 UWMP.

Bay Area Regional Desalination Project (BARDP)

Five Bay Area water agencies, including the SCVWD and the SFPUC, are currently collaborating on the Bay Area Regional Desalination Project (BARDP). The BARDP will leverage existing pipelines and interties so multiple agencies can share a new regional seawater desalination facility. The planned facility will increase regional supply reliability, especially in the face of emergencies, droughts, and temporary maintenance closures of other major facilities. The BARDP agencies completed a pilot study in 2010, and preliminary design and modeling efforts are currently underway. Construction of a regional desalination facility is expected to begin in 2015 after all plans and environmental studies have been completed. Possible locations for the regional facility are shown in Figure 6-1.

Figure 6-1: Possible Locations for a Regional Desalination Facility[26]

Brackish Water Desalination

SCVWD may exchange or transfer water with San Benito County Water District, which is a fellow CVP contractor. From 2005 to 2008, the two agencies conducted a joint feasibility study to evaluate the potential for treating brackish groundwater in the Pajaro Watershed for potable uses. The study attempted to determine whether a joint desalination project could significantly reduce infrastructure development, minimize environmental impacts, and provide effective and coordinated backup facilities to be shared by both agencies.

The SCVWD also worked with Stanford University to test various brackish water membrane systems and determine their cost-effectiveness. Though the tested membranes successfully desalinated brackish water, the pilot study found that most landlocked sites would face prohibitive brine management costs.

6.5.2 Transfer and Exchange Opportunities

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

[26] Map from: *http://regionaldesal.com*.

The City of Mountain View has water system interties with the City of Sunnyvale and the City of Palo Alto to assist in short-term water transfers during periods of system maintenance or in the event of an emergency.

Mountain View's diverse water supply enables the City to provide a reliable supply of water without the need to exchange or transfer water on a long-term basis. Within the SFPUC Regional System, however, the current water supply contracts (Supply Agreement and Allocation Plan) do allow agencies to transfer entitlements and/or unused portions of water allocations amongst each other. Mountain View may explore potential options in the future, if it is deemed beneficial to the City.

The SFPUC and the SCVWD independently manage water transfers and exchanges that affect their respective systems. The SCVWD has historically used transfers and exchanges as part of its water supply portfolio. The details of these efforts are described by the SFPUC and the SCVWD in their respective UWMPs.

6.6 Water Demand and Supply Comparison

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 state, regional, or local agency population projections within the service area of the urban water supplier.

Mountain View's water system is expected to be able to meet projected water demand during normal, single dry and multiple dry year scenarios. Demand will be met through a combination of potable supply sources, recycled water, water conservation, and water shortage contingency measures. The following paragraphs provide a comparison of projected supply production and water demand during normal, single dry, and multiple dry year scenarios. This analysis is based on information provided by Mountain View's wholesale suppliers, anticipated groundwater production, and anticipated recycled water use. As discussed at the beginning of this section, "normal year," "single dry year" and "multiple dry years" refer to hydrologic conditions experienced in the past. For the purpose of this UWMP, the year 1978 was used to represent the "single dry year" scenario and the period 1987 to 1991 was used to represent the "multiple dry years" scenario.

6.6.1 Normal Water Year

During normal and wet water years between 2015 and 2035, Mountain View expects to be able to meet 100 percent of the projected water demands in the service area (Table 6-2).

Table 6-2: Normal Year Supply and Demand Comparison

Supply Source	Projected Water Supply and Demand (afy)				
	2015	2020	2025	2030	2035
SFPUC	*11,036*	*11,097*	*11,581*	*12,105*	*12,645*
SCVWD Treated	*1,325*	*1,325*	*1,325*	*1,325*	*1,325*
Groundwater	*252*	*254*	*263*	*274*	*285*
Potable Supply	12,613	12,675	13,169	13,704	14,255
Potable Demand	12,613	12,675	13,169	13,704	14,255
Difference (% demand)	0%	0%	0%	0%	0%
Recycled Supply	1,026	1,610	1,610	1,610	1,610
Recycled Demand	1,026	1,610	1,610	1,610	1,610
Difference (% demand)	0%	0%	0%	0%	0%

As mentioned in Section 5.6, the supply numbers presented above for normal dry years are based on expected supply needs and do not necessarily reflect the maximum supply availability. For conservative planning purposes, the demands presented above include water savings expected from plumbing code updates but do not incorporate conservation savings (Section 4.2.2).

6.6.2 Single Dry Water Year

During single dry years between 2015 and 2035, Mountain View anticipates a difference between potable supply and demand ranging 3 percent in 2015 to 14 percent in 2035 (Table 6-3). Projected shortfalls will be met through the implementation of temporary demand reduction measures in accordance with the City's Water Shortage Contingency Plan, described in Section 8.

Table 6-3: Single Dry Year Supply and Demand Comparison

Supply Source	Projected Water Supply and Demand (afy)				
	2015	2020	2025	2030	2035
SFPUC	*10,938*	*10,938*	*10,938*	*10,938*	*10,938*
SCVWD Treated	*1,060*	*1,060*	*1,060*	*1,060*	*1,060*
Groundwater	*252*	*254*	*263*	*274*	*285*
Potable Supply	12,251	12,252	12,262	12,272	12,283
Potable Demand	12,613	12,675	13,169	13,704	14,255
Difference (% demand)	-3%	-3%	-7%	-10%	-14%
Recycled Supply	1,026	1,610	1,610	1,610	1,610
Recycled Demand	1,026	1,610	1,610	1,610	1,610
Difference (% demand)	0%	0%	0%	0%	0%

6.6.3 Multiple Dry Water Years

Based on supply reliability information provided by the SFPUC, Mountain View chose to present a 5-year period for the multiple dry year analysis. During the first two years of a multiple dry year period, Mountain View anticipates a potable supply shortfall of 2 percent (Table 6-4). Projected shortfalls are expected to increase during the later years of a drought, and reach 14 percent to 24 percent during the fifth successive dry year in 2015 and 2035, respectively. Projected shortfalls will be met through the implementation of temporary demand reduction measures in accordance with the City's Water Shortage Contingency Plan (Section 8). Note that values shown for SFPUC during the first and second dry years in Table 6-4 reflect projected purchases and not Mountain View's maximum available supply from the Regional System. Pursuant to the Drought Allocation Plan (Section 6.1.4), Mountain View expects that 13,189 af will be available from the SFPUC system during the first and second years of a 5-year drought.

Table 6-4: Multiple Dry Year Supply and Demand Comparison

(TABLE IS SHOWN ON FOLLOWING PAGE)

Table 6-4: Multiple Dry Year Supply and Demand Comparison

	Projected Water Supply and Demand (afy)														
	2015			2020			2025			2030			2035		
Supply Source	Years 1 & 2	Years 3 & 4	Year 5	Years 1 & 2	Years 3 & 4	Year 5	Years 1 & 2	Years 3 & 4	Year 5	Years 1 & 2	Years 3 & 4	Year 5	Years 1 & 2	Years 3 & 4	Year 5
SFPUC	*11,036*	*10,938*	*9,498*	*11,097*	*10,938*	*9,498*	*11,581*	*10,938*	*9,498*	*12,105*	*10,938*	*9,498*	*12,645*	*10,938*	*9,498*
SCVWD Treated	*1,060*	*1,060*	*1,060*	*1,060*	*1,060*	*1,060*	*1,060*	*1,060*	*1,060*	*1,060*	*1,060*	*1,060*	*1,060*	*1,060*	*1,060*
Groundwater	*252*	*252*	*252*	*254*	*254*	*254*	*263*	*263*	*263*	*274*	*274*	*274*	*285*	*285*	*285*
Potable Supply	12,348	12,251	10,810	12,410	12,252	10,811	12,904	12,262	10,821	13,439	12,272	10,832	13,990	12,283	10,843
Potable Demand	12,613	12,613	12,613	12,675	12,675	12,675	13,169	13,169	13,169	13,704	13,704	13,704	14,255	14,255	14,255
Difference (% demand)	**-2%**	**-3%**	**-14%**	**-2%**	**-3%**	**-15%**	**-2%**	**-7%**	**-18%**	**-2%**	**-10%**	**-21%**	**-2%**	**-14%**	**-24%**
Recycled Supply	1,026	1,026	1,026	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610
Recycled Demand	1,026	1,026	1,026	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610
Difference (% demand)	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**

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7 WATER CONSERVATION

The City of Mountain View recognizes the importance of water conservation and is committed to promoting and practicing the sustainable use of its water resources. Mountain View demonstrates this commitment through outreach and education programs, financial incentive programs, and by implementing water conservation measures at City properties. This section outlines the City's water conservation measures (also referred to as "demand management measures"), many of which are implemented in partnership with the SCVWD and BAWSCA, and in coordination with the California Urban Water Conservation Council (CUWCC). Water conservation is a key component to meeting Mountain View's 2020 urban water use target, discussed in Section 4.3.

7.1 Conservation Program Overview

7.1.1 SCVWD Water Use Efficiency Strategic Plan

The SCVWD works to reduce water demands throughout Santa Clara County in order to meet the SCVWD Board's "Ends Policies" for water supply reliability, water conservation and water recycling. These policies require that the SCVWD achieve a water conservation target of 98,500 af of water savings by 2030.

The *Water Use Efficiency Strategic Plan* (SCVWD, 2008) is a blueprint for meeting the identified water conservation policy objectives and targets, and for meeting the policy objectives and targets for water recycling, and desalination. Included in the plan is a schedule for implementation, estimated costs, and protocols for monitoring and evaluating program performance over time. The plan also aids the SCVWD in its response to the Governor's call for 20 percent reduction in per capita water use statewide by 2020 and ensuring compliance with AB 1420 requirements for accessing State funding programs for urban conservation (SCVWD, 2008). The SCVWD achieves these savings by implementing education and incentive programs County-wide. In 2010, approximately $6 million was budgeted for water conservation staff and program implementation. These funds originate, at least in part, from the SCVWD's wholesale water rates.

According to the SCVWD (2008), by 2030 water savings from conservation programs are projected to be the third largest source of water supply in Santa Clara County in normal years, behind local supplies and CVP imported water. In multiple dry years, conservation water savings are expected to provide supply comparable to CVP imports – 98,500 af versus 99,600 af. For a single dry year, water savings from conservation would be the second largest source of water supply for the County. Only

supply from groundwater reserves are projected to provide more supply for a single critically dry year (SCVWD, 2008).

7.1.2 BAWSCA Regional Water Conservation Implementation Plan

In September 2009, BAWSCA completed the Water Conservation Implementation Plan (Regional Conservation Plan). The goal of the Regional Conservation Plan was to develop an implementation plan for BAWSCA and its member agencies to attain the water efficiency goals committed to in 2004 as part of the Program Environmental Impact Report for the SFPUC's WSIP, which is described in Section 6.1.1. Upon adoption of the Interim Limitation, the Regional Conservation Plan'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. The SFPUC imposed the Interim Limitation in October 2008, to limit the volume of water that the wholesale and retail customers can collectively consume from the Regional System to 265 mgd through 2018 (Section 6.1.2).

As part of the Regional Conservation Plan, BAWSCA identified five new water conservation measures, which, if implemented fully throughout the BAWSCA service area, could potentially save an additional 8.4 mgd by 2018 and 12.5 mgd by 2030 – thus keeping the wholesale customers' collective purchases below 184 mgd through 2018.

In order to reach this, and other, conservation goals, BAWSCA administers several regional water conservation programs. Many member agencies have elected to participate in these programs and BAWSCA continues to work with individual member agencies to incorporate the savings identified in the Regional Conservation Plan into their future water use projections, with the goal of maintaining collective SFPUC purchases below 184 mgd through 2018.

7.1.3 California Urban Water Conservation Council (CUWCC)

The CUWCC is a partnership of water suppliers, environmental groups, and others interested in conserving California's water resources. Mountain View has been a member of the CUWCC since its inception in 1991. In its efforts to conserve water throughout California, the CUWCC has identified several "best management practices" intended to reduce long-term urban water demand. The CUWCC's Best Management Practices (BMP) are identified in a Memorandum of Understanding (MOU) that is periodically updated to incorporate new technologies and practices. At present, the BMPs are divided into two groups: (1) "Foundational"; or (2) "Programmatic." Foundational BMPs include activities related to utility operations and education, while Programmatic BMPs relate to water conservation programs designed specifically for the three major customer sectors: (1) residential; (2) commercial, industrial and institutional

(CII); and (3) landscape. The CUWCC BMPs are equivalent to the demand management measures (DMM) required for a UWMP.

Agencies that are signatories to the MOU, including Mountain View, have agreed to implement the CUWCC BMPs as a means of conserving water within their service areas and report progress toward implementing the BMPs in biennial reports.[27] Pursuant to Water Code Section 10631 (j), agencies may submit their BMP reports as a means of complying with the UWMP DMMs. As the CUWCC is currently in the process of updating its online reporting database, Mountain View has opted instead to include specific DMM information in the body of this UWMP.

7.2 Demand Management Measure Reporting

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:

(A) Water survey programs for single-family residential and multifamily residential customers.

(B) Residential plumbing retrofit.

(C) System water audits, leak detection, and repair.

(D) Metering with commodity rates for all new connections and retrofit of existing connections.

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

(I) Conservation programs for commercial, industrial, and institutional accounts.

(J) Wholesale agency programs.

(K) Conservation pricing.

(L) Water conservation coordinator.

(M) Water waste prohibition.

(N) Residential ultra-low-flush toilet replacement programs.

Mountain View is committed to implementing the Foundational and Programmatic BMPs outlined in the CUWCC MOU, which correspond to the DMMs listed in Water Code Section 10631(f). For many DMMs, Mountain View participates in regional water-conservation programs administered by the SCVWD and/or BAWSCA. Mountain

[27] Signatories may also comply with the MOU by implementing other water conservation measures (e.g., the "flex track" option) or through meeting a "gallons per capita per day" target.

View's DMM implementation is described below, with each specific DMM and corresponding BMP noted in parentheses.

7.2.1 Foundational BMPs

Water Conservation Coordinator (BMP 1.1 / DMM L)

The City of Mountain View has a permanent full-time Water Conservation Coordinator position. Current coordinator information is listed below:

Name: Elizabeth Flegel
Title: Water Conservation Coordinator
Address: 231 North Whisman Road, Mountain View, CA 94043
Phone: (650) 903-6774
Email: *elizabeth.flegel@mountainview.gov*

Water Waste Prohibitions (BMP 1.1 / DMM M)

Mountain View incorporated the following water waste prohibitions into its City Code:

- Wasting water due to broken, defective, or malfunctioning plumbing or irrigation equipment.
- Flooding or runoff of potable water on hard surfaces.
- Using a hose for washing surfaces or vehicles without a positive automatic shutoff valve.
- Serving water in a restaurant, except on request.
- Using potable water in single-pass cooling systems.

These prohibitions are enforced on a complaint basis. Violation penalties include fines, installation of flow restrictors, and, as a last resort, discontinuation of water service.

System Audits, Leak Detection, and Repair (BMP 1.2 / DMM C)

The City monitors system water loss on an annual basis as part of its water loss control and prevention program. System losses are calculated by comparing the volume of water purchased from wholesalers and pumped from local wells to the volume of water delivered to customers. Mountain View's annual system audits have shown less than 10 percent system water loss, with the exception of 2005, when unaccounted for water was 11 percent. In addition to monitoring water losses, the City maintains an infrastructure and capital improvement program, as well as ongoing maintenance and repair activities, to ensure the integrity of its water system.

Metering with Commodity Rates and Conservation Pricing (BMP 1.3 & 1.4/DMM D & K)

Mountain View meters all water accounts and bills customers based on the volume of water used. Mountain View's three-tiered water rate structure charges customers more per unit for higher volumes of use.

Public Information and Outreach Program (BMP 2.1/DMM G)

Mountain View's ongoing public information and outreach program educates residents and businesses about water conservation and promotes incentive programs through the following media and activities:

- Web Site - The Water Conservation Program maintains a web site which serves as a repository of information on Mountain View's water sources, conservation tips and programs available to customers. In 2010, staff performed a complete overhaul of the City's Water Conservation web site, and now update the site bimonthly, to provide a more informative and user-friendly experience for customers. The web site URL is: *www.conservewater.mountainview.gov*.

- Phone Hotline and Brochure Racks - Mountain View maintains a dedicated phone line for conservation-related customer inquiries as well as brochure racks of educational and program material in public buildings throughout the City. Hotline: (650) 903-6216.

- Meetings and Events - Water conservation staff distribute education materials, conservation program information, and free low-flow fixtures at approximately 10 community and corporate and meetings events each year.

- Utility Bill Design, Messaging, and Inserts - The City uses space on customer utility bills on a quarterly basis for conservation messaging and to promote incentive programs.

Education Programs (BMP 2.2)

School Education Classes and Field Trips (DMM H)

Since 2008, Mountain View Water Conservation staff have regularly visited elementary school classrooms and hosted field trips to provide lessons on the City's water sources and water conservation. Each year, 100 to 500 students are provided with activity materials and residential fixture retrofit devices (shower heads and faucet aerators), which are available upon request. The SCVWD also provides free in-class lessons and age-appropriate materials for varying grade levels that fulfill California core curriculum standards.

Landscape Education Classes

Starting in 2009, Mountain View hosts approximately eight free landscape classes each year in a partnership with BAWSCA. The classes focus on water-efficient gardening principles and techniques and are taught by local landscape professionals. The City will continue to partner with BAWSCA in the future to provide this educational resource to customers.

Green Garden Showcase

The City is developing a program to encourage the spread of water-efficient landscapes throughout Mountain View by increasing the visibility of attractive water-efficient landscapes maintained by residents and businesses. The Green Garden Showcase will highlight gardens in Mountain View that successfully employ water-conserving techniques like efficient irrigation, drought-tolerant plants, and mulching.

7.2.2 Programmatic BMPs:

The CUWCC's Programmatic BMPs correspond with the DMMs for residential assistance, plumbing fixture replacements, landscape programs, and programs for CII customers. Mountain View implements the Programmatic BMPs by partnering with the SCVWD and BAWSCA for several programs, which are described below. Though individual programs may change based on the SCVWD and BAWSCA decisions, Mountain View will continue to actively market those services and rebates offered by the SCVWD and BAWSCA.

Residential (BMP 3)

Residential Assistance, Leak Detection, and Fixture Retrofits (DMM A & B)

Through the "Water Wise House Call" program, single- and multifamily residential customers can receive a free water use survey, a customized irrigation schedule and recommendations for saving water. Approximately 1,450 house calls have been completed in Mountain View since 2005. High-quality low-flow shower heads and faucet aerators are provided during the house calls, and are also distributed by Mountain View staff during outreach events, free of charge.

High-Efficiency Toilet (HET) Rebates and Direct Installations (DMM N)

Residential customers are encouraged to replace older toilets which use 3.5 gallons or more per flush (gpf) with high-efficiency WaterSense toilets through a rebate program and a direct installation program. Over 400 residential toilets have been rebated since 2005. The rebate program, which is available for single- and multifamily

customers, currently offers $125 per toilet. The free HET direct installations are available to multifamily residences with four or more units (see CII measures below).

High-Efficiency Clothes Washer Rebates (DMM F)

Customers who purchase clothes washers in the Consortium for Energy Efficiency's Tier 3, the most water-efficient category, can receive a rebate of up to $125 through the SCVWD's residential high-efficiency washer incentive program. This program is particularly popular due to additional incentives offered by the Pacific Gas and Electric Company, and over 2,000 residential high-efficiency washers have been installed in Mountain View since 2005 as part of this program.

Submeter Rebate Program

Many Mountain View multifamily complexes share a single water meter and, thus, are unable to bill residents based on their actual water use. Holding residents responsible for their own water use, and billing them accordingly, has been shown to help apartment complexes reduce water use by an average of 25 percent. To reduce water use in multifamily residences, Mountain View promotes the SCVWD submeter rebate program, which pays up to $100 of the cost of installing a submeter at mobile home parks and apartment complexes.

Commercial, Industrial, and Institutional (BMP 4 / DMM I)

One of Mountain View's water conservation goals, as required by BMP 4 of the MOU, is to reduce CII water use by 10 percent. The City promotes several water conservation incentive programs for businesses, detailed below, to achieve the target CII water savings.

Indoor Water Use Audits

Free indoor water use audits help business owners and facility managers identify water-saving opportunities and provide conservation program recommendations specific to their buildings. Since the start of the program in 2006, 30 commercial audits have been completed in Mountain View. In 2011, the SCVWD will limit indoor audits to large facilities on a case-by-case basis while it assesses the effectiveness of the overall program.

Toilet Replacement and Urinal Retrofit

CII customers and apartment buildings with 3.5 gpf toilets (or greater) qualify for a free full installation of HETs to replace older toilets. In the last five years, Mountain View customers have replaced over 2,000 toilets through this program. CII buildings with

urinals using one gallon or more per flush may have the urinal valves retrofitted for free to reduce the flush volume to 0.5 gpf.

Pre-Rinse Dishwashing Spray Valves

Low-flow pre-rinse dishwashing spray valves are available free of charge to restaurants that have less efficient spray valves. Both Mountain View and the SCVWD distribute these devices upon request.

Clothes Washer Rebates

Laundromats and customers with common-area laundry rooms that purchase water-efficient commercial-grade clothes washers (water factor of 4.5 or less) are eligible for a rebate of up to $400 per machine through SCVWD's commercial washer rebate program. Through this program, 230 high-efficiency washers have been installed in CII settings in Mountain View over the last five years.

Water Efficient Technologies Rebate

Businesses that implement process and equipment changes which result in significant water savings are eligible for the SCVWD's Water Efficient Technologies (WET) rebate. Improving cooling system efficiency, installing a recirculating car wash system, and utilizing an ozone laundry system are some examples of projects that businesses may complete to increase their water-use efficiency. The rebate amount awarded is determined by the actual water savings realized by the WET project, up to $50,000 per customer.

Landscape (BMP 5 / DMM E)

Large Landscape Water Audits

Mountain View encourages customers with 5,000 square feet or more of landscaping to participate in a free landscape water audit offered by the SCVWD. Auditors provide landscape managers with water-use analyses, scheduling information, in-depth irrigation evaluation, and recommendations for affordable irrigation upgrades. Approximately 10 landscape water audits are completed in Mountain View each year.

Irrigation Equipment and Landscape Conversion

Both residential and business customers who install water-efficient irrigation equipment and/or replace high-water-using landscape like turf with low-water-use plantings may receive rebates from the SCVWD. Irrigation equipment rebates are available for the installation of dedicated irrigation meters, ET controllers, drip

irrigation and similar equipment. Landscape rebates are determined by the area converted from high-water-use to drought-tolerant plantings.

Landscape Water Budgets (BMP 5)

In 2010 the City of Mountain View began a program in partnership with BAWSCA to provide landscape water budget reports for the City's largest dedicated landscape irrigation accounts. Each billing period, account owners and landscape managers receive a customized report that compares actual irrigation water use to the ideal water use for their site. Water budgets are calculated using the conditions of individual sites and current ET data. This program is free for report recipients, and helps to connect the individuals paying the water bill with those managing the landscape's irrigation. Mountain View will continue adding landscape irrigation customers to this program and plans to provide water budget reports to 90 percent of dedicated landscape accounts by 2018. Fifty (50) customers began receiving water budget reports in 2010.

Regulations

In addition to implementing the DMMs described above, to comply with State law Mountain View recently adopted two regulations promoting water-use efficiency.

Mountain View Landscaping Regulations

Mountain View's Water Conservation in Landscaping Regulations, based on the State's Model Water Efficiency in Landscaping Ordinance, reduces water waste in landscaping by promoting the use of region-appropriate plants that require minimal supplemental irrigation and by establishing standards for irrigation efficiency. These regulations were adopted in July 2010 and generally apply to new and rehabilitated landscapes of 1,000 sq ft or greater.

Mountain View Green Building Code (MVGBC)

The Mountain View Green Building Code (MVGBC), approved by the City Council in March 2011, was modeled after the California Green Building Code (CalGreen) and sets standards for improved energy efficiency, water conservation, indoor environmental quality, and waste reduction. Under the MVGBC, new and renovated buildings must use water-efficient plumbing fixtures or demonstrate a 20 percent reduction from a baseline water use. The MVGBC is currently awaiting approval from the California Energy Commission and is tentatively scheduled for formal adoption in June 2011.

7.3 Monitoring

10631. (3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measure implemented or described under the plan.

Mountain View staff evaluates the effectiveness of conservation measures by monitoring the City's water use on a monthly basis, and comparing it to the previous year and to a representative "normal" year. This analysis provides a monthly mechanism with which to monitor short- and long-term water savings. Although not all reductions in water use are due to the City's conservation measures, this comparison provides a cursory evaluation and indicates to staff when increased outreach is needed.

Water conservation incentive and service programs are assessed based on participation on a quarterly basis. Though program participation data do not necessarily quantify water savings, staff uses this data to determine the effectiveness of marketing efforts.

7.4 Conservation Savings

10631. (4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

Using program participation data and estimated water saving factors from the DSS model, Mountain View has attempted to quantify the volume of water savings attributable to its conservation programs. Since 2005, Mountain View has saved approximately 210 mg (640 af) as a result of its conservation measures. The City is currently saving about 0.18 mgd (205 afy) due to cumulative conservation efforts since 2005. It is important to remember that these are not direct measurements, but merely a rough estimate of conservation.

Replacing old plumbing fixtures with newer water-efficient fixtures and converting landscapes from high-water-use plantings to drought-tolerant plantings results in "demand hardening." As water use becomes more efficient and excess water use is reduced, achieving additional water savings becomes more difficult. The City anticipates some demand hardening due to demand management measures (DMMs) but has not quantified the reduced potential water savings due to demand hardening.

7.5 Conservation Program Implementation

10631. (f) (2) A schedule of implementation for all water demand management measures proposed or described in the plan.

10631. (g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

Mountain View currently implements all DMMs listed in Water Code Section 10631. (f)(1), as described above. The City's partnerships with BAWSCA and the SCVWD provide key resources in Mountain View's effort to implement the DMMs. If unable to implement the DMMs through SCVWD or BAWSCA programs in the future, either due to a change in the partnerships or availability of programs, the City will reevaluate its plan for meeting the DMM requirements.

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8 WATER SHORTAGE CONTINGENCY PLAN

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

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

(b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

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

(g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

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

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

8.1 Goals and Guiding Principles

This section contains the City of Mountain View's Water Shortage Contingency Plan, developed to serve as a flexible framework of planned response measures to mitigate water supply shortages of up to at least 50 percent. This plan assesses alternative water supply sources, describes demand-reducing water restrictions in times of shortage, and discusses the impacts of restrictions on customers, City water sales revenue, and staff resources during shortages of varying severity.

Guiding principles:

Mountain View developed this Water Shortage Contingency Plan in accordance with the following guiding principles:

- Shared contribution - All customers will share the burden of reducing water use in order to meet necessary reduction goals during water shortages.

- Eliminate water waste and prioritize reducing non-essential water uses - The plan concentrates on the elimination of non-essential water uses and on outdoor reductions. The plan gives the highest priority to essential health and safety uses.
- Minimize economic impacts to businesses - The plan minimizes actions that would have substantial impact on the community's economy and prioritizes job-related water use over residential and landscape water use.
- Communication at every stage - Public outreach and communication at every level of shortage is essential for customer response and will instill confidence in the City's ability to respond to water shortages.

8.2 Estimated Minimum Three-Year Supply

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:…(b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

As discussed in previous sections, Mountain View imports about 84 percent of its total water supply from the SFPUC; 9 percent is imported from the SCVWD; 4 percent is produced at local groundwater wells; and 3 percent is recycled water delivered from the RWQCP for non-potable irrigation purposes.

Based on information provided by the SFPUC from its Water Supply Reliability Model, Mountain View's minimum water supply from the SFPUC for the next three years (2011 through 2013) is estimated to be 9.8 mgd if there is a single dry year or up to 8.5 mgd if there is a multi-year drought (Table 8-1).

Using a conservative worst-case scenario for treated water delivery projections from the SCVWD, Mountain View assumes that at least 80 percent of the contract supply will be available in the next three years.

Based on the above information provided by Mountain View's wholesale agencies, Table 8-1 presents Mountain View's estimated minimum three-year supply for 2011 through 2013.

Table 8-1: Estimated Minimum Three Year Supply

Source	Actual 2010 Production	Single Dry Year	Multiple Dry Year		
			Year 1	Year 2	Year 3
SFPUC	*9,476*	*9,763*	*10,938*	*9,498*	*9,498*
SCVWD Treated	*1,007*	*1,060*	*1,060*	*1,060*	*1,060*
Groundwater	*476*	*252*	*252*	*252*	*252*
Potable Water	10,959	12,250	12,250	10,810	10,810
Recycled Water	389	1,026	1,026	1,026	1,026
Total Supply	11,348	13,276	13,276	11,836	11,836

8.3 Historical Monthly Water Use by Customer Category

As discussed in Section 4, residential customers represent the largest proportion of the City's water demand, followed by landscape irrigation. Water use across all customer types varies seasonally, with demand lowest in the winter and greatest in the summer. Most of the increased summer consumption is attributed to higher volumes of outdoor water use for landscape irrigation. During water supply shortages, landscape irrigation is considered a non-essential water use and its reduction is prioritized over essential business and home water use. In Mountain View, most of this irrigation occurs in three customer categories: (1) dedicated landscape irrigation accounts; (2) single-family residential accounts; and (3) multifamily residential accounts.

In contrast to residential water use, seasonal variations in use for CII water accounts likely reflect changes in cooling requirements for buildings and production processes more than they do changes landscape irrigation needs. One reason for this is because most large CII customers utilize a dedicated irrigation meter for outdoor uses. Since outdoor use represents a relatively small proportion of CII account water demand (see Figure 4-4), CII customers generally have fewer opportunities to reduce water use without changing their operations or incurring significant economic impacts.

8.4 Supply Augmentation

In the event of a water supply reduction from the SFPUC and/or the SCVWD, Mountain View is capable of augmenting a small portion of its supply with groundwater. Recycled water distribution via tanker trucks could also be made available outside of the North Bayshore Area for construction, landscape irrigation, and other non-potable water uses. These strategies may be employed during critical water supply situations.

8.5 Stages of Action

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

8.5.1 Supply Shortage Scenarios

Multiple factors, including drought, disaster and water supply system failure, could cause a reduction in Mountain View's water supply. Disasters and water supply system failures are more likely to cause severe water shortages. Drought may cause smaller-scale shortages of up to 25 percent, though severe multi-year droughts could trigger greater supply reductions.

8.5.2 Stages of Action Regional Model

To increase the effectiveness of water shortage response efforts of individual agencies across Santa Clara County, a subcommittee of retailer suppliers developed model "Stages of Action" to serve as a common framework for individual retailers' 2010 UWMPs. The City of Mountain View incorporated the County-wide model into this Water Shortage Contingency Plan, adjusting as necessary, based on the City's water-use patterns and to align with the City's plans and operating capabilities.

Mountain View will implement each Stage of Action of the Water Shortage Contingency Plan when the City's annual water supply is reduced by the specific levels outlined in the Santa Clara County regional framework: up to 10 percent, 11 percent to 25 percent, 26 percent to 40 percent and greater than 40 percent.

The overall concept of this approach is that water shortages of different magnitudes require different measures to overcome the supply deficiency. As explained in further detail below, each stage includes a set of demand reduction actions and measures which become progressively more stringent as the shortage condition escalates. All of the stages allow for adequate water to protect public health and safety and satisfy the fire protection needs of the City. Implementation of the plan will be contingent upon adoption of a Water Shortage Ordinance by the City Council. A draft ordinance is provided in Attachment K.

8.6 Demand Reduction

Indoor and outdoor water use reduction goals have been developed for each Stage of Action, ranging from 5 percent to 15 percent for indoor water use and from 15 to 100 percent for outdoor water use. These water use reduction goals for different supply shortage levels are summarized in Table 8-2. The goals do not reflect mandatory rationing or allocations for individual customers, but instead serve as general guidelines that will be communicated to customers during a shortage. Table 8-3 presents the average household water use needed to meet the reduction goals for each stage.

Table 8-2: Water Shortage Stages of Action and Water Use Reduction Goals

Stage of Action	Supply Reduction[28]	Use Reduction Goal	
		Indoor	Outdoor
Stage 1	Up to 10%	5%	15%
Stage 2	11 - 25%	7%	45%
Stage 3	26 - 40%	10%	85%
Stage 4	Greater than 40%	15%	100%

Table 8-3: Average Residential Water Use Needed to Meet the Water Use Reduction Goals[29]

Stage of Action	Supply Reduction[30]	Average Single-Family Household (gpd/household)		Average Multifamily Household (gpd/household)	
		Indoor	Outdoor	Indoor	Outdoor
Normal	0%	168	80	122	20
Stage 1	Up to 10%	160	68	116	17
Stage 2	11 - 25%	157	44	113	11
Stage 3	26 - 40%	151	12	110	3
Stage 4	Greater than 40%	143	0	104	0

The water use restrictions described below are expected to meet the demand reduction goals for each Stage of Action.

Normal Supply Conditions:

Under all water supply conditions, Mountain View enforces five water use prohibitions and implements several demand management measures. The existing potable water use prohibitions, listed below, are currently incorporated into Mountain View's City Code.

- Wasting water due to broken or defective plumbing, sprinkler, watering or irrigation systems for more than 10 days.
- Flooding or runoff on sidewalks, roads and other hard surfaces.
- Serving water in restaurants, except on request.
- Using single-pass cooling systems.

[28] In order to estimate reduction goals, supply reductions of 10 percent, 25 percent, 40 percent and 50 percent were assumed.
[29] Average indoor and outdoor uses are based on the application of the water use reduction goals listed in Table 8-2 and based on water billing data from 2005 through 2009.
[30] In order to estimate average water use, supply reductions of 10 percent, 25 percent, 40 percent and 50 percent were assumed.

- Using hoses without an automatic shut-off device for cleaning paved surfaces or vehicles.

In addition to Mountain View's current water waste prohibitions, the City encourages water conservation through ongoing implementation of several conservation measures. These measures, which are discussed in greater detail in Section 7, include indoor and landscape water use surveys, rebates for high-efficiency plumbing fixtures, and public outreach activities.

Stage 1: Up to 10 Percent Water Supply Reduction

During supply shortages of up to 10 percent, the City will expand existing efforts to promote conservation and will also intensify water conservation public information and outreach programs, notifying customers of the water shortage and the need to voluntarily conserve.

Stage 2: 11 to 25 Percent Water Supply Reduction

Stage 2 initiates several mandatory water use restrictions that affect a broad range of activities:

- Time to correct broken or defective plumbing or equipment is reduced to 5 days (compared to 10 days under normal conditions).
- Watering is prohibited between 9:00 a.m. and 5:00 p.m. and during rain events. Irrigation with potable water is restricted to two days per week during the summer, and one day per week between November and March, for no more than 15 minutes per day.
- Washing of hard surfaces is prohibited except for health and safety reasons.
- At-home car or vehicle washing is prohibited.
- New commercial car washes and commercial laundry operations must install recirculating systems.
- Restaurants are required to use water-conserving dishwashing spray valves.
- Only recirculating decorative water fountains and water features may be operated.
- Hotels must provide their guests with an option to reuse their linens.

- Recycled water must be used for non-potable construction needs.

Stage 3: 26 to 40 Percent Water Supply Reduction

The City will further restrict water used in ornamental water features, swimming pools, and car washing:

- Time to correct broken or defective plumbing or equipment is reduced to three days.
- Only car washes with recirculating systems are allowed to operate.
- Pools and spas may only be filled by 1 foot.
- Ornamental ponds and water features may only be filled to sustain aquatic life.

Stage 4: Greater than 40 Percent Water Supply Reduction

Under supply reductions of 40 percent or greater, the City will consider limiting new potable water service connections in addition to intensifying previous water use prohibitions:

- Time to correct broken or defective plumbing or equipment is reduced to 24 hours.
- Watering landscapes with potable water is prohibited except for the purposes of fire prevention, erosion control, and maintaining public parks and playing fields.

8.7 Water Use Monitoring

10632 (i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

Staff currently monitors water use through monthly analyses of wholesale water purchases, well production data, and readings for recycled water and Parks Division irrigation meters. During a supply shortage, staff will continue to monitor water use on a monthly basis to determine the effectiveness of the Water Shortage Contingency Plan's water use restrictions.

8.8 Publicity and Communication

Even before formal declaration of a water shortage, a public information program will be activated to provide customers with as much advance notice as possible. Following Council action declaring a shortage, residents and businesses would need to be provided notice of water shortage rules and regulations via a variety of media and

communications methods. Coordination between City departments and with other public agencies can begin prior to formal declaration of a water shortage and can be accomplished through regular meetings, e-mail group updates, and presentations.

In a regional water shortage scenario, the City would use the public outreach resources and materials provided by the SCVWD and/or BAWSCA. In addition to these materials, the City may develop its own materials and use the following media and methods to communicate with customers:

- City of Mountain View web site.
- *The View* (a triennial City-wide newsletter).
- Utility bill messaging and inserts.
- Television public service announcements.
- Brochure racks distributed throughout the City.
- Newspaper ads (e.g., the *Mountain View Voice*).
- Water Conservation phone hotline.
- Booths at community and corporate events.

8.9 Staff Resources

The City of Mountain View currently has two full-time staff positions dedicated to water conservation. Under normal conditions, a portion of conservation staff time is allotted to activities indirectly related to water conservation. Staff time dedicated to activities related solely to water conservation will increase with the severity of a supply shortage. Additional duties may be assigned to current City employees or hiring of temporary staff may be considered to meet staffing needs during extreme shortages.

8.10 Revenue Impacts of a Water Shortage

Mountain View's water rates are designed to fully fund ongoing annual costs such as wholesale water purchases and water system operation, a base level of annual capital improvement projects, and maintain an adequate Water Fund reserve. Water rates are composed of a flat fee and a per-unit fee for water consumed. Under Mountain View's three-tiered rate structure, customers' per-unit fee increases as the quantity of water used increases.

Reduced water consumption during a water shortage will cause City Water Fund operating revenues to decline. Table 8-4 provides the estimated revenue impacts of a water shortage at a 10 percent, 25 percent, 40 percent and 50 percent water supply reduction. Mountain View's tiered rate structure results in a nonlinear relationship between reduced consumption and revenue reductions. When water supply is reduced, water use reductions typically occur in the highest tiers, causing the percentage of revenue reduction to exceed the water supply reduction. Mountain View plans to conduct a detailed rate study to identify potential modifications to the City's rates and rate structure.

Table 8-4: Estimated Revenue and Expenditure Impacts[31]

	Stage of Action (% reduction in water sales)			
Estimated Impacts	**1**	**2**	**3**	**4**
Supply reduction	10%	25%	40%	50%
Reduction in water revenue	15%	32%	47%	67%
Reduction in water costs	10%	25%	40%	50%
Reduced sewage volume (RWQCP expenses)	5%	7%	10%	15%
Increased outreach (mailing / advertising)	No Change	$10,000	$20,000	$25,000
Increased enforcement (staff hours)	No Change	$20,000	$50,000	$100,000

In the event of a water shortage, City staff will consider options for correcting revenue shortfalls depending on the severity of the water shortage and the City's ability to recover both operationally and financially. The City may consider several actions, including adjusting the water rate structure, implementing a one-time water use surcharge, reallocating staff resources, reassessing capital improvement project expenditures and reevaluating the ability to sustain new construction (Table 8-5). During a severe water shortage, the City (in conjunction with the RWQCP) may need to evaluate the ability to meet recycled water demands if sewer flows are reduced significantly.

[31] This analysis concluded that impacts to groundwater treatment and electricity expenditures would be minimal (in comparison to the other impacts) and that there would be no change groundwater pumping, gas and electric expenditures. Impacts of reduced sewage volume would affect the City's Wastewater Fund, not the Water Fund.

Table 8-5: Proposed Cost Recovery Measures

Proposed Measure	Stage of Action (% reduction in water sales)			
	1 (10%)	2 (25%)	3 (40%)	4 (50%)
Add additional rate tiers	X	X	X	X
Change rate structure; increase higher consumption tiers		X	X	X
Reevaluate fixed charge component to ensure fixed costs are captured	X	X	X	X
Reevaluate staffing levels, reassigning as needed or applicable		X	X	X
Penalty assessment to non-compliant customers		X	X	X
Reassess capital improvement project expenditures			X	X
Implement a one-time emergency surcharge			X	X

8.11 Enforcement

Enforcement of Mountain View's water conservation regulations is focused on soliciting cooperation from water customers who are unaware of the restrictions or have failed to comply with the provisions of the ordinance. If discussions with the customer are unsuccessful in obtaining compliance, available enforcement mechanisms detailed in Mountain View's City Code include fines, installation of flow restrictors and, as a last resort, discontinuation of service.

City employees and members of the public may register water waste complaints through a telephone hotline or bring the complaint directly to water conservation staff. Staff will be available to provide information and respond to complaints. Water conservation staff may seek assistance from the Code Enforcement Division in responding to complaints and enforcing water use restrictions.

8.12 Effects of Demand Hardening

Landscape irrigation water use through dedicated irrigation accounts represents approximately 23 percent of Mountain View's total demand. Most irrigation demand is met with potable water, with a small portion met by recycled water. Future conversions of dedicated irrigation accounts from potable to recycled water will reduce irrigation demand for potable water, resulting in "demand hardening." Because less landscaping will be irrigated by potable water, restrictions on landscape watering will produce smaller reductions in potable water use than if recycled water were not used. Recycled water demand for 2015 is estimated to result in only nominal demand hardening, and, thus, is not expected to significantly reduce on the effectiveness of water-use restrictions over the next five years. Increased recycled water use after 2015 is expected to result in greater demand hardening effects and future analyses will be updated to provide a more accurate idea of recycled water use patterns and their impacts on water conservation during shortages.

8.13 Water Shortage Contingency Plan Termination

A water supply shortage ends when available wholesale deliveries improve to the point where the water system is once again capable of supporting normal water use, and any special water use rules and regulations in effect at the time are officially rescinded by City Council and public notice is given that the water shortage is over. The Public Works Director would then oversee any remaining termination and plan review activities. These activities could include:

- Publicize gratitude for the community's cooperation.
- Restore water utility operations, organization, and services to pre-event levels.
- Document the event and response and compile applicable records for future reference.
- Collect cost accounting information, assess revenue losses and financial impact, and review deferred projects or programs.
- Debrief staff to review effectiveness of actions, to identify the lessons learned, and to enhance response and recovery efforts in the future.
- Complete a detailed evaluation of affected facilities and services to prepare an "after action" report.
- Update the Water Shortage Contingency Plan as needed.

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9 CATASTROPHIC SUPPLY INTERRUPTION PLAN

10632(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

In compliance with the Federal Bioterrorism Act and Department of Homeland Security guidelines, the City prepared a Water System Emergency Response Plan to mitigate the effects of natural disasters and man-made threats on Mountain View's water supply.

This confidential document:

- Identifies the types of emergencies to which Mountain View may need to respond, including power outages, floods and earthquakes.
- Describes the roles and responsibilities of City personnel during an emergency response.
- Outlines the processes and procedures for responding to different threats and emergencies.

Based on the type and severity of the emergency, the City will implement corrective measures which may include isolating water storage reservoirs, isolating portions of the water system and deploying emergency generators to operate groundwater wells. In the event of a sudden supply interruption, the City will maintain the ability to provide a minimum amount of water to customers for life safety and sanitary provisions.

SFPUC Regional System

Emergency Operations Plan

Following the 1989 Loma Prieta Earthquake, the SFPUC created an Emergency Operations Plan (EOP). The EOP was originally released in 1992 and has been updated on average every two years. The latest plan update will be released in spring 2011. The EOP addresses a broad range of potential emergency situations that may affect the SFPUC and that supplements other plans prepared by the Department of Emergency Management. Specifically, the purpose of the SFPUC EOP is to describe the department's emergency management organization, roles and responsibilities, and emergency policies and procedures.

Regional Water System Emergency Response and Recovery Plan

In 2006, the SFPUC updated the *SFPUC Regional Water System Emergency Response and Recovery Plan* (ERRP), originally prepared in 2003. The purpose of this plan is to

describe the SFPUC Regional System emergency management organizations, roles and responsibilities within those organizations, and emergency management procedures. This contingency plan addresses how to respond to and to recover from a major 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.

Suburban Customer Water Supply Emergency Operations and Notification Plan

The SFPUC also prepared a *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 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; and SFPUC wholesale customers; BAWSCA; and the San Francisco City Distribution Division. For the purposes of this plan, water quality issues are treated as potential or actual supply problems.

Power Outage Preparedness and Response:

The SFPUC's water transmission system is primarily gravity fed from Hetch-Hetchy Reservoir. 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 back-up 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 back-up generators in place.

The WSIP also includes projects which will expand the SFPUC's ability to remain in operation during power outages and other emergency situations.

SCVWD System

Water Utility Infrastructure Reliability Project

In 2003, the SCVWD initiated the Water Utility Infrastructure Reliability Project (IRP) to determine the current reliability of its water supply infrastructure (pipes, pump stations, treatment plants) and to appropriately balance level of service with cost. The project measured the baseline performance of critical SCVWD facilities in emergency events and identified system vulnerabilities and concluded that the SCVWD's water supply system could suffer up to a 60-day outage if a major event, such as a 7.9-magnitude earthquake on the San Andreas Fault, were to occur. Less severe hazards, such as smaller earthquakes, flooding and regional power outages had less of an impact on the SCVWD, with outage times ranging from 1 to 45 days.

The level of service goal identified for the IRP was:

> *Potable water service at average winter flow rates available to a minimum of one turnout per retailer within seven days, with periodic one day interruptions for repairs.*

In order to meet this level of service goal, the project included seven portfolios to mitigate system risks and identified a recommended portfolio for implementation. The SCVWD has been implementing the recommended portfolio – which is expected to reduce the postearthquake outage period from 45 - 60 days to 7 - 14 days.

Office of Emergency Services

The Office of Emergency Services (OES) coordinates emergency response and recovery for the SCVWD. During any emergency, the SCVWD continues its primary missions of providing clean, safe water and flood protection to the people of Santa Clara County. The OES ensures that critical services are maintained and emergency response is centralized. The OES maintains a full-time professional emergency management staff trained and equipped to respond quickly at any time of day or night to support and coordinate more than 170 SCVWD Emergency Operations Center (EOC) and field responders. Over 150 staff from the SCVWD have completed the specialized California Standardized Emergency Management System/National Incident Management System training and more than 100 of those individuals have taken advanced EOC action planning training.

The EOC is connected to other agencies and jurisdictions by an array of telecommunications, two-way radio, satellite telephone and wireless messaging systems. In addition, two response vehicles with similar communications capabilities of the EOC enable staff to establish mobile emergency command posts as required for field operations.

The OES maintains communications with local, State and national emergency management organizations and allied disaster preparedness and response agencies.

10 REFERENCES

BAE, 2010 City of Mountain View 2010-2015 Consolidated Plan; prepared by Bay Area Economics for the City of Mountain View, dated May 2010.

DWR, 2003 California's Groundwater – Bulletin 118; prepared by the California Department of Water Resources, dated October 2003.

DWR, 2009a Draft 20x2020 Water Conservation Plan; prepared by the California Department of Water Resources, dated April 30, 2009.

DWR, 2009b State Water Project Delivery Reliability Report; prepared by the California Department of Water Resources, dated December 2009.

DWR, 2011 Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan; prepared by the California Department of Water Resources, dated March 2011.

IEC, 2010a City of Mountain View Water Master Plan; prepared by Infrastructure Engineering Corporation for the City of Mountain View, dated August 2010.

IEC, 2010b City of Mountain View Sewer Master Plan; prepared by Infrastructure Engineering Corporation for the City of Mountain View, dated August 2010.

Mtn View, 2010 Consumer Confidence Report – Water Quality Report; prepared by the City of Mountain View, dated June 2010.

Oster, 2010 Solutions Project Report; prepared by J. D. Oster, Corey S. Barnes, Lorence R. Oki, Richard Y. Evans, Jocelyn Marie Beudette, dated 2010.

Palo Alto, 2011 Draft Urban Water Management Plan; prepared by the City of Palo Alto Utilities, dated June 2011.

PBS&J, 2009 Final Water Supply Availability Study for the City and County of San Francisco; prepared by PBS&J for the San Francisco Public Utilities Commission, dated October 2009.

RMC, 2004 Regional Water Recycling Facility Planning Study for the Mountain View/Moffett Field Area Water Reuse Project; prepared by RMC for the City of Mountain View, dated March 2004.

SCVWD, 2001 Santa Clara Valley Water District Groundwater Management Plan; prepared by the Santa Clara Valley Water District, dated July 2001

SCVWD, 2008 Water Use Efficiency Strategic Plan – Phase 1; prepared by the Santa Clara Valley Water District, dated September 2008.

SCVWD, 2011 Draft Urban Water Management Plan; prepared by the Santa Clara Valley Water District, dated March 30, 2011.

SFPUC, 2011 Draft Urban Water Management Plan; prepared by the San Francisco Public Utilities Commission, dated 2011

USGS, 1984 Guidebook to Studies of Land Subsidence due to Groundwater Withdrawal: Case History No. 9.14. Santa Clara Valley, California, U.S.A., edited by Joseph F. Poland.

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