Prepared for:
City of Rohnert Park

FINAL

Urban Water Management Plan

2010



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KEY ACRONYMS AND ABBREVIATIONS

ABAG	Association of Bay Area Governments
Act	Urban Water Management Planning Act
AFY	Acre-feet per year
BMP	Best Management Practice
BO	Biological Opinion
cfs	Cubic feet per second
CDPH	California Department of Public Health
CII	Commercial, irrigation and institutional
City	City of Rohnert Park
CUWCC	California Urban Water Conservation Council
DFG	California Department of Fish and Game
DMM	Demand Management Measure
DWR	California Department of Water Resources
EIR	Environmental Impact Report
ETo	Evapo-transpiration of common turf grass
gpcd	Gallons per capita per day
gpd	Gallons per day
HETs	High-efficiency toilets
IRWP	Incremental Recycled Water Program
mgd	Million gallons per day
MCL	Maximum contaminant level
MOU	Memorandum of Understanding
NBWRP	North Bay Water Recycling Project
ND	New Development Standards and conservation measures
NMFS	National Marine Fisheries Service
PD	Planned Development
PG&E	Pacific Gas and Electric
PVP	Potter Valley Project
Restructured Agreement	Restructured Agreement for Water Supply
River	Russian River
SCWA	Sonoma County Water Agency
SBx7-7	Water Conservation Act of 2009
SPA	Specific Plan Area
SRP	Santa Rosa Plain
SRPGMP	Santa Rosa Plain Groundwater Management Plan
SRV	Santa Rosa Valley
SWRCB	California Water Resources Control Board
Subregional System	Santa Rosa Subregional System (recycled water system)
TAC	Technical Advisory Committee
Tier 1	Tier 1 conservation measures
Tier 2	Tier 2 conservation measures
UFW	Unaccounted-for water
USGS	U.S. Geological Survey
UWMP	Urban Water Management Plan
WWTP	Wastewater treatment plant

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SECTION 1
PLAN PREPARATION

1.1 INTRODUCTION

The State Legislature has declared that "every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years." This Urban Water Management Plan (UWMP) was prepared in conjunction with City of Rohnert Park (City) staff to ensure that it is reasonable in addition to meeting the requirements of the Urban Water Management Planning Act as envisioned by the Legislature. Since the adoption of the City's previous 2005 UWMP, the State has enacted the Water Conservation Act of 2009 (Water Conservation Act), which requires a 20 percent reduction in per capita water consumption by 2020. This UWMP establishes the City's baseline per capita water consumption and conservation targets, as well as outlining the methods for achieving the necessary water efficiencies.

1.1.1 Purpose

The purpose of developing a UWMP is to evaluate whether a water supplier can meet the water demands of its water customers as projected over a 20- or 25-year planning horizon. The City has chosen to use a 25-year planning horizon. The UWMP analyzes current and projected water supply and demand for normal, single-dry or multiple-dry water year conditions. With adoption of the Water Conservation Act, this UWMP also analyzes how the City will determine, and reach, its water conservation goals. The purpose of the UWMP is to:

- Identify measures to be implemented or projects to be undertaken to reduce water demands and address water supply shortfalls;
- Identify stages of action to address up to 50 percent reduction in water supplies during dry water years;
- Identify actions to be implemented in the event of a catastrophic interruption in water supplies;
- Assess the reliability of the sources during normal, single-dry and multiple-dry water years; and
- Identify when, how and what measures the City could undertake in order to meet the Water Conservation Act's requirement to establish baseline water usage and conservation targets.

The City supplies potable water to a population of approximately 41,000 people. The City's potable water supply is from two sources: water purchased from the Sonoma County Water Agency (SCWA) and water pumped from 29 active groundwater wells owned and operated by the City. The SCWA water supply is delivered to the City from 12 turnouts from the SCWA's Petaluma Aqueduct and Russian River-Cotati Intertie system and is supplied with water from the natural flow of the Russian River. The City also has a recycled water system that delivers water from the Santa Rosa Subregional Water Reclamation System (Subregional System) and which offsets approximately 1,000 acre-feet per year of potable water demand.

1.1.2 Law

The State of California Urban Water Management Planning Act (Act) is codified in California Water Code Sections 10610 though 10656 and requires each urban water supplier with 3,000 or more connections, or which supplies at least 3,000 acre-feet per year (AFY) of water, to submit a UWMP to the California

Department of Water Resources (DWR) every five years. The City has approximately 8,998 connections and meets the threshold for this State requirement.

For the current 2010 UWMP, the Water Conservation Act (SBx7-7) requires a 20 percent statewide reduction in per capita urban potable water use by the year 2020. The water use reduction required by each water supplier varies by region and includes water savings targets measured in daily per capita use to be met by 2020 as well as an interim water savings target to be met by 2015. Each water supplier's 2010 UWMP will establish the baseline use from which targeted reductions are made, making the 2010 UWMP a particularly important document. Because of the new requirements, DWR extended the due date for submittal of the UWMP to July 1, 2011.

1.1.3 Structure of the Plan

The outline of this UWMP generally follows the *Guidebook to Assist Water Suppliers to Prepare a 2010 Urban Water Management Plan* developed by DWR. The guidelines can be found in the following website link: *http://www.water.ca.gov/urbanwatermanagement/guidebook/*.

Some sections of the outline presented in the guidelines have been combined or arranged in a different order than the guidelines, but all the information requested in the UWMP guidelines and Act is provided within this document. This document is organized in six (6) sections as shown on Table 1.1. The table also includes a description of the key elements in the sections.

Table 1.1
Structure of the Plan

Section	Title	Key Elements
1	Plan Preparation	Introduction
		Coordination
		Plan Adoption, Submittal and Implementation
2	System Description	Service Area Physical Description
		Service Area Population
3	System Demands	Baselines and Targets
		Water Demands
		Water Demand Projections for Retailers
		Water Use Reduction Plan
4	System Supplies	Water Sources
		Groundwater
		Transfer Opportunities
		Desalinated Water Opportunities
		Recycled Water Opportunities
		Future Water Supply Projects
5	Water Supply Reliability and Water Shortage Contingency Planning	Water Supply Reliability
		Water Shortage Contingency Planning
		Drought Planning
		Water Quality
6	Demand Management Measures (DMMs)	Description of DMMs
		Implementation of DMMs

1.1.4 Level of Planning

The Act specifies the required content of each UWMP and allows for the level of detail provided in each UWMP to reflect the size and complexity of the water supplier. The Act requires projections in five-year increments for a minimum of 20 years. This UWMP considers a 25-year planning horizon through year 2035.

The Act does not require that a UMWP contain the level of system-specific detail that would be included in a water system master plan. The Act specifically exempts UWMPs from review under the California Environmental Quality Act (CEQA)[1]. Additionally, Water Supply Assessments (Water Code Section 10631) and Water Supply Verifications (Water Code Section 66473.7) may rely on the UWMP as a foundational document for findings required in these documents.

1.1.5 Assumptions

The evaluation and projections in this document are based on the City's current water supply contract with the SCWA and its planned (future) water supply projects. This document is a "living" document (i.e., intended to be updated every five years) and as the City's water supply picture changes, the updated UWMP will incorporate those changes accordingly.

1.2 COORDINATION

This section describes the various agencies and stakeholders with which the City communicated in order to obtain input and information in preparing this UWMP.

1.2.1 Agency Coordination

The City meets regularly with other water purveyors. In particular, the City meets at least monthly with its water wholesaler, SCWA, and with other water contractors who purchase water from the SCWA. This monthly coordination has been instrumental in coordinating water supply and demand analyses for the preparation of this document. The City meets more often with the cities of Cotati and Petaluma as well as the North Marin Water District because of its shared delivery system through the SCWA Petaluma aqueduct system that transports water from the Russian River south to the Sonoma transmission system.

In addition to sending notices to the various agencies listed in the table below, the City also included a public notice in the local newspaper, The Community Voice, notifying the public of the City's intent to prepare its UWMP. The notice asked for public input during the preparation of the UWMP.

Table 1.2 (DWR Table 1) identifies the various agencies that the City is coordinating with during the UWMP preparation process.

[1] Water Code Section 10652

Table 1.2 (DWR Table 1)
Coordination with Appropriate Agencies

Coordinating Agencies	Participated in developing the plan	Commented on the draft	Attended public meetings	Was contacted for assistance/ input	Was sent a copy of the draft plan	Was sent a notice of intention to adopt	Not involved/ No information
Sonoma County Water Agency	✓	✓		✓			
County of Sonoma				✓			✓
City of Cotati	✓			✓			
City of Petaluma	✓			✓			
City of Santa Rosa	✓			✓			
City of Sonoma	✓			✓			
North Marin Water District	✓			✓			
Town of Windsor	✓			✓			
Valley of the Moon Water District	✓			✓			
City of Sebastopol				✓			✓
Penngrove Water Company				✓			✓
Sonoma State University				✓			✓

1.2.2 Public Participation

Urban water suppliers are required by the Act to encourage active involvement of the community within the service area prior to and during the preparation of its UWMP. The Act also requires urban water suppliers to make a draft of the UWMP available for public review and to hold a public hearing regarding the findings of the UWMP prior to its adoption. Table 1.3 identifies the public participation activities and the participants. A description of the governance of the SCWA water supply is described in Section 2.

Table 1.3
Public Participation and Outreach

Date	Description	Participants
2010-2011	UWMP planning and coordination, discussion, projections at quarterly Water Advisory Committee (WAC) meetings	WAC Members, General Public
Apr. 8, 2011	Public notice of UWMP preparation	[Community Voice]
Mar. 17, 2011	Letters sent to Interested Parties	See List on Table 1.2 (DWR Table 1)
May 30, 2011	Public hearing notice #1	[Community Voice]
May 27, 2011	Draft UWMP 2010 released	City Council, General Public
Jun. 5, 2011	Public hearing notice #2	[Community Voice]
Jun. 14, 2011	Draft UWMP 2010 public hearing	City Council, General Public

The findings of the Draft UWMP were presented before the City Council on June 14, 2011. The meeting was publicly noticed and the public given the opportunity to offer comments to the UWMP and to ask questions regarding the findings. A copy of the City Council resolution of adoption is included in Appendix A.

1.3 PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

The UWMP was adopted by the City Council on June 14, 2011. The Final UWMP incorporates comments made by the City Council and the public. The Final UWMP is available for public viewing at the following website link: *http://www.rpcity.org/* and at the City's main office during normal business hours. A copy of the Final UWMP will be submitted to DWR, the California State Library, the SCWA and Sonoma County no later than 30 days after adoption by the City Council. Comments to the Final UWMP made by DWR and the City's responses to the comments will be added to the website for the public's information.

Implementation of the 2010 Final UWMP will be the responsibility of the City Engineer and consists of the activities shown on Table 1.4.

Table 1.4
Plan Implementation

Description	Guidance Document(s)	Activity	Timeframe
Water supply projects and Capital Improvement Program (CIP)	City of Rohnert Park Annual Budget	Preparation of Annual CIP for water supply projects	March, 2011-2015
Water supply reliability	Final UWMP	Continued coordination and collaboration with SCWA to acquire consistent Russian River water supply entitlement in accordance with water supply contract	Monthly meetings with Water TAC and quarterly meetings with WAC
Water demand reduction targets	SBx7-7, Final UWMP, City Water Conservation Program	Ongoing tracking of GPCD and modifying Water Use Reduction Plan as needed	10% reduction by 2015; 20% reduction by 2020
Voluntary and mandatory Water conservation policies and procedures	Water shortage contingency plan in Final UWMP	Implement existing policies and procedures to incorporate elements from the revised contingency plan	2012

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SECTION 2
SYSTEM DESCRIPTION

This section describes the physical and political characteristics of the City's water service area as well as current and projected population for the service area.

2.1 PHYSICAL ATTRIBUTES

The City of Rohnert Park is located approximately 50 miles north of San Francisco. The water service area under consideration is bounded by the City's Sphere of Influence as outlined in its 2000 General Plan. The City's General Plan identified six major Specific Plan Areas (SPAs):

- Northeast SPA
- University District SPA
- Southeast SPA
- Canon Manor SPA
- Wilfred Dowdell SPA
- Northwest SPA

The City's General Plan anticipated annexation and development of all of the SPAs except Canon Manor. To date the University District, Southeast and Wilfred Dowdell SPAs have been approved and annexed, and the Northeast SPA is moving through the development approval process. Since the adoption of the General Plan in 2000, a casino has been proposed just inside the City's Sphere of Influence in the Northwest SPA; however this proposed land use is not in the General Plan, is still under review and remains uncertain. Therefore, Northwest SPA land uses are modeled as proposed by General Plan.

This UWMP also takes into account two major infill planned development (PD) projects: the Stadium Lands PD and the Sonoma Mountain Village PD. The City has approved Final Development Plans and Environmental Documents for each of these planned developments.

The Canon Manor Specific Plan Area has contracted with the Penngrove Water Company for water supply, and its demands are not considered demands on the City supply. Additionally, the Sphere of Influence includes Sonoma State University, which has its own water system and is not served by the City.

The water service area is approximately 6.4 square miles and serves residential and commercial needs. Figure 2.1 shows the City's water service area which is the current City Limit boundary. The figure also shows the SPAs described above. The City does not have outside service area connections. The City is at elevation 106 feet above mean sea level. The water distribution system contains two pressure zones. The distribution system consists of approximately 115 miles of water distribution system mains. Most of the distribution system mains are 6- to 8-inch diameter pipes and a small number are 10- to 12-inch diameter pipes.

The City also delivers recycled water to customers from Title 22 treated wastewater from the Santa Rosa Subregional System (Subregional System). The Subregional System operates a low-pressure and a high-pressure distribution system. The low-pressure system is delivered through an 18-inch diameter pipeline

that runs along Wilfred Avenue and Golf Course Drive and ends at Foxtail Golf Course near the northern City Limits. This low-pressure system delivers approximately 500 acre-feet per year to five customers. The high-pressure system begins at the Rohnert Park Pump Station, located at the intersection of Stony Point Road and Rohnert Park Expressway. The high-pressure system delivers 500 AFY to 27 customers.

2.2 POLITICAL CHARACTERISTICS AND GOVERNANCE OF PUBLIC WATER SYSTEM

The City's water system is governed by a 5-member City Council which includes a mayor. The water system, including its groundwater system, is managed and operated by the Public Works Department. The recycled water system is managed and operated by the Subregional System. The City Engineer is a member of the Technical Advisory Committee (TAC) to the Subregional System.

The governance of the SCWA water supply is provided for under the *Restructured Agreement for Water Supply* (Restructured Agreement), the agreement which provides for a Water Advisory Committee (WAC). The WAC representatives for the City are one Council member and one alternate Council member selected by the Council. The power of the WAC is limited to an advisory role.

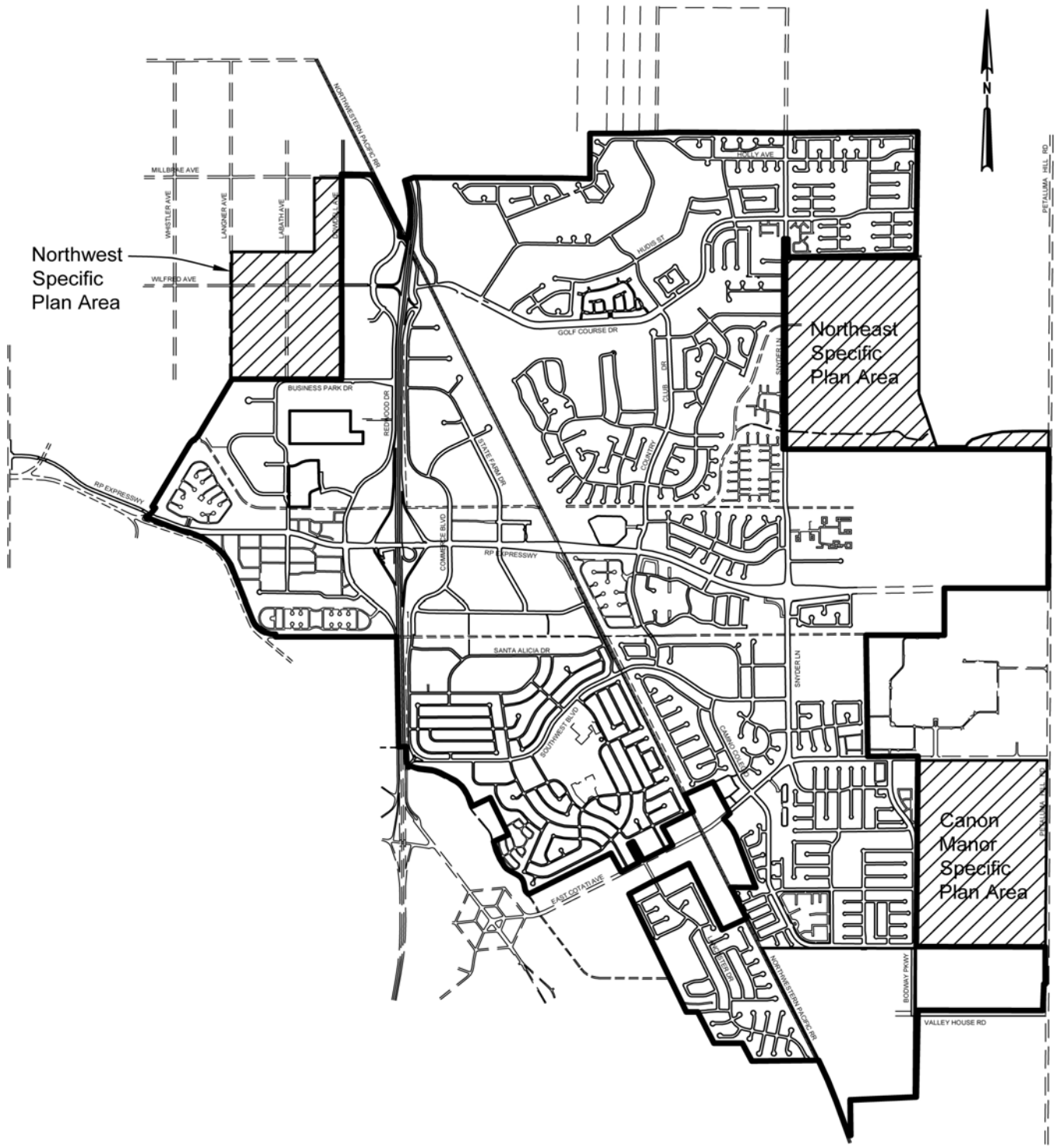
2.3 CLIMATE

The City is located in the Russian River watershed. The climate and hydrology of the Russian River watershed directly affect the City because its wholesale supply from SCWA is drawn from the Russian River. The climate of the Russian River watershed is tempered by its proximity to the Pacific Ocean and is characterized by seasonal rainfall patterns. Over 90 percent of the total annual precipitation falls between October and April, with a large percentage of the rainfall typically occurring during three or four major winter storms. The regional averages of the rate of evapo-transpiration of common turf grass (ETo), rainfall, and temperature are summarized in Table 2.1.

Table 2.1
Climate

	Average Eto, in	Average Rainfall, in	Average Temp, °F
January	1.2	6.25	47.0
February	1.7	5.32	50.5
March	2.8	4.09	52.8
April	3.7	2.06	55.8
May	5.0	0.97	59.8
June	6.0	0.26	64.6
July	6.1	0.03	66.5
August	5.9	0.08	66.6
September	4.5	0.38	65.9
October	2.9	1.60	61.2
November	1.5	3.64	53.4
December	0.7	5.50	47.6
Annual	**42.0**	**30.18**	**57.6**

Data obtained from Western Regional Climate Center, wrcc@dri.edu for Santa Rosa station, 1902-2010



Legend:

City Limits/Service Area Boundary

Specific Plan Areas

Figure 2.1
Water Service Area

City of Rohnert Park
2010 Urban Water Management Plan

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The average annual rainfall and annual ETo for the region are approximately 30 and 42 inches per year, respectively. ETo is a measurement of water evaporation combined with plant transpiration and is expressed in the form of a rate, typically inches per time period. In other words, ETo is the amount of water needed for common turf to grow in a specific region.

The average annual ETo for the region is approximately 12 inches more than the average annual precipitation. Because of this difference, and because over 90 percent of the annual precipitation occurs between the months of October and April, growing turf in this region requires a significant amount of irrigation during the dry season.

2.4 SERVICE AREA POPULATION

The information provided in this section is from the document entitled *2010 Urban Water Management Plan Water Demand Analysis and Water Conservation Measures Update* prepared by Maddaus Water Management dated November 19, 2010 (referred to in this UWMP as the "Maddaus Report" and included in Appendix B), and is used in this UWMP as permitted by the City.

State regulations concerning the preparation of the UWMP reports allow water agencies to select the most appropriate demographic projections for use. The City selected population and employment projections based on the 2009 Association of Bay Area Governments (ABAG). ABAG published the projections report in 2009, which includes population and employment estimates for the City of Rohnert Park. The 2009 ABAG projections are the most current information available for the City and take into consideration the City's 2000 General Plan and the SPAs described earlier, with some adjustments. The projections also take into account the recent economic conditions, especially the loss of jobs. The City previously used the 2000 General Plan projections which do not account for current economic conditions and end in 2020. Because of these limitations, the 2009 ABAG projections were selected for use in this UWMP. Table 2.2 (DWR Table 2) shows the current and projected population for the City's service area. Employment projections are shown in Table 2 of the Maddaus Report.

Table 2.2 (DWR Table 2)
Population – Current and Projected

	2010	2015	2020	2025	2030	2035	Data Source
Population [a]	43,398	46,400	47,900	49,300	51,000	53,000	2009 ABAG

[a] Population estimate for 2010 is from Department of Finance (2000 Census)

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SECTION 3
SYSTEM DEMANDS

This section describes the urban water system demands, including calculating its baseline (base daily per capita) water use and interim and final urban water use targets. It includes a detailed description of how the baseline and targets were calculated. The calculations follow the *Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan* dated March 2011 and developed by DWR (DWR Guidebook). Background information and the approach used to develop baselines and targets are also included.

This section quantifies the current water system demands by category and projects them over the planning horizon of the UWMP. These projections include water sales to other agencies, system water losses, and water use target compliance. The future water demands are based on the assumed reduction in per capita daily use determined from planning for and implementing actions associated with the Water Conservation Act of 2009 (Water Conservation Act). The provisions of the Water Conservation Act are incorporated into Part 2.55 of Division 6 of the California Water Code, commencing with Section 10608.

3.1 BASELINES AND TARGETS

One of the new requirements for completing a UWMP in 2010 is the requirement for each urban water supplier to calculate a baseline daily per capita water use and develop a per capita water use target for 2020 and an interim water use target for 2015. After establishing the City's baseline water usage per capita and the related conservation goals described in the following paragraphs, the City decided to use regional conservation goals as part of a regional alliance with other water contractors and customers to the SCWA. However, it should be noted, that the City's individual base daily per capita water use will still apply if the regional alliance goals are not met. In other words, if the regional alliance goals are not met, the City's individual goals will apply to the City for DWR reporting and compliance purposes.

3.1.1 Base Daily Per Capita Water Use

The base daily per capita water use is the water supplier's average gross daily per capita use in gallons. The gross water use includes all water entering the delivery system, including water losses, but excluding recycled water delivered within the supplier's service area, water placed into long-term storage and water conveyed to other urban water suppliers.

The purpose of developing a base daily per capita water use is to have a baseline from which to derive the 2020 and 2015 water use targets. The base daily per capita water use is developed for each water supplier using one of the methodologies authorized by the Department of Water Resources. In most cases, the calculation is based on a 10-year average beginning no earlier than 1994 and ending no later than 2010. However, the City may instead use a 10- to 15-year average because of its recycled water program. The methodology for determining the base daily per capita water use, in consideration of the City's recycled water program, is described in the paragraphs that follow.

The City, through the Subregional System, delivers recycled water to its customers. Because of this recycled water supply and in accordance with the DWR Guidebook, the City selected a 13-year average to calculate the base daily per capita water use. The 13-year average included data from 1992 to 2004.

A second baseline is computed in order to establish the maximum allowable 2020 target. This baseline consists of a continuous five year period ending no earlier than December 31, 2007 and no later than December 31, 2010. The range used for calculating the City's maximum allowable target is the period from 2003 to 2007. Table 3.1 illustrates the 13-year and 5-year base period ranges.

Table 3.1 (DWR Table 13)
Base Period Ranges

Base	Parameter	Value	Units
10- to 15-Year Base Period	2008 total water deliveries	5,733	AFY
	2008 total volume of delivered recycled water	1,113	AFY
	2008 recycled water as a percent of total deliveries	19	percent
	Number of years in base period [a]	13	years
	Year beginning base period range	1992	--
	Year ending base period range [b]	2004	--
5-Year Base Period	Number of years in base period	5	years
	Year beginning base period range	2003	--
	Year ending base period range [c]	2007	--

[a] If the 2008 recycled water percent is less than 10 percent of total water deliveries, then the first base period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first base period is a continuous 10- to 15-year period.

[b] The ending year must be between December 31, 2004 and December 31, 2010.

[c] The ending year must be between December 31, 2007 and December 31, 2010.

As is shown in Table 3.2 (DWR Table 14), the City's base daily per capita water use is 162 gallons per capita per day (gpcd). The base daily per capita water use was developed using the total service area population.

Table 3.2 (DWR Table 14)
Base Daily Per Capita Water Use — 10- to 15-Year Range

Base Period Year		Distribution System Population	Daily System Gross Water Use (mgd)	Annual Daily Per Capita Water Use (gpcd)
Sequence Year	Calendar Year			
Year 1	1992	38,162	6.2	162
Year 2	1993	38,766	6.3	162
Year 3	1994	39,128	6.7	171
Year 4	1995	39,056	7.0	180
Year 5	1996	39,843	7.1	179
Year 6	1997	40,495	7.3	179
Year 7	1998	41,314	6.5	158
Year 8	1999	42,025	6.9	163
Year 9	2000	42,236	6.5	155
Year 10	2001	42,309	6.7	157
Year 11	2002	42,233	6.4	151
Year 12	2003	42,455	6.0	141
Year 13	2004	42,282	5.9	141
Year 14	n/a	n/a	n/a	n/a
Year 15	n/a	n/a	n/a	n/a
			Base Daily Per Capita Water Use	**162**

Note: The City has selected a 13-year range for determining base daily use.

A second requirement for completing the 2010 UWMP is that the City determine its 5-year base daily per capita water use. If the 5-year base daily water use exceeds 100 gpcd, then the 2020 water use target established by the City must be less than or equal to 95 percent of this 5-year baseline. As shown in Table 3.3 (DWR Table 15), the 5-year base daily per capita water use is 125 gpcd.

Table 3.3 (DWR Table 15)
Base Daily Per Capita Water Use — 5-Year Range

Base Period Year		Distribution System Population	Daily System Gross Water Use (mgd)	Annual Daily Per Capita Water Use (gpcd)
Sequence Year	Calendar Year			
Year 1	2003	42,455	6.0	141
Year 2	2004	42,282	5.9	141
Year 3	2005	42,262	5.2	123
Year 4	2006	42,833	4.9	115
Year 5	2007	42,722	4.6	108
			Base Daily Per Capita Water Use	**125**

Based on the calculations for the 13-year baseline, the 5-year baseline and the 100 gpcd threshold, the City's 2020 water use target that is calculated under Section 3.1.2 must be less than or equal to 95 percent of the 5-year baseline, or 119 gpcd. In summary, 119 gpcd is the minimum 2020 water use target that must be met under the calculations that follow in Section 3.1.2.

3.1.2 Water Use Targets (2015, 2020)

The Water Conservation Act established requirements for the state of California to reduce its statewide urban per capita water use by 20 percent by the year 2020. An interim target is set for 2015 which is halfway between the baseline and the 2020 target. After year 2021, failure to meet the 2020 water use target constitutes a violation of law. Compliance with the 2015 and 2020 water use targets is also a requirement for eligibility for state grants and loans.

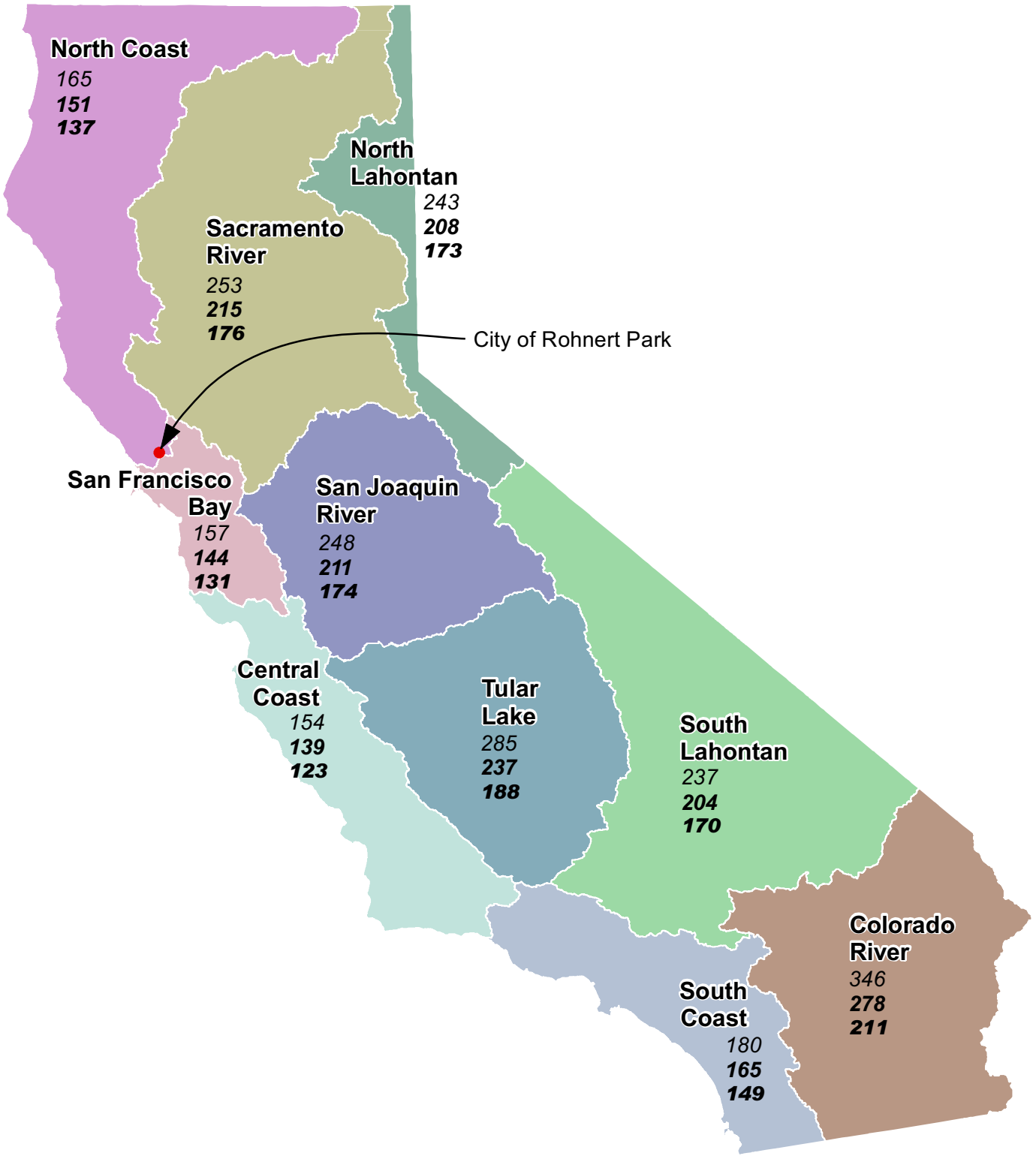
3.1.2.1 Individual Agency Targets

Under the Water Conservation Act, each individual urban water supplier must develop a water use target for the year 2020 using one of four allowable methods. The 2015 interim target is a per capita water use figure which is halfway between the City's base daily per capita water use of 119 gpcd (determined in Section 3.1.1) and the 2020 target.

There are four methods that an urban water supplier may use to develop their 2015 and 2020 water use targets. Three methods were provided in the Water Conservation Act and the fourth was subsequently established by DWR. The four methods are generally described below. A more complete description can be found in DWR's Guidebook.

- Method 1: 80 percent of Base Daily Per Capita Use;
- Method 2: Performance standards based on actual water use data for indoor residential water use, landscaped area, and commercial, industrial and institutional (CII) water use;
- Method 3: 95 percent of the San Francisco Bay hydrologic region (see Figure 3.1); and
- Method 4: Savings by water sector (indoor residential and CII) and landscape and water loss savings.

The City has elected to use Method 1 for the development of its individual water use target. Based on the City's base daily per capita water use of 162 gpcd, the 2020 water use target under Method 1 equals 130 gpcd. Because the minimum 2020 water use target determined in Section 3.1.1 is 119 gpcd and is less than the Method 1 calculation, the individual agency water use target that applies is 119 gpcd.



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Cartography: RMR

Legend

Region Water Use Targets

in gallons per capita per day

165 Baseline (1995-2005)

151 Interim Target (2015)

137 2020 Target

0 40 80 Miles

1 inch = 81 miles

N

Sources: Department of Water Resources (DWR) Hydrologic Regions

Figure 3.1
Hydrologic Region Map

City of Rohnert Park
2010 Urban Water Management Plan

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Table 3.4 summarizes the calculation on the "95 percent target check." Table 3.5 summarizes the City's 2015 and 2020 water use targets.

Table 3.4
Water Use Target Calculations for the City of Rohnert Park

Year	Population	Gross Water Use (mgd)	Daily Per Capita Water Use (gpcd)
2003	42,455	6.0	141
2004	42,282	5.9	141
2005	42,262	5.2	123
2006	42,833	4.9	115
2007	42,722	4.6	108
Average Daily Water Use (2003-2007)			**125**
2020 Target (95% of 2003-2007 average)			**119**
Base Daily Water Use [a]			**162**
2015 Interim Target [b]			**140**

[a] From Table 3.2

[b] Halfway between Base Daily Water Use and 2020 Target

Table 3.5
Water Use Targets for the City of Rohnert Park

Year	Projected Water Use, AFY [a]	Population [b]	Projected Per Capita Water Use, gpcd	Water Use Target, gpcd	Meets Target?
2015	5,314	46,400	102	140	Yes
2020	5,486	47,900	102	119	Yes

[a] Total potable water deliveries (i.e., excludes recycled water)

[b] Population projections from Section 2

3.1.2.2 Regional Targets

The Water Conservation Act provides that urban water retail suppliers may plan, comply and report on the 2020 water use target on a regional basis, an individual basis, or both. The City is one of nine water contractors to the Sonoma County Water Agency (SCWA) for purchase of Russian River water supply. The water contractors are eligible to form a regional alliance, under the provisions of the Water Conservation Act because the water contractors are recipients of water from a common wholesale water supplier, the SCWA. A water conservation regional alliance among the nine water contractors is already in existence and comprises the Sonoma-Marin Saving Water Partnership, effectively combining the regional water conservation efforts with regional alliance for purposes of meeting regional water use targets. The members of the alliance are the cities of Rohnert Park, Santa Rosa, Sonoma, Cotati and Petaluma, the Town of Windsor, Valley of the Moon Water District, North Marin Water District and Marin Municipal Water District.

DWR established three options for calculating a regional alliance target. The City, along with the other water contractors in the regional alliance, selected Option 1, for establishing the regional alliance target. Option 1 consists of each member of the regional alliance calculating their individual targets and then weighting the individual targets by each member's population. The weighted targets are then averaged to determine the regional alliance target. Detailed calculations under the regional alliance can be found in

Appendix C.1. The regional alliance per capita water use targets in comparison to the projected per capita water use are shown in Table 3.6.

Table 3.6
Regional Water Use Targets

Year	Projected Water Use, AFY	Population	Projected Per Capita Water Use, gpcd	SBx7-7 Water Use Target, gpcd	Meets Target?
2015	95,032	637,687	133	142	Yes
2020	94,602	659,825	128	129	Yes

The City Council approved becoming a member of the regional alliance and using regional targets at its Council meeting of April 12, 2011. A copy of the letter approving the City's membership in the regional alliance is included in Appendix C.2. Use of the regional approach allows the City, together with the other regional alliance members, to have a (combined) conservation target of 129 gpcd.

Becoming a member of the regional alliance will help the City focus efforts on regional water conservation programs that the water contractors intend to actively engage in through the Sonoma-Marin Saving Water Partnership. This regional effort provides for an "economies of scale" cost benefit for implementing regional programs and also provides for a consistent water conservation message throughout the region.

3.2 WATER DEMANDS

The water demand and water conservation savings analyses are included in the Maddaus Report (Appendix B). Excerpts and water demand data from the Maddaus Report are directly used in this section.

3.2.1 Past and Current Water Deliveries

Water use in the City's service area is predominantly residential use. The residential customers account for approximately 90 percent of the total water billing accounts and approximately 80 percent of the total water deliveries. Commercial customers are the next largest customer type with irrigation accounts next in terms of number of accounts and water deliveries. The relatively modest use associated with irrigation accounts can be attributed to the fact that many large landscapes in the City are connected to the recycled water system. Fire system water accounts were not listed separately in the account estimates because they are already included as part of commercial or multi-family customer accounts.

Past customer water use for the year 2005, as presented in Table 3.7 was obtained from actual billing data for the various water use sectors.

Table 3.7 (DWR Table 3)
Water Deliveries — Actual, 2005 (AFY)

	2005				
	Metered		Not Metered		Total
Water Use Sectors	# of Accounts	Volume	# of Accounts	Volume	Volume
Single family	7,590	2,455	-	-	2,455
Multi-family	413	1,191	1	-	1,191
Commercial	496	951	-	-	951
Industrial/Institutional	2	-	-	-	-
Irrigation	250	212			212
Total	**8,751**	**4,809**	**1**	**-**	**4,809**

Current customer water use for year 2010, as presented in Table 3.8 is also based on actual billing data for the various water use sectors.

Table 3.8 (DWR Table 4)
Water Deliveries — Actual, 2010 (AFY)

	2010				
	Metered		Not Metered		Total
Water Use Sectors	# of Accounts	Volume	# of Accounts	Volume	Volume
Single family	7,655	1,642	-	-	1,642
Multi-family	473	1,467	-	-	1,467
Commercial/Institutional	549	417	1	-	417
Industrial	2	0	-	-	0
Irrigation	321	316	-	-	316
Total	**9,000**	**3,843**	**1**	**-**	**3,843**

3.2.2 Projected Water Deliveries

For purposes of water use projections, the Maddaus Report used an adjusted usage figure for year 2010 and not the actual metered delivery data presented in the previous table. The 2010 planning estimate is then used as a "take-off" point from which future demand projections are based. The reason for using an adjusted usage figure rather than basing the estimate on actual water delivery is that the 2010 actual delivery is an artificially low "take-off" point for future projections due to a cooler than normal 2010 summer. This results in lower summertime water use, water use reduction due to the economic climate in 2010 and carryover residual reductions in water demands coming from mandatory water conservation in 2009. The adjusted water use figure for 2010 was based on the 2007 water use.

The land use and population assumptions for the water use projections are based on the 2009 Association of Bay Area Governments (ABAG) population and employment projections. The 2009 ABAG projections were used to create the demand projections. They take into account the recent economic conditions, especially the loss of jobs. By using this employment information, this analysis effectively accounts for commercial vacancies the City is experiencing. Lower jobs in 2010 correlate with higher vacancies, lower water use per account and lower jobs per account. Job growth in the future is used to increase the number of accounts in the future. The City previously used 2000 General Plan projections which do not account for current economic conditions and end in 2020. Because of these limitations, 2009 ABAG projections were used in the Maddaus Report. The 2000 Census data was used as a general reference when determining population and household sizes for the City's service area in 2010.

Table 3.9 (DWR Table 5)
Water Deliveries — Projected, 2015 (AFY)

	2015				
	Metered		Not Metered		Total
Water Use Sectors	# of Accounts	Volume	# of Accounts	Volume	Volume
Single family	8,077	2,536	-	-	2,536
Multi-family	453	1,593	-	-	1,593
Commercial	576	637	-	-	637
Industrial/Institutional	2	3	-	-	3
Irrigation	266	433	-	-	433
Total	**9,374**	**5,202**	**-**	**-**	**5,202**

Note: Delivery projections are based on savings including plumbing code and excluding unaccounted-for water.

Table 3.10 (DWR Table 6)
Water Deliveries — Projected, 2020 (AFY)

	2020				
	Metered		Not Metered		Total
Water Use Sectors	# of Accounts	Volume	# of Accounts	Volume	Volume
Single family	8,339	2,569	-	-	2,569
Multi-family	475	1,609	-	-	1,609
Commercial	716	766	-	-	766
Industrial/Institutional	3	3	-	-	3
Irrigation	275	447	-	-	447
Total	**9,808**	**5,394**	**-**	**-**	**5,394**

The projections for 2020, if realized, would bring the City's per capita water use down to 102 gpcd which is less than the City's 2020 water use target of 119 gpcd.

Table 3.11 (DWR Table 7)
Water Deliveries — Projected, 2025, 2030, and 2035 (AFY)

	2025		2030		2035	
	Metered		Metered		Metered	
Water Use Sectors	# of Accounts	Volume	# of Accounts	Volume	# of Accounts	Volume
Single family	8,582	2,597	8,878	2,651	9,226	2,726
Multi-family	490	1,620	507	1,647	527	1,689
Commercial	807	849	901	935	1,012	1,041
Industrial/Insyitutional	3	4	4	4	4	5
Irrigation	283	460	292	476	304	495
Total	**10,165**	**5,530**	**10,582**	**5,713**	**11,073**	**5,956**

3.2.3 Water Sold to Other Agencies

The City did not sell water to other agencies. This information is presented in table 3.12 in DWR's required format.

Table 3.12 (DWR Table 9)
Sales to Other Water Agencies (AFY)

Water Distributed	2005	2010	2015	2020	2025	2030	2035
Name of Agency	--	--	--	--	--	--	--
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**

3.2.4 Actual and Projected "Other" Water Demands

Table 3.13 shows unaccounted-for water, which is defined to be the difference between water produced and water sold to customers. This differential between water supply and metered water use includes system flushing, leak repair flushing, hydrant leaks, street sweeping and known leaks that are subsequently repaired. The remainder is "unaccounted-for" water, that is, un-metered water and/or water leaking from the system. Unaccounted-for water can also result from meter inaccuracies. Unaccounted-for water is calculated before the result of conservation programs is calculated and increases due to an overall increase in demand.

The City is committed to minimizing its unaccounted-for water and staying within the industry average of 10 percent loss (maximum). The City's unaccounted-for water for the past 5 years is approximately 7 percent. The City's unaccounted-for water in 2005 was uncharacteristically high (approximately 17 percent of potable water deliveries). During this period the City was replacing commercial and multi-family meters. In many cases the work included constructing new services, and temporary un-metered services were used to keep businesses and apartment complexes with water. It is believed that during 2005, some water was not metered as a result of the work associated with the metering project.

The City has no other uses (such as groundwater recharge or conjunctive use) at this time. Table 3.13 below shows actual losses for 2005 and 2010 and estimates losses for the years 2015 through 2035. The City's recycled water use is from the Santa Rosa Subregional System. A detailed description of the City's recycled water use is included in Section 4.6.

Table 3.13 (DWR Table 10)
Additional Water Uses and Losses (AFY)

Water Use	2005	2010	2015	2020	2025	2030	2035
Saline Barriers	-	-	-	-	-	-	-
Groundwater Recharge	-	-	-	-	-	-	-
Conjunctive Use	-	-	-	-	-	-	-
Raw Water	-	-	-	-	-	-	-
Recycled Water	810	710	1,300	1,300	1,300	1,300	1,300
Unaccounted-for System Losses [a]	962	656	391	406	416	430	448
Other (define)	-	-	-	-	-	-	-
Total	1,772	1,366	1,691	1,706	1,716	1,730	1,748

[a] In 2005 and 2010, the City had one commercial account that was un-metered. It is assumed that this un-metered account caused unaccounted-for system losses to be very high. In addition, in 2005, the City replaced commercial and multi-family meters causing higher unaccounted-for water in 2005.

3.2.5 Summary of Total Water Use

Table 3.14 presents the projected water conservation savings resulting from the City's conservation implementation plan described in Section 3.4.2.

Table 3.14
Conservation Savings (AFY)

Existing Tier 1 Program, New Development Standards, Plumbing Code					
	2015	2020	2025	2030	2035
Conservation Savings (Tier 1 + ND)	279	314	342	376	418
Plumbing Code	167	309	434	541	638
Total Conservation Savings	446	623	776	917	1,056

Table 3.15 summarizes the actual water use in 2005 and 2010 and projects water use for years 2015 through 2035. As with previous tables, water use for years 2005 and 2010 are actual water use figures.

Table 3.15 (DWR Table 11)
Total Water Use (AFY)

Water Use	2005	2010	2015	2020	2025	2030	2035
Total Water Deliveries (from Tables 3.7 to 3.11)	4,809	3,843	5,202	5,394	5,530	5,713	5,956
Sales to Other Water Agencies (from Table 3.12)	0	0	0	0	0	0	0
Less Conservation Savings [a] (from Table 3.14)	--	--	(279)	(314)	(342)	(376)	(418)
Additional Water Uses and Losses (from Table 3.13)	1,772	1,366	1,691	1,706	1,716	1,730	1,748
Total	6,581	5,209	6,614	6,786	6,904	7,067	7,286

[a] Conservation excludes plumbing code savings (included in Total Water Delivery projections); 2005 and 2010 deliveries are actual deliveries and include conservation savings and losses

3.2.6 Lower income Water Use Projections

The Water Conservation Act includes a new requirement for identifying water use projections for lower income households. Under the statute, a lower income household is as defined under the California Health and Safety Code and is established to be 80 percent of median income, adjusted for family size. Based on Census data for the service area, the 80 percent median income figure is approximately $55,389. Lower income households are estimated to comprise approximately 34 percent of the total households in the City. Table 3.16 shows the projected water demands for lower income households based on 34 percent of the total single family and multi-family residential projected water use.

Table 3.16 (DWR Table 8)
Lower Income Projected Water Demands (AFY)

Water Distributed	2015	2020	2025	2030	2035
Single-family residential	872	884	893	912	938
Multi-family residential	548	553	557	567	581
Total	**1,420**	**1,437**	**1,451**	**1,479**	**1,519**

3.3 WATER DEMAND PROJECTIONS FOR RETAILERS

The City's water supply primarily comes from water purchased from the SCWA. The City, along with eight other water contractors, has a water supply agreement with the SCWA for the purchase of Russian River water. As referenced earlier in this section, the demand analysis and projections can be found in the Maddaus Report.

The City has provided its demand projections to the SCWA. However, as discussed in Section 3.2.2, the projected 2015 and subsequent years' water demands are based on a 2010 planning estimate. It is not known how much of this projected amount will actually occur. The City will be coordinating and working closely with the SCWA to determine the timing of capital improvement projects that may need to come online in order to meet the City's water demands.

Table 3.17 provides the projected amount of water that the City expects to purchase from the SCWA to meet water demands in the future under normal water supply conditions. The remaining demand will be met with a combination of the City's own groundwater wells, water conservation implementation and recycled water use. The SCWA's water supply, the City's groundwater and recycled water supply are further described in Section 4. The City's water conservation implementation is further described in Section 6. Table 3.17 illustrates the recycled water that the City expects to have delivered through the Subregional System.

Table 3.17 (DWR Table 12)
Retail Agency Demand Projections Provided to Wholesale Suppliers (AFY)

Wholesaler	Contracted Volume	2010 [c]	2015	2020	2025	2030	2035
Sonoma County Water Agency	7,500 [a]	2,758	3,514	4,583	4,937	5,292	5,646
Santa Rosa Subregional	1,300 [b]	710	1,200	1,300	1,300	1,300	1,300

[a] Maximum entitlement under the *Restructured Agreement for Water Supply*

[b] Recycled water contracted volume is based on maximum projected delivery

[c] 2010 based on actual volume

2010 water use is not representative of normal water use characteristics for SCWA and its customers (water contractors). From 2007 – 2010, the SCWA and the water contractors' water use was significantly reduced by a number of factors including drought conditions, implementation of water shortage response plans, economic recession and increases in residential and commercial vacancy. The methodology used for the SCWA and water contractors for the demand projections for 2015 through 2035 are based on normal water use characteristics and do not incorporate the effects of the conditions described above.

3.4 WATER USE REDUCTION PLAN

In this section, the phrases "Best Management Practices" (BMPs) and "Demand Management Measures" (DMMs) are used interchangeably and also referred to as "conservation measures." The City's water use reduction plan is detailed in the Maddaus Report. The report identifies current and projected savings from the City's conservation programs. The programs include the following categories:

- **Tier 1.** Tier 1 consists of BMPs that were originally identified and established by the California Urban Water Conservation Council (CUWCC). A Memorandum of Understanding (MOU) was voluntarily signed by many urban water agencies and environmental groups who pledged to develop and implement 14 conservation BMPs. The City became a signatory to the MOU on October 23, 2001.
- **Tier 2.** Tier 2 consists of conservation measures beyond Tier 1. City staff conducted a review and screening of various conservation measures that included a water savings device or program that would result in a reduction in water uses. Due to the low cost effectiveness of Tier 2 measures, the City did not select any Tier 2 measures for implementation other than the new development standards described below.
- **New Development Standards (ND).** These are a subset of Tier 2 measures which apply to new development. Conservation savings resulting from Cal Green building codes have been included as this affects all new development in California after January 1, 2011. The City adopted an ordinance for "Cal Green" building standards and the ordinance became effective on January 1, 2011.

3.5 WATER DEMAND REDUCTION GOALS AND PROGRAMS

Based on the programs identified in the section above, the Maddaus Report identified a conservation savings of 418 acre-feet per year by 2035. This amount of conservation savings is a result of implementing the City's Existing Tier 1 and ND programs. In addition to the conservation savings of 418 acre-feet per year,

the Maddaus Report identifies 638 acre-feet per year savings resulting from State-mandated plumbing code changes in the Building Code.

3.6 IMPLEMENTATION PLAN FOR GPCD REDUCTION

The implementation plan is discussed in detail in the Maddaus Report. The plan is summarized below and includes water savings quantified for the following conservation measures consisting of existing Tier 1 program measures, New Development (ND) measures and other measures:

- CUWCC #1 – Residential Water Surveys, Interior
- CUWCC #1 – Residential Water Surveys, Outdoor
- CUWCC #2 – Plumbing Retrofit Kits
- CUWCC #5a – Large Landscape Water Budgets
- CUWCC #6 – Washer Rebates
- CUWCC #7 – Residential Public Education
- CUWCC #9 – Commercial Water Audits
- ND1 – Rain-sensor shut off device on irrigation controllers (Cal Green)
- ND2 – Smart Irrigation Controller (Cal Green)
- ND3 – High Efficiency Toilets (state law 2014)
- ND4 – Efficient Dishwashers
- ND5 – Efficient Clothes Washing Machines
- ND6 – Hot Water on Demand Systems
- ND7 – High Efficiency Faucets and Showerheads (Cal Green)
- ND8 – Landscape and irrigation requirements
- SB-407 Plumbing Retrofit on Resale or Remodel (state law)
- Submetering Requirement for New Multifamily Accounts
- Submetering Requirement for Existing Multifamily Accounts (retrofit upon sale or remodel)

The City's service area has a high proportion of residential water use and a significant amount of outdoor water use. Consequently, residential conservation programs produce the most savings. The City's service area does not have a heavy manufacturing sector so the conservation potential in the commercial sector is relatively low. The City's implementation plan includes projected water conservation savings from the measures listed above, although the actual implementation of some measures will depend on further review of water use patterns, economic factors, and market demands for programs.

3.6.1.1 Current Plan and Economic Impacts

The economic analysis is shown in Table 18 of the Maddaus Report for the City's selected water conservation program, which includes Tier 1 and ND conservation measures. The water savings cost for the City's conservation program is expressed in two ways in the Maddaus Report: i) Total present value over the analysis period of 2010 through 2035; and ii) Cost of water saved. As shown on Table 18 of the Maddaus Report, the cost of water saved is $182 per acre-foot. In comparison, the SCWA wholesale water rate is $634 per acre-foot. Based on the analysis conducted in the Maddaus Report, the cost of implementing the City's water conservation program is less expensive than buying additional water from the SCWA.

3.6.1.2 Additional Measures for Future Discussion

The City's implementation plan described in Section 3.4.2 is expected to be adequate for the City to comply with its 2020 water use target; therefore, no additional measures are being considered at this time.

SECTION 4
SYSTEM SUPPLIES

This section describes the imported water, groundwater and recycled water supply sources, quantities, supply constraints, and future water supply projects. The City primarily uses imported water purchased from the SCWA and local groundwater supply. The City also uses recycled water delivered to large landscape accounts by the Subregional System.

4.1 SCWA WATER SUPPLY

From 2005 to 2010, an average of 70 percent of the City's total water supply (i.e., SCWA water, recycled water and groundwater) was water purchased from the SCWA. More detailed information regarding SCWA's water supply and facilities can be found in SCWA's Urban Water Management Plan at the following link: *www.scwa.ca.gov/uwmp/*. A general description of the SCWA Water Supply and Transmission System follows.

4.1.1 SCWA Water Supply and Transmission System

The City's water supply is conveyed through the Petaluma Aqueduct through turnouts along the Petaluma Aqueduct and Russian River-Cotati Intertie that are owned and operated by the SCWA. The SCWA aqueduct system is supplied water from the natural flow of the Russian River. Russian River water is stored in winter behind Warm Springs Dam for later release from Lake Sonoma; water is also stored in winter and other times of the year behind Coyote Dam for later release from Lake Mendocino. These dams are federal projects under the jurisdiction of the U.S. Army Corps of Engineers. The SCWA is the local sponsor and partners with the U.S. Army Corps of Engineers for the water supply portion of the reservoir projects. The SCWA owns and operates the water supply pools at both Lake Sonoma and Lake Mendocino. The water supply pool of Lake Sonoma is 212,000 acre-feet and Lake Mendocino is 111,000 acre-feet.

The SCWA also owns and operates three groundwater supply wells located in the Santa Rosa Valley groundwater basin. Information and sufficiency analysis of the SCWA groundwater wells can be found in the SCWA's UWMP.

The SCWA uses about 14 miles of the natural channel of Dry Creek and about 8 miles of the Russian River to convey water from Lake Sonoma to its diversion facilities. Water is diverted from the stretch of river located just upstream of Wohler Bridge and downstream of Mirabel via six Ranney Collectors. Because the water has been naturally filtered by the gravels of the Russian River, it only needs the addition of chlorine to meet California Department of Public Health drinking water quality standards. A system of aqueducts, booster pumps and tanks then distribute the water to the various water contractors and other water transmission system customers, including the Marin Municipal Water District (see Figure 4.1). The system was designed and planned to meet peak daily demands of its customers.

The existing Petaluma Aqueduct facilities also serve the cities of Rohnert Park, Cotati, and Petaluma, North Marin Water District and Marin Municipal Water District. Potable water, from the SCWA turnouts and City wells is delivered to customers through the City's potable distribution system.

4.2 OTHER EXISTING AND PLANNED WATER SOURCES

The City uses local groundwater supply and also uses recycled water. A detailed discussion of the City's groundwater supply is included in Section 4.3. A discussion of the recycled water supply is included in Section 4.4. The City has no other planned water sources than what it is currently using.

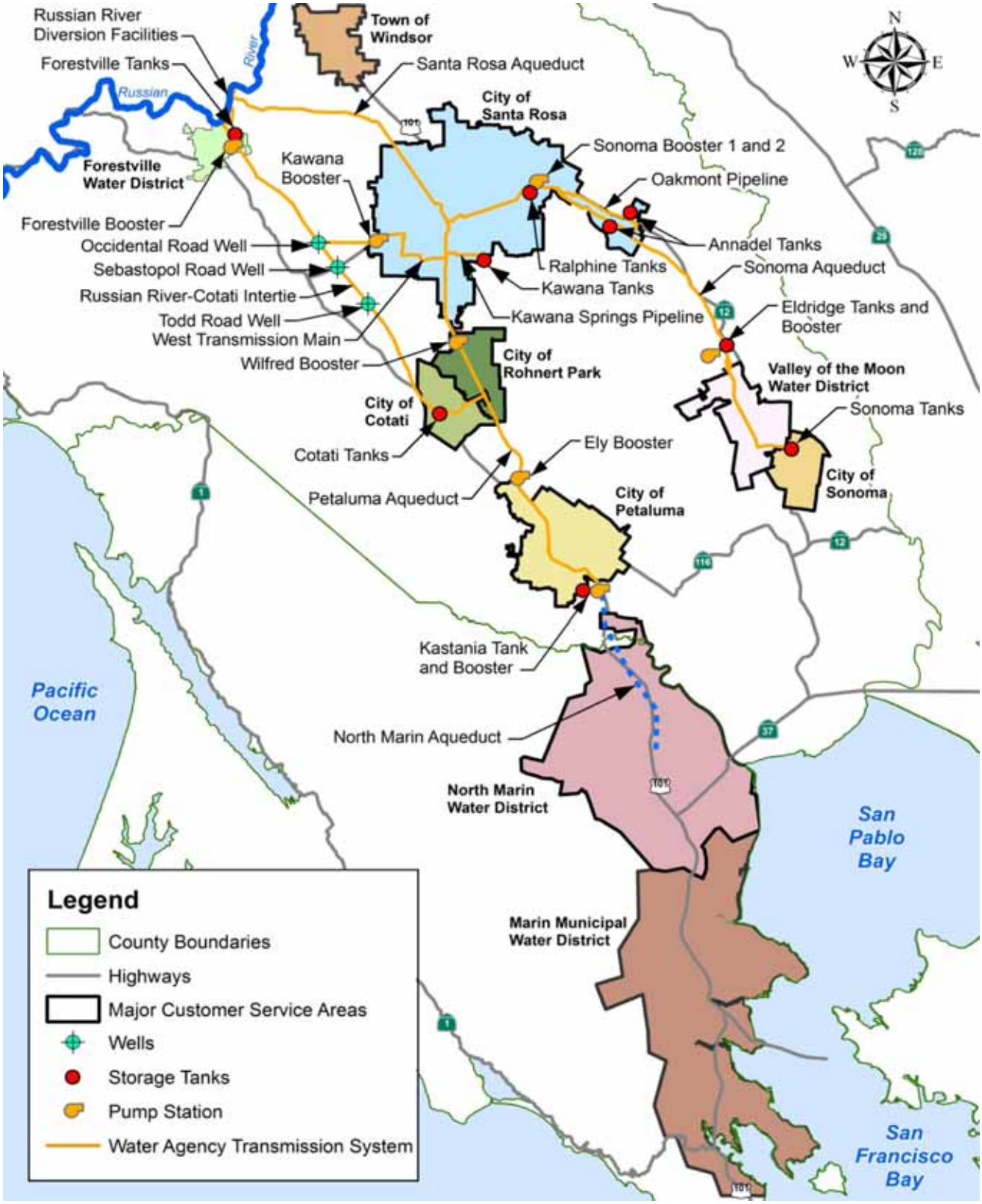
4.3 GROUNDWATER

From 2005 to 2010, an average of 17 percent of the City's total water supply (i.e., SCWA water, recycled water and groundwater) was from local groundwater wells (see Table 4.2 (DWR Table 18). The discussion that follows provides a description of the groundwater portion of the City's supply, the Santa Rosa Plain Groundwater Management Plan (SRVGMP), the hydrogeology of the basin from which the City pumps groundwater from, the City's groundwater supply and water quality, as well as a summary of the sufficiency of the groundwater for projected groundwater pumping.

4.3.1 Introduction

The City's groundwater supply is from 29 local active groundwater supply wells, located in the Santa Rosa Valley Groundwater Basin. The City manages its SCWA and groundwater supplies in a conjunctive use manner: it relies primarily on SCWA supplies, when those supplies are unconstrained. During periods when the SCWA supply is restricted, primarily for legal and institutional reasons, the City increases groundwater pumping.

The City has developed 42 groundwater wells, 29 of which are currently active, and the City has one standby well that can be used in emergencies for up to five consecutive days but not more than 15 days in a year. The active wells have a total rated production capacity of 8.3 mgd. Table 4.1 outlines the status and production capacity of all the City's wells, which are illustrated on Figure 4.2.



Source: Sonoma County Water Agency 2005 UWMP

Figure 4.1
SCWA Service Area and Water Transmission System Facilities

City of Rohnert Park
2010 Urban Water Management Plan

WINZLER & KELLY
www.w-and-k.com

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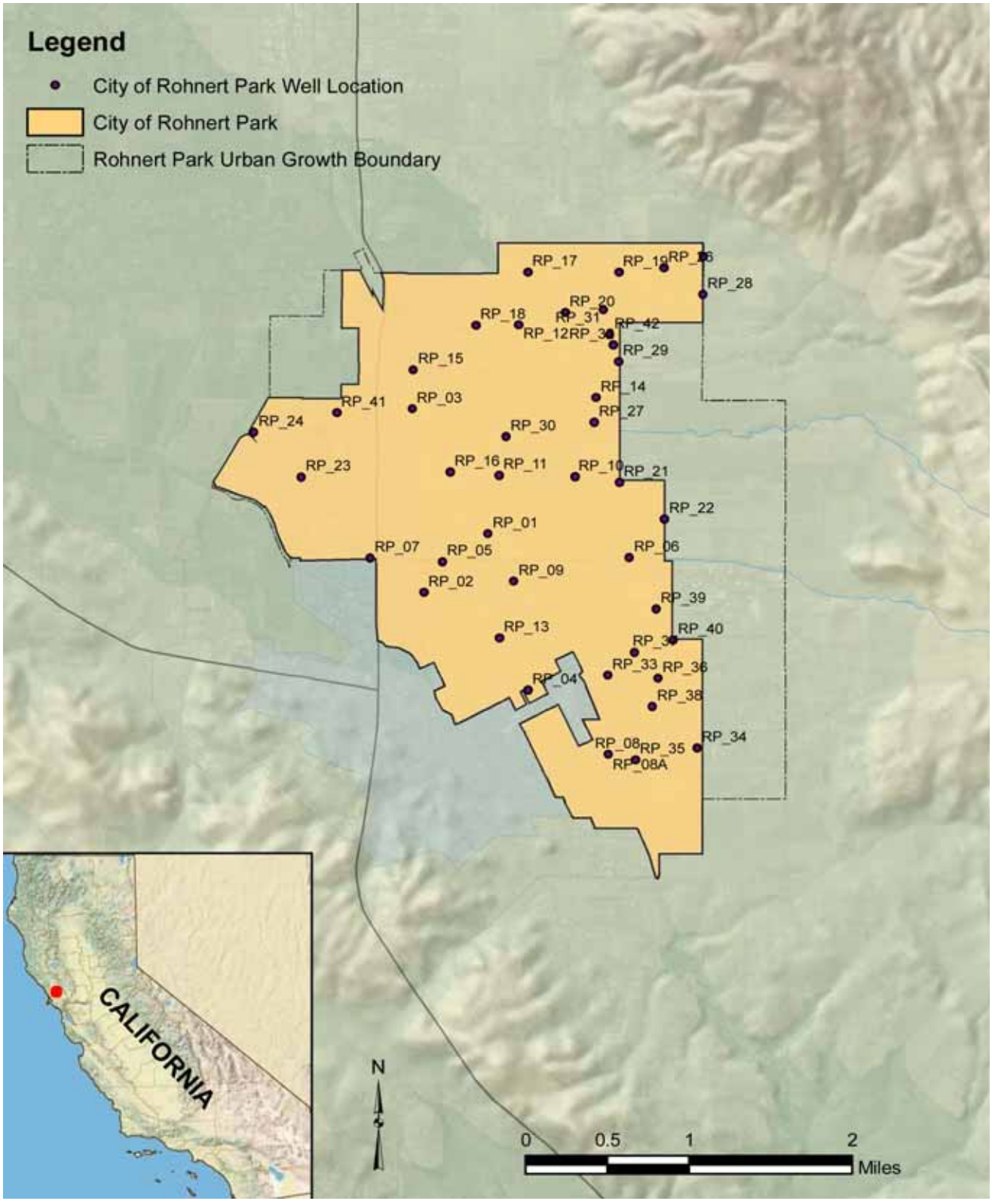

Source: Sonoma County Water Agency 2005 UWMP

Figure 4.2
City Wells Map

City of Rohnert Park
2010 Urban Water Management Plan

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Table 4.1
City Well Site Information

Well No.	Production, gpm	Status
1	230	Active
2	150	Active
3	0	Abandoned/monitoring well
4	0	Inactive (75gpm)
5	180	Active
6	100	Active
7	250	Active
8	145	Active
8A	95	Active
9	250	Active
10	185	Active
11	345	Active
12	130	Active
13	265	Active
14	140	Active
15	0	Standby Status (302 GPM)
16	450	Active
17	0	Inactive (Uknown GPM)
18	180	Active
19	0	Disconnected/monitoring well
20	120	Active
21	150	Active
22	170	Active
24	0	Disconnected/monitoring well
26	0	Disconnected/monitoring well
27	320	Active
29	130	Active
30	250	Active
31	160	Active
33	230	Active
34	85	Active
35	195	Active
37	0	Inactive (40 GPM)
39	300	Active
40	90	Active
41	285	Active
42	155	Active
Total	**5,735**	**Gallons Per Minute**
	8.26	**Million Gallons Per Day**

4.3.2 Santa Rosa Plain Groundwater Management Plan

Under the Groundwater Management Act (AB 3030), there are no groundwater management plans in effect for the Santa Rosa Valley (SRV) Groundwater Basin or the Santa Rosa Plain (SRP) Subbasin, but a consensus-based Santa Rosa Plain Groundwater Management Plan (SRPGMP) will be completed over the next several years. The SRPGMP process is being led by the SCWA, and its staff has developed a work plan where a small steering committee comprised of representatives from SCWA, County, cities, agriculture and environmental organizations, has been formed to guide pre-planning work and initiate education and outreach on the groundwater management planning process. Three public workshops were held around

the County, including one in the City in January 2011, and all were well attended by the public. The steering committee recommended to the Sonoma County Board of Supervisors that groundwater stakeholders develop a non-regulatory, voluntary groundwater management plan for the SRV Basin. It was approved on March 22, 2011, and the SCWA will move forward in convening a broad-based Basin Advisory Panel to begin the plan.

4.3.3 Description of Groundwater Basin

The City is located in the southern portion of the SRV Groundwater Basin, which drains to the northwest, toward the Russian River and then to the Pacific Ocean. All of the City's water supply wells are located in the SRV Groundwater Basin and no City wells are planned to be constructed outside the SRV Basin. Figure 4.3 shows other nearby groundwater basins including the Petaluma Valley Groundwater Basin, which is located immediately south of the SRV Groundwater Basin and drains to the southeast toward San Pablo Bay. The basin boundaries displayed on Figure 4.3 are from DWR's website.

This section contains a summary of the geology and hydrogeologic conditions in the SRV Groundwater Basin (DWR, 2004). The basin description was described in the 2005 UWMP and has not changed. Additional data reviewed for this UWMP included data for the last 5 years of groundwater levels; historical pumpage; precipitation; groundwater quality; updated geological information, and published and unpublished reports and maps.

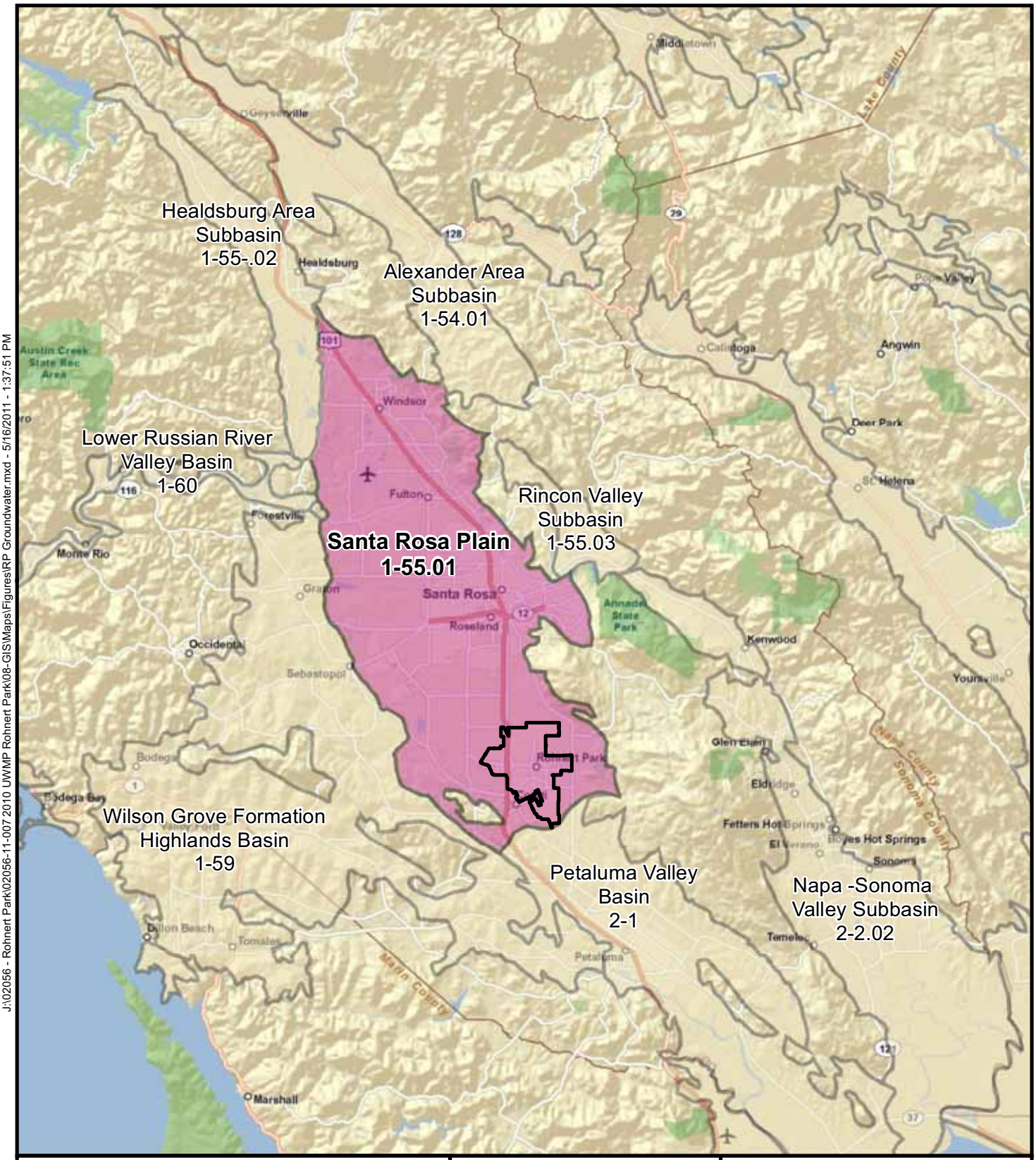
Santa Rosa Valley Groundwater Basin

The SRV Groundwater Basin encompasses an area of 158 square miles. There are three subbasins within this basin: the SRP Subbasin, the Healdsburg Area Subbasin, and the Rincon Valley Subbasin (DWR, 2004). The City pumps groundwater from the SRP Subbasin, which has an area of 125 square miles; this is the largest of the three subbasins. The Healdsburg Area Subbasin has an area of 24 square miles, and the Rincon Valley Subbasin contains 9 square miles. The Russian River valley forms the boundary between the Healdsburg Area Subbasin and the SRP Subbasin. The Rincon Valley Subbasin is separated from the SRP Subbasin by a narrow constriction in the bedrock of the Sonoma Volcanics east of Santa Rosa. The southern boundary of the basin is formed by a groundwater divide located just south of the cities of Rohnert Park and Cotati. This divide separates the basin from the Petaluma Valley Groundwater Basin to the south.

Santa Rosa Plain Subbasin

The SRP Subbasin extends from the City, going north to the Russian River, and to just south of Healdsburg, in the northwest. The subbasin is approximately 22 miles long and up to nine miles wide. It is drained by the Laguna de Santa Rosa, which flows north to the Russian River. The subbasin contains three primary water-bearing units: the Wilson Grove Formation, Quaternary alluvial fan deposits, and Quaternary alluvium. Groundwater quality in these formations is generally good (DWR, 2004). The geology of which is discussed in 4.3.3.1. The hydrogeology is discussed below.

DWR (1982) described groundwater levels in the SRP Subbasin as "about in balance, with increased ground water levels in the northeast contrasting with decreased ground water levels in the south." During the period from 1990 to 2003, groundwater levels in the northern part of the subbasin continued to increase, and groundwater levels in the south showed marked increases between 2004 and 2007, primarily in response to decreased pumping in the subbasin. During the last five years, the water levels continued



J:\02056 - Rohnert Park\02056-11-007 2010 UWMP Rohnert Park\08-GIS\Maps\Figures\RP Groundwater.mxd - 5/16/2011 - 1:37:51 PM

Cartography: RMR

Legend

- Santa Rosa Plain Subbasin
  DWR Basin Number 1-55.01
- Rohnert Park City Limits

0 2 4 Miles

1 inch = 5 miles

N

Sources: Department of Water Resources (DWR) Hydrologic Regions: ESRI, DeLorme, AND, Tele Atlas, First American

Figure 4.3
Groundwater Basin and Subbasin Map

City of Rohnert Park
2010 Urban Water Management Plan

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to increase until 2008 and 2009, when the drought occurred and water levels dropped somewhat. The water levels are recovering again in 2010 when less groundwater was pumped. The areas south of the City appear to be recovering more slowly than those in the City. Hydrographs in the SRV Groundwater Basin from the DWR Water data library were reviewed to update the groundwater conditions reported by DWR in 1982, and these show no indication of overdraft conditions near Rohnert Park.

Storage capacity for the SRP Subbasin was estimated at 948,000 acre-feet based on an average specific yield of 7.8 percent at depths of 10 to 200 feet (DWR, 2004; Cardwell, 1958). Average annual natural recharge from 1960 to 1975 for the entire subbasin was estimated to be 29,300 acre-feet and average annual pumping during the same time was estimated at 29,700 acre-feet (DWR, 1982a).

Healdsburg Area and Rincon Valley Subbasins

The Healdsburg Area Subbasin is located northwest of the SRP Subbasin and includes the flood plain of the Russian River. Quaternary alluvium, alluvial fan deposits, terrace deposits, and the Wilson Grove Formation are the principal water bearing units in the subbasin. The Quaternary alluvium is highly permeable and receives recharge from the Russian River and its tributaries.

The City of Healdsburg uses wells perforated in the alluvium for most of its groundwater supply. DWR monitors groundwater levels in eight wells in this subbasin, and water levels have remained stable for the last 5 years (DWR Water Data Library, 2011).

The Rincon Valley Subbasin is located east of the City of Santa Rosa and consists of a valley approximately seven miles long and up to 2.5 miles wide. The valley is bounded by the Sonoma Mountains except where it connects with the SRP Subbasin. The Rincon Valley Subbasin drains to Brush Creek, which flows south to Santa Rosa Creek. Quaternary alluvium and alluvial fan formations are the principal water bearing units in the subbasin, and groundwater quality in these formations is generally good. The water level data on the DWR water data library generally shows that water levels dipped in the low water years of 2008 and 2009, but recovered in 2010 and remained stable in this area between 2006 and 2010.

4.3.3.1 Geology of Santa Rosa Valley Groundwater Basin

Many investigations pertaining to the geology in Sonoma County and more specifically to the SRV Basin area have been conducted. Continued evaluation and interpretation of the lithostratigraphic and structural complexities of the geology of the area present uncertainties with even the most recent geologic maps. A brief synopsis of the major geologic formations occurring in the SRV Basin area is provided below and is taken directly from the 2005 UWMP.

The surficial exposure of geologic units in SRV Basin consists mostly of Quaternary alluvium and alluvial fan deposits (W&K, 2005; Clahan, 2004; Allen, 2003; and DWR, 1982a) (Figure 4.4). The plain is bordered by the Rodgers Creek fault to the east and the Sebastopol and Meacham Hill faults to the west. In the vicinity of the Rodgers Creek fault, the low hills and mountain ranges are predominantly composed of mafic rocks of the Sonoma Volcanics and the Petaluma Formation. West of the Sebastopol fault, the Petaluma Formation has been uplifted and is exposed along the southwestern edge of the Basin. West of the Meacham Hill fault, a broad, low topographic area contains exposures of the Wilson Grove Formation and fragments of the Franciscan complex.

The basement complex in the SRV Basin is formed by the Mesozoic Franciscan complex, which is the oldest geologic unit in the area. The Franciscan consists largely of clastic and chemical sediments of marine origin

intercalated with pillow basalts and more basic igneous rock, and weakly metamorphosed marine sedimentary rocks.

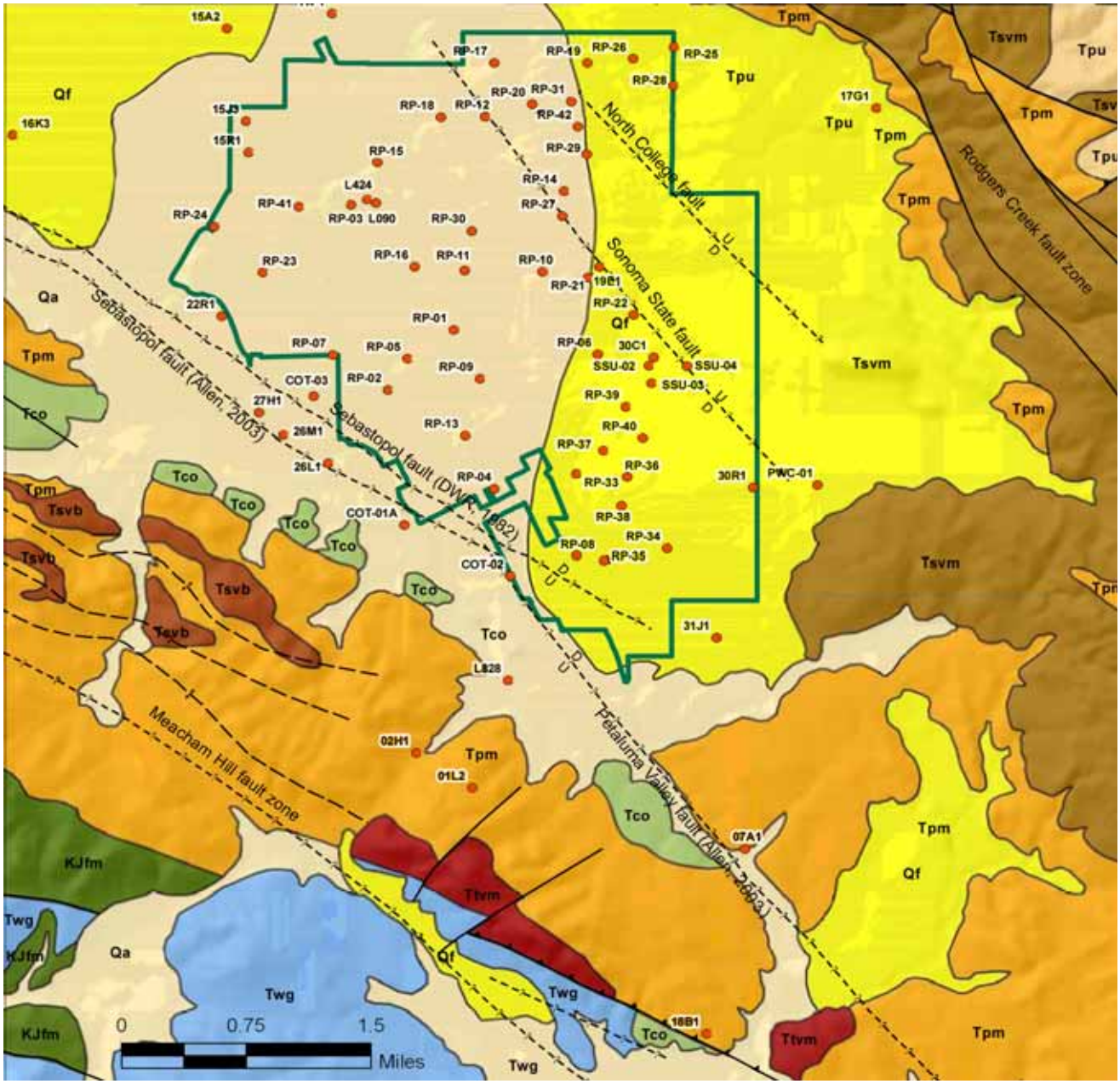
Unconformably overlying the Franciscan basement complex are sequences of volcanic and volcano-clastic rocks of late Tertiary age (late Miocene and Pliocene) known as the Tolay and Sonoma Volcanics. The Tolay Volcanics have been described by Morse and Bailey (1935) as a series of lava flows, breccia, tuff, and agglomerate that extends beneath the southern SRV Basin at a depth of about 2,100 feet (DWR, 1982a). The Sonoma Volcanics consist of a Pliocene age series of lava flows, agglomerates, tuffs, and intercalated sediments of volcanic debris forming a very complex assemblage of flows, dikes, plugs, mudflows, breccias, pumice beds, and stratified (volcanic in origin) materials. Rocks have been folded, intensely faulted, and eroded causing considerable differences in the formation between adjacent areas. The Sonoma Volcanics are exposed in the Sonoma Mountains east of the SRV Basin.

Interbedded and interfingered with the Tolay and Sonoma Volcanics are non-marine, transitional marine and marine sedimentary rocks of the Wilson Grove Formation (formerly known as the Merced Formation), the Petaluma Formation, and the Cotati Formation. The Wilson Grove Formation is a late Miocene marine deposit consisting predominantly of massive beds of coarse to fine-grained sandstone and thin interbeds of clay and silty clay, lenses of gravel and pebbles. Material is largely derived from the Franciscan Formation and to a much lesser extent from the Sonoma Volcanics. The Petaluma Formation is late Miocene to Pliocene in age and largely consists of strongly folded continental and shallow marine to brackish-water deposits of clay, shale, and sandstone, some conglomerate and nodular limestone. Clay is particularly abundant in this unit. The Cotati Formation is similar in age to the upper Petaluma Formation and is classified as Petaluma Formation on older maps. It consists of marine transitional deposits, primarily massive sandstone and conglomerate.

A Quaternary (Pliocene and Pleistocene) sequence of alluvial deposits, described as primarily consolidated alluvial fan deposits but also containing fluvial and lacustrine deposits, overlies and interfingers with the Tertiary units in the Cotati Valley. This sequence was formerly known as the Glen Ellen Formation, and some reports still use this terminology. In the southern portion of the SRP, the consolidated alluvial fan deposits are overlain by largely unconsolidated Quaternary (Pleistocene and Holocene) alluvium, including alluvial fan deposits.

The lithostratigraphic relationship between the western and eastern areas remains obscure due to poor exposures and because it is covered by the younger deposits in the Santa Rosa Valley. A generalized relationship of interfingering and interbedding of the western marine deposits with transitional marine and non-marine deposits is believed to occur beneath the Valley. Allen (2003) mapped a region just west of the City of Cotati that contains interbedded Wilson Grove and Petaluma Formation, which extend beneath the Valley.

Surface geophysical survey interpretations indicate that up to 2.5 to 3 kilometers of Tertiary and younger deposits underlie the SRV Basin (Allen, 2003; Mclaughlin & Sarna-Wojcicki, 2003). Investigators (Cardwell, 1958; DWR, 1978 and 1982a; and Allen, 2003) have developed various interpretations of the depositional relationships. These interpretations tend to show an interfingering and/or interbedding relationship between the Wilson Grove Formation to the west with the Petaluma Formation and Sonoma Volcanics to the east. Interpretation of these relationships are largely based on limited deep borehole information from a few oil and gas test holes, deep water wells, and/or projections of measured angles of dip at surface exposures (Allen, 2003) and need further study to better understand this complex environment.



Note: Due to uncertainty about the Sebastopol fault, two locations are shown based on DWR (1982) and Allen (2003). DWR (1982) does not show the Petaluma Valley fault.

Modified from: Clahan, K.B., et al, 2004, Draft, Geologic map of the Cotati 7.5' Quadrangle, California Geological Survey.

Allen, James, 2003, Stratigraphy and tectonics of neogene strata, Northern San Francisco Bay Area: San Jose State University, M.S. Thesis, 183 p.

DWR, 2003, Evaluation of ground water resources, Sonoma County: Volume 2, Santa Rosa Plain, Bulletin 118-4, 107 p.

Source: Sonoma County Water Agency 2005 UWMP

Legend

Figure 4.4
Geologic Map
City of Rohnert Park and Vicinity

City of Rohnert Park
2010 Urban Water Management Plan

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As noted in the previous pages, the USGS is working with SCWA and other participating agencies and water companies, including the City, to complete an update to the SRP Subbasin Study (USGS, 2003 and 2007).

The lithostratigraphy is complicated by faulting and the local faults are described below. The lithostratigraphy and the faulting indicate the hydrologic properties which are also described below.

Faults

The SRV Groundwater Basin is in the northwest trending structural province of the Coast Ranges. Folds and faults have deformed or displaced all formations with the exception of the younger alluvium. The syncline forming the Santa Rosa Plain was named the Windsor syncline by Gealey (1951). The northwest trending faults at the margins of the SRV Basin have displaced the formations and, therefore, control much of the shape of the Plain and the thickness of the water-bearing deposits. One of the primary faults in the area is the Rodgers Creek fault, located between the Valley and Sonoma Mountain to the east. In the northern portion of the SRV Basin, the Healdsburg fault is generally considered a continuation of the Rodgers Creek fault. The Meacham Hill and Tolay faults are located west of the Valley in the Wilson Grove Formation Highlands Groundwater Basin. There are often multiple smaller faults in the vicinity of these major faults, and these areas are described or mapped as "fault zones" in some reports.

Several buried faults have been mapped within the Valley, most notably the Sebastopol fault, which extends from the southern portion of the subbasin northwest to Sebastopol. Although the Sebastopol fault is mapped near the southwestern boundary of the City, its location is approximate because the fault trace is not exposed at the surface. The Petaluma Valley fault was first proposed by Collins (1992) and Wright and Smith (1992). It is located primarily in the Petaluma Valley Groundwater Basin but is shown on some maps intersecting the Sebastopol fault just west of the City.

DWR (1982a and 1987) investigated the hydraulic properties of the Sebastopol fault, but the results were inclusive. Water level hydrographs of the City's wells show similar trends in pumpage are to nearby City of Cotati wells located on opposite sides of the mapped location of the fault. This suggests that the Sebastopol fault does not act as a significant barrier to groundwater flow. Data are not available to determine the hydraulic properties of faults in the Rohnert Park area, but water level data shown on hydrographs and contour maps indicate there is flow across the faults. There is no evidence that faults in the vicinity of Rohnert Park act as significant barriers to groundwater flow.

Groundwater Production Zones

In the southern portion of the SRP Subbasin, groundwater is produced largely from the upper 800 feet of the sedimentary deposits. A groundwater evaluation of local hydrogeologic conditions was completed for the 2005 UWMP by Ludorff and Scallmanini (2007), where geologic cross sections were prepared. Using these cross sections from nearby water supply wells and some private well logs, local hydrogeology was evaluated. The well profiles and cross sections completed for the study provided a generalized depiction of the subsurface geologic conditions that was used to divide the aquifer into depth zones to facilitate the analysis of groundwater levels. These zones do not represent laterally extensive aquifers but are strictly depth based for purposes of evaluating hydrogeologic conditions. These designations are based on an approximate correlation to the geologic units and on water well completion depths. The vertical zones of the aquifer system were designated:

- Shallow (0 to 200 foot depth),
- Intermediate (200 to 600 foot depth),

- Deep (600 to 800 foot depth), and
- Lower (depths greater than 800 feet).

The City's wells pump predominantly from the intermediate zone, but several wells are also completed partially in the deep and lower zones of the aquifer system.

Shallow Zone
The shallow zone appears to consist largely of clays and sandy clays with a few thin sand to gravel beds. The sands appear to occur largely towards the margins of the Plain in the northern part of the southern SRP Subbasin. Somewhat more sand occurs further south possibly deposited by alluvial fan sources in the Copeland and Lichau Creek areas. The depositional system appears to have been small alluvial fans grading into a fluvial plain or possibly lacustrine area.

Intermediate Zone
Water supply wells operated by the Cities of Rohnert Park and Cotati are constructed primarily in the intermediate zone, with perforated intervals between depths of 200 to 600 feet. Based on review of well profiles and geologic cross sections, this zone consists of a complex sequence of largely thin (and rare occurrences of thick) sand and sand to gravel deposits interbedded with deposits of sandy clay to clay. The correlation of individual sand and gravel beds between wells is generally poor. The intermediate zone appears to be the most complex stratigraphically of the four zones, and it is difficult to identify specific formations based on individual driller logs. Geologic cross sections prepared by DWR (1982a) suggest that the Rohnert Park wells are completed primarily in Quaternary alluvial fan formations. Deeper wells may also be completed partially in the underlying Wilson Grove Formation, especially in the northern portion of Rohnert Park.

Deep Zone
Underlying the intermediate zone, the deep zone is defined as occurring at depths between 600 to 800 feet. The deep zone is best defined in the northern portion of the southern SRP Subbasin as an approximately 100 to 150 foot interval of thin to thicker sand and gravel beds with interbeds of clays. These beds appear to rapidly thin or pinch out to the south. Correlation of the deep zone to surficial map units is difficult. It is unclear whether the deposits in the deep zone represent Tertiary sedimentary deposits (interbedded Wilson Grove-Petaluma) or Quaternary non-marine deposits.

Lower Zone
Underlying the deep zone, the lower zone is defined as occurring at depths between 800 to 1,500 feet. The units encountered in well logs constructed to depths greater than 800 feet are believed to be older Tertiary sedimentary units, probably Petaluma Formation or interbedded Wilson Grove-Petaluma Formation or equivalent. Because of the fine-grained nature of this zone, and the limited potential aquifer thickness, it appears the lower zone represents a poor target for groundwater production.

Precipitation
The City lies within the watershed of the Laguna de Santa Rosa, which is a tributary of the Russian River. The City lies in a region that has a “Mediterranean” climate, meaning the normal weather pattern is a dry summer season with little or no rain. Typically, over 96 percent of the region’s annual precipitation falls during the months of October through April. The mean annual precipitation is about 30 inches near the City and increases in an easterly direction to more than 45 inches at Sonoma Mountain.

Sonoma County precipitation gauges with long periods of record are located north and northwest of the City. Annual precipitation data from 1905 to 2010 are from the Santa Rosa gauge, which is located north of the City of Santa Rosa at an elevation of 174 feet. The lowest annual rainfall during this period was 12.78 inches during the 1977 water year (October 1, 1976 to September 30, 1977), and the highest annual rainfall was 55.68 inches in the 1983 water year. The mean annual precipitation was 30 inches, which is similar to the annual mean precipitation for the City. This represents an annual precipitation volume of 2.5 acre-feet per year. In 2008-2009, the precipitation dropped to 19.4 inches per year during a two year drought period, but then increased to 35.3 inches in 2009-2010.

4.3.3.2 Groundwater Quality

Groundwater produced by the City is tested for a total of 139 constituents, including bacteria, pesticides, herbicides, fungicides, organic chemicals, inorganic chemicals, nitrates, radioactivity, corrosivity, trihalomethanes, iron, and manganese.

Groundwater produced from the City's wells meets primary state drinking water standards. Overall mineral content for all zones in 2009, as indicated by specific conductance (electrical conductance; EC), ranges from 280 to 610 µmhos/cm. EC values are below the recommended secondary Maximum Contaminant Level (MCL) of 900 µmhos/cm. Other water quality concerns in the Rohnert Park area include elevated nitrate, arsenic, iron, and manganese concentrations in some wells. Nitrate concentrations in City wells perforated in the intermediate zone or in multiple zones range from non-detect to 35 mg/L, which is less than the primary MCL of 45 mg/L. Samples collected from five wells in 1997 exceeded secondary MCLs for iron and manganese, which do not pose health hazards but are considered nuisance pollutants. However, treatment can be used to reduce iron and manganese to levels that meet the secondary MCLs (Dyett & Bhatia, 2000).

Arsenic is naturally occurring in the area, and concentrations in City wells range from 2 to 12 µg/L. Arsenic concentrations at the upper end of the range of detected concentrations occur in City wells completed in the northwestern area in the deep and lower zones (well depths greater than 600 feet). Arsenic concentrations in these deeper wells are at levels near or above the federal MCL of 10 µg/L.

Organic chemicals introduced through known point sources could influence groundwater quality conditions in the future. No serious or widespread issues that affect community water supplies due to organic chemical sources are known to be present in the City.

4.3.3.3 Adjudicated Basins

Neither the SRV Basin nor the SRP Subbasin has been adjudicated. Thus, there are no legal limits on the right to pump water from the basin.

4.3.4 Sufficiency of Groundwater

A full analysis of the water level hydrographs and their relationship to pumpage and sufficiency was evaluated in the 2005 UWMP for a time period between 1977 and 2003, where there were several periods of wet, normal, single- dry and multiple-dry years. The analysis is not included here, but the reader is referred to the 2005 UWMP for the full analysis. This UWMP update used the information from that analysis, extending it to include the last five years to assess the sufficiency of groundwater over the next 25 years.

Groundwater recharge was estimated to be about 8,300 acre-feet per year based on the water budget completed in 2005, and showed a positive change in groundwater storage through 2003 with a decrease in groundwater pumpage. Since then, with the decrease of groundwater pumpage, it has produced more of a positive change in groundwater storage. The observed groundwater level trends indicate stable to continued increasing levels during 2005-2007, a temporary lowering in groundwater levels during the drought period of 2008 and 2009, and a recovery and a continued increase in water levels in 2010.

Hydrologic Availability of the Groundwater Supply

The City's groundwater supply has not historically been subject to hydrologic variability.

Groundwater levels in the shallow zone have generally been stable except for small responses to changes in precipitation. In the intermediate zone, larger responses or fluctuations in water levels occur in direct response to pumpage. Groundwater levels in the intermediate zone show little response to changes in precipitation; most of the water level changes that have been observed in the Rohnert Park area are associated with pumpage rather than climatic conditions. Correspondingly, the City's management strategy, which further reduces groundwater utilization by the City, provides an additional buffer against hydrologic variability because the City's groundwater resource can be managed in conjunction with other water sources to maximize reliability.

Reliability and Vulnerability of the Groundwater Supply

There are no physical constraints to groundwater pumping. The City has more than adequate capacity from its well field to pump what it anticipates utilizing.

Maintaining sustainable groundwater supplies is one of the primary goals of groundwater management. Groundwater level trends within the basin indicate that pumpage over the last five years has been sustainable.

The 2005 analysis of the historical groundwater level and pumpage data resulted in an estimated range of pumpage within which the City and other pumpers in the southern portion of the SRP Subbasin could operate without causing persistent groundwater level declines. On the whole, groundwater levels within the SRP Subbasin have remained in balance and significantly increased in the southern portion of the SRP Subbasin since DWR's 1982 study (DWR, 1982a). As described in earlier sections, the City's pumpage for the 25-year horizon falls within a range that is historically demonstrated to be sustainable. Thus, groundwater supplies from the basin are sufficient to meet the City's projected groundwater demands.

4.3.4.1 Groundwater Pumped (2005-2010)

In 2003, the City began a shift toward greater use of Agency water and reduced groundwater pumping. Table 4.2 illustrates the City's groundwater use for the five-year period from 2005-2010.

Table 4.2 (DWR Table 18)
Groundwater – Volume Pumped (AFY)

Santa Rosa Plain Subbasin	Metered or Unmetered [a]	2005	2006	2007	2008	2009	2010 [b]
Groundwater pumped	metered	805	348	933	1,078	2,102	1,582
Total City Water Supply [c]		7,391	6,754	7,067	7,363	7,579	5,266
Groundwater as percentage of total water supply		11%	5%	13%	15%	28%	30%

[a] Data obtained from DWR Annual Reports

[b] See Table 4.11

[c] Includes SCWA water purchased, groundwater produced and recycled water used

The City has continued its operational strategy, using more SCWA supply while decreasing its groundwater use. Since this change, the City decreased it groundwater use significantly. Between 2005 and 2007, the City pumped as little as 348 acre-feet in 2006, down from 3,556 acre-feet in 2003. The City's pumpage increased in 2008 and 2009, to 2,102 acre-feet in 2009, when there was a drought. This amount pumped in 2009 was still less than the 2.3 million gallons per day (mgd) (total of 2,577 acre-feet per year) as specified in the City's 2004 Water Policy Resolution. The City has continued to decrease its pumpage to 1,582 acre-feet in 2010 and continues with its strategy to pump less and maximize its use of SCWA water.

4.3.4.2 Limitations to Groundwater Pumping and Overdraft Conditions

The City has adopted local policies related to groundwater management. Resolution No. 2004-95 (the Water Use Policy Resolution, see Appendix D), was adopted on April 27, 2004, and specifies that new development outside of the current City limits will not be approved if it would contribute to the City exceeding an average annual pumping rate of approximately 2,577 acre-feet per year. The Water Use Policy Resolution is the only local policy determination related to groundwater management in Sonoma County. The City also has a policy of not allowing private wells within the City Limits.

4.3.5 Projected Groundwater Pumping

Table 4.3 illustrates the groundwater usage proposed for the future. The City's groundwater use through 2035 is projected in accordance with its Water Use Policy Resolution. The projected groundwater supply figures are needed to supplement the SCWA supply to meet demand. The City will use a conjunctive use strategy, balancing groundwater and SCWA supplied water. The City will use SCWA water first, and supplement with groundwater at the amount necessary to meet demand. It is expected that the City will not have to use groundwater as much as is currently used, but will decrease over time. The City expects to decrease their groundwater use from the current 30% down to 6% by 2035 as indicated on the table below.

Table 4.3 (DWR Table 19)
Groundwater – Volume Projected to be Pumped (AFY)

Santa Rosa Plan Subbasin	2015	2020	2025	2030	2035
Projected Groundwater Use	1,800	903	667	475	340
Total water supply	5,314	5,486	5,604	5,767	5,986
Groundwater as percentage of total water supply	34%	16%	12%	8%	6%

4.3.6 Planned Groundwater Supply Projects and Programs

The City has no new planned groundwater supply projects except for the groundwater banking project it is investigating with the SCWA and other water customers in the Santa Rosa Plain Subbasin. The City,

however, plans to continue rehabilitating wells and continue to decrease the amount of groundwater to the extent necessary to supplement SCWA water and meet peak flows, periods of drought or interruptions in supply. Table 4.3 (DWR Table 19) illustrates this groundwater strategy.

The USGS has almost completed a comprehensive five year SRP Subbasin study that will update the Sonoma County groundwater model. The study will allow groundwater users in the basin to better understand impacts of groundwater use on the resource, and will help with planning future use and management of the resource. Once completed later this year, the USGS study should provide updated information on aquifer yield, storage, and recharge that will be based on the longer period of record now available for these characteristics.

In 2010 SCWA and several agencies including the City entered into an agreement to study the feasibility of groundwater banking in the Santa Rosa Valley. The agency group hired consultants who are currently reviewing the hydrogeology of the Valley to assess potential areas, such as the groundwater depression areas, that could possibly bank groundwater. The feasibility study outcome is to determine locations and have an understanding of the specific ramifications, such as water quality changes, of such a program and to allow the various participating local agencies enough information to proceed with appropriate workplans to further investigate specific locations to bank groundwater. The study is expected to be completed after this UWMP is completed.

4.4 TRANSFER OPPORTUNITIES

Water transfers between SCWA's water contractors are authorized under the Restructured Agreement. Such transfers and exchanges between Agency water contractors have been necessary in the past and may continue to be necessary in the future to improve water reliability. The City does not anticipate any transfers or exchanges as has previously occurred because of increased water entitlement limits under the Restructured Agreement as well as recent improvements to the SCWA's water supply and transmission system.

Table 4.4 (DWR Table 20)
Transfer and Exchange Opportunities (AFY)

Transfer Agency	Transfer or Exchange	Short Term or Long Term	Proposed Volume
Name of agency	N/A	N/A	--
		Total	**0**

4.5 DESALINATED WATER OPPORTUNITIES

There are currently no plans for desalination, and no desalination for future water supply is anticipated.

4.6 RECYCLED WATER OPPORTUNITIES

This section describes the wastewater characteristics, flows, and treatment facilities that provide recycled water in the City. The UWMP Act requires the following items to be addressed for recycled water:

- Information on the recycled water supply including coordination with dischargers
- Description of the wastewater collection and treatment systems in the service area
- Quantity of treated wastewater that meets recycled water standards
- Recycled water currently being used in the service area

- Potential for recycled water use in the service area
- Actions to encourage recycled water use
- Plan for optimizing recycled water use.

4.6.1 Coordination

The City currently provides wastewater collection service and is a partner in the Subregional System. The Subregional System, which is operated and managed by the City of Santa Rosa (Santa Rosa), provides wastewater treatment, disposal and water recycling services for the cities of Cotati, Rohnert Park, Sebastopol and Santa Rosa and portions of unincorporated Sonoma County. This UWMP has been coordinated with the Subregional System.

4.6.2 Existing Wastewater Collection, Treatment and Reuse System

The Subregional System includes the following facilities:

- The Laguna Water Reclamation Plant (WRP), a tertiary wastewater treatment plant that utilizes aeration, clarification, conventional filtration, and ultraviolet disinfection;
- A permitted wet weather discharge to the Russian River of up to 5% of the river flow under the NPDES Permit CA 0022764;
- The forty-mile long Geysers Pipeline that delivers 11 mgd of recycled water, year round, to the Geysers Steamfield; and
- Approximately 62 miles of recycled water distribution piping that deliver recycled water to approximately 675 parcels for agricultural reuse and impoundment and approximately 100 parcels for urban reuse, largely in the cities of Rohnert Park and Santa Rosa.[1] This recycled water distribution system includes approximately 1,480 million gallons of storage[2] in open ponds.
- The Subregional System's facilities have a rated dry weather capacity of 21.4 million gallons per day (mgd) and the City is allotted 3.43 mgd of the total capacity. These facilities, including the existing Rohnert Park Reuse System, are illustrated in Figure 4.5.

The Subregional System produces Title 22 Tertiary Recycled Water, which is suitable for unlimited irrigation uses and most industrial process water uses. Without additional treatment, the recycled water supply is not suitable for potable use.

While a great deal of the Subregional System's recycled water is used for urban, agricultural or industrial purposes, the Subregional System maintains a permitted discharge to the Russian River. The Subregional System is committed to supplying recycled water users first and its permitted discharge is used primarily to manage variations in hydrologic conditions. For example, in a cool wet year when rainfall is high and irrigation demand is low, the Subregional System will discharge more water than in a warm dry year when irrigation demand is high. Table 4.5 provides the total recycled water volumes from the Subregional System.

[1] Engineering Report for Master Water Recycling Permit for the City of Santa Rosa Water Reclamation System.
[2] Santa Rosa Incremental Recycled Water Program, Technical Memorandum No. 16 – Water Balance Modeling Summary

Table 4.5 (DWR Table 21)
Recycled Water – Wastewater Collection and Treatment (AFY)

Type of Wastewater	2005	2010	2015	2020	2025	2030	2035
Wastewater collected & treated in service area	24,858	23,047	24,882	26,718	28,553	30,388	32,223
Volume that meets recycled water standard	24,858	23,047	24,882	26,718	28,553	30,388	32,223

Table 4.6 summarizes the existing and planned disposal methods for water that is not recycled by the Subregional System. The table indicates that the vast majority of the recycled water produced by the Subregional System is beneficially reused. The Subregional System projects that less than 10% of the recycled water produced will be discharged to surface water.

Table 4.6 (DWR Table 22)
Recycled Water – Non-Recycled Wastewater Disposal (AFY)

Method of Disposal	Treatment Level	2010	2015	2020	2025	2030	2035
Russian River	Tertiary	288	600	911	1,223	1,534	2,286
	Total	**288**	**600**	**911**	**1,223**	**1,534**	**2,286**

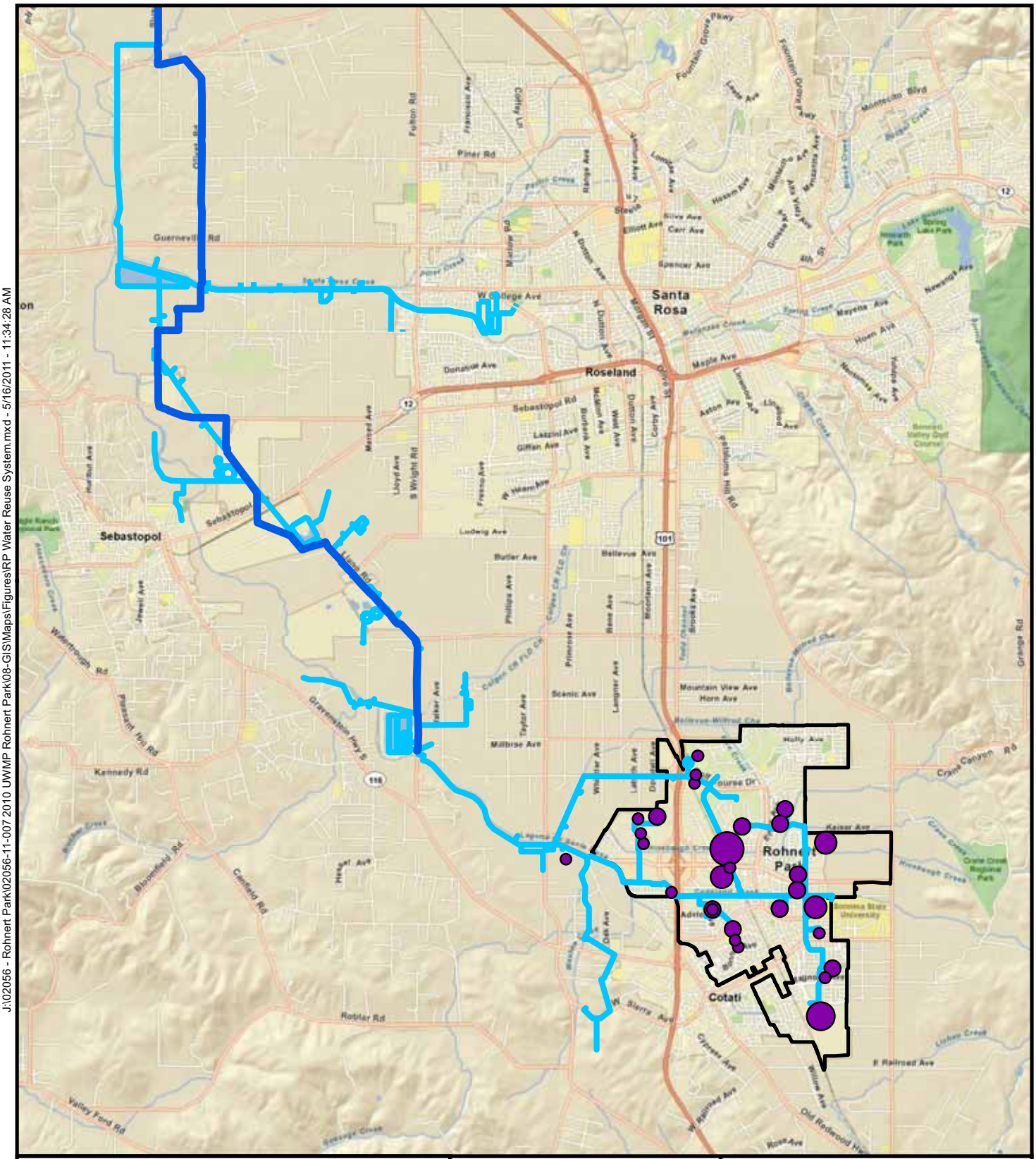
4.6.2.1 Limitations on Use of Available Recycled Water

The recycled water supply available to the City is relatively drought-proof because of the operational nature of the Subregional System's recycled water program. The Subregional System facilities include extensive recycled water storage ponds, System-owned land ("City Farms"), facilities to deliver recycled water to customers including urban and agricultural users and the Geysers Steamfield, and facilities to discharge recycled water under an NPDES permit. The Subregional System treats and stores recycled water for reuse by its customers. The volume of wastewater recycled is relatively constant, but the total volume of water available to the System is influenced by rainfall on the open storage ponds. During periods of lower rainfall, the system can be operated to minimize discharges to the Russian River and delivery of water to the City Farms in order to assure delivery to paying recycled water customers first. This provides the system with operational flexibility and the ability to meet recycled water demands under a range of hydrologic conditions. Expanding the recycled water system will require additional seasonal storage facilities in order to retain this level of flexibility.

The Subregional System currently maintains a contract with each individual user of the Rohnert Park Urban Reuse system, including the City. These contracts are included in the Subregional System's *Engineering Report for Master Water Recycling Permit for the City of Santa Rosa Water Reclamation System*. The contracts outline the acreage which is committed to recycled water use and generally provide for a 20-year term. Recycled water service can only be suspended as a result of inadequate treatment of recycled water (a temporary situation) or regulatory directive (i.e. changes in the State Health or Regional Board Regulations regarding the use of recycled water for landscape irrigation). These regulatory requirements are well established, well tested and have been the basis of recycled water use throughout the State for over 30 years

4.6.3 Existing Recycled Water Use

The City hosts the largest urban recycled water system in Sonoma County. This system was installed in the 1990s and recycled water is used for irrigation of many large nonresidential landscapes in the City including



J:\02056 - Rohnert Park\02056-11-007 2010 UWMP Rohnert Park\08-GIS\Maps\Figures\RP Water Reuse System.mxd - 5/16/2011 - 11:34:28 AM

Cartography: RMR

Legend

- City Limits
- GeysersPipeline
- Subregional System Irritation Pipeline

Existing Recycled Water Demands MGY

- 0 - 1
- 2 - 5
- 6 - 20
- 21 - 50
- 51 - 160

0 0.5 1 Miles

1 inch = 2 miles

N

Sources: Department of Water Resources (DWR) Hydrologic Regions: ESRI, DeLorme, AND, Tele Atlas, First American

Figure 4.5
Subregional Water Reuse System

City of Rohnert Park
2010 Urban Water Management Plan

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parks and school grounds, various commercial and industrial sites, and the Foxtail Golf Course. Recycled water use offsets historic demands on the City's potable water system and demands on irrigation wells. From 2005 to 2010, recycled water use averaged between 710 and 1,010 acre-feet per year. The use is relatively constant, however because recycled water is used almost exclusively for irrigation purposes the demand can fluctuate with local rainfall patterns and attendant irrigation demands.

4.6.4 Potential Uses of Recycled Water

In 2004 the Subregional System completed its Incremental Recycled Water Program (IRWP) Master Plan and certified a programmatic Environmental Impact Report (EIR) for the Master Plan. The IRWP identified up to 6,600 acre-feet per year in potential urban and agricultural recycled water uses throughout Sonoma County. The IRWP Master Plan defined Urban Reuse as recycled water use that occurs within the Urban Growth Boundaries of the cities of Santa Rosa, Rohnert Park and Cotati or at the Santa Rosa Golf and Country Club. The IRWP set a 500 acre-feet per year "Target" for Urban Reuse and established a programmatically approved range from 0 to 6,600 acre-feet per year to allow for the development of cost-effective systems from both the water and wastewater perspective.

Review of the City's planned development indicates that an additional 300 acre-feet per year of recycled water could be used for urban use, primarily in areas of new growth. Recycled water would be used for landscape irrigation in a variety of settings as authorized by California's Title 22 Code of Regulations.

Table 4.7 (DWR Table 23) identifies the projected total recycled water use, for the next 20 years as provided by the Subregional System. Use within the City currently accounts for all existing landscape irrigation use. The City projects that an additional 300 acre-feet per year of landscape irrigation use will come on line in its service area, as planned development progresses.

Table 4.7 (DWR Table 23)
Recycled Water – Potential Future Use (AFY)

User Type	Description	Feasibility[a]	2015	2020	2025	2030	2035
Agricultural irrigation		Feasible	5431	5608	5784	5961	6138
Landscape irrigation[b]		Feasible	900	900	1700	1700	1700
Commercial irrigation[c]		Feasible	N/A	N/A	N/A	N/A	N/A
Golf course irrigation		Feasible	N/A	N/A	N/A	N/A	N/A
Wildlife habitat		Unknown	0	0	0	0	0
Wetlands		Unknown	0	0	0	0	0
Industrial reuse		Feasible	0	0	0	0	0
Groundwater recharge		Unknown	0	0	0	0	0
Seawater barrier		Not Feasible	0	0	0	0	0
Getothermal/Energy		Feasible	17952	19299	19846	21193	22100
Indirect potable reuse		Unknown	0	0	0	0	0
Total		**0**	**24,283**	**25,807**	**27,330**	**28,854**	**29,938**

[a] Technical and economic feasibility

[b] Agricultural use offsets groundwater pumping. Includes areas outside of the City.

[c] Includes parks, schools, cemeteries, churches, residential, or other public facilities

[d] Includes commercial building use such as landscaping, toilets, HVAC, etc. and commercial uses (car washes, laundries, nurseries, etc)

4.6.4.1 Technical and Economic Feasibility of Projected Use

Recycled water use within the City is both technically and economically feasible. Expansion of recycled water use within the City's service area is dependent on new development, because it is that growth that will result in new demand for recycled water. As noted above, many existing large non-residential landscapes in the City's service area have been converted to recycled water.

4.6.5 Comparison of Previously Projected Use and Actual Use

In the 2005 UWMP, the City projected that it would be using approximately 1,200 acre-feet per year of recycled water in 2010 and 1,300 acre-feet per year thereafter. These projections reflected both the City's historic use, which was a much as 1,000 acre-feet per year, and planned development.

Because of the general economic downturn in California, planned development in the City did not occur on the schedule projected in the 2005 UWMP. While the City still has the policy tools necessary to assure that new development utilizes recycled water, expanded use will not occur until economic conditions favor development.

Additionally, because of relatively cool damp weather conditions, the City's existing recycled water customers actually used approximately 710 acre-feet per year in 2010 instead of the previously projected amount of 1,200 acre-feet per year. This reflects the normal variation that can be expected in irrigation demands, not a decrease in recycled water customers.

Table 4.8 summarizes the comparison of the 2005 UWMP projections and actual 2010 use.

Table 4.8 (DWR Table 24)
Recycled water — 2005 UWMP Use Projection Compared to 2010 Actual (AFY)

User Type	2010 Actual Use	2005 Projection for 2010 [a]
Agricultural irrigation	0	0
Landscape irrigation[b]	710	1,200
Commercial irrigation[c]	-	-
Golf course irrigation	-	-
Wildlife habitat	-	-
Wetlands	-	-
Industrial reuse	-	-
Groundwater recharge	-	-
Seawater barrier	-	-
Getothermal/Energy	-	-
Indirect potable reuse	-	-
Total	**710**	**1,200**

[a] From the 2005 UWMP. There has been some modification of use types. Data from the 2005 UWMP can be left in the existing catagories or modified to the new catagories, at the discretion of the water supplier.
[b] Includes parks, schools, cemeteries, churches, residential, or other public facilities
[c] Includes commercial building use such as landscaping, toilets, HVAC, etc. and commercial uses (car washes, laundries, nurseries, etc)

4.6.6 Promoting Recycled Water Use

4.6.6.1 City Promotion of Recycled Water Use

The City has fully integrated recycled water use with its land use planning. Specifically within the Water Supply and Conservation Section of its 2000 General Plan, the City has adopted the following goals and policies:

- *Goal PF-G: Continue to encourage water conservation through the use of reclaimed water and reduction of water consumption and discharge for both existing and new development.*
- *Policy PF-21: Continue to use reclaimed water to irrigate parks, recreation facilities and landscapes.*

On October 26, 2004, the City adopted its Ordinance 723, a Water Waste Prohibition Ordinance. This Ordinance requires the use of recycled water when it is available and of appropriate quality. This Ordinance will assure that the recycled water supply is fully utilized where appropriate. A copy of the City's Water Waste Ordinance is included in Appendix E. This Ordinance provides City staff with the authority necessary to condition new development to install the infrastructure required to deliver recycled water.

On June 13, 2006 the City adopted its 2006 Public Facilities Finance Plan Update and its revised its Public Facilities (PF) Fees. The PF Fees were established to provide a funding source for the infrastructure required to serve new development. The IRWP Master Plan and EIR have identified new seasonal storage as necessary to serve new urban reuse projects. While the PF Plan and program are currently being updated, the City will continue to include expansion of Subregional System facilities in its planning in order to assure that funding is available to support planned expansions of the recycled water system.

4.6.6.2 Subregional System Promotion of Recycled Water Use

The Subregional System's IRWP Master Plan and EIR provide critical programmatic guidance and planning support for an expanded recycled water system. The Subregional System has historically priced recycled water at 75% of the alternative supply. This financial incentive provides property owners with a reason to convert to recycled water use.

4.6.6.3 SCWA Promotion of Recycled Water Use

The SCWA encourages recycled water use by collecting, as part of its water rates, funds that are held in a special reserve for water recycling and Tier 2 water conservation projects that are carried out by its water contractors. This funding source provides an incentive to the water contractors to invest in local recycling and conservation projects because the Agency will contribute to the costs of these projects.

Methods to encourage recycled water use are summarized in Table 4.9.

Table 4.9 (DWR Table 25)
Methods to Encourage Recycled Water Use (AFY)

Actions	Projected Results					
	2010	2015	2020	2025	2030	2035
City General Plan Policies	x	x	x	x	x	x
City Mandatory Use Ordinance	x	x	x	x	x	x
City PF Fee Funding	x	x	x	x	x	x
Subregional System Planning Support	x	x	x	x	x	x
Subregional System Financial Incentives	x	x	x	x	x	x
Agency Financial Incentives	x	x	x	x	x	x

4.7 WHOLESALE WATER SUPPLIERS AND WATER SUPPLY SUMMARY

The City has one existing wholesale source (SCWA) and one wholesale source for recycled water. Table 4.10 shows the existing and future supply requested from wholesalers.

Table 4.10 (DWR Table 17)
Wholesale Supplies – Existing and Planned Sources of Water (AFY)

Wholesale Sources	Contracted Volume	2015	2020	2025	2030	2035
Sonoma County Water Agency [a]	7,500 (max.)	3,514	4,583	4,937	5,292	5,646
Subregional System [b]	1,300	1,300	1,300	1,300	1,300	1,300

[a] Under the Restructured Agreement for Water Supply, the contracted volume is the entitlement limit.

[b] Recycled water capacity is based on Subregional System's Incremental Recycled Water Program master plan.

The supply amount is based on the City's water demands described in Section 3. The SCWA and its water contractors are tracking Russian River system water deliveries and conducting on-going short and long-range capital project planning to identify capital improvement needs, financing and timing, to address system deficiencies, as they become needed.

Table 4.11 (DWR Table 16)
Water Supplies – Current and Projected (AFY)

Water Supply Sources							
Water Purchased From:	Wholesaler Supplied Volume (Y/N)	2010	2015	2020	2025	2030	2035
Sonoma County Water Agency	yes	2,974	3,514	4,583	4,937	5,292	5,646
Supplier-produced groundwater [a]		1,582	1,800	903	667	475	340
Supplier-produced surface water		--	--	--	--	--	--
Transfers in		--	--	--	--	--	--
Exchanges In		--	--	--	--	--	--
Recycled Water (See Table 4.10)		710	1,300	1,300	1,300	1,300	1,300
Desalinated Water		--	--	--	--	--	--
Other		--	--	--	--	--	--
Total		**5,266**	**6,614**	**6,786**	**6,904**	**7,067**	**7,286**

[a] The City can produce up to 2,577 AFY to supplement its SCWA supply during periods of drought and water shortages

4.8 FUTURE WATER SUPPLY PROJECTS

The City's water supply projects and programs include:

- **Groundwater Wells Replacement/Upgrade**. The City is evaluating its well system and will be assessing the yield and condition of its wells. The project will include replacing and/or rehabilitating its local groundwater supply well system.
- **Groundwater Banking**. The City is working with the SCWA and other interested participants in a groundwater banking pilot testing project. Groundwater banking may increase the sustainable yield of existing wells, but at the time of this report, the feasibility of groundwater banking is yet not known.

- **SCWA Russian River Diversion Rights Increase**. While the City has adequate supplies from the SCWA, some of the other water contractors to the SCWA Russian River water supply will need an increase to the water supply entitlements, as provided for under the Restructured Water Supply Agreement, by year 2030 to 2035. This increase is also needed for the reliability of the SCWA supply. SCWA will be working towards this permit application as well as the needed improvements to increase the capacity of the transmission and delivery system to implement this water supply increase.
- **Recycled Water System Expansion**. Consistent with IRWP Master Plan, its General Plan and the environmental documents for proposed new development, the City will work with the Subregional System to incrementally expand the recycled water system within its service are in order to provide recycled water for irrigation and other non-potable uses. This expansion will provide up to 300 acre-feet per year of additional supply. All environmental clearances are complete for this expansion. The actually timing of the expansion is dependent on the timing of new development.

4.8.1 Amount of Supply Increase

The water supply projects listed in this section are preliminary, and supply increase amounts have not been determined. For the groundwater well replacement/upgrade, it is assumed that the upgraded well will produce as much as what was being produced historically before production decreased due to age of the well.

Table 4.12 (DWR Table 26)
Future Water Supply Projects (AFY)

Project Name	Projected Start Date	Projected Completion Date	Potential Project Constraints	Normal Year Supply	Single-Dry Year Supply	Multiple-Dry Year		
						Year 1	Year 2	Year 3
Groundwater Wells Replacement and Upgrade	2013	2035	Funding	TBD	TBD	TBD	TBD	TBD
Groundwater Banking	2011	2020	Feasibility	TBD	TBD	TBD	TBD	TBD
SCWA Russian River Diversion Rights Increase [a]	2015	2035	Environ.	0	0	0	0	0
Recycled Water System Expansion	2012	2030	Timing of Development	300	300	300	300	300
Total				**300**	**300**	**300**	**300**	**300**

This table represents 2035 projected water supply needs.

[a] Increased entitlement not needed, but increase is needed to "perfect" the SCWA's water rights for reliability of supply.

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SECTION 5
WATER SUPPLY RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING

This section compares the water demand information developed in Chapter 3 and the water supply information developed in Chapter 4. Comparisons are provided under DWR's required range of hydrologic conditions including the normal, single-dry year and multiple-dry year scenarios. This section also describes the City's water shortage contingency and drought planning as required by Water Code Section 10632.

5.1 SUMMARY OF FACTORS AFFECTING SUPPLY

The City has three sources of water supply: Sonoma County Water Agency (SCWA) supply, groundwater, and recycled water. Table 5.1 (DWR Table 29) summarizes the City's supplies and factors affecting the consistency of these supplies. The City's supply projections indicate that its long term water supply portfolio is composed of the following:

- Sixty-three percent SCWA water;
- Twenty-five percent local groundwater;
- Twelve percent recycled water.

The City is able to balance these supplies using a conjunctive use strategy. The City's current Agency supply, groundwater supply and recycled water supply are all highly stable and supported by contracts, policy and a court judgment.

The SCWA's proposed supply increase is not predictable, particularly with respect to the schedule upon which it can be delivered. The City's supply planning strategy is to rely only upon the SCWA's currently permitted supply, its own sustainable groundwater production and a modest increase in recycled water deliveries. The anticipated increase in recycled water deliveries is highly predictable because major distribution infrastructure already exists; the Subregional System has completed the planning and environmental studies; predesign studies are currently underway; and the City has adopted development impact fee programs to fund the construction of the expanded system.

Table 5.1 (DWR Table 29) summarizes the factors affecting the City's water supplies described above.

Table 5.1 (DWR Table 29)
Factors Resulting in Inconsistency of Supply

Water Supply Sources	Sonoma County Water Agency	Groundwater Wells	Subregional System
Specific Sources Name (if any)	Russian River surface water	Santa Rosa Plain groundwater subbasin	Recycled Water
Limitation Quantification	7,500 acre-feet per year 15 million gallons per day	2,577 acre-feet per year	1,300 acre-feet per year
Legal	Controlled by 4 SWRCB permits and subject to permit constraints including reductions in water supply during water shortage years; District will need to increase entitlement limit by 2035 to meet demands	none	none
Environmental	Biological Opinion calls for reduction of impacts to salmonids and results in minimum flow requirements during normal and dry years	none	none
Water Quality	None	None; some wells have pretreatment for iron and manganese	none
Climatic	Water supply curtailments during drought conditions	Groundwater is generally used to further supplement Russian River supply during drought conditions	none
Additional Information			

5.2 HYDROLOGIC RELIABILITY

The SCWA has developed a model of its water system in order to project hydrologic reliability. This model, which is described in detail in SCWA's Urban Water Management Plan, is based on the water year types presented in Table 5.2 (DWR Table 27).

Table 5.2 (DWR Table 27)
Basis of Water Year Data

Water Year Type	Base Year(s)
Average Water Year	1962
Single-Dry Water Year	1977
Multiple-Dry Water Years	1988-1991

SCWA's model indicates that its system is not impaired by hydrology in the normal and multiple dry years. However, in single dry years the system's reliability is reduced slightly. Based on SCWA's analysis for the single-dry year, it can deliver the following percentages of its supply to its customers (see SCWA 2010 UWMP Tables 6-1 and 6-2):

- 2015: 78.9 percent
- 2020: 80.1 percent
- 2025: 82.3 percent
- 2030: 79.4 percent
- 2035: 81.3 percent

Section 3.5 of the Restructured Agreement for Water Supply includes an allocation methodology that will be used when there are water supply shortages. This allocation methodology takes into account each contractors' basic health and safety needs and current conservation practices. As a result of this, shortages are not uniformly shared by all contractors (i.e., if 80 percent of the SCWA's water supply is available, all contractors will not automatically experience a 20 percent cutback). Contractors with lower baseline demands, reflecting more mature water conservation programs, receive somewhat smaller water shortage reductions than contractors with higher baseline demands and less mature conservation programs.

SCWA and its contractors developed a spreadsheet-based allocation model that reflected the commitments of Section 3.5 of the Restructured Agreement. The City has reviewed the Water Shortage Allocation Model and it indicates that the City could generally expect to receive more water than a straight-line percentage reduction would predict. However, there have been changes to the SCWA's water contractors and their populations since the model was developed and it may no longer perfectly reflect each contractor's current conditions. The process of updating the model is discussed in more detail in Section 5.3.1.

In an effort to be conservative in estimating potential single-dry year reductions, the City has used a straight-line percentage allocation to arrive at an estimated single-dry year supply. This assumption is reflected in Table 5.3 (DWR Table 28) below. While the City is utilizing conservative assumptions to estimate its supply in dry years, should a dry year even occur, the City will work with the SCWA and other contractors to appropriately implement the provisions of Section 3.5 of the Restructured Agreement.

Table 5.3 (DWR Table 28)

Supply Reliability – Historic Conditions (AFY) [a]

Water Supply Sources	Average/Normal Water Year Supply	Single-Dry Water Year	Multiple-Dry Water Years			
			Year 1	Year 2	Year 3	Year 4
Sonoma County Water Agency [b]	3,514	2,776	3,514	3,514	3,514	3,514
Groundwater [c]	1,800	2,538	1,800	1,800	1,800	1,800
Recycled Water [d]	1,300	1,300	1,300	1,300	1,300	1,300
Total Supply	6,614	6,614	6,614	6,614	6,614	6,614
Percent of Average/Normal Year		100%	100%	100%	100%	100%

[a] 2015 is used as basis (see Table 4.11)

[b] Reliability for SCWA supply is 79% for single-dry year; 100% for all other water years (see SCWA 2010 UWMP)

[c] Reliability for groundwater is 100% for all water years and can be pumped up to 2,577 AFY during periods of drought

[d] Reliability for recycled water is 100% for all water years

5.3 LEGAL & ENVIRONMENTAL CONSTRAINTS

There are factors that cause or have the potential to cause inconsistent supply to meet demands. These factors that affect the reliability of the City's water supply are legal, environmental, water quality or climatic issues and are described in this section.

5.3.1 SCWA Water Supply Agreement

The City is one of nine water contractors under contract with the SCWA, known as the *Restructured Agreement for Water Supply* ("Restructured Agreement"). Under the contract, the SCWA is obligated to

deliver up to 15 million gallons per day (mgd) during any month and up to 7,500 acre-feet of water during a fiscal year. The term of the agreement is through 2037 and can be extended by amendment.

The Restructured Agreement was executed in 2006 and generally provides for the finance, construction, and operation of existing and new diversion facilities, transmission lines, storage tanks, booster pumps, conventional wells, and appurtenant facilities. The Restructured Agreement provides the contractual relationship between the SCWA and its eight contractors, including the City, and includes specific maximum amounts of water that the SCWA is obligated to supply to its water contractors. Maximum water allocations set forth within the Restructured Agreement for each of SCWA's water contractors and other customers such as Marin Municipal Water District were premised on SCWA's diversion/rediversion water rights being increased from 75,000 acre-feet per year to 101,000 acre-feet per year and on the construction of the new facilities authorized by the Restructured Agreement.

During periods of shortage, Section 3.5 of the Restructured Agreement provides a method for allocating water among the various water contractors and customers of the SCWA water supply. On April 18, 2006, the SCWA's Board of Directors adopted Resolution No. 06-0342 which approved a methodology for allocating water in the event of a water supply shortage or in the event of a temporary impairment of the capacity of the SCWA's transmission system. It is anticipated that the approved methodology will be modified and updated in 2011-2012 to address changes that have occurred over the last five years. These include changes in customer demands, local supply and recycled water.

5.3.1.1 Water Rights

Four State Water Resources Control Board (SWRCB) permits currently authorize the SCWA to store up to 122,500 acre-feet per year of water in Lake Mendocino and up to 245,000 acre-feet of water in Lake Sonoma, and to divert and redivert 180 cubic feet per second (cfs) of water from the Russian River at SCWA's Wohler and Mirabel facilities, up to 75,000 acre-feet per year. SCWA has a pending application with the SWRCB for increasing its Russian River diversion limit from 75,000 to 101,000 acre-feet. SCWA plans to modify that petition to match the amount of water that would be needed in future years (2025 to 2035) for the water contractors including the City.

In September 2008, a final Biological Opinion (BO) was released by the National Marine Fisheries Service (NMFS) and issued to the SCWA, the U.S. Army Corps of Engineers, the California Department of Fish and Game, and the Mendocino County Russian River Flood Control and Water Conservation Improvement District. The BO is a federal mandate on Russian River operations of the receiving agencies listed above that affect salmonids on state and federal endangered species lists (steelhead, coho and Chinook). The BO affects the SCWA's water supply operations and subsequent delivery to its water contractors, including the City.

The BO calls for the elimination or reduction of impacts to salmonids due to water supply and flood control activities in the Russian River watershed through measures deemed "reasonable and prudent alternatives," including:

- Extensive monitoring of both habitat and fish in Dry Creek, the estuary and the Russian River;
- Eliminating impediments to fish migration and improving habitat on several streams;
- Restoring up to six miles of habitat in Dry Creek and studying a bypass project;

- Requesting the State Water Resources control Board to reduce summertime flows in the Russian River;
- Creating a freshwater lagoon in the estuary at the mouth of the Russian River during the summer months.

NMFS concluded that lower flows in Dry Creek and Russian River create a better environment for juvenile salmon and steelhead, and the BO identified habitat restoration projects in Dry Creek to reduce water velocities in the stream/river. Current minimum summer flows are based on weather conditions, and range from 125 cfs (during a normal year, as measured at Hacienda Bridge in Guerneville) to 85 cfs (as measured during a dry year). Under the terms of the BO, minimum flows would be dropped to 70 cfs with an additional 15 cfs to maintain system flexibility for a total flow of 85 cfs. For a more complete and comprehensive discussion of minimum flow requirements, refer to the SCWA's 2010 UWMP found at the website link noted in Section 4. The BO acknowledged a need for balance and flexibility and noted that SCWA may find alternative minimum flow requirements that meet the goals of restoring functional salmonid-rearing habitat while promoting water conservation and limited adverse effects on other in-stream resources. In summary, the SCWA is managing its water supply operations and activities in a manner consistent with the BO and is protecting its Russian River water rights and its ability to deliver water to the City and other SCWA water contractors and customers.

5.3.1.2 Entitlements

Water entitlements are set forth in terms of average day peak month demand. The City's entitlement limit is 15 mgd and an annual entitlement limit of 7,500 acre-feet. As long as the capacity is available, the Restructured Agreement permits the City to take delivery of water in excess of its entitlement during a given month provided specific conditions as specified in the agreement are met.

5.4 WATER QUALITY CONSTRAINTS

The quality of the City's water deliveries is regulated by the California Department of Health Services (DHS), which requires regular collection and testing of water samples to ensure that the quality meets regulatory standards and does not exceed MCLs. The City, the SCWA and the Subregional System perform water quality testing, which has consistently yielded results within the acceptable regulatory limits (Dyett & Bhatia, 2000).

The quality of existing surface water, groundwater, and recycled water supply sources over the next 25 years is expected to be adequate. Surface and groundwater water will continue to be treated to drinking water standards, and no surface water, groundwater, or recycled water quality deficiencies are foreseen to occur in the next 25 years. Table 5.4 (DWR Table 30) shows that there is not anticipated to be any impacts to the current and projected water supply due to water quality.

Table 5.4 (DWR Table 30)
Water Quality – Current and Projected Water Supply Impacts

Water source	Description of Condition	2010	2015	2020	2025	2030	2035
Sonoma County Water Agency	no impacts	-	-	-	-	-	-
Groundwater	no impacts	-	-	-	-	-	-
Recycled Water	no impacts	-	-	-	-	-	-

5.5 SUPPLY AND DEMAND COMPARISONS

The following tables compare the projected normal year water supply available to the City under a current multiple-dry water year condition to the supply and demand from 2015 to 2035, in 5-year increments.

Table 5.5 (DWR Table 31)

Supply Reliability – Current Water Sources (AFY) [a]

Water Supply Sources	Average/Normal Water Year Supply	Multiple-Dry Water Year Supply [b]			
		Year 1	Year 2	Year 3	Year 4
Sonoma County Water Agency [c]	3,514	3,514	3,514	3,514	3,514
Groundwater	1,800	1,800	1,800	1,800	1,800
Recycled Water	1,300	1,300	1,300	1,300	1,300
Total Supply	6,614	6,614	6,614	6,614	6,614
Percent of Normal Year		100%	100%	100%	100%

[a] Basis year is 2015

[b] 100% reliability for SCWA supply for multiple-dry years (see SCWA 2010 UWMP)

[c] See Table 4.11

Table 5.6 (DWR Table 32)

Supply and Demand Comparison – Normal Year (AFY)

	2015	2020	2025	2030	2035
Supply (from Table 4.11):					
Sonoma County Water Agency	3,514	4,583	4,937	5,292	5,646
Groundwater	1,800	903	667	475	340
Recycled Water (Subregional System)	1,300	1,300	1,300	1,300	1,300
Supply Totals	6,614	6,786	6,904	7,067	7,286
Demand Totals (from Table 3.15)	6,614	6,786	6,904	7,067	7,286
Difference (supply minus demand)	0	0	0	0	0
Difference as % of Supply	0%	0%	0%	0%	0%
Difference as % of Demand	0%	0%	0%	0%	0%

Table 5.7 (DWR Table 33)

Supply and Demand Comparison – Single Dry Year (AFY)

	2015	2020	2025	2030	2035
Supply:					
SCWA Supply Reliability [a]	79%	80%	82%	79%	81%
SCWA Supply [b]	2,776	3,666	4,048	4,181	4,573
Groundwater [c]	2,538	1,820	1,556	1,586	1,413
Recycled Water [d]	1,300	1,300	1,300	1,300	1,300
Supply Totals	6,614	6,786	6,904	7,067	7,286
Demand Totals (Table 3.15)	6,614	6,786	6,904	7,067	7,286
Difference (supply minus demand)	0	0	0	0	0
Difference as % of Supply	0%	0%	0%	0%	0%
Difference as % of Demand	0%	0%	0%	0%	0%

[a] Single-dry year reliability based on SCWA reliability analysis (see SCWA 2010 UWMP)

[b] SCWA supply equals reliability times SCWA supply from Table 5.6

[c] Groundwater reliability is 100% and can be pumped up to 2,577 AFY during periods of drought

[d] Recycled water supply reliability is 100%

Table 5.8 (DWR Table 34)
Projected Supply & Demand Comparison during Multiple Dry Year Period (AFY)

		2015	2020	2025	2030	2035
Multiple Dry Year - First Year Supply	Supply Totals (see Table 4.11)	6,614	6,786	6,904	7,067	7,286
	Demand Totals (see Table 3.15)	6,614	6,786	6,904	7,067	7,286
	Difference (supply minus demand)	0	0	0	0	0
	Difference as % of Supply	0%	0%	0%	0%	0%
	Difference as % of Demand	0%	0%	0%	0%	0%
Multiple Dry Year - Second Year Supply	Supply Totals (see Table 4.11)	6,614	6,786	6,904	7,067	7,286
	Demand Totals (see Table 3.15)	6,614	6,786	6,904	7,067	7,286
	Difference (supply minus demand)	0	0	0	0	0
	Difference as % of Supply	0%	0%	0%	0%	0%
	Difference as % of Demand	0%	0%	0%	0%	0%
Multiple Dry Year - Third Year Supply	Supply Totals (see Table 4.11)	6,614	6,786	6,904	7,067	7,286
	Demand Totals (see Table 3.15)	6,614	6,786	6,904	7,067	7,286
	Difference (supply minus demand)	0	0	0	0	0
	Difference as % of Supply	0%	0%	0%	0%	0%
	Difference as % of Demand	0%	0%	0%	0%	0%

5.6 SUMMARY OF SUPPLY AND DEMAND ANALYSIS

As indicated in Section 1, the City, often in cooperation with the SCWA, has previously prepared water supply planning documents. This document is a regular update to the City's UWMP as anticipated by the Act. The regular update process allows water suppliers to provide current information regarding their projected water supplies and demands. While this document is generally consistent with previous work, it does incorporate information that became available after the completion of the City's previous comprehensive analysis in January 2005.

Highlights of this analysis include:

- The City is basing its projections of available SCWA supply on the SCWA's current water rights, which are more restrictive than hydrologic constraints.
- The City is basing its projections of groundwater availability upon the findings of a court-ordered judgment and an ongoing analysis of groundwater pumping and levels in the basin from which it pumps. The City projects that up to 2,577 acre-feet per year of groundwater supply is available over the horizon of this Plan. This projection is consistent with legal decisions, is sustainable based on analysis of the City's demands and other demands in the area, and is identical to the projections the City made in its 2005 City-wide Water Supply Assessment.
- The City is basing its projections of available recycled water on existing contracts for supply and planned expansion. The City projects that a total 1,300 acre-feet per year of recycled water will be available over the horizon of this Plan. This projection is consistent with Subregional System's adopted IRWP Master Plan and EIR and is identical to the projections the City made in its 2005 City-wide Water Supply Assessment.
- The City is basing its demand projections on a detailed demand model developed in partnership with the SCWA. The demand model utilizes the City's current billing records as the basis for projections and includes allowances for Plumbing Code Changes and a variety of demand management measures.

The City's combined projected water supplies are sufficient to meet projected demands. The City's projected water supply portfolio is highly stable because it relies largely on current contracted and permitted water supplies that are not subject to hydrologic constraints.

5.7 WATER SHORTAGE CONTINGENCY AND DROUGHT PLANNING

This section provides information required by Water Code Section 10632. The City has adopted a Water Shortage Emergency Plan within Section 13.66 of its Municipal Code, which is included in Appendix F of this UWMP.

5.7.1 Actions in Response to Water Supply Shortages (Water Code 10632(a))

Water Code Section 10632(a) requires a description of the actions to be undertaken by the urban water supplier in response to water supply shortages of up to 50 percent. This section also requires the water supplier to outline the specific water supply conditions that are applicable at each stage of action.

The City has the authority to declare a water shortage emergency under Section 375 and 10632 of the Water Code and has implemented an ordinance to exercise this authority (Appendix F). Emergencies are declared in three stages with specific reduction methods used for each stage. The stages of action, including a 50 percent reduction goal, are shown in Table 5.9 (DWR Table 35).

Table 5.9 (DWR Table 35)
Water Shortage Contingency – Rationing Stages to Address Water Supply Shortages

Stage No.	Water Supply Conditions	% Shortage
1 Voluntary	Irrigation morning and evening only	10%
	Inspection/repair/adjustment of irrigation systems	
	Reduction in irrigation run times for weather	
	Reduction of irrigation run time if runoff occurs	
	Utilization of City information, incentives & rebates	
	Serve water in restaurants on request only	
2 Mandatory	Prohibition against filling swimming pools and using ornamental fountains	20%
	Prohibition against noncommercial vehicle washing	
	Prohibition against use of water from fire hydrants (except for fighting fires)	
	Prohibition against use of water for construction dust control	
	Restrictions on hours for residential irrigation	
	20% reductions for potable water irrigation accounts	
	20% reductions for vehicle washing facilities	
	20% reductions for most non-residential land uses	
3 Mandatory	Prohibition against filling swimming pools and using ornamental fountains	30%
	Prohibition against noncommercial vehicle washing	
	Prohibition against use of water from fire hydrants (except for fighting fires)	
	Prohibition against use of water for construction dust control	
	Restrictions on automatic sprinkler use in residential settings	
	Restrictions on new landscaping	
	30% reductions for potable water irrigation accounts	
	30% reductions for vehicle washing facilities	
	30% reductions for most non-residential land uses	
4 Mandatory	Prohibition against filling swimming pools and using ornamental fountains	50%
	Prohibition against noncommercial vehicle washing	
	Prohibition against use of water from fire hydrants (except for fighting fires)	
	Prohibition against use of water for construction dust control	
	Restriction on new landscaping	
	Irrigation prohibition (exceptions for established perennial plants/trees)	
	Vehicle washing prohibition	
	50% reductions for most non-residential land uses	
	100% offset for new development demands	

5.7.2 Minimum Water Supply during the Next Four Years (Water Code 10632(b))

The minimum water supply available during the next four years during a multiple year drought is shown in Table 5.5 (DWR Table 31), above. Because the City has based its planning on SCWA's current water rights. Because these current water rights are more restrictive than any hydrologic condition, including the Multiple-Dry Year condition, this minimum water supply analysis is identical to the Normal Water Year analysis.

5.7.3 Catastrophic Supply Interruption Plan (Water Code 10632(c))

In accordance with the Emergency Services Act, the City has developed an Emergency Operation Plan (EOP). This EOP guides response to unpredicted catastrophic events that might impact water delivery

including regional power outages, earthquakes or other disasters. The EOP outlines standard operating procedures for all levels of emergency, from minor accidents to major disasters. The EOP has been coordinated with the SCWA and neighboring water purveyors. Table 5.14 provides a summary of the actions included in the EOP for specific catastrophic events.

Table 5.10
Preparation Actions for Catastrophes

Possible Catastrophe	Summary of Actions
Earthquake	Shut-off isolation valves and use of spare piping for ruptured mains
	Storage supplies for service interruption
	Portable and emergency generators available for City facilities
	Procedures for assessing water quality, notifying public and disinfecting system
Flooding	Portable and emergency generators available for City facilities
	Storage supplies for service interruption
	Procedures for assessing water quality, notifying public and disinfecting system
Toxic Spills (interrupts Agency Supply)	Use of local groundwater
	Procedures for assessing water quality, notifying public and disinfecting system
Fire	Storage supplies for fire flows
	Mutual aid plans and responders identified
	Portable and emergency generators available for City facilities
Power outage or grid failure	Portable and emergency generators available for City facilities
Severe Winter Storms	Portable and emergency generators available for City facilities
Hot Weather	Portable and emergency generators available for City facilities

5.7.4 Prohibitions, Penalties and Consumption Reduction (Water Code 10632(d)-(f))

Section 13.62 of the Municipal Code specifies prohibited water uses. These are outlined in Table 5.11 (DWR Table 36) below.

Table 5.11 (DWR Table 36)
Water Shortage Contingency – Mandatory Prohibitions

Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
Washing of sidewalks, walkways, driveways, parking lots and other hard-surfaced areas by direct hosing, except in specific circumstances	Permanent Prohibition
The escape of water through breaks or leaks within the customer's plumbing or private distribution system	Permanent Prohibition
Irrigation in a manner or to an extent which allows excessive runoff	Permanent Prohibition
Washing cars, boats, trailers or other vehicles with a hose not equipped with a shutoff nozzle	Permanent Prohibition
Water for single pass evaporative cooling systems for air conditioning	Permanent Prohibition
Water for new non-recirculating conveyor car wash systems	Permanent Prohibition
Water for new non-recirculating industrial clothes washing systems	Permanent Prohibition
Use of potable water when recycled water of adequate quality is available	Permanent Prohibition

Section 13.66.070 of the Municipal Code outlines the City's enforcement process, which is presented in Table 5.12 (DWR Table 38).

Table 5.12 (DWR Table 38)
Water Shortage Contingency – Penalties and Charges

Penalty or Charge	Stage When Penalty Takes Effect
Personal contact with the customer	Any Stage
Delivery of written notice	Any Stage
Installation of a flow restricting device	Any Stage
Imposition of water waste fees	Any Stage

Table 5.17 (DWR Table 37) presents the consumption reduction method, stage and projected reduction in DWR's required form.

Table 5.13 (DWR Table 37)
Water Shortage Contingency – Consumption Reduction Methods

Consumption Reduction Method	Stage When Method Takes Effect	Projected Reduction (%)
Irrigation morning and evening only	1	10%
Inspection/repair/adjustment of irrigation systems		
Reduction in irrigation run times for weather		
Reduction of irrigation run time if runoff occurs		
Utilization of City information, incentives & rebates		
Serve water in restaurants on request only		
Prohibition against filling swimming pools and using ornamental fountains	2	20%
Prohibition against noncommercial vehicle washing		
Prohibition against use of water from fire hydrants (except for fighting fires)		
Prohibition against use of water for construction dust control		
Restrictions on hours for residential irrigation		
20% reductions for potable water irrigation accounts		
20% reductions for vehicle washing facilities		
20% reductions for most non-residential land uses		
All Stage 2 Prohibitions	3	30%
Restrictions on new landscaping		
30% reductions for potable water irrigation accounts		
30% reductions for vehicle washing facilities		
30% reductions for most non-residential land uses		
All Stage 3 Prohibitions	4	50%
Irrigation prohibition (exceptions for established perennial plants/trees)		
Vehicle washing prohibition		
50% reductions for most non-residential land uses		
100% offset for new development demands		

5.7.5 Effect on Revenues and Expenditures (Water Code 10632 (g))

The Water Code requires the City to analyze the impacts on revenue from a 50% reduction in supplies. When water deliveries are reduced, the City also experiences reduced revenue from water rates. This reduced revenue would be balanced by some reduction in costs, since the City would be purchasing less water from the SCWA. In addition the City would have the option of deferring planned capital expenditures

and utilizing its utility system reserves. The City manages its Water Enterprise Fund to maintain cash reserves, and these operating reserves currently exceed 50% of its annual operating costs.

In order to understand the potential impacts of supply reduction on revenues and expenditures, the City has analyzed the effects of 20%, 30% and 50% reductions on water delivered. For the purpose of this analysis, FY 2006-2007 budget data was used. The City's current water rate[1] includes a monthly service charge and a commodity charge. These are presented in Table 5.14.

Table 5.14
Water Shortage Contingency – Rate Schedule

Monthly Service Charge		Commodity Rate Charge
Residential		
$18.32		$0.003/gallon
Commercial and Multifamily		
¾" or 1" meter	$18.32	$0.003/gallon
1 ½" meter	$31.10	$0.003/gallon
2" meter	$44.27	$0.003/gallon
3" meter	$79.65	$0.003/gallon
4" meter	$124.49	$0.003/gallon
6" meter	$242.45	$0.003/gallon
8" meter	$384.00	$0.003/gallon

Reductions in water use will affect the revenue that the City receives from its commodity charges because less water will be sold. The anticipated revenue from commodity charges can be calculated by subtracting the revenue generated from monthly service charges from the total budgeted revenue. Table 5.15 illustrates this calculation.

Table 5.15
Water Shortage Contingency – Effect of Reduced Water Sales on Total Revenue

	No. of Accounts	Monthly Service Charge[a]	Revenue from Monthly Service Charge	Total Budgeted Revenue	Budgeted Revenue Subject to Reduction
	(a)	(b)	(c)	(d)	(e)
			=		=
			(a)*(b)*12 mos/yr		(d)-(c)
Residential	7655	$18.32	$1,682,875	$3,443,672	$1,760,797
Commercial/MFR	1345	$44.27	$714,518	$2,912,332	$2,197,814

[a] Assumes average Commercial/MFR meter at the 2" rate

Should the City experience a drop in revenues as a result of a water shortage emergency, it would incur lower costs (because it would be purchasing less water from the SCWA); it would defer capital projects as necessary and use available reserves to cover operational expenses. The effect of potential revenue reductions on overall expenditures and reserve balances is illustrated in Table 5.16 below.

[1] Ordinance No. 801

Table 5.16
Water Shortage Contingency – Effect of Reduced Supply on Revenues & Expenditures

	Normal	20% Reduction in Supply	30% Reduction in Supply	50% Reduction in Supply
Revenues				
Residential	$3,443,672	$3,091,513	$2,915,433	$2,563,274
Commercial/MFR	$2,912,332	$2,472,769	$2,252,988	$1,813,425
Other	$6,000	$6,000	$6,000	$6,000
Totals	**$6,362,004**	**$5,570,282**	**$5,174,421**	**$4,382,699**
Expenditures				
Purchase of Water	$1,707,137	$1,365,710	$1,194,996	$853,569
Operations & Maintenance	$2,382,923	$2,382,923	$2,382,923	$2,382,923
Demand Management	$20,000	$20,000	$20,000	$20,000
Capital Outlay	$618,284	$618,284	$618,284	$618,284
Net Transfers	$1,533,024	$1,533,024	$1,533,024	$1,533,024
Totals	**$6,261,368**	**$5,919,941**	**$5,749,227**	**$5,407,800**
Surplus (Deficit)	**$100,636**	**($349,659)**	**($574,806)**	**($1,025,101)**
Reserves [a]	$4,171,722	$4,171,722	$4,171,722	$4,171,722
Available Balance	$4,272,358	$4,171,722	$4,171,722	$4,171,722
Used to Cover Operations	$0	($349,659)	($574,806)	($1,025,101)
Ending Balance	**$4,272,358**	**$3,822,063**	**$3,596,916**	**$3,146,621**

[a] Reserves for "Normal" scenario from April 30, 2011 Cash Report from the City

Currently, the City is able to manage even a 50% reduction in supplies with funding available from its current reserves. However, as demands grow in the future, the City will need to take more actions to manage supply reductions, and the revenue impacts will be more severe. The City will continue to monitor its reserves in order to assure that reserve funding remains available to manage unanticipated reductions in demand.

5.7.6 Water Shortage Contingency Ordinance (Water Code 10632(h))

As noted above, the City has adopted a Water Shortage Emergency Plan which was codified by Ordinance in Section 13.66 of the Municipal Code. This Ordinance has recently been updated and the update is attached in Appendix F.

5.7.7 Mechanisms for Determining Actual Reductions (Water Code 10632(i))

The City's wells and SCWA supply turnouts are all equipped with water meters. Additionally, each potable and recycled water customer is metered. Non-residential landscape irrigation is metered separately from indoor use at most non-residential sites. The City reads meters on a monthly basis and is able to document both demand reductions and atypically high water use. The City contacts individual customers to resolve issues related to atypically high water use.

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SECTION 6
DEMAND MANAGEMENT MEASURES

Demand management measures (DMMs) are water conservation measures. The DMMs listed in the UWMP Act correlate to the California Urban Water Conservation Council's (CUWCC) original Best Management Practices (BMPs) for water conservation. The 2010 UWMP Guidebook uses the terms DMMs and BMPs interchangeably. The CUWCC revised and updated its BMP program in December of 2008 and its BMPs no longer correlate identically to the DMMs described in the 2010 UWMP Guidebook. The City is a signatory to the CUWCC's Memorandum of Understanding, and has worked to voluntarily implement the CUWCC program beginning in the year 2000. The Act requires that if an agency is a CUWCC signatory, it must document compliance with the CUWCC program in its UWMP.

The purpose of this section is to provide a comprehensive description of the City's currently implemented and planned water conservation programs, to correlate these programs to the water use reduction plan meant to achieve the 2015 and 2020 water use targets of the Water Conservation Act and to document its voluntary compliance with the CUWCC's Memorandum of Understanding.

6.1 DESCRIPTION OF DEMAND MANAGEMENT MEASURES

The 2010 UWMP Guidebook lists 14 conservation measures to be addressed. These DMMs correspond to the 14 BMPs in the original CUWCC Memorandum of Understanding (MOU). In this UWMP, the DMMs are listed and described consistently with the Water Conservation Act of 2009 and the 2010 UWMP Guidebook. The Maddaus Report identifies three conservation categories: Tier 1, Tier 2, and New Development Standards (ND). Tier 1 refers to the original CUWCC BMPs which are documented in the CUWCC reporting forms that the City files annually. Tier 2 refers to DMMs that are "above and beyond" the Tier 1 measures and can apply to new or existing development. ND refers to conservation standards and requirements that are applicable only to new development. The Maddaus Report provides detail on the combination of Tier 1, Tier 2 and New Development Standards that the City will use to meet its 2015 and 2020 water use targets.

Historically the CUWCC required a signatory agency like the City to work on all 14 BMPs in a prescribed fashion until it achieved a certain "penetration rate" in its service area, in order to stay in compliance with the Memorandum of Understanding. Compliance with the Memorandum of Understanding is necessary for agencies to be eligible for State grants and loans for water and wastewater systems. Starting in 2009, the CUWCC provided a new option for BMP compliance, the "CUWCC GPCD Option." This option allows members to selectively implement the BMPs that are best suited for their service areas as long as they achieve a certain water use "target" (which is not necessarily identical to the targets adopted under the Water Conservation Act of 2009). Because its water use reduction plan relies on a combination of Tier 1, Tier 2 and New Development standards, not just implementation of the 14 original BMPs, the City has chosen the CUWCC gallon per capita per day (GPCD) Option for compliance with the CUWCC MOU.

6.2 CUWCC GPCD OPTION BASELINE AND TARGET

The CUWCC's GPCD Option requires calculation of a baseline and conservation target but uses a different methodology from the Water Conservation Act of 2009. The CUWCC GPCD Option requires a specific baseline time period (1997-2006), whereas the Water Conservation Act of 2009 allows calculation over a rolling 10-15 year period beginning as early as 1989. The CUWCC GPCD Option requires an 18 percent reduction by 2018, whereas the Water Conservation Act of 2009 requires a nominal 20 percent reduction by 2020. Despite these differences in methodology, the CUWCC GPCD option provides the City with the

best method to simultaneously achieve its 2015 and 2020 targets while staying in compliance with the CUWCC's Memorandum of Understanding.

The City's baseline for the CUWCC GPCD Option compliance is 148 gpcd. The City's 2018 target for the CUWCC GPCD Option is 122 gpcd. The CUWCC GPCD Option water use target of 122 gpcd is higher than the City's target calculated on an individual agency basis but is 7 gpcd lower than the Regional Alliance figure that the City has chosen to use as its Water Conservation Act target. This is illustrated in Table 6.1 below.

Table 6.1
Water Use Targets for the City of Rohnert Park (gpcd)

Year	Regional Alliance Target[a]	City Individual Target[b]	CUWCC MOU GPCD Option Target (Voluntary)	Projected Per Capita Water Use[b]	Meets Target?
2015	142	140	-	102	Yes
2018	-	-	122	102	Yes
2020	129	119	-	102	Yes

[a] From Table 3.6

[b] From Table 3.5

The data used to calculate this baseline and target is presented in Appendix G. As the spreadsheets attached illustrate, the City's water use in 2010 was 93 gpcd, well below the City's 2018 target. The 2010 use is considered atypically low due to the current economic conditions in the City. Although it is projected to increase as the economy improves, the City's water use is also expected to be below the CUWCC GPCD Option target.

The calculations for, and descriptions of, the Regional Alliance and Individual water use targets are explained in Section 3.

According to DWR's 2010 UWMP Guidebook, a CUWCC member is in compliance with the DMM reporting requirements of the Water Conservation Act if the member is in compliance with their CUWCC GPCD Option reporting requirements. The requirements for CUWCC GPCD Option compliance are as follows:

- Potable water gpcd for each year in the baseline period
- 2018 gpcd target and five biennial gpcd targets
- Supporting data to calculate gpcd for this period's potable water gpcd
- Calculations showing the reporting period's potable water gpcd is less than or equal to that period's biennial gpcd target
- Completed water supply and water use CUWCC reporting forms for 2009 and 2010 for both potable and non-potable water
- Completed Foundational BMP reporting forms for 2009 and 2010

Spreadsheets presenting data for calculating the CUWCC GPCD Option baseline, targets and use are presented in Appendix G. Copies of the CUWCC reporting forms listed above are also presented in Appendix G.

6.3 DMMs Currently Being Implemented

As permitted by in the Water Conservation Act, the City has attached the CUWCC reporting forms in lieu of supplying a narrative of DMMs being implemented. These documents are presented in Appendix G.

6.4 Other Measures (Additional DMMs Currently Being Implemented Beyond the DMMs Listed in the UWMP Act)

Section 3.6 of this UWMP details the DMMs planned for implementation.

6.5 Conservation Savings

As detailed in Section 3.5 of this UWMP, the water conservation implementation plan is expected to yield 418 AFY of water savings by 2035. Conservation savings are described in detail in the Maddaus report (Appendix B) and described in Section 3 of this UWMP.

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Appendix A
Public Involvement Documents

Appendix A.1
60-Day Notice

March 17, 2011

Pete Parkinson
Director
Sonoma County Permit and Resource Management Department
550 Ventura Avenue
Santa Rosa, CA 95403

Re: Notice of Review and Preparation of 2010 Urban Water Management Plan

Dear Mr. Parkinson,

Each urban water supplier serving more than 3,000 connections is required by the State of California to prepare an Urban Water Management Plan every five years. The due date for the 2010 UWMP is July 1, 2011.

The City of Rohnert Park is providing notice that it is in the process of preparing its 2010 UWMP. The 2010 UWMP will provide information relating to water demand, water supply, and water supply reliability for the next 25 years.

If Sonoma County would like to provide input on the preparation of the City's 2010 UWMP, please feel free to contact me at (707) 588-2243 or via email at dajenkins@rpcity.org.

Sincerely,

Original Signed

Darrin Jenkins, PE
Director of Development Services/City Engineer

ec: Sonoma County Water Agency, Attn: Grant Davis
City of Cotati, Attn: Damien O'Bid
City of Petaluma, Attn: Pamela Tuft
City of Santa Rosa, Attn: Miles Ferris
City of Sonoma, Attn: Milenka Bates
North Marin Water District, Attn: Chris De Gabriele
Town of Windsor, Attn: Richard Burtt
Valley of the Moon Water District, Attn: Krishna Kumar
City of Sebastopol, Attn: Sue Kelly
Penngrove Water Company, Attn: Jim Downey
Sonoma State University, Attn: Christopher Dinno
City of Rohnert Park, Attn: John McArthur, Pat Barnes, Ellen Beardsley

Appendix A.2
Public Notice Newspaper Advertisements

CERTIFICATION OF PUBLICATION IN
"The Community VOICE"
(Published every Friday)
in the
SUPERIOR COURT
of the
STATE OF CALIFORNIA
In and For the County of Sonoma
COUNTY OF SONOMA

City of Rohnert Park
Public Notice
City's Urban Water Management Plan

STATE OF CALIFORNIA, The undersigned does hereby certify and declare: That at all times hereinafter sworn, deposes and says: That at all times hereinafter mentioned she was a citizen of the United States, over the age of eighteen years and a resident of said county and was at all said times the principal clerk of the printer and publisher of The Community VOICE, a newspaper of general circulation, published in the City of Rohnert Park, in said County of Sonoma, State of California; that The Community VOICE is and was at all times herein mentioned, a newspaper of general circulation as that term is defined by Section 6000 of the Government Code; its status as such newspaper of general circulation having been established by Court Decree No. 35815 of the Superior Court of the State of California, in and for the County of Sonoma, Department No. 1 thereof; and as provided by said Section 6000, is published for the dissemination of local and telegraphic news and intelligence of a general character, having a bona fide subscription list of paying subscribers, and is not devoted to the interest, or published for the entertainment or instruction of a particular class, profession, trade, calling, race or denomination, or for the entertainment and instruction of such classes, professions, trades, callings, races or denominations; that at all said times said newspaper has been established and published in the said City of Rohnert Park, in said County and State at regular intervals for more than one year preceding the first publication of this notice herein mentioned; that said notice was set in type not smaller than non-pareil and was preceded with words printed in black face type no smaller than non-pareil, describing and expressing in general terms, the purport and character of the notice intended to be given; that the "City of Rohnert Park Public Notice City's Urban Water Management Plan" of which the annexed is a printed copy, was published in said newspaper at least __1_ consecutive time(s), commencing on the _8_ day of April, and ending on the _8_ day of April, 2011.

* * *

I HEREBY CERTIFY AND DECLARE UNDER THE PENALTY OF perjury that the foregoing is true and correct.
EXECUTED this 8 day of April, 2011 at Rohnert Park, California

Signed _____

Rose Shah Chief Clerk
*

CITY OF ROHNERT PARK · 130 AVRAM AVENUE · ROHNERT PARK, CA 94928
PHONE: (707) 588-2225 · FAX: (707) 792-1876 · WEB: www.rpcity.org
OFFICE OF THE CITY CLERK

PUBLIC NOTICE

Notice of Commencement of UWMP Review and Update

The City of Rohnert Park is currently reviewing and updating the City's Urban Water Management Plan ("UWMP"), as is required by law every five years. The 2010 UWMP is due to the California Department of Water Resources July 1, 2011. The UWMP will provide an analysis of projected water demand and supply over the next 25 years as well as an updated water conservation plan. The public will have an opportunity to review and comment on the draft UWMP. For any questions regarding this Notice or if you are interested in providing input during the preparation of the UWMP, please contact Darrin Jenkins at (707) 588-2243 or dajenkins@rpcity.org. A draft review will be available for public review at a later date.

DATED: April 6, 2011 Judy Hauff, City Clerk

PUBLICATION DATE: April 8, 2011
The Community Voice

Appendix A.3
Public Hearing Notices

NOTICE OF PUBLIC HEARING

NOTICE IS HEREBY GIVEN that the City Council of the City of Rohnert Park will be holding a PUBLIC HEARING.

WHERE: Rohnert Park City Hall – Council Chamber
130 Avram Avenue
Rohnert Park, California

WHEN: Tuesday, June 14, 2011, at the hour of 6:00 p.m. or as soon thereafter as the matter is reached on the agenda.

PURPOSE: To solicit input regarding:

1) Community Water Use Target for 2020, as required by the Water Conservation Act of 2009, and
2) draft 2010 Urban Water Management Plan.

The City Council of the City of Rohnert Park will hold a public hearing on June 14, 2011, at 6:00 p.m. to receive comments on 1) Community Water Use Target for 2020, as required by the Water Conservation Act of 2009 and 2) draft 2010 Urban Water Management Plan (Plan). The City's proposed Community Water Use Target for 2020 is included in the Plan. The purpose of the Plan is to consolidate information regarding water supply and demand, provide public information, and improve statewide water planning. Documents related to this item are available for public review during normal business hours at:

Rohnert Park City Hall - City Clerk's Office
130 Avram Avenue, Rohnert Park, CA

Rohnert Park-Cotati Regional Library
6250 Lynne Conde Way, Rohnert Park, CA

On the Rohnert Park City Web Page
at http://www.rpcity.org under Public Notices

All persons interested in this matter should appear at the June 14, 2011, City Council meeting. Written statements may be submitted in advance for presentation to the Council as part of the public hearing addressed to Judy Hauff, City Clerk, City of Rohnert Park, 130 Avram Avenue, Rohnert Park, CA 94928. Comments may also be received by email to: UWMP@rpcity.org prior to the hearing date.

NOTE: If you challenge this matter in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice, or in written correspondence delivered to the City of Rohnert Park at, or prior to, the public hearing.

Questions regarding this matter should be directed to Darrin Jenkins, Director of Development Services/City Engineer, (707) 588-2243.

Dated: May 25, 2011 Judy Hauff, City Clerk
Published: May 27, 2011 and June 3, 2011

CERTIFICATION OF PUBLICATION IN
"The Community VOICE"
(Published every Friday)
in the
SUPERIOR COURT
of the
STATE OF CALIFORNIA
In and For the County of Sonoma
COUNTY OF SONOMA

City of Rohnert Park
Notice of Public Hearing

STATE OF CALIFORNIA, The undersigned does hereby certify and declare: That at all times hereinafter sworn, deposes and says: That at all times hereinafter mentioned she was a citizen of the United States, over the age of eighteen years and a resident of said county and was at all said times the principal clerk of the printer and publisher of The Community VOICE, a newspaper of general circulation, published in the City of Rohnert Park, in said County of Sonoma, State of California; that The Community VOICE is and was at all times herein mentioned, a newspaper of general circulation as that term is defined by Section 6000 of the Government Code; its status as such newspaper of general circulation having been established by Court Decree No. 35815 of the Superior Court of the State of California, in and for the County of Sonoma, Department No. 1 thereof; and as provided by said Section 6000, is published for the dissemination of local and telegraphic news and intelligence of a general character, having a bona fide subscription list of paying subscribers, and is not devoted to the interest, or published for the entertainment or instruction of a particular class, profession, trade, calling, race or denomination, or for the entertainment and instruction of such classes, professions, trades, callings, races or denominations; that at all said times said newspaper has been established and published in the said City of Rohnert Park, in said County and State at regular intervals for more than one year preceding the first publication of this notice herein mentioned; that said notice was set in type not smaller than non-pareil and was preceded with words printed in black face type no smaller than non-pareil, describing and expressing in general terms, the purport and character of the notice intended to be given; that the "City of Rohnert Park Notice of Public Hearing To solicit input regarding Community Water Use Target for 2020, Draft 2010 Urban Water Management Plan" of which the annexed is a printed copy, was published in said newspaper at least __2_ consecutive time(s), commencing on the _27_ day of May, and ending on the _3_ day of June, 2011.

* * *

I HEREBY CERTIFY AND DECLARE UNDER THE PENALTY OF perjury that the foregoing is true and correct.
EXECUTED this 3 day of June, 2011 at Rohnert Park, California

Signed R Shah

Rose Shah Chief Clerk
*

NOTICE OF PUBLIC HEARING

NOTICE IS HEREBY GIVEN that the City Council of the City of Rohnert Park will be holding a PUBLIC HEARING.

WHERE: Rohnert Park City Hall – Council Chamber
130 Avram Avenue
Rohnert Park, California

WHEN: Tuesday, June 14, 2011, at the hour of 6:00 p.m. or as soon thereafter as the matter is reached on the agenda.

PURPOSE: To solicit input regarding:
1) Community Water Use Target for 2020, as required by the Water Conservation Act of 2009, and
2) draft 2010 Urban Water Management Plan.

The City Council of the City of Rohnert Park will hold a public hearing on June 14, 2011, at 6:00 p.m. to receive comments on 1) Community Water Use Target for 2020, as required by the Water Conservation Act of 2009 and 2) draft 2010 Urban Water Management Plan (Plan). The City's proposed Community Water Use Target for 2020 is included in the Plan. The purpose of the Plan is to consolidate information regarding water supply and demand, provide public information, and improve statewide water planning. Documents related to this item are available for public review during normal business hours at:

Rohnert Park City Hall - City Clerk's Office
130 Avram Avenue, Rohnert Park, CA

Rohnert Park-Cotati Regional Library
6250 Lynne Conde Way, Rohnert Park, CA

On the Rohnert Park City Web Page
at http://www.rpcity.org under Public Notices

All persons interested in this matter should appear at the June 14, 2011, City Council meeting. Written statements may be submitted in advance for presentation to the Council as part of the public hearing addressed to Judy Hauff, City Clerk, City of Rohnert Park, 130 Avram Avenue, Rohnert Park, CA 94928. Comments may also be received by email to: UWMP@rpcity.org prior to the hearing date.

NOTE: If you challenge this matter in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice, or in written correspondence delivered to the City of Rohnert Park at, or prior to, the public hearing.

Questions regarding this matter should be directed to Darrin Jenkins, Director of Development Services/City Engineer, (707) 588-2243.

Judy Hauff, City Clerk

Dated: May 25, 2011
Published: May 27, 2011 and June 3, 2011
The Community Voice

Appendix A.4
Notice of Draft UWMP Availability

May 27, 2011

To: Interested Agencies

Re: Notice of Availability of the 2010 Draft Urban Water Management Plan

The City of Rohnert Park Draft 2010 Urban Water Management Plan (draft plan) is now available for public review. A copy of the draft plan is available for public review during normal business hours at:

Rohnert Park City Hall - City Clerk's Office
130 Avram Avenue, Rohnert Park, CA, 94928

Rohnert Park-Cotati Regional Library
6250 Lynne Conde Way, Rohnert Park, CA

On the Rohnert Park City Web Page
at http://www.rpcity.org

The City Council will hold a public hearing at 6:00 p.m. on June 14, 2011, at the City Hall Council Chamber to receive comments to the draft plan. Written statements may be submitted to the City Clerk in advance for presentation to the Council as part of the public hearing. Comments can also be received by emailing to: UWMP@rpcity.org prior to the hearing date.

Sincerely,

Darrin Jenkins
Director of Development Services / City Engineer

ec: Sonoma County Water Agency, Attn: Grant Davis
City of Cotati, Attn: Damien O'Bid
City of Petaluma, Attn: Pamela Tuft
City of Santa Rosa, Attn: Miles Ferris
City of Sonoma, Attn: Milenka Bates
North Marin Water District, Attn: Chris De Gabriele
Town of Windsor, Attn: Richard Burtt
Valley of the Moon Water District, Attn: Krishna Kumar
City of Sebastopol, Attn: Sue Kelly
Penngrove Water Company, Attn: Jim Downey
Sonoma State University, Attn: Christopher Dinno
City of Rohnert Park, Attn: John McArthur, Pat Barnes, Ellen Beardsley
Winzler & Kelly, Attn: Toni Bertolero, Cristina Goulart

Appendix A.5
Resolution of Adoption

RESOLUTION NO. 2011-48

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ROHNERT PARK ADOPTING THE CITY OF ROHNERT PARK 2010 URBAN WATER MANAGEMENT PLAN AND AUTHORIZING ITS FILING WITH THE CALIFORNIA DEPARTMENT OF WATER RESOURCES

WHEREAS, the Urban Water Management Planning Act (the Act, California Water Code Section 10610 et. seq.) requires that every urban water supplier that supplies water for municipal purposes to more than 3,000 customers prepare an Urban Water Management Plan (UWMP) every five years, the primary objectives of which are to plan for the efficient management and use of the water supply;

WHEREAS, the City of Rohnert Park (City) is an urban water supplier within the meaning of the Act;

WHEREAS, the City of Rohnert Park staff and its consultants, in consultation with the Sonoma County Water Agency and other local water agencies, have prepared an UWMP (the City of Rohnert Park 2010 Urban Water Management Plan) to meet the requirements of the Act, as supplemented by the Water Conservation Act of 2009 (the 2009 Act), in accordance with the guidelines published by the California Department of Water Resources;

WHEREAS, the City staff, Agency staff, and the respective consultants who prepared the City of Rohnert Park 2010 Urban Water Management Plan have the training, experience and expertise necessary to prepare an UWMP meeting the requirements of the Act and the 2009 Act;

WHEREAS, the 2009 Act requires that the State of California reduce daily per capita water use by twenty percent by the year 2020, and that urban water suppliers identify baseline water usage and set community water use targets in the 2010 UWMP;

WHEREAS, the City of Rohnert Park 2010 Urban Water Management Plan has been available for public review since May 27, 2011 in compliance with the requirements of the Act;

WHEREAS, the City Council conducted a public hearing on June 14, 2011, in compliance with the Act and the 2009 Act to receive oral and written comments upon the City of Rohnert Park 2005 Urban Water Management Plan, including community water use targets and their potential economic impact, having published notice on May 27, 2011, and June 3, 2011;

WHEREAS, the City Council has reviewed the City of Rohnert Park 2010 Urban Water Management Plan, City staff reports and presentations and the oral and written comments received;

WHEREAS, the economic impacts of the 2010 Urban Water Management Plan may be positive, in that the Plan identifies adequate and reliable water supplies and finds the City's existing water conservation measures adequate to meet the requirements of the 2009 Act;

WHEREAS, the City of Rohnert Park 2010 Urban Water Management Plan was prepared in accordance with and meets the requirements of the Act and the 2009 Act, and the

facts, assumptions and analyses in the City of Rohnert Park 2010 Urban Water Management Plan are reasonable and supported by substantial evidence; and

WHEREAS, in accordance with CEQA Guidelines Section 15282(v), the preparation and adoption of an Urban Water Management Plan pursuant to the provisions of Section 10652 of the Water Code is exempt from the California Environmental Quality Act.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Rohnert Park that it does hereby find, determine and declare as follows:

1. All of the above recitals are true and correct.

2. The City Council hereby elects to use the method described in Water Code Section 10608.20(b)(1), (eighty percent of baseline use) in calculating its individual water use target for 2020.

3. The City elects to use the regional water use target established by the region for determining compliance with the 2009 Act.

4. The City of Rohnert Park 2010 Urban Water Management Plan is adopted.

BE IT FURTHER RESOLVED that the City Manager is hereby authorized and directed to make the appropriate filings with the California Department of Water Resources in accordance with the requirements of the Act.

DULY AND REGULARLY ADOPTED this 14th day of June, 2011.

CITY OF ROHNERT PARK

Mayor

ATTEST:

City Clerk

ROHNERT PARK 19 62 CALIFORNIA

AHANOTU: AYE	**CALLINAN: AYE**	**MACKENZIE: ABSENT**	**STAFFORD: AYE**	**BELFORTE: AYE**
AYES: (4)	**NOES: (0)**	**ABSENT: (1)**	**ABSTAIN: (0)**	

Appendix A.6
Transmittal Letters for Final UWMP

July 8, 2011

Department of Water Resources (DWR)
Statewide Integrated Water Management
Water Use and Efficiency Branch
P.O. Box 942836
Sacramento, CA 94236-0001
Attention: Coordinator, Urban Water Management Plans

California State Library (State Library)
Government Publications Section
P.O. Box 942837
Sacramento, CA 94237-0001
Attention: Coordinator, Urban Water Management Plans

County of Sonoma
2300 County Center Drive, Suite B177
Santa Rosa, CA 95403
Attention: County Clerk

Enclosed is your copy of the Final Urban Water Management Plan 2010 for the City of Rohnert Park in the following formats: Print copy plus CD (DWR), CD copy (State Library), and Print copy (County Clerk).

A copy of the UWMP checklist can be found in Appendix H of the attached report. For any questions regarding this report, please feel free to call me at (707) 588-2243 or email at dajenkins@rpcity.org .

Sincerely,

Darrin Jenkins
Director of Development Services / City Engineer

Enclosure

cc (letter only): City Council
City Manager
City Attorney

cc (w/ CD): City Clerk

FILE: Water/2010 Urban Water Management Plan

Appendix B
Maddaus Report

City of Rohnert Park

2010 Urban Water Management Plan Water Demand Analysis and Water Conservation Measures Update

November 19, 2010

MADDAUS WATER MANAGEMENT

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

1.1 Introduction

The 2010 Urban Water Management Plan demand and conservation technical analysis was conducted by Maddaus Water Management (MWM) for the City of Rohnert Park. The purpose of the analysis was to:

1. Calculate a demand forecast for the year 2010 to 2035.
2. Calculate the range of conservation costs and savings for the year 2010 to 2035. This effort included:
    - Incorporate activity from current conservation measures for the year 2005 and 2009 into the DSS model.
    - Evaluate up to three new conservation measures that will reduce future water demand.
    - Estimate the costs and water savings of these measures.
    - Combine the measures into increasingly more aggressive programs and evaluate the costs and water savings of these programs.

1.2 Long-Term Demand and Conservation Program Analysis Results

The project for the Sonoma County Water Agency (SCWA) contractors included two main parts, (1) create a demand and conservation analysis for 2010 to 2035 and (2) evaluate conservation savings potential for the years 2010 to 2035 with a variety of different measures and conservation programs.

The first step in the analysis was to review and analyze historical water use production and billing data. For most contractors, the billing data was provided for the years 2000 to 2009 (a few contractors had data back to 1995 and one contractor has new meters, so data is only available after the year 2006). The data was graphically analyzed and discussed with the individual contractors. The historical water use along with the selected population and employment projections were used to create a demand forecast for the year 2010 to 2035.

Once the demands were completed, the conservation measures were analyzed for a total of 31 measures. The conservation analysis included all the measures from the 2005 conservation study that MWM completed for the SCWA contractors along with up to three new measures for each contractor. The following important assumptions about the conservation measures were included in this analysis:

1. Due to increased regulations and additional research and analysis on conservation measures, conservation measures Tier 2-8 (Reduced Connection Fees), Tier 2-9 (Synthetic Turf Rebate) and Tier 2-11 (Dishwasher Rebate) were removed from all programs at the request of the contractors.
2. No modifications to costs or savings assumptions were made to any of the Tier One and Tier Two Measures. To comply with new regulations and ordinances, minimal changes were made to the New Development measures ND-1 to ND-8
3. The table of the new measures for each contractor is listed in Section 5.1. An analysis of the new state law SB 407 was included for all contractors.
4. New development ordinances were updated to reflect new local ordinances, the Model Water Efficient Landscape Ordinance, and the Cal Green building code.

Table ES-1, ES-2 and ES-3 and Figure ES-1 show the water demands and conservation savings for the years 2010 to 2035. The Plumbing Code includes the new California State Law requiring High Efficiency Toilets and High Efficiency Urinals by 2014.

Table ES-1

City of Rohnert Park
Conservation Measures in each Program

Measure Name	Program Existing	Program Existing and New	Program Tier One	Program Tier 1 and ND	Program Tier 1 and Tier 2	Program Tier 1 and Tier 2 and ND
CUWCC #1a - Residential Water Surveys - Interior	✓	✓	✓	✓	✓	✓
CUWCC #1b - Residential Water Surveys - Outdoor	✓	✓	✓	✓	✓	✓
CUWCC #2 - Plumbing Retrofit Kits	✓	✓				
CUWCC #5a - Large Landscape Water Budgets	✓	✓	✓	✓	✓	✓
CUWCC #6 - Washer Rebates	✓	✓	✓	✓	✓	✓
CUWCC #7 - Residential Public Education	✓	✓	✓	✓	✓	✓
CUWCC #9 - Commercial Water Audits	✓	✓	✓	✓	✓	✓
CUWCC #14a - RSF Toilet Replacement			✓	✓	✓	✓
CUWCC #14b - RMF Toilet Replacement			✓	✓	✓	✓
Tier2 - 1Rain Sensor Retrofit					✓	✓
Tier2 - 2Cash for Grass					✓	✓
Tier2 - 3Financial Incentives for Being Below Water Budget					✓	✓
Tier2 - 4Irrigation Meter Rebates					✓	✓
Tier2 - 5aSmart Irrigation Controller Rebates - RSF					✓	✓
Tier2 - 5bSmart Irrigation Controller Rebates - RMF, CII, IRR					✓	✓
Tier2 - 6Financial Incentives/Rebates for Irrigation Upgrades					✓	✓
Tier2 - 7Hotel Retrofit					✓	✓
Tier2 - 10 High Efficiency Toilets					✓	✓
Tier2 - 12CII Rebates - Replace Inefficient Water Using Equipment					✓	✓
Tier2 - 13New Commercial Urinals					✓	✓
Tier2 - ND1Rain Sensor Retrofit				✓		✓
Tier2 - ND2Smart Irrigation Controller				✓		✓
Tier2 - ND3 High Efficiency Toilets				✓		✓
Tier2 - ND4Dishwasher New Efficient				✓		✓
Tier2 - ND5Clothes Washing Machine Requirement				✓		✓
Tier2 - ND6Hot Water on Demand				✓		✓
Tier2 - ND7High Efficiency Faucets and Showerheads				✓		✓
Tier2 - ND8Landscape and Irrigation Requirements				✓		✓
SB-407 Requirements (Plumbing Retrofit on Resale or Remodel)		✓				
Require Multifamily Submeter - New Accounts		✓				
Require Multifamily Submeter - Exsiting Account Retrofit		✓				

NOTE – Due to increased regulations and additional research and analysis, conservation measures Tier 2-8, Tier 2-9 and Tier 2-11 are out of date and were removed from analysis at the request of all the contractors.

Figure ES-1
Long Term Demands with Conservation Programs

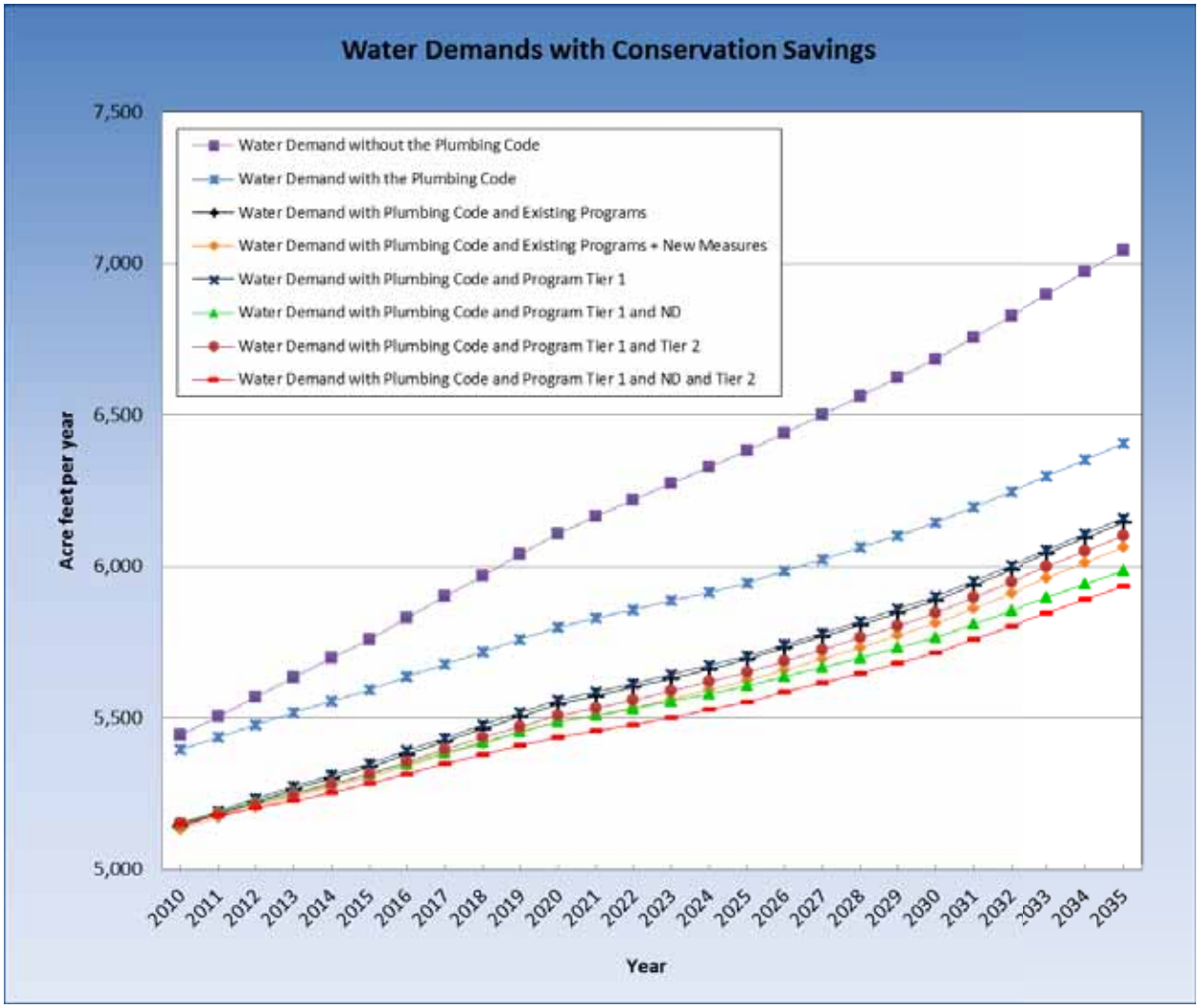


Table ES-2
Water Demand Projections

Water Demand with Conservation Program Savings						
Water Demand (AFY)	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Water Demand without the Plumbing Code	5,444	5,760	6,109	6,380	6,684	7,042
Water Demand with the Plumbing Code	5,396	5,593	5,800	5,946	6,143	6,404
Water Demand with Plumbing Code and Existing Programs	5,142	5,337	5,546	5,693	5,887	6,144
Water Demand with Plumbing Code and Existing Programs + New Measures	5,132	5,305	5,487	5,622	5,811	6,062
Water Demand with Plumbing Code and Program Tier 1	5,151	5,348	5,557	5,705	5,900	6,157
Water Demand with Plumbing Code and Program Tier 1 and ND	5,151	5,314	5,486	5,604	5,767	5,986
Water Demand with Plumbing Code and Program Tier 1 and Tier 2	5,151	5,316	5,506	5,650	5,845	6,102
Water Demand with Plumbing Code and Program Tier 1 and ND and Tier 2	5,151	5,282	5,437	5,553	5,715	5,935

Table ES-3
Economic Analysis of Alternative Programs

Comparison of Conservation Program Costs and Savings									
Conservation Program	Water Utility Benefit-Cost Ratio	Community Benefit-Cost Ratio	2035 Water Savings (AFY)	2035 Indoor Water Savings (AFY)	2035 Outdoor Water Savings (AFY)	Total Water Savings as a % of Total Production in 2035*	30 Year Present Value of Water Utility Costs ($1,000)	Total Utility Cost for Five Years 2011-2015 ($1,000)	Utility Cost of Water Saved ($/AF)
Existing Program	2.50	4.04	260	119	141	4.06%	$1,654	$398	$216
Existing Program + New Measures	2.04	3.41	342	201	141	5.34%	$2,371	$757	$259
Tier One	2.42	3.49	247	106	141	3.85%	$1,635	$398	$223
Tier One + Tier Two	1.73	1.81	302	119	184	4.72%	$2,594	$1,053	$306
Tier One + New Development	2.84	1.19	418	176	242	6.53%	$1,735	$429	$182
Tier One + Tier Two + New Development	2.02	1.01	469	189	280	7.33%	$2,694	$1,084	$254

2. INTRODUCTION AND PURPOSE

The purpose of this report is to present an overview of the demand and conservation evaluation process which has been completed for the City of Rohnert Park (City). The goal was to develop forecasts of demand and conservation savings for the 2010 Urban Water Management Plan.

The City of Rohnert Park has a current water conservation program. This report evaluates whether expanding existing efforts is a cost-effective way to meet future water needs.

The conservation measures and programs were analyzed using the Least Cost Planning Water Demand Management Decision Support System (DSS Model). In this report demand management and water conservation are used interchangeably. The evaluation includes measures directed at existing accounts as well as new development measures to make new residential and business customers more water efficient. Six programs were provided to help evaluate the net effect of running multiple measures together over time. Assumptions and results for each of the 31 individual measures and six programs will be described in detail in this report.

2.1 Contents

This report provides a general overview for the methodology, assumptions, and results for the demand forecast and conservation analysis. The following information is included in this report and is discussed in individual sections below:

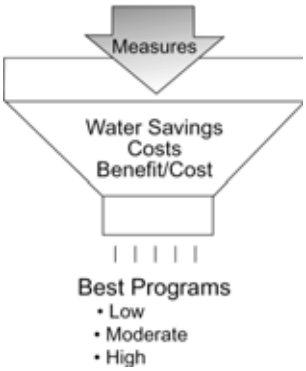
- Overview of evaluation process
- Baseline water demands with and without the plumbing code
- Comparison of individual conservation measures
- Results of the conservation analysis
- Conclusions
- Appendix A: Assumptions for the Conservation Measures Evaluated
- Appendix B: Water Production and Billing Data Graphs for all Customer Categories

Long Term Demand and Conservation Evaluation Process

During the evaluation process, water demand and savings were estimated. Benefits and costs were compared in a formal present value analysis and conclusions were drawn about which measures produce cost-effective water savings. The measure costs were previously developed by MWM and the contractors as part of the 2005 conservation study MWM completed for the SCWA contractors. This process can be thought of as an economic screening process, shown in Figure 1. Packaging the best measures into alternative programs allows City of Rohnert Park to consider what level of conservation implementation is appropriate.

Figure 1

Evaluation Process



Benefit-cost analysis has been used by many water agencies to evaluate and help select a water conservation measure best suited to local conditions. This analysis requires a locale-specific set of data, such as historical water consumption patterns by customer class, population projections, age of housing stock, and prior conservation efforts.

The following ten steps were used to implement the methodology by expanding upon the same DSS Model used to prepare the demand projections.

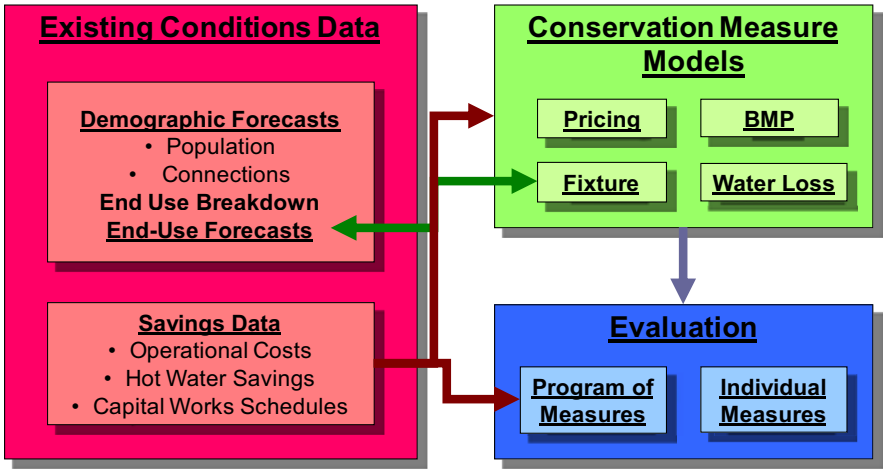
1. **Generate water use projections with and without the state and national plumbing code**. Projections cover each key customer category and are broken down into indoor and outdoor end uses. Evaluate the impact of the plumbing code changes arising from the 1992 and 2005 Federal Energy Policy Act. The plumbing code also includes fixture changes that will result from the State of California plumbing code which requires only high efficiency toilets and high efficiency urinals be sold in the state after the year 2014.
2. **Evaluate previous conservation measures and up to three new measures** to identify those that are applicable to the service area. Develop appropriate unit water savings and costs for each measure.
3. **Estimate the affected customers (or number of accounts) for each conservation measure** by dividing the measure's projected customers (or accounts) that implement the measure by the total service area customers (accounts). This factor is called the market penetration or installation rate.
4. **Estimate total annual average day water savings.** The water savings are computed by multiplying unit water savings, per measure, by the market saturation or installation rate (i.e. 10% to 90% of accounts), and then multiplying by the number of units in the service area (such as

dwelling units) targeted by a particular measure. The indoor and outdoor water savings were also calculated.

5. **Identify benefits to the water agency** including potential reduced water purchases from SCWA, calculated as the wholesale water rate and delivery cost per acre-foot for each contractor with an escalator based on historical water rates and Consumer Price Index (CPI).
6. **Quantify total benefits for each year** in the planning period by multiplying average water savings for each measure by the computed value of the benefits.
7. **Determine initial and annual costs to implement the measures** based upon current conservation program data, local experience, and the costs of goods, services, and labor in the community. This is multiplied by the number of units participating each year and then added to overall administration and promotion costs to arrive at a total measure cost, which may be spread over a number of years. For this project the costs for all measures were used from the 2005 study, except for the three new measures selected by each contractor which had all new parameters developed.
8. **Compare costs of measures** by computing the present value of costs and costs of water saved over the planning period.
9. **Compile six programmatic packages** or programs containing various new and existing measures.
10. **Evaluate the six programs for water savings and cost-effectiveness** and identify the point of diminishing returns from further investments in conservation.

For conservation measure evaluation, the DSS Model performs economic analysis by using net present value and benefit-to-cost ratio as economic indicators. The benefit cost analysis is performed from various perspectives including the utility and community (community perspective equates to the utility plus customer). Figure 2 shows the structure of the model. Results are presented in subsequent sections.

Figure 2
Structure of the DSS Model



4. WATER DEMANDS WITH AND WITHOUT PLUMBING CODE

4.1 Future Population and Employment Projections

Description of Population and Employment Forecasts

There are generally two main sources of population and employment projections used to generate future water demands for the 2010 Urban Water Management Plans.

Available Demographic Projections

- *Local General Plan (population and employment)* – Typically these plans, depending upon when they were published, have a population and jobs forecast for 2030 and build out.
    - The City of Rohnert Park provided a copy of their General Plan dated 2000 (published in 2002). The plan contains build out population and a build out employment within the City.
- *Association of Bay Area Governments (ABAG) (population and employment)* - ABAG recently published a new projections report in 2009 that includes population and employment estimates for each city in the Bay Area. This report provides estimates for 2000, 2005, 2010, 2015, 2020, 2025, 2030 and 2035. ABAG publishes demand projections every two years. The previous DSS Model projections and ABAG Projections for 2005, 2007, and 2009 were reviewed to determine the most appropriate data set to use in this DSS Model update.

The City of Rohnert Park selected the2009 ABAG population and employment projections as shown in Figure 3, 4 and Table 1 and 2. The values shown in the "Selected" column, the 2009 ABAG projections were used to create the demand projections. The 2009 ABAG projections are the most current information available for Rohnert Park. They take into account the recent economic conditions, especially the loss of jobs. By using this employment information, this analysis effectively accounts for commercial vacancies Rohnert Park is experiencing. Lower jobs in 2010 correlate with higher vacancies, lower water use per account, and lower jobs per account. Job growth in the future is used to increase the number of accounts in the future. The City previously used 2000 General Plan projections which do not account for current economic conditions and end in 2020. Because of those limitations, 2009 ABAG projections were substituted in this 2010 analysis.

Figure 3
Population Projections

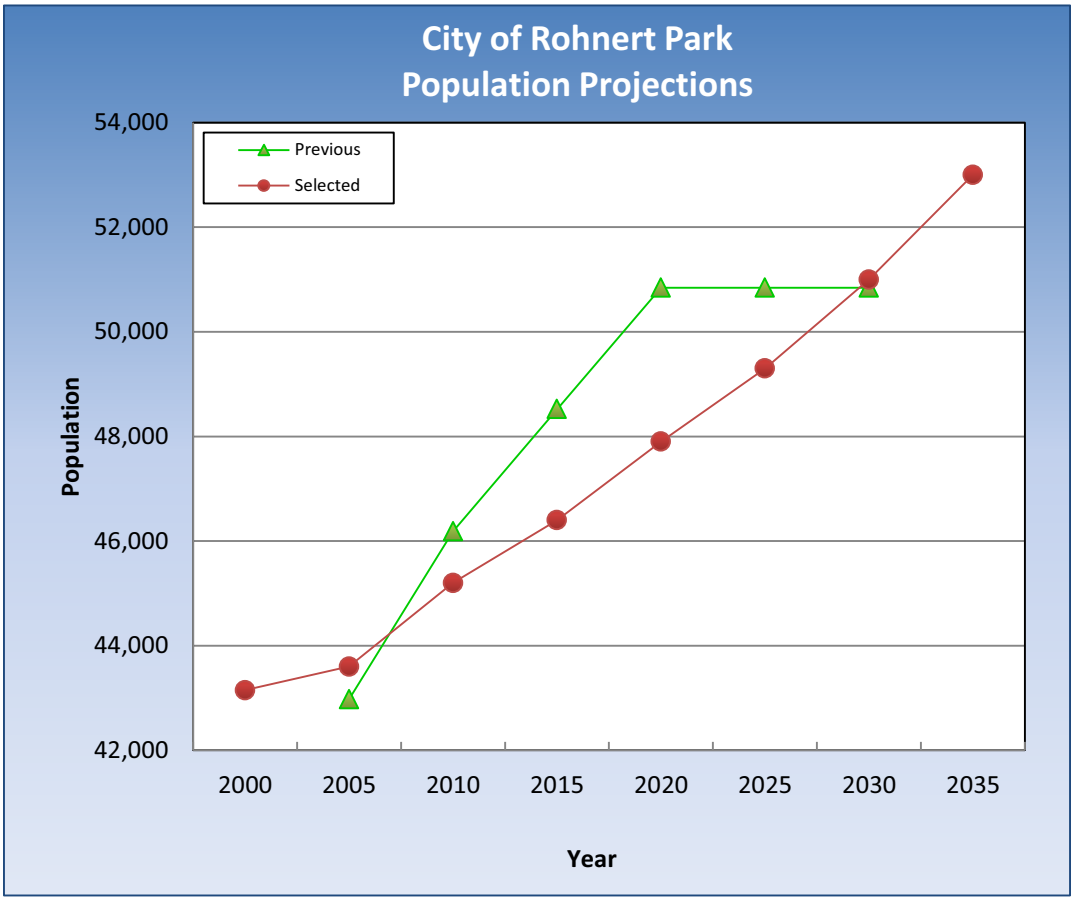


Table 1
Table of Population Projections

City of Rohnert Park Population Projections		
Year	Previous[1]	Selected[2]
2000		43,148
2005	42,971	43,600
2010	46,183	45,200
2015	48,517	46,400
2020	50,841	47,900
2025	50,841	49,300
2030	50,841	51,000
2035		53,000

Notes:
1) 2005 DSS Model data based on the 2000 City of Rohnert Park General Plan
2) Based on 2009 ABAG subregional data

Figure 4
Employment Projections

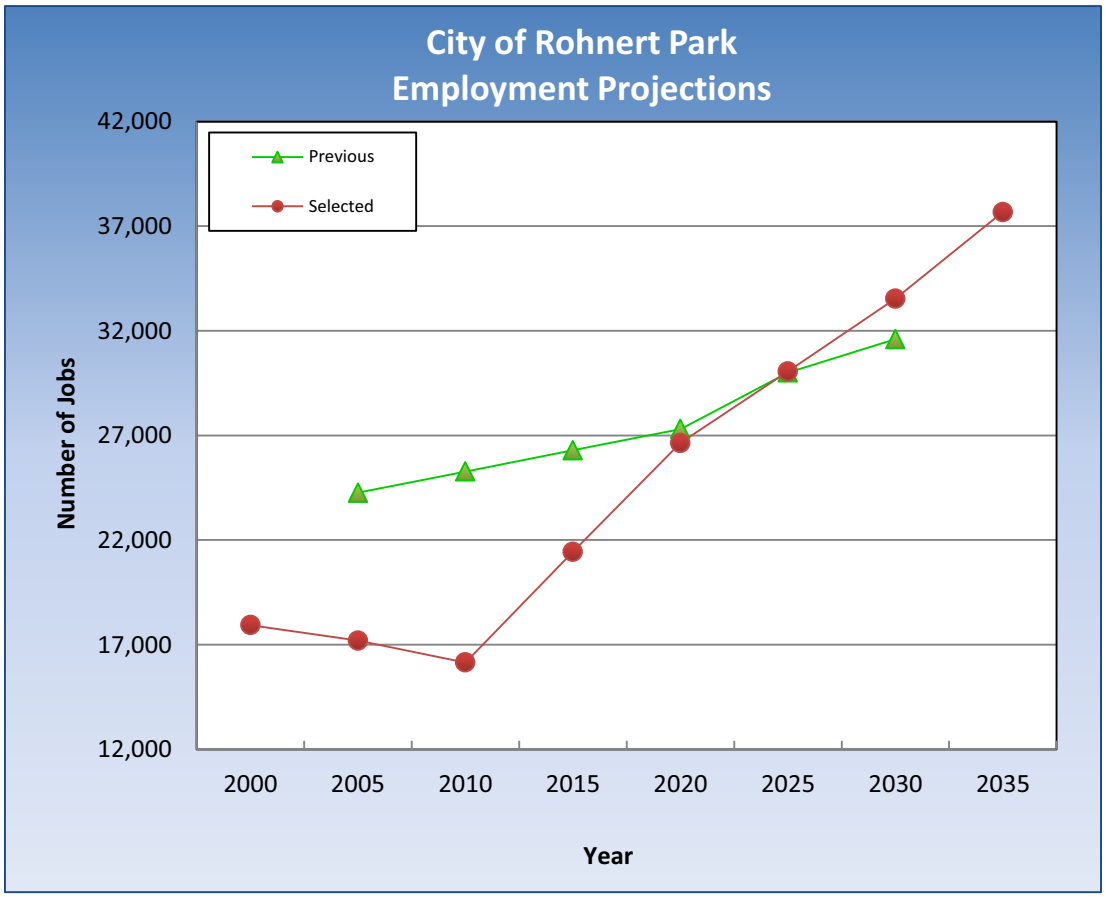


Table 2
Table of Employment Projections

City of Rohnert Park Employment Projections		
Year	Previous[1]	Selected[2]
2000		17,940
2005	24,264	17,200
2010	25,279	16,150
2015	26,293	21,440
2020	27,308	26,640
2025	30,003	30,060
2030	31,600	33,540
2035		37,670

Notes:

1) 2005 DSS Model data based on the 2000 City of Rohnert Park General Plan

2) Based on 2009 ABAG subregional data

4.2 Water Use and Demographic Data Inputs to the Model

Description of "Water Use Data Input Sheet"

Figure 5 is a two-page print out of an Excel spreadsheet. The purpose of this "Water Use Data Input Sheet" is to gather and document basic information about the individual service area. The data shown on the "Water Use Data Input Sheet" can be broken into two main categories, (a) current water use data and (b) demographic data. Each area is broken out below and helps to provide some basic definitions and assumptions.

(a) Water Use Data

- *Model Start Year* – This is the starting year for the analysis. For this project, the start year for the model is 2005. The selection of 2005 as a model start year allowed the historical conservation efforts to be included for the past 5 years (2005 to 2009). The DSS Model includes 30 years of data projecting information until the year 2035.
- *Base Year for Future Water Factors* - Based on an analysis of historical water billing data, each contractor selected a year or average of multiple years that is representative of current water use and used as a base year demand factor for developing future water use projections. The year 2007 was chosen by the City of Rohnert Parkfor the following reasons:
    1. The selected year, 2007, shows less of an effect of the recession. For all contractors the years 2008 and 2009 show a dip in water demand in many areas due to reduction in economic activity.
    2. The year selected had relatively "normal" climate conditions – i.e. not a drought or excessively wet year, so no significant weather adjustments were necessary. For all contractors the years 2008 and 2009 were affected by drought conditions. The water billing or production data was not weather normalized for this analysis.
    3. Meter reading data anomalies due to reading cycles for multifamily and commercial in 2005, 2006, and 2008 made averaging of multiple years problematic.
- No additional adjustment factors were added other than the "new single family home category" for three of the contractors (City of Santa Rosa, Valley of the Moon and North Marin Water District). The adjustment was made based on analysis of actual data which showed an increase in water use for homes built since 2000. Because Rohnert Park does not have data for new single family homes (no more than ten have been constructed in the last decade) this factor is not used in Rohnert Park. New single family homes are assumed to use the same amount of water as existing single family homes.
- *Average gal/day/acct*- This is the amount of water in gallons that is used per day, per account.
- *Indoor/outdoor water use* – This is the amount of water per account split into the percent that is used indoors and outdoors.
- *Consumption by customer class*- This shows the annual amount of water used for an entire calendar year, broken down by customer class (Single Family, Multi Family, Commercial, Irrigation, etc.)
- *Provision for New Single Family Account Use*– For selected agencies, and upon their specific request, a new category was created to model water use of new single family homes. This value is held constant in the baseline projection and not subject to plumbing codes. All new homes include the plumbing code change in the State of California that requires HETs in 2014. The new homes will also be affected by Cal Green building code after July 1, 2011 and required to install efficient fixtures for the toilets, low flow shower heads and faucets. The effects from Cal Green were run as a conservation measure as they were not in effect at the time of this analysis.

- *Unaccounted for water (UFW) also known as Non-Revenue Water* – This is the sum of all water input to system that is not billed (metered and unmetered) water consumption, including apparent (metering accuracy) and real losses. The values were calculated by taking the difference between the amount of water produced and the amount of water that was sold. Data provided by the water contractor was used, if provided, unless UFW was less than 7 percent, in which case 7 percent was used.
- *Water Produced*– This is the total amount of potable water produced. The water can come from multiple sources including amount purchased from SCWA, purchased from other agencies, local surface water, or obtained from groundwater. This does not include recycled water.
- *Peak day factor* – The ratio of water produced on the maximum day of the year to that produced on the average day.

(b) Demographic Data

- *Census 2000* – The 2000 Census data was used as a general reference when determining population and household sizes for each individual city (and/or unincorporated area) serviced by the water agencies.
- *2005 City of Rohnert Park Service Area Population*- The 2005 total population for the City of Rohnert Park was taken directly from the 2005 selected population source discussed earlier in this report.
- *Single and multi family dwelling units*- The 2005 single family dwelling units is equal to the number of single family accounts for 2005. The 2005 multi family dwelling unit estimate was calculated by applying a growth factor to the 2000 data as noted on the water use data sheet in Figure 5.
- *Procedure for service areas not contiguous with city boundaries* – When a service area serves outside a city boundary, estimates were generated either from census tract data when available for the unincorporated areas, Department of Finance data, ABAG Projections, DWR reported data, General Plan or by the local water district if known. If none of the six sources were available, then the modeling team worked with the local water district to make reasonable estimates.
- *Employment data*– The employment figures were obtained from the selected source as discussed earlier in this report.

In summary, the key features of this sheet include the existing 2005 level of water use, 2005 baseline accounts in each customer category, and 2005 baseline forecasts for population and employment.

Figure 5
Water Use Data Input Sheet

City of Rohnert Park Service Area[1]

DSS Input Sheet

November 12, 2010

Base Year Average Use and Indoor Percentages by Billing Category for DSS Model[2]

	Single family		Multifamily		Commercial		Institutional/Ind	
Year	Average, gpd/a	Indoor	Average, gpd/a	Indoor	Average, gpd/a	Indoor	Average, gpd/a	Indoor
2007	287	59%	3320	78%	1051	78%	1001	23%

New Single Family category was removed at the request of Darrin Jenkins of Rohnert Park due to lack of new single family home data.

Irrigation	
Average, gpd/a	Indoor
1453	0%

Data for DSS Model - - Start Year: 2005

Category	Number of Accounts	Water Use gpd/a [2]	Water Use, MGD	Use Profile Percent	Water Use gcd	Indoor Water Use gcd
Single family	7,590	287	2.177	49.48%	95	57
Multifamily	413	3,320	1.371	31.18%	70	54
Commercial	462	1,051	0.485	11.04%	28	22
Institutional/Ind	2	1,001	0.002	0.05%		
Irrigation	250	1,453	0.363	8.26%		
Total [9]	8,717	7,112	4.399	100%		

Projected UFW for DSS Model[5]	**7.0%**	Percent	7% if actual is < 7%, otherwise = agreed upon % by agency for 30 year forecast
Water Produced for use in DSS Model[4]	**4.73**	MGD	Add UFW % to Total Billed Water Use
Peaking Factor	1.5	Ratio of average day in peak month to average day water produced	
Peaking Factor for DSS Model=	**1.5**	Ratio of average day in peak month to average day water produced	

- Blue cells are entered by modeler

- Yellow cells are input to DSS Model

NOTES

1. - The City of Rohnert Park, located in the southern Santa Rosa plain of Sonoma County, depends upon ground water and Sonoma County Water Agency (SCWA) aqueduct water to meet the demands of its 42,000 residents. Water is obtained during peak demand periods from 12 turnout connections to the SCWA. The principal source of water is the SCWA (80 percent) and local groundwater makes up the remaining 20 percent of supply. The City does not deliver water outside the city limits. The water distribution system consists of approximately 90 miles of water mains. Rohnert Park has seven reservoirs with 4.2 million gallons of storage.

2 - Average gpd/a is based on data supplied by the water agency

3 - Number of accounts is from data provided by water agency for this project

4 - Total water produced is calculated from the total billed water use and the projected UFW.

5 - Unaccounted for Water (UFW) is the percent difference between the total water purchased and the total billed water use. As noted above if the UFW was lower than 7%, for planning purposes a value of 7% was used.

6 - For reference see additional population estimates provided in population and employment estimates corresponding to service area table.

7 - Initial estimate based on census data for renter occupied units. For reference see table with 2000 census data for corresponding water service area.

8 - Group Quarters Population includes Institutionalized and non-Institutionalized and assumes their water use is in the Commercial sector.

Definitions / Abbreviations

ABAG	Association of Bay Area Governments	HHS	household size
DOF	Department of Finance	NA	not available
DSS	Decision Support System Model	MF	multi family
du	dwelling unit	MGD	million gallons per day
DWR	Department of Water Resources	No.	number
FY	Fiscal Year	Pop	population
gcd	gallons per capita / per day	Res	residential
gpd/a	gallons per day / per account	SF	single family
gpd	gallons per day	UFW	unaccounted for water

Data Prepared :	June 26, 2005	By: W. Maddaus
Revised:	July 21, 2010	By: W. Maddaus
	November 12, 2010	By: C. Matyas

Water Use Data Input Sheet (Page 2)

City of Rohnert Park Service Area[1]

Reconcile agency account billing data and census data

Total Dwelling Units in Census 2000 for Rohnert Park by Census Track

Single family		2000 Units	No. Buildings	Service Area Billing Accounts - Year 2000 [3]	Difference between billing and census data	Data Sources / Notes	
1-detached		7,662	7,662				
1-attached		1,699	850				
Subtotal		9,361	8,512	7,590	-922	*When negative value some of the attached units classified by City as Multifamily*	
Multi family							
2-units		106	53			*Assumes average of 2 units per account*	
3-4 units		824	235			*Assumes average of 3.5 units per account*	
5 to 9 units		615	88			*Assumes average of 7 units per account*	
10 to 19 units		562	37			*Assumes average of 15 units per account*	
20 or more units		2,938	84			*Assumes average of 50 units per account*	
mobile homes		1,362	27			*Assumes average of 50 mobile home units per master meter*	
Subtotal		6,407	525	413	-112	*Must be more than one building on an MF meter.*	
	MF Average =	12.2	units/building	15.5	units/account	This is a typical value of DUs/account	
	MF for Billing =	8,106	1,374	19.63	units/account	Water use at 150 gpd/unit	2944.1
	Total SF + MF units =	15,768				150 say	2800 gpd/account

2000 Census Group Quarters Data			2000 Census Data
Institutionalized	0	Average household size	2.65
Non-Institutionalized	1,101	Average household size of single family unit	3.06
Total	1,101	Average household size of multi family unit	2.04
		Homeowner vacancy rate (percent)	0.01
		Rental vacancy rate (percent)	0.02

Population and Household Size in Census 2000 for Rohnert Park

		Census Data Service Area 2000	2009 ABAG Projections Estimated Population 2005	Estimated Service Area Residential Population 2005		Data Sources / Notes	
						Estimated annual growth from 2000 to 2005 (ABAG 2009 Subregional Projections):	*0.21%*
						Estimated annual employment growth from 2000 to 2005 (ABAG 2009 Employment Projections):	*-0.82%*
Total Population from Census data [6] =		42,236	43,600	*Based on 2009 ABAG data*			
Subtract Group Quarter Population =		1,101	1,113				
Residential Population =		41,135	42,487			*Water use for the institutionalized population is accounted for in nonresidential billing categories*	
Avg. HHS [7] =		2.61	2.61			*Residential population shown corresponds to the city or cities represented by Census data*	
MF Pop @ MF HHS [7] =	2.40	19,454	19,659	19,659	45.1%	*Percent of Population that is MF*	
SF Pop =		21,681	22,829	22,829	52.4%	*Percent of Population that is SF*	
SF HHS [7] =		2.86	3.01	1,113	2.6%	*Percent of Population in Group Quarters*	
			Total	43,600	100.0%		

Estimate Service Area Dwelling Units for 2005		
SF Res	7,590	*Equals No. of single family accounts in start year*
MF Res	8,106	*Equals No. of multifamily accounts times average units per account*

4.3 Key Assumptions for the DSS Model

Table 3 shows the key assumptions used in the model. The assumptions having the most dramatic effect on future demands are the natural replacement rate of fixtures, how residential or commercial future use is projected, and finally the percent of estimated water losses.

Table 3
List of Baseline Demand Projection Assumptions for DSS Model

List of Baseline Demand Projection Assumptions for DSS Model	
Parameter	Model Input Value, Assumptions, and Key References
Model Start Year	2005
Water Demand Factor Year(s)	Average of Years: 2007
Peak Day Factor	1.49
Unaccounted for Water in the Start Year	7.0%
Population Projection Source	2009 ABAG Subregional
Employment Projection Source	2009 ABAG Subregional
Number of Water Accounts for Start Year	8717
Avoided Cost of Water $/AF (includes SCWA cost + $27.7 / AF for pumping cost)	$631.62
Distribution of Water Use Among Categories	Single Family: 49.5% Multifamily: 31.2% Commercial: 11% Industrial/Institutional: 0% Irrigation: 8.3%
Indoor Water Use by Category	Single Family: 59.4% Multifamily: 77.8% Commercial: 77.7% Industrial/Institutional: 23.3% Irrigation: 0%
Residential End Uses	AWWARF Report “Residential End Uses of Water” 1999
Non-Residential End Uses, %	AWWARF Report Commercial End Uses of Water” 1999
Efficient Residential Fixture Current Installation Rates	U.S. Census, Housing age by type of dwelling plus natural replacement plus rebate program (if any). Reference "High Efficiency Plumbing Fixtures - Toilets and Urinals" Koeller & Company July 23, 2005. Reference Consortium for Efficient Energy (www.cee1.org)
Water Savings for Fixtures, gal/capita/day	AWWARF Report “Residential End Uses of Water” 1999, , CUWCC Cost and Savings Study April 28, 2005, Agency supplied data on costs and savings, professional judgement where no published data availble
Non-Residential Fixture Efficiency Current Installation Rates	U.S. Census, assume commercial establishments built at same rate as housing, plus natural replacement
Residential Frequency of Use Data, Toilets, Showers, Washers, Uses/user/day	Falls within ranges in AWWARF Report “Residential End Uses of Water” 1999
Non-Residential Frequency of Use Data, Toilets and Urinals, Uses/user/day	Estimated based using AWWARF Report “Commercial and Institutional End Uses of Water” 1999
Natural Replacement Rate of Fixtures	Residential Toilets 3% (1.28 gpf toilets), 4% (1.6 gpf and higher toilets) Commercial Toilets 3% (1.28 gpf toilets), 4% (1.6 gpf and higher toilets Residential Showers 4% Residential Clothes washers 6.7% A 3% replacement rate corresponds to 33 year life of a new fixture. A 6.67% replacement rate corresponds to 15 year washer life based on “Bern Clothes Washer Study, Final Report, Energy Division, Oak Ridge National Laboratory, for U.S. Department of Energy, March 1998, Internet address: www.energystar.gov
Future Residential Water Use	Increases Based on Population Growth
Future Non-Residential Water Use	Increases Based on Employment Growth

4.4 Water Demand Projections With and Without the Plumbing Code

Development of the Water Demand Projections Table and Graph

Water demand projections were developed out to the year 2035 using the Demand Side Management Least Cost Planning Decision Support System (DSS) model. This model incorporates information from the:

- "Water Use Data Sheet" and the "Key Assumptions"
- Questions asked of agencies
- Contractor provided data
- 2000 Census data and 2006-08 American Community Survey 3 year estimates
- Local General Plans
- Association of Bay Area Governments Projections

Water demand projections were input for 30 years using the DSS Model. This model incorporates information from the:

- Contractor selected population and employment forecasts.
- Data provided by City of Rohnert Park staff including estimates for value of water saved, historical water use, past conservation efforts, and water system facilities.

Table 4 shows the projected demands with and without plumbing codes and appliance standards. This page includes both a table and a graph. Each will be described below.

National Plumbing Code

The Federal Energy Policy Act of 1992, as amended in 2005 requires only fixtures meeting the following standards can be installed in new buildings:

- Toilet – 1.6 gal/flush maximum
- Urinals – 1.0 gal/flush maximum
- Showerhead - 2.5 gal/min at 80 psi
- Residential Faucets – 2.2 gal/min at 60 psi
- Public Restroom Faucets - 0.5 gal/min at 60 psi
- Dishwashing pre-rinse spray valves – 1.6 gal/min at 60 psi

Replacement of fixtures in existing buildings is also governed by the Federal Energy Policy Act that requires only devices with the specified level of efficiency (shown above) can be sold today (2010). The net result of the plumbing code is that new buildings will have more efficient fixtures and old inefficient fixtures will slowly be replaced with new more efficient models. The national plumbing code is an important piece of legislation and must be carefully taken into consideration when analyzing the overall water efficiency of a service area.

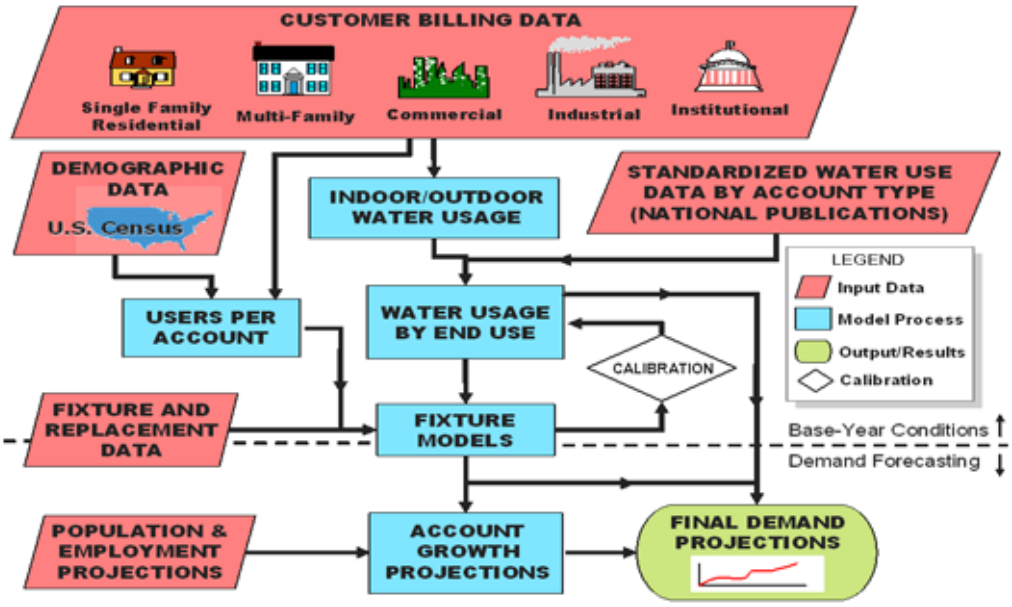
In addition to the plumbing code the US Department of Energy regulates appliances such as residential clothes washers. Regulations to make these appliances more energy efficient has driven manufacturers to dramatically reduce the amount of water these efficient machines use. Generally horizontal axis washing machines use 30-50 percent less water than conventional models (which are still available). In the analysis for City of Rohnert Park, the DSS Model forecasts a gradual transition to high efficiency clothes washers (using 19 gallons or less) so that by the year 2020 this will be the only type of machines purchased. In addition to the industry becoming more efficient, rebate programs for washers have been

successful in encouraging customers to buy more water efficient models. Given that machines last about 15 years eventually all machines in the City of Rohnert Park area will be of this type.

State Plumbing Code

The Plumbing Code includes the new California State Law requiring High Efficiency Toilets and High Efficiency Urinals be exclusively sold in the state by 2014. Figure 6 below describes conceptually how the above listed items are incorporated into the flow of information in the DSS Model.

Figure 6
DSS Model Overview Used to Make Potable Water Demand Projection
"With the Plumbing Code"



Graph of projected demands (Figure 7)

Figure 7 shows the potable water demand projection at five-year increments. The graph shows projections for demand with and without the plumbing code through 2035.

Table of water demand projections (Table 4)

The table of water demands projections includes:

1. The water demand projections shown in Table 4 are based on the future population and employment projections provided in Table 1 and Table 2.
2. Projections were made *with and without* the plumbing codes.
3. Projections are for potable water only. It does not include recycled water use. Recycled water use and projections are included in a separate Chapter of the UWMP.

Dry Year Demands

The demand projections reflect average weather conditions and **do not** reflect drier and hotter drought conditions. Climate change, which might alter weather patterns, either increased or decreased rainfall, and possibly increased irrigation demand in the spring and fall due to a warmer climate have also not been addressed in this analysis.

Figure 7
Potable Water Use Projections for City of Rohnert Park

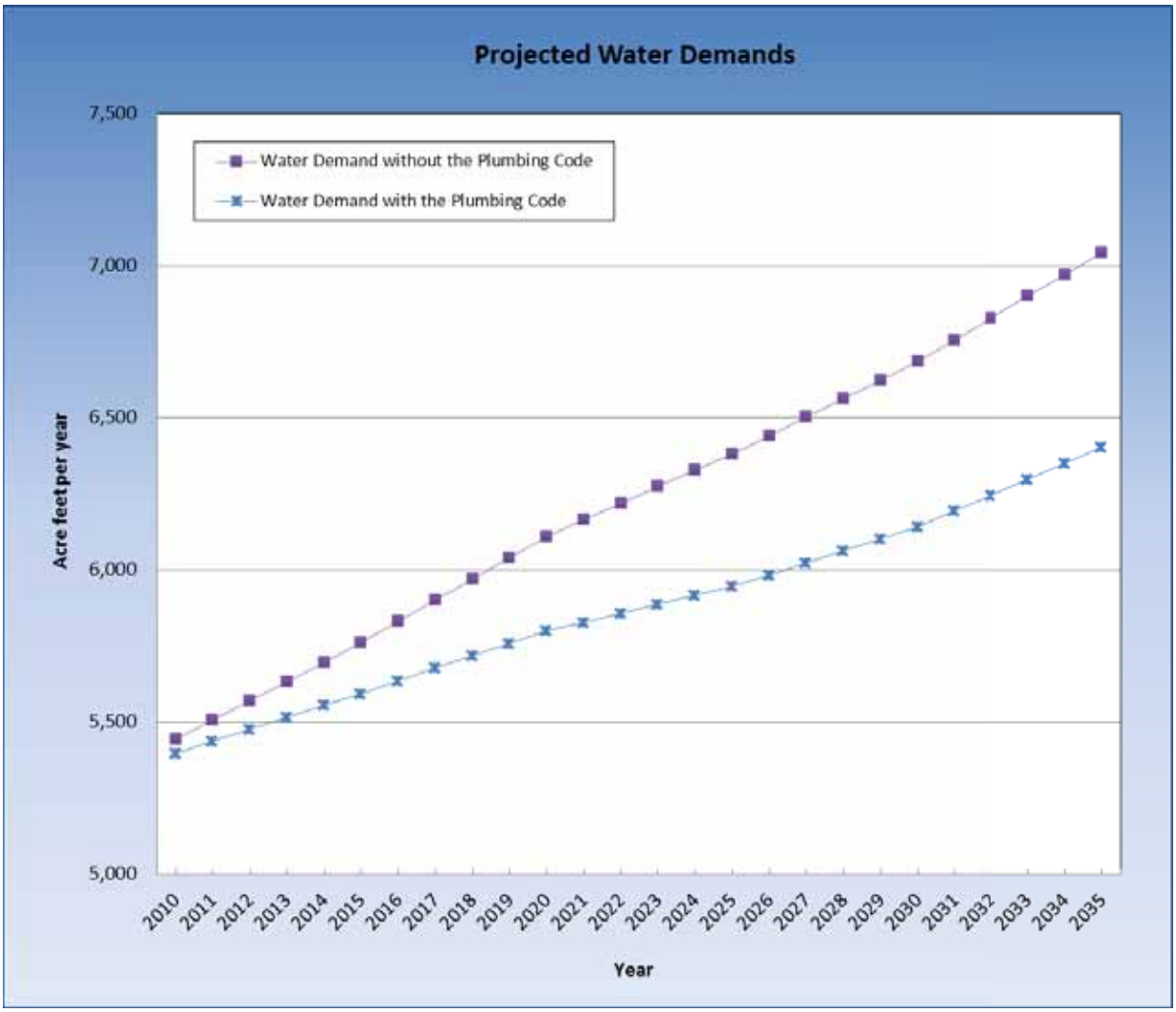


Table 4
Potable Water Use Projections for City of Rohnert Park

Water Demands						
Water Demand (AF/Yr)	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Water Demand without the Plumbing Code	5,444	5,760	6,109	6,380	6,684	7,042
Water Demand with the Plumbing Code	5,396	5,593	5,800	5,946	6,143	6,404

*Data is not weather normalized. Total Water use is potable only. Does not include recycled water use. Recycled water use and projection are in a separate section in the UWMP.

4.5 Water Demand Projections – 2005 Urban Water Management Plan (UWMP) Format

The 2010 Urban Water Management Plan Guidance Document from the California Department of Water Resources is not planned to be released until after December 2010. Without the guidance document, the exact formatting of the tables for the 2010 UWMP are not known. Therefore, it was elected to place the demand data into the 2005 UWMP format.

Conversion of the Water Demand Projections Table and Graph to 2005 UWMP Format

The 2005 Urban Water Management Plan Guidance Document from the California Department of Water Resources (DWR) requests that future demand information be in a specific format. Provided below are the five tables relating to future average day demands they requested. The demand projection shown is the "with Plumbing Code" demands and is otherwise the same as Table 4 and Figure 7. The demand projections in the Urban Water Management Plan appeared in the required DWR tables 2, 12, 13, 14, and 15 (2005 Plan requirement table numbers).

Urban Water Management Plan Tables for of 2005 UWMP

Table 5 below provides population projections for City of Rohnert Park service area.

Table 5 (DWR Table 2) Population – Current and Projected

Current and Projected Population	
Year	**Population**
2010	45,200
2015	46,400
2020	47,900
2025	49,300
2030	51,000
2035	53,000

Current and Future Water Use by Customer Type

The current and projected number of connections and deliveries to the City's water distribution system, by sector are identified below on Table 6.

Table 6 (DWR Table 12) Current and Projected Water Deliveries

Demands and Accounts By Customer Category (Based on Demand with Plumbing Code, excluding UFW)							
Year		**Single Family**	**Multifamily**	**Commercial**	**Industrial/ Institutional**	**Irrigation**	**Total**
2010	**Number of Accounts**	7,869	435	434	2	259	8,998
	Deliveries (AF/Yr)	2,510	1,579	504	2	422	5,016
2015	**Number of Accounts**	8,077	453	576	2	266	9,375
	Deliveries (AF/Yr)	2,537	1,593	637	3	433	5,202
2020	**Number of Accounts**	8,339	475	716	3	275	9,807
	Deliveries (AF/Yr)	2,569	1,609	766	3	447	5,394
2025	**Number of Accounts**	8,582	490	807	3	283	10,166
	Deliveries (AF/Yr)	2,597	1,620	849	4	460	5,530
2030	**Number of Accounts**	8,878	507	901	4	292	10,582
	Deliveries (AF/Yr)	2,650	1,647	935	4	476	5,713
2035	**Number of Accounts**	9,226	527	1,012	4	304	11,073
	Deliveries (AF/Yr)	2,727	1,689	1,041	5	495	5,956

Water Sales to Other Agencies

The City of Rohnert Park does not currently sell water to any other agency. According to City of Rohnert Park, all "outside sales" are local businesses and residents, and not to another agency.

Table 7 (DWR Table 13) Sales to Other Agencies

Sales to Other Agencies						
	2010	2015	2020	2025	2030	2035
Water Distributed (AF/Yr)	0	0	0	0	0	0

Unaccounted-for Water and Additional Water Use

For this project unaccounted for water is defined to be the difference between water produced and water sold to customers. Unaccounted-for water use normally includes unmetered water use such as for fire protection and training, system and street flushing, sewer cleaning, construction, system leaks, meter inaccuracy, and unauthorized connections. Unaccounted-for water can also result from meter inaccuracies.

Table 8 (DWR Table 14) Additional Water Uses and Losses, AF/yr

Unaccounted for Water						
	2010	2015	2020	2025	2030	2035
Unaccounted-for system losses (AF/Yr)	379	391	406	416	430	448

Total Water Use

The total current and future water use for the system is shown in the table below.

Table 9 (DWR Table 15) Total Potable Water Use, AF/yr*

Total Demand with Plumbing Code						
	2010	2015	2020	2025	2030	2035
Total Demand with Plumbing Code and UFW (AF/Yr)	5,396	5,593	5,800	5,946	6,143	6,404

*Total Water use is potable only. Does not include recycled water use. Recycled water use and projection are in another section of the UWMP.

5. COMPARISON OF INDIVIDUAL CONSERVATION MEASURES

5.1 Selecting Conservation Measures to be Evaluated (Conservation Measure Screening)

An important step in updating the water conservation program is the review and screening of new water conservation measures. In 2005, a list of 75 potential conservation measures was developed by Maddaus Water Management from known technology that included devices or programs (e.g., such as a high efficiency toilet) that would save water if installed by a water retailer, contractor, or customer. These measures are considered to be beyond the Tier One measures. A description of the potential conservation measure was developed that addressed the methods through which the device or program will be implemented, including the distribution method, or mechanism, that would be used to activate the device or program.

A screening process was undertaken to reduce the number of measures to a more manageable number and to eliminate those measures that are not as well suited to the Marin-Sonoma County area as other

potential measures. Each potential measure was screened based on four qualitative criteria (below), scored on a scale of 1 to 5, with 5 being the most acceptable, and 20 being the maximum possible number of points for all criteria. The screening was completed by local conservation professionals, in a one day meeting in July 2005, facilitated by Maddaus Water Management.

Qualitative Criteria

The rating group used the following criteria to evaluate the measures:

- **Technology/Market Maturity** – Refers to whether the technology needed to implement the conservation measure, such as an irrigation control device, is commercially available and supported by the local service industry. A measure was scored low if the technology was not commercially available or high if the technology was widely available in the service area. A device may be screened out if it is not yet commercially available in the region.
- **Service Area Match** – Refers to whether the measure or related technology is appropriate for the area's climate, building stock, or lifestyle. For example, promoting Xeriscape gardens for multi-family or commercial sites may not be appropriate where water use analysis indicates little outdoor irrigation. Thus, a measure scored low in this category if it was not well suited for the area's characteristics and could not save water. A measure scored high in this criterion if it was well suited for the area and could save water.
- **Customer Acceptance/Equity** – Refers to whether retail customers within the wholesale customer service area would be willing to implement and accept the conservation measures. For example, would retail customers attend homeowner irrigation classes and implement lessons learned from these classes? If not, then the water savings associated with this measure would not be achieved and a measure with this characteristic would score low for this criterion. This criterion also refers to retail customer equitability (i.e., one category of retail customers receives benefit while another pays the costs without receiving benefits). Retail customer acceptance may be based on:
    - Convenience
    - Economics
    - Perceived fairness
    - Aesthetics
- **Relative Effectiveness of Measure Available** – Refers to the selection of the most effective measure if alternate conservation measures address the same end use (example – irrigation for single family customers). If the measures are equally effective the most appropriate was selected (e.g., the measure that was easier or less expensive to implement).

Measures with low scores were eliminated from further consideration, while those with high scores passed into the next evaluation phase (cost-effectiveness analysis using the DSS Model). To reduce the list to a more manageable number, normally a score of 17 or more was necessary to pass. The process reduced the measures to be evaluated further down to 22 new measures in addition to the 10 Tier One measures.

Upon inspection of the overall list of new measures it became apparent that some measures could be combined and others could be separated into two categories as follows:

- Measures that were voluntary and incentive based
- Measures that were regulatory and applied to new development only

This division was used to create two lists of measures that could be evaluated separately. Tier Two targets various types of customers and offers a range of incentives to enhance participation. New Development measures were originally targeted at single family homes (including town homes and condos), as this category represents the largest category of new development with the most water savings potential.

The following table presents the measure descriptions that were originally analyzed as part of the 2005 study for "Tier 2" and "New Development" (ND) as well as the new measures that the contractors selected for this analysis. We have not modified the Tier 2 and New Development measure descriptions from their original description other than to add information for Cal Green, SB 407, and the Model Water Efficient Landscape Ordinance. The Tier 1 measures follow the definition of the CUWCC BMPs.

Cal Green (New Development Building Code): MWM added the Cal Green requirements that effect all new development in the State of California after January 1, 2011. MWM modeled water savings from the Cal Green building code by adding Multifamily and Commercial customer categories as appropriate to the following six measures: Tier 2 – 13 (Urinals), ND 1 (Rain Sensors), ND 2 (Smart Controllers), ND 3 (HETs), ND 7 (High Efficiency Faucets and Showerheads) and ND 8 (Landscape Requirements). As this is a new development law and based on discussions with contractors it was assumed actual water savings seen by contractor would begin to occur in the year 2012. The new development ordinances for each contractor are listed in Table 10.

SB 407 (Plumbing Fixture Retrofit on Resale or Remodel): MWM included the new California Law SB 407 to the measure description table and in all of the contractors' models as a new measure. In the model MWM worked carefully such that SB 407 takes into account the overlap with the plumbing code (natural replacement), Cal Green and rebate programs (such as through Tier 2-10 Toilets). SB 407 begins from the year 2017 in residential and 2019 in commercial properties. SB 407 program length continues until all the older high flush toilets have been replaced in each service area.

Tables 11, 12, 13 and 14 summarize the new measures selected for each contractor. Note that measures Tier 2-8, Tier 2-9 and Tier 2-11 were removed from this program at the request of all the contractors on August 2, 2010 for the following reasons:

- Measure Tier 2-8 was removed because new development regulations have changed significantly since this measure was analyzed in 2005 and the regulations require higher efficiency fixtures than this measure.
- Measure Tier 2-9 was removed as rebates for installing synthetic turf are incorporated into Measure Tier 2-2, Cash for Grass.
- Measure Tier 2-11 was removed because this measure is not cost-effective.

The removed measures are included in Table 13 for reference purposes only, but were not included in any of the DSS Model or any of the quantitative water saving calculations.

Table 10
New Development Ordinances

New Development Ordinances								
ND Measure	NMWD	City of Rohnert Park[1]	City of Cotati[2]	City of Santa Rosa	Town of Windsor	City of Sonoma	Valley of the Moon WD	Draft Cal Green Requirement
Applicability (Customer Classes)	All	All	All	All	All	All	All	All
ND1-Rain Sensor Retrofit	2005	No	No	2010	2010 (SF>4 lots) & >2,500 sq ft/lot	No	2010, SF>5,000 sq ft	No
ND2-Smart Irrigation Controller	2005	No	2010	2010	2010 (SF>4 lots) & >2,500 sq ft/lot	No	2010, SF>5,000 sq ft	Yes
ND3- High Efficiency Toilets	2005	No	2009	2011	No	No	No	Yes
ND4-Dishwasher New Efficient	2005	No	2009	No	No	No	No	No
ND5-Clothes Washing Machine Requirement	2000	No	2009	No	No	No	No	No
ND6-Hot Water on Demand	No	No	No	No	No	No	No	No
ND7-High Efficiency Faucets and Showerheads	2006	No	2009	2011	No	No	No	Yes
ND8-Landscape and Irrigation Requirements	2004	2010 (State ordinance)	2010	SF since 2007. All other since 1993	2011 for landscapes > 2,500 sq ft (applies to all but SF<5 lots)	2010 (adopted ordinance planned to be adopted September 1, 2010, budgets w/ 60% ET	2010 for All except SF<5,000 sq. ft. and turf<600 sq ft	Yes
Urinals	2008	No	No	2011	No	2009	No	Yes
Source	NMWD Reg 15	Use Build it Green Checklist (Mandatory)	Use Build it Green Checklist (Mandatory)	Adopting Cal Green 2010	Adopting Landscape ordinance June 2010	Use Build it Green Checklist (Mandatory)	County ordinance effective Jan 1, 2010	State Reqmt; May take effect 2012

[1]City of Rohnert Park has extensive green building ordinance requiring developers to select from a set of green building measures including some of the listed measures.
[2]City of Cotati ND-3 confirmed to start in 2009 based on July 27, 2010 with City of Cotati at the request of Damien O'Bid. Build It Green Checklist mandatory, beginning in the year 2004. The year 2009 was selected as a start date for 100% deployment of measures, as the measures can be selectively deployed providing the overall point minimum is achieved.

Table 11
Cal Green Building Code

Cal Green Building Code						
Building Class	**Component**	**Effective Date[i]**	**Indoor Fixtures Included**	**Indoor Requirement**	**Landscaping & Irrigation Requirements**	**Are the Requirements Mandatory?**
Residential	Indoor	1/1/2011	Toilets, Showers, Lavatory & Kitchen Faucets, Urinals	Achieve 20% savings overall below baseline		Yes
	Outdoor	1/1/2011			Provide weather adjusting controllers	Yes
Non Residential	Indoor	1/1/2011	Submeter leased spaces	Only if building >50,000 sq. ft. & if leased space use >100 gpd		Yes
			Toilets, Showers, Lavatory & Kitchen Faucets, Wash Fountains, Metering Faucets, Urinals	Achieve 20% savings overall below baseline		Yes
	Outdoor	1/1/2011			Provide water budget	> 1,000 sq ft. landscaped area
					Separate meter	As per Local or DWR ordinance
					Prescriptive landscaping requirements	> 1,000 sq ft. landscaped area
					Weather adjusting irrigation controller	Yes

[i] Effective date is 7/1/2011 for toilets

Table 12
Tier One Conservation Measures Evaluated in the DSS Model

Measure Number	Original CA BMP Number	Target Customer Category	Measure	Short Description
1	1	RSF, RMF	Residential Water Surveys - Indoor	This is the indoor component of indoor and outdoor water surveys for existing single-family and multi family residential customers. Normally those with high water use are targeted and provided customized report to homeowner.
2	1	RSF, RMF	Residential Water Surveys - Outdoor	This is the outdoor component of indoor and outdoor water surveys for existing single-family and multi family residential customers. Normally those with high water use are targeted and provided customized report to homeowner.
3	2	RSF, RMF	Residential Retrofit	Provide owners of pre-1992 homes with retrofit kits that contain easy-to-install low flow showerheads, faucet aerators, and toilet tank retrofit devices, until saturation reaches 75%.
4	5a	IRR	Water Budgets	90% of all irrigators of landscapes with separate irrigation accounts would receive a monthly or bi-monthly irrigation water use budget.
5	5b	IND	Large Landscape Conservation Audits	All public and private irrigators of landscapes larger than one acre would be eligible for free landscape water audits upon request.
6	6	RSF	Clothes Washer Rebate	Homeowners would be eligible to receive a rebate on a new water efficient clothes washer.
7	7	RSF, NRSF	Public Information Program	Public education would be used to raise awareness of other conservation measures available to customers. Programs could include poster contests, speakers to community groups, radio and television time, and printed educational material such as bill inserts, etc.
8	9	COM	Commercial Water Audits	High water use accounts would be offered a free water audit that would evaluate ways for the business to save water and money.
9	14	RSF	Single Family Residential ULF Toilet Rebate	Homeowners would be eligible to receive a rebate to replace an existing high volume toilet with a new water efficient toilet.
10	14	RMF	Multi family Residential ULF Toilet Rebate	Homeowners would be eligible to receive a rebate to replace an existing high volume toilet with a new water efficient toilet.

Notes:

RSF = Residential Single Family RMF = Residential Multi Family NRSF = New Residential Single Family

COM = Business INS = Institutional IND = Industrial

Table 13
Tier Two and New Development Conservation Measures Evaluated in the DSS Model

Measure No.	Name of Measure	Customer Sector	Description
Tier 2-1	Rain-sensor (shut off device) retrofit on irrigation controllers	Existing Customers SF	Agency pays for the rain sensor, homeowner pays for the optional installation ($35).
Tier 2-2	Cash for Grass (turf removal program)	Existing Customers SF, MF, CII	Provide a rebate for customers who remove irrigated turf grass and replace it with low water using plants. The rebate would require that an appropriate irrigation system be installed for the replacement landscaping. Limited to $500 rebate at $1.00 per square foot.
Tier 2-3	Financial Incentives for Being Below Water Budget	All Dedicated Irrigation Meter customers	For dedicated irrigation customers, link a landscape water budget to a retail water agency's rate schedule so that the dedicated irrigation meter customer pays less when their water use is at or under their water budget.
Tier 2-4	Financial Rebates for Irrigation Meters	Existing CII Customers with mixed water use (indoor and outdoor)	Provide financial incentives/rebates for selected permits and equipment to convert mixed use meters to a separate dedicated irrigation meter. Model implementation program after City of Santa Rosa's Service Split program. Utility will provide a water budget for the new irrigation meter.
Tier 2-5	Smart Irrigation Controller Rebates	Existing Customers SF, MF, CII, IRR	Provide an up to $450 rebate for the purchase of a SMART irrigation controller and associated signal fees (up to $150). Assume one controller for RSF and two for others. Minimum participant requirements: at least 500 sq ft of well maintained turf irrigated with an automatic irrigation control system.
Tier 2-6	Financial Incentives/ Rebates for Irrigation Upgrades	Existing Customers MF, CII, IRR, and SF for some contractors if requested as a new measure	For MF & CII customers with landscape provide rebates for selected types of irrigation equipment upgrade including rain sensors, rain harvesting, and grey water. Each contractor can include any equipment desired and allow the customers to select the items they prefer up to the maximum rebate value per customer. Water savings assumes a mixture of many different irrigation technologies. Model program after water agencies such as EBMUD or Contra Costa Water District or Santa Rosa.
Tier 2-7	Hotel retrofit (w/financial assistance) - CII Existing	Existing Customers: CII	Following a free water audit, offer the hotel a rebate for equipment identified that would save water. Provide a rebate schedule for certain efficient equipment such as air-cooled ice machines, steamers, washers, cooling towers, and spray rinse valves.
Tier 2-10	High Efficiency Toilet (HET)	Existing Customers: SF & MF	Provide a rebate or voucher for the installation of a high efficiency toilet (HET). HET are defined as any toilet to flush 20% less than an ULFT and include dual flush technology. Rebate amounts would reflect the incremental purchase cost.

Measure No.	Name of Measure	Customer Sector	Description
Tier 2-12	CII Rebates - replace inefficient water using equipment	Existing Customers: CII	Provide a rebate for a standard list of water efficient equipment. Included would be x-ray machines, icemakers, air-cooled ice machines, steamers, washers, spray valves, efficient dishwashers, replace once through cooling, add conductivity meters on cooling towers, etc.
Tier 2-13	0.5 gal/flush urinals in new buildings	New Customers: CII	Require that new buildings be fitted with 0.5 gpf or less urinals rather than the current standard of 1.0-gal/flush models.
ND1	Rain-sensor shut off device on irrigation controllers	New Customers: SF, MF and CII depending upon local ordinances and contractor request of new measures	Require-sensor or rain shut off devices with all new automatic irrigation system installations on new homes.
ND2	Smart Irrigation Controller	New Customers: SF, MF and CII depending upon local ordinances and contractor request of new measures	Require developers to provide the latest state of the art SMART irrigation controllers. These SMART controllers have on-site temperature sensors or rely on a signal from a central weather station that modifies irrigation times at least weekly.
ND3	High Efficiency Toilet (HET)	New Customers: SF, MF and CII depending upon local ordinances and contractor request of new measures	Require new single family and multifamily residents to install a high efficiency toilet (HET). HET are defined as any toilet to flush 20% less than an ULFT and include dual flush technology.
ND4	Dishwasher New Efficient	New Customers: SF, MF and CII depending upon local ordinances and contractor request of new measures	Require new single-family residents to install an efficient dishwasher (meeting certain water efficiency standards, such as gallons/load).
ND5	Clothes washing machines requirement for new residential	New Customers: SF, MF and CII depending upon local ordinances and contractor request of new measures	Building departments would be responsible to ensure that an efficient washer was installed before new home occupancy.
ND6	Hot Water on Demand	New Customers: SF, MF and CII depending upon local ordinances and contractor request of new measures	Require developers to equip new homes with a hot water on demand system or tankless hot water heaters, such as those made by Metland Systems and others. These systems use a pump placed under the sink to recycle water sitting in the hot water pipes to the water heater.
ND7	High efficiency faucets and showerheads	New Customers: SF, MF and CII depending upon local ordinances and contractor request of new measures	Require developers to install Lavatory faucets that flow at no more than 1.5 gpm, kitchen faucets at 2.2 gpm, showerheads at 2.0 gpm
ND8	Landscape and irrigation requirements	New Customers: SF, MF and CII depending upon local ordinances and contractor request of new measures	Enforce a regulation that specifies that homes be landscaped according to Xeriscape principals and the Model Water Efficient Landscape Ordinance, with appropriate irrigation systems. (Combines with Smart Controller listed above). Goal is overall 25% reduction in irrigation water use.

Measure No.	Name of Measure	Customer Sector	Description
New Measure	SB 407	Existing: SF, MF and CII	Measure will start in the year 2017 for SF accounts and 2019 for MF and CII accounts to coincide with the California State Law SB 407. The law includes working with the real estate industry to require a certificate of compliance be submitted to the City stating that, when a property is sold, information on whether or not indoor water fixtures are efficient was disclosed to the buyer.
Potential New Measure Selected by One or More Contractors	Rainwater harvesting	New Customers SF; Existing SF, MF	Provide a rebate ($100 RSF and $200 RMF) to assist a certain percentage of single family homeowners per year with installation of rain barrels or cisterns.
Potential New Measure Selected by One or More Contractors	Grey Water System Rebate	New Customers SF; Existing SF	Provide a rebate (up to $500) to assist a certain percentage of single family homeowners per year to install gray water systems. Parts cost approx $200, installation is approx $400-$500
Potential New Measure Selected by One or More Contractors	Tiered Water Rates	Existing Customers: SF, MF, CII	Change Rate Structure to an inclining block rate and increase prices significantly periodically to maintain savings, such as every ten years.
Potential New Measure Selected by One or More Contractors	Submetering and Consumption Billing of Apartments and Mobile Homes	New Customers: MF	Require installation of submeters on all new MF and mobile home accounts unless the building has a central, circulating hot water system (which precludes a meter on all water going to each unit).

RSF = Residential Single Family RMF = Residential Multi Family NRSF = New Residential Single Family

COM = Business INS = Institutional IND = Industrial

Table 14
Conservation Measures Evaluated in the DSS Model

New Conservation Measures for Analysis (New for the 2010 analysis)							
Measure	City of Cotati	North Marin Water District	City of Rohnert Park	City of Santa Rosa	City of Sonoma	Valley of the Moon Water District	Town of Windsor
Rainwater Harvesting Rebate				✓			
Grey Water System Rebate				✓		✓	
Tiered Water Rates (Conservation Pricing)	✓				✓		
Submetering and Consumption Billing of Apartments and Mobile Homes - New and Existing			✓				
Add CII to New Develoment Requirements	✓	✓					✓
SB407 - Retrofit of High Efficiency Fixtures	✓	✓	✓	✓	✓	✓	✓
Add SF Residential to Irrigation System Upgrades (T2-6)		✓			✓	✓	✓

5.2 Perspectives on Benefits and Costs

The determination of the economic feasibility of water conservation programs depends on comparing the costs of the programs to the benefits provided. The analysis was performed using the DSS Model. The DSS Model calculates savings at the end-use level; for example, the model determines the amount of water a toilet rebate program saves in daily toilet use for each single family account.

Present value analysis using constant 2010 dollars and a real discount rate of 3% is used to discount costs and benefits to the base year. From this analysis, benefit-cost ratios of each measure are computed. When measures are put together in programs, the model is set up to avoid double counting savings from multiple measures that act on the same end use of water. For example, multiple measures in a program may target toilet replacements. The model includes assumptions to apportion water savings between multiple measures.

Economic analysis can be performed from several different perspectives, based on which party is affected. For planning water conservation programs for utilities, the perspectives most commonly used for benefit-cost analyses include the utility and the community. The "utility" benefit-cost analysis is based on the benefits and costs to the water provider. The "community" benefit-cost analysis includes the utility benefit and costs together with account owner/customer benefits and costs. These include customer energy and other capital or operating cost benefits plus costs of implementing the measure, beyond what the utility pays.

The utility perspective offers two advantages for this analysis. First, it considers only the program costs that will be directly borne by the utility. This enables the utility to fairly compare potential investments for saving and supplying water. Second, because revenue shifts are treated as transfer payments, the analysis is not complicated with uncertainties associated with long-term rate projections and retail rate design assumptions. Because it is the water provider's role in developing a conservation plan that is paramount in this study, the utility perspective was primarily used to evaluate elements of the plan.

The community perspective is defined to include the utility and the customer costs and benefits. Costs incurred by customers striving to save water while participating in conservation programs are considered, as well as the benefits received in terms of reduced energy bills (from water heating costs) and wastewater savings, among others. Other factors external to the utility, such as environmental effects and climate change, are not included in the benefit-cost analysis. Because these external factors are often difficult to quantify and are not necessarily under the control of the utility, they are therefore frequently excluded from economic analyses, including this one.

5.3 Present Value Parameters

The time value of money is explicitly considered. The value of all future costs and benefits is discounted to 2005 (the model start year) at the real interest rate of 3.0%. The DSS Model calculates this real interest rate, adjusting the current nominal interest rate (assumed to be approximately 6.1%) by the assumed rate of inflation (3.0%). Cash flows discounted in this manner are herein referred to as "Present Value" sums.

5.4 Assumptions about Measure Costs

Costs were determined for each of the measures based on industry knowledge, past experience and data provided by the City of Rohnert Park. Costs may include incentive costs, usually determined on a per-participant basis; fixed costs, such as marketing; variable costs, such as the costs to staff the measures and to obtain and maintain equipment; and a one-time set-up cost. The set-up cost is for measure design by staff or consultants, any required pilot testing, and preparation of materials that will be used in marketing the measure. Measure costs were estimated for 30 years, (each year between 2005 and 2035). Costs were spread over the time period depending on the length of the implementation period for the measure and estimated voluntary customer participation levels.

Lost revenue due to reduced water sales is not included as a cost because the conservation measures evaluated herein generally take effect over a span of time that is sufficient to enable timely rate adjustments, if necessary, to meet fixed cost obligations.

5.5 Assumptions about Measure Savings

Data necessary to forecast water savings of measures include specific data on water use, demographics, market penetration, and unit water savings. Savings normally develop at a measured and predetermined pace, reaching full maturity after full market penetration is achieved. This may occur three to ten years after the start of implementation, depending upon the implementation schedule.

5.6 Assumptions about Avoided Costs

The most expensive source of water for almost all of the contractors, and in some cases the only source of water is the SCWA Russian River Supply. The price of the water to the contractors is set by SCWA every year and varies by contractor location, depending upon which aqueduct they draw from. Since 1990 the annual price of water has increased significantly. The annual rate of increase for 1989/1990 to 2010/11 has varied from 4.5 to 5.1% per year depending upon the aqueduct.
Since 1990 the annual rate of inflation has increased 2.64% per year in the San Francisco Bay Area, as measured by the Consumer Price Index (CPI). Based on this data the price of SCWA water has increased faster than the CPI.

Therefore in evaluating the benefit cost ratio of conservation measures and programs it is appropriate to consider the net increase in benefits (i.e., the net increase in the avoided cost of water). Other costs, such as the cost of conservation will increase presumably at the CPI rate. Also the cost of conservation programs will be paid for with inflated dollars.

For this evaluation the avoided costs were escalated from the 2010/11 value to a projected 2025/26 value (15 years). The cost escalated was the 2010/11 current price plus a distribution cost of $27.70 per acre-foot taken from pumping costs documented by North Marin Water District, which was the only contractor that had pumping costs readily available, and used for all contractors.

The net increase and the avoided costs used in this evaluation are listed below:

- Santa Rosa aqueduct contractors - 1.86% per year escalation or $ 832 per acre-foot
- Petaluma aqueduct contractors - 1.81% per year escalation or $ 827 per acre-foot
- Sonoma aqueduct contractors - 2.43% per year escalation or $1,006 per acre-foot
- Windsor was escalated at the Santa Rosa rate to $ 991 per acre-foot

This has the effect of raising the benefit-cost ratios in our evaluation by the amount that is roughly the percentage difference in the future vs. the current price of SCWA water. In our opinion this escalation represents a more realistic comparison of benefits and costs of conservation.

5.7 Measure Assumptions including Unit Costs, Water Savings, and Market Penetrations

Appendix A includes assumptions in the DSS Model for each of the following variables for all measures modeled:

- *Targeted Water User Group; End Use* – Water user group (e.g., single-family residential) and end use (e.g., indoor or outdoor water use).
- *Utility Unit Cost (for contractor)* – Cost of rebates, incentives, and contractors hired (by the utility) to implement measures.
- *Retail Customer Unit Cost* – Cost for implementing measures that is paid by retail customers (i.e., the remainder of a measure's cost that is not covered by a utility rebate or incentive).
- *Utility Administration and Marketing Cost* – The cost to the utility administering the measure, including consultant contract administration, marketing, and participant tracking. The mark-up is sufficient (in total) to cover local agency conservation staff time and general expenses and overhead.

The unit costs vary according to the type of account and implementation method being addressed. For example, a measure might cost a different amount for a residential single family account, than a residential multi-family account, and for a rebate versus a direct installation implementation method. Typically water utilities have found that there are increased costs associated with achieving higher market saturation, such as more surveys per year. Appendix A shows the unit costs used in the study. The model calculates the annual costs based on the number of participants each year. The general formulas for calculating annual costs are:

Annual Utility Cost = Annual market saturation x total accounts in category x utility unit cost per account x (1+administration and marketing markup)

Annual Customer Cost = Annual number of participants x retail customer unit cost

Annual Community Cost = Annual utility cost + annual customer cost

5.8 Comparison of Individual Measures

Table 15 presents how much water the measures would save over 30 years, how much they would cost, and what cost of water saved is *if the measures were run on a stand-alone basis (i.e. without interaction or overlap from other measures that might address the same end use(s).* Only the net or highest water savings for overlapping conservation measures was included in each program.

Economic indicators are defined below:

- *Utility costs:* those costs that the utility would spend include measure set-up, annual administration, and payment of rebates or purchase of devices or services as specified in the measure design.
- *Customer costs:* those costs customers would spend to participate in City of Rohnert Park programs and maintaining its effectiveness over the life of the measure.
- *Community costs:* Community costs include utility and customer costs to implement measures.

The column headings in Table 15 are defined as follows:

- *Year 2035 Water Savings (AF/Yr)* = Water savings in 2035 (AF/Yr) where AF/Yr = acre-feet per year.
- *Present Value of Water Utility Costs* = 30 year present value of the time stream of annual costs.
- *Utility Benefit-Cost ratio* = NPV of utility costs/NPV of utility benefits over 30 years.
- *Community Benefit-Cost ratio* = (NPV of Utility Benefits plus NPV of customer energy savings)/NPV of utility plus NPV of customer costs).
- *Utility Cost of Savings per Unit Volume ($/AF, by cost category)* = NPV of Category Costs divided by 30-year volume of water saved.
- *Total Utility Cost for Five Years 2011-2015* = Total cost in dollars to run the program for the years 2011 to 2015 (five years). This is a five year cost often useful for short term financial budgeting purposes.

Table 15
Conservation Measure Cost and Savings

Conservation Measure Cost and Savings						
Measure Name	Year 2035 Water Savings (AF/Yr)	Present Value of Water Utility Costs	Utility Benefit Cost Ratio	Community Benefit Cost Ratio	Utility Cost of Savings per Unit Volume ($/AF)	First Five Years of Utility Cost
CUWCC #1a - Residential Water Surveys - Interior	69.0	$436,119	2.4	5.6	$677	$106,850
CUWCC #1b - Residential Water Surveys - Outdoor	42.6	$382,679	1.6	1.3	$1,043	$96,500
CUWCC #2 - Plumbing Retrofit Kits	16.0	$47,783	5.5	25.0	$301	$49,679
CUWCC #5a - Large Landscape Water Budgets	83.7	$293,411	4.8	4.8	$349	$24,380
CUWCC #6 - Washer Rebates	7.2	$70,065	2.1	3.2	$808	$53,528
CUWCC #7 - Residential Public Education	25.8	$264,863	1.5	3.1	$1,090	$60,602
CUWCC #9 - Commercial Water Audits	16.6	$158,872	1.7	2.4	$955	$162,000
CUWCC #14a - RSF Toilet Replacement	0.0	$29,067	2.0	1.0	$893	$0
CUWCC #14b - RMF Toilet Replacement	0.0	$204	92.1	36.8	$19	$0
Tier2 - 1Rain Sensor Retrofit	8.4	$33,101	2.3	1.0	$613	$7,931
Tier2 - 2Cash for Grass	2.2	$27,082	0.9	0.5	$1,609	$22,124
Tier2 - 3Financial Incentives for Being Below Water Budget	14.1	$233,814	0.5	0.2	$2,810	$0
Tier2 - 4Irrigation Meter Rebates	1.2	$8,758	1.5	0.9	$970	$6,983
Tier2 - 5aSmart Irrigation Controller Rebates - RSF	6.7	$220,069	0.3	0.2	$5,158	$46,398
Tier2 - 5bSmart Irrigation Controller Rebates - RMF, CII, IRR	12.7	$178,858	0.7	0.6	$2,131	$42,989
Tier2 - 6Financial Incentives/Rebates for Irrigation Upgrades	1.7	$23,623	0.6	0.3	$2,327	$3,987
Tier2 - 7Hotel Retrofit	4.3	$9,408	3.8	1.5	$367	$1,588
Tier2 - 10 High Efficiency Toilets	5.5	$185,807	0.4	0.2	$3,790	$225,290
Tier2 - 12CII Rebates - Replace Inefficient Water Using Equipment	1.1	$24,462	0.4	0.8	$3,450	$4,129
Tier2 - 13New Commercial Urinals	2.5	$13,242	3.4	0.4	$466	$8,266
Tier2 - ND1Rain Sensor Retrofit	28.3	$16,148	9.6	1.9	$140	$1,591
Tier2 - ND2Smart Irrigation Controller	47.1	$16,148	15.9	0.4	$84	$1,591
Tier2 - ND3 High Efficiency Toilets	2.8	$3,082	11.9	0.5	$127	$2,528
Tier2 - ND4Dishwasher New Efficient	1.8	$10,827	0.8	0.2	$1,592	$1,149
Tier2 - ND5Clothes Washing Machine Requirement	19.0	$10,827	10.3	1.3	$131	$1,149
Tier2 - ND6Hot Water on Demand	9.9	$10,827	4.7	0.2	$283	$1,149
Tier2 - ND7High Efficiency Faucets and Showerheads	39.7	$16,148	13.5	9.9	$99	$1,591
Tier2 - ND8Landscape and Irrigation Requirements	31.4	$16,148	10.6	0.0	$126	$1,591
Tier2 - SB-407	0.0	$2	21.7	0.6	$61	$0
Require Multifamily Submeter - New Accounts	46.5	$2,052	178.4	5.3	$8	$519
Require Multifamily Submeter - Exsiting Account Retrofit	41.5	$714,791	0.5	1.4	$2,688	$88,601

6. RESULTS OF CONSERVATION PROGRAM EVALUATION

6.1 Selection of Measures for Programs

Table 16 provides a summary of which measures are included in each of the six draft alternative programs. The six packages are designed to illustrate a range of various measure combinations and resulting water savings.

These programs are not intended to be rigid programs but rather to demonstrate the range in savings that could be generated if selected measures were run together. In this step we account for a percent overlap in water savings (and benefits) and estimate combined savings and benefits from programs or packages of measures.

A description of each program evaluated follows. For most contractors Tier Two measures are modeled to commence in 2011. The only reason the measure would not start in 2011 is if an agency had submitted data showing activity in one of the Tier 2 programs from 2005 to 2009. Most agencies have shown significant activity on the Tier One measures since the model start year of 2005.

Program – Existing

Savings for the "Existing Program" include the measures that have been run during the time period of 2005 and 2009 as submitted by each individual contractor. For the City of Rohnert Park, the following measures were included:

Existing Program Conservation Measures:

- CUWCC #1 - Residential Water Surveys - Interior
- CUWCC #1 - Residential Water Surveys - Outdoor
- CUWCC #2 - Plumbing Retrofit Kits
- CUWCC #5a - Large Landscape Water Budgets
- CUWCC #6 - Washer Rebates
- CUWCC #7 - Residential Public Education
- CUWCC #9 - Commercial Water Audits

Program – Existing + New Measures

Savings for the "Existing Program + New Measures" include the measures that have been run during the time period of 2005 and 2009 as submitted by each individual contractor in addition to the three new measures evaluated for each contractor. The new measures for each contractor are listed in Table 14.

Program – Tier One Measures

This program was designed to be the future program with full compliance for "Tier One Measures" including all the CUWCC BMPs. Program water savings includes actual achievements for the years 2005 to 2009 and then projected participation rates starting in 2011 in accordance with those specified in the California Urban Water Conservation Council's Memorandum Of Understanding, which may be higher (or lower) than you are currently achieving. If you continue to implement the BMPs as planned, your future demands will be reduced by the amount of savings from Tier One future measures.

Program - Tier One + New Development Measures

Savings for Tier One + New Development Measures were designed to isolate the effects of the New Development measures that would be implemented as well as the completion of Tier One measures. These eight New Development measures target new single family homes, multifamily homes, and commercial development based on the local ordinances or Cal Green as shown in Table 12 and 13.

Program – Tier One + Tier Two Measures

Savings for Tier One + Tier Two Measures includes 13 additional measures beyond the CUWCC BMPs. Tier One Future was designed to be the future program with full compliance for all the CUWCC BMPs. The participation rates starting in 2005 are in accordance with historical conservation efforts for the years 2005 to 2009. Then they proceed with the rate specified in the California Urban Water Conservation Council's Memorandum Of Understanding, which may be higher (or lower) than you are currently achieving. If you continue to implement these measures, your future water demands will be reduced by the amount of conservation savings. Descriptions of the Tier Two measures are in Table 13 and cost and saving assumptions for each individual measure can be found in Attachment A. Note that due to increased regulations and additional research and analysis on conservation measures, measures Tier 2-8, Tier 2-9 and Tier 2-11 were removed from this program at the request of all the contractors on August 2, 2010.

Program: Tier One, Tier Two, New Development

Savings for Tier One, Tier Two, and New Development includes all analyzed conservation measures except for the "new measures" because the new measures are unique to each contractor and did not go through the original measure screening process as the other measures in 2005. Also note that measures that either saved a small amount of water or were not cost-effective (Benefit-Cost ratio less than 1.0 and a high cost of water saved) were included here. Some of the Tier Two measures are small programs in that the target number of accounts is very small. So even though they appear to be relatively expensive from a measure point of view, their impact on the overall program costs and savings is relatively minor. Note that due to increased regulations and additional research and analysis on conservation measures, measures Tier 2-8, Tier 2-9 and Tier 2-11 were removed from this program at the request of all the contractors on August 2, 2010.

Table 16
Conservation Measures Selected for Programs

City of Rohnert Park Conservation Measures in each Program						
Measure Name	**Program Existing**	**Program Existing and New**	**Program Tier One**	**Program Tier 1 and ND**	**Program Tier 1 and Tier 2**	**Program Tier 1 and Tier 2 and ND**
CUWCC #1a - Residential Water Surveys - Interior	✓	✓	✓	✓	✓	✓
CUWCC #1b - Residential Water Surveys - Outdoor	✓	✓	✓	✓	✓	✓
CUWCC #2 - Plumbing Retrofit Kits	✓	✓				
CUWCC #5a - Large Landscape Water Budgets	✓	✓	✓	✓	✓	✓
CUWCC #6 - Washer Rebates	✓	✓	✓	✓	✓	✓
CUWCC #7 - Residential Public Education	✓	✓	✓	✓	✓	✓
CUWCC #9 - Commercial Water Audits	✓	✓	✓	✓	✓	✓
CUWCC #14a - RSF Toilet Replacement			✓	✓	✓	✓
CUWCC #14b - RMF Toilet Replacement			✓	✓	✓	✓
Tier2 - 1Rain Sensor Retrofit					✓	✓
Tier2 - 2Cash for Grass					✓	✓
Tier2 - 3Financial Incentives for Being Below Water Budget					✓	✓
Tier2 - 4Irrigation Meter Rebates					✓	✓
Tier2 - 5aSmart Irrigation Controller Rebates - RSF					✓	✓
Tier2 - 5bSmart Irrigation Controller Rebates - RMF, CII, IRR					✓	✓
Tier2 - 6Financial Incentives/Rebates for Irrigation Upgrades					✓	✓
Tier2 - 7Hotel Retrofit					✓	✓
Tier2 - 10 High Efficiency Toilets					✓	✓
Tier2 - 12CII Rebates - Replace Inefficient Water Using Equipment					✓	✓
Tier2 - 13New Commercial Urinals					✓	✓
Tier2 - ND1Rain Sensor Retrofit				✓		✓
Tier2 - ND2Smart Irrigation Controller				✓		✓
Tier2 - ND3 High Efficiency Toilets				✓		✓
Tier2 - ND4Dishwasher New Efficient				✓		✓
Tier2 - ND5Clothes Washing Machine Requirement				✓		✓
Tier2 - ND6Hot Water on Demand				✓		✓
Tier2 - ND7High Efficiency Faucets and Showerheads				✓		✓
Tier2 - ND8Landscape and Irrigation Requirements				✓		✓
SB-407 Requirements (Plumbing Retrofit on Resale or Remodel)		✓				
Require Multifamily Submeter - New Accounts		✓				
Require Multifamily Submeter - Exsiting Account Retrofit		✓				

NOTE – Due to increased regulations and additional research and analysis on conservation measures, Measures Tier 2-8, Tier 2-9 and Tier 2-11 were removed from analysis at the request of all the contractors

6.2 Results of Program Evaluation

Figure 8 shows annual water demand with no conservation, plumbing code only, and the six programs. Table 17 shows the savings in 5 year increments for all six programs. The savings in Table 17 are just from the conservation programs alone and do not include the plumbing code savings. The separate starting points for the demand with and without the plumbing code versus the conservation programs is directly correlated to the fact that the contractors have existing conservation programs active from 2005 and 2009 that are already saving water by the year 2010. MWM has thoroughly checked the differences for each year and they remain relatively consistent between the Demand with plumbing code and all the conservation programs. The graph makes it appear as they slightly "converge" but in fact the numbers show that they do not vary more than 4 AF/Yr over the 30 year analysis period. The slight fluctuations are due to the differences in rates of new development, measure lives, and project program activity.

Figure 8
Long Term Demands with Conservation Programs

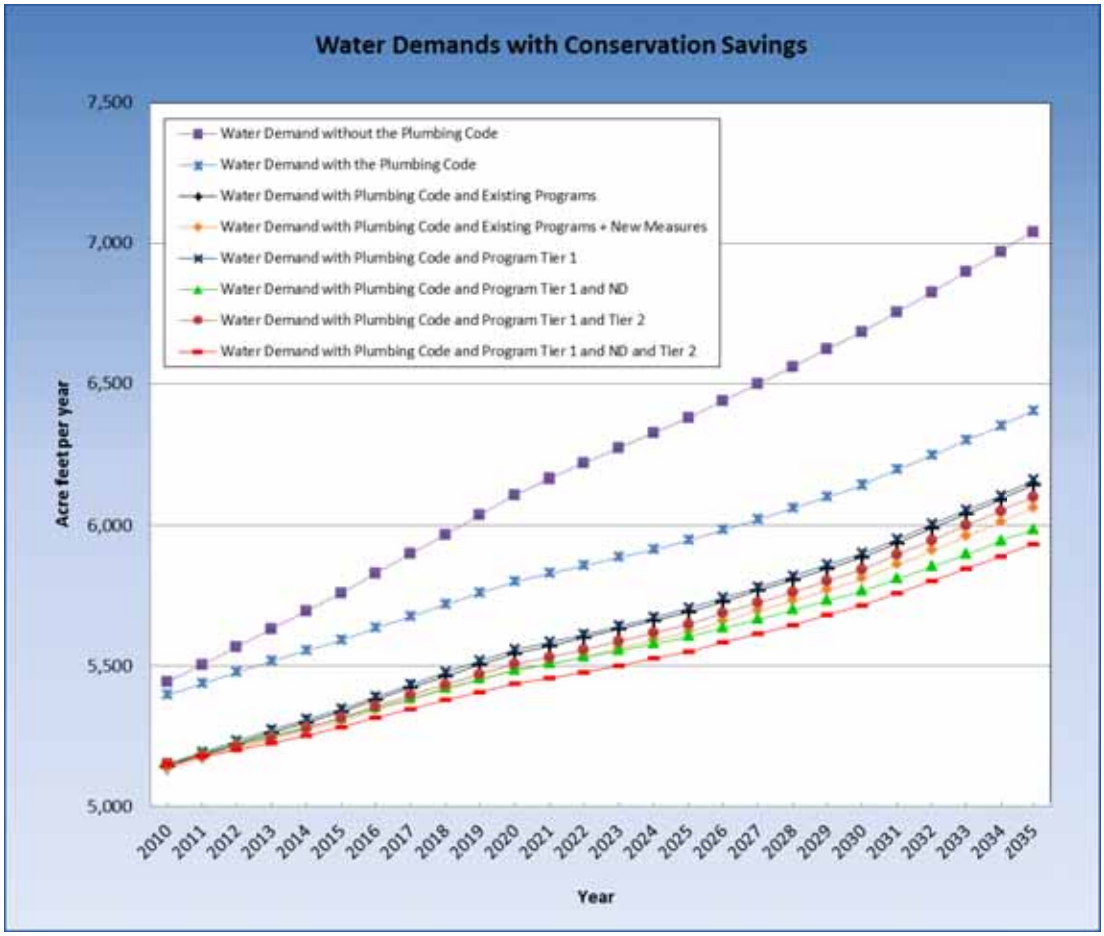


Table 17
Long Term Conservation Program Savings

Water Conservation Savings								
Conservation Savings (AF/Yr)	2010	2015	2020	2025	2030	2035	Benefit to Cost Ratio Utility	Benefit to Cost Ratio Community
Existing Programs	254	256	254	253	256	260	2.5	4.0
Existing Programs + New Measures	264	288	313	324	332	342	2.0	3.4
Program Tier 1	245	245	243	241	243	247	2.4	3.5
Program Tier 1 and ND	245	279	314	342	376	418	2.8	1.2
Program Tier 1 and Tier 2	245	277	293	296	298	302	1.7	1.8
Program Tier 1 and ND and Tier 2	245	311	363	394	428	469	2.0	1.0

Figure 9 shows how marginal returns change as more money is spent to achieve savings. As the figure shows the cost versus saving curve is starting to decline after Program Tier One + New Development. This means that the added cost of going from that Program to Tier One + Tier Two will save less water per unit expenditure. In other words there are diminishing returns when the curve starts to flatten out as Tier Two measures are added to the program. It is clear that the New Development measures are more cost-effective to the utility than Tier Two measures. It is not to say that the Tier Two measures are a poor investment. The decision on which program is appropriate for each agency is dependent on many

factors. Most recently it may be impacted by the goals set forth by SB7x-7 which calls for a reduction in per capita was use by 2020, which is independent of the economic analysis.

Figure 9
Present Value of Utility Costs versus Cumulative Water Saved

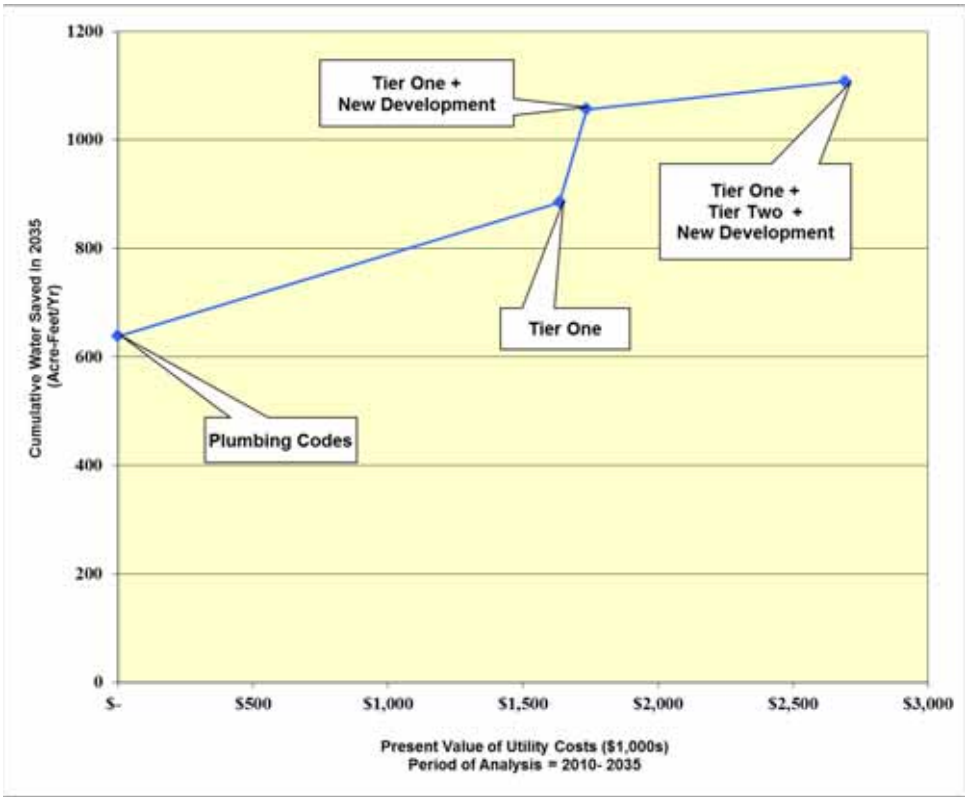


Table 18 presents key evaluation statistics compiled from the DSS Model. Assuming all measures are successfully implemented, projected water savings for 2030 in AF are shown, as are the costs of achieving this reduction. Water savings for programs have been shown for 2035 in Table 18.

The costs are expressed two ways.

1. Total present value over the analysis period,
2. The cost of water saved. Cost of water saved is presented two ways: for the utility and the total community (customer plus utility).

These cost parameters are derived from the annual time stream of utility, customer and community costs.

The water savings are expressed as a percentage of the projected 2035 demand. One column indicates the percentage of the new water demand in 2035 each program could provide. The new water needed by new customers over the full planning period is the difference between 2005 demand and 2035 demand without the plumbing code. The plumbing code is an additional savings that could be added on top of the water savings shown in Table 18. This allows the plumbing code savings percent and water savings in AF/Yr shown in Table 4 to be additive to the conservation program savings in AF/Yr and percentages shown in Table 18.

Table 18
Comparison of Long-Term Conservation Programs – Utility Costs and Savings

Comparison of Conservation Program Costs and Savings										
Conservation Program	Water Utility Benefit-Cost Ratio	Community Benefit-Cost Ratio	2015 Water Savings (AFY)	2035 Water Savings (AFY)	2035 Indoor Water Savings (AFY)	2035 Outdoor Water Savings (AFY)	Total Water Savings as a % of Total Production in 2035*	30 Year Present Value of Water Utility Costs ($1,000)	Total Utility Cost for Five Years 2011-2015 ($1,000)	Utility Cost of Water Saved ($/AF)
Existing Program	2.50	4.04	256	260	119	141	4.06%	$1,654	$398	$216
Existing Program + New Measures	2.04	3.41	288	342	201	141	5.34%	$2,371	$757	$259
Tier One	2.42	3.49	245	247	106	141	3.85%	$1,635	$398	$223
Tier One + Tier Two	1.73	1.81	277	302	119	184	4.72%	$2,594	$1,053	$306
Tier One + New Development	2.84	1.19	279	418	176	242	6.53%	$1,735	$429	$182
Tier One + Tier Two + New Development	2.02	1.01	311	469	189	280	7.33%	$2,694	$1,084	$254

Notes:

- Present Value is determined using an interest rate of 3%
- Cost of water saved is present value of water utility cost divided by total 30-year water savings.
- * % of water saved refers to the demand without the plumbing code
- Total water savings in 2035 as a percent of production is relative to no plumbing code production
- Conversion 1 MGD is equal to1120 AF/Yr

7. CONCLUSIONS

7.1 Relative Savings and Cost-Effectiveness of Programs

The City of Rohnert Park service area has a relatively high portion of residential water use and a significant amount of outdoor water use. Consequently, residential conservation programs produce the most savings. City of Rohnert Park's service area is not a heavy manufacturing sector so the conservation potential in the commercial sector is relatively low. Based on the assumed avoided cost of new water, water conservation programs are cost-effective. Overall conclusions are:

- The decrease in demand for Rohnert Park compared to the water demand projections in the 2005 Demand and Water Conservation Measure Analysis completed by MWM was due to the reduction in population, employment projections, removal of the new single family home category, and change to using actual water use data rather than estimated values for water use.
- Water savings from implementation of the Tier One, Tier Two and New Development conservation programs would reduce water needs in 2035 by about 7.33 percent (469 AF/Yr as shown on Table 18) when compared to the 2035 water demand without the plumbing code.
- Water savings from implementation of the Tier One conservation programs would reduce water needs in 2035 by about 3.85 percent (247 AF/Yr as shown on Table 18) when compared to 2035 water demands without the plumbing code.
- For Future Tier One measures, more than half of the conservation potential in 2035 is in reducing outdoor use; the rest is indoor use reduction potential.
- The average cost of water saved over 30-years is lower than the current price of SCWA water. Thus measures that are cost-effective at today's water rates will be more so if SCWA rates rise in the future.
- Savings contributed by Tier Two measures alone are 55 acre-feet in 2035.
- Savings contributed by the New Development measures alone are 171 acre-feet by 2035.
- Benefit-cost ratios of program combinations range from 1.73 to 2.84 so all program combinations are cost-effective from the utility standpoint.
- The average cost of water saved for all of the programs from the utility standpoint (as shown on Table 18) is lower than the forecasted 2025 price of $827 per AF.
- The cost for the new development measures is largely funded by the builders of the new homes, which tends to reduce the overall cost to the utility for all measures.