# RESOLUTION NO. 2016-72

## A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ROHNERT PARK ADOPTING THE CITY OF ROHNERT PARK 2015 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 (Plan) 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; and

**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 the *City of Rohnert Park 2015 Urban Water Management Plan* to meet the requirements of the Act, as supplemented by the Water Conservation Act of 2009 (2009 Act), in accordance with the guidelines published by the California Department of Water Resources; and

**WHEREAS**, the preparers of the City of Rohnert Park 2015 Urban Water Management Plan have the training, experience and expertise necessary to prepare a Plan meeting the requirements of the Act and the 2009 Act; and

**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 report on the progress they have made towards the community water use targets established with the suppliers' 2010 Urban Water Manager Management Plans; and

**WHEREAS**, the *City of Rohnert Park 2015 Urban Water Management Plan* documents that both the City of Rohnert Park and its Regional Alliance have exceeded both the 2015 interim water use target and the 2020 water use target, which were adopted in 2010; and

**WHEREAS**, the City of Rohnert Park 2015 Urban Water Management Plan has been available for public review since June 15, 2016 in compliance with the requirements of the Act; and

**WHEREAS**, the City Council conducted a public hearing on June 28, 2016, in compliance with the Act and the 2009 Act to receive oral and written comments upon the *City of Rohnert Park 2015 Urban Water Management Plan*, including compliance with the community water use targets, having published notice on June 15, June 17 and June 24, 2016; and

**WHEREAS**, the City Council has reviewed the *City of Rohnert Park 2015 Urban Water Management Plan,* City staff reports and presentations and the oral and written comments received; and

**WHEREAS**, the *City of Rohnert Park 2015 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 2015 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 and material to the adoption of this Resolution.

2. The City Council hereby elects to continue 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 continue to use the regional water use target established by the region for determining compliance with the 2009 Act.

4. The City of Rohnert Park 2015 Urban Water Management Plan, which is attached hereto and incorporated by this reference, 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 and to take all actions reasonably necessary to effectuate the purposes of this Resolution.

**DULY AND REGULARLY ADOPTED** this 28th day of June, 2016.

**CITY OF ROHNERT PARK**

Gina Belforte, Mayor

**ATTEST:**

Caitlin Saldanha, Deputy City Clerk

Attachment: City of Rohnert Park 2015 Urban Water Management Plan

AHANOTU: Aye CALLINAN: Aye STAFFORD: Absent MACKENZIE: Aye BELFORTE: Absent

AYES: ( 3 ) NOES: ( 0 ) ABSENT: ( 2 ) ABSTAIN: ( 0 )

# City of Rohnert Park Urban Water Management Plan 2015

Draft
June 2016

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# 1. INTRODUCTION & OVERVIEW

The City of Rohnert Park (City) is located in central Sonoma County, approximately 50 miles north of San Francisco. The City provides water service to approximately 9,000 service connections in the North Coast Hydrologic Region and meets the definition of an "urban water supplier" as outlined in California Water Code Section 10610 et. seq.. The City receives its wholesale potable water from the Sonoma County Water Agency (Agency), its wholesale recycled water from the Santa Rosa Subregional System (Subregional System) and also uses groundwater from the Santa Rosa Plain Sub-basin of the Santa Rosa Valley Groundwater Basin as part of its potable supply. This 2015 Urban Water Management Plan (UWMP) was prepared by the City in order to comply with the requirements of the California Water Code. In addition to meeting the requirements of state law, the City will use this UWMP to support the preparation of Water Supply Assessments and Water Supply Verifications for new development.

## 1.1 BACKGROUND AND PURPOSE

The purpose of the UWMP is to demonstrate that a water supplier can meet the water demands of its water customers over a 25-year planning horizon and under a range of hydrologic conditions. This UWMP analyzes current and projected water supply and demand for normal, single-dry and multiple-dry water year conditions. This UWMP also provides an update on the City's progress towards meeting the water use targets it adopted in 2010 as required by the Water Conservation Act of 2009. Specifically this UWMP describes, reports, and evaluates the City's:

- Water deliveries and uses;
- Water supply sources;
- Water use efficiency practices;
- Demand Management Measures; and
- Water Shortage Contingency Plan.

The evaluations and projections in this document are based on the City's current water supply contracts with the Agency and the Subregional System and planned water supply projects. This document is a "living" document and will be updated every five years or as changes to the City's water supply and demand pattern require.

## 1.2 URBAN WATER MANAGEMENT PLANNING AND THE CALIFORNIA WATER CODE

The Urban Water Management Planning Act (Act) is codified in California Water Code Sections 10610 through 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 9,000 connections and meets the definition of an "urban water supplier".

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 2040.

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.

In this 2015 UWMP, the City is also revisiting and reporting on its progress towards achieving the water supply targets it adopted in 2010 in accordance with the Water Conservation Act (SB X7-7). At this point the City's actual 2015 per capital water use is lower than its adopted targets for both 2015 and 2020. The regional alliance, in which the City participates, is also reporting actual 2015 per capita water use that is lower than the regional alliance's adopted targets. More detail on the water conservation targets is provided Chapter 5.

## 1.3 Urban Water Management Plans in Relation to Other Planning Efforts

### 1.3.1 Relationship to the City's General Plan

The City is currently working under its General Plan 2020, originally adopted in July 2000 and updated as recently as March 2016 to approve the Central Rohnert Park Priority Development Area. This UWMP considers all land uses described in the General Plan for areas within the City's corporate limits and its adopted Sphere of Influence. The City anticipates significant new growth in its defined Specific Plan Areas and Priority and Planned Development Areas. This growth had been stalled as a result of economic conditions.

### 1.3.2 Relationship to the North Coast Integrated Regional Water Management Plan

The City is signatory to the Memorandum of Mutual Understanding that governs the North Coast Resource Partnership (Resource Partnership). The Resource Partnership prepares and updates the North Coast Integrated Regional Water Management Plan (IRWMP). While a strong focus of the North Coast IRWMP is the recovery of salmonid species, through the IRWMP, the City has secured grant funding for water conservation and for the planning and design of a multi-purpose detention and groundwater recharge basin on Copeland Creek, just east of the City limits.

### 1.3.3 Relationship to the Santa Rosa Plain Groundwater Management Plan

In October 2014, the Sonoma County Board of Supervisors adopted the *Santa Rosa Plain Watershed Groundwater Management Plan* (Groundwater Management Plan). This voluntary groundwater management plan was developed in accordance with the requirements of Water Code 10750 et. seq. (the Groundwater Management Act) and includes a series of implementation strategies to better monitor, model and manage groundwater in the Santa Rosa Plain. The City funds and participates in the Santa Rosa Plain Basin Advisory Panel, which is implementing the Groundwater Management Plan. While the Groundwater Management Plan concludes that there is a possibility that future groundwater demands could exceed the budget for the basin, recent monitoring efforts demonstrate generally stable or rising groundwater levels throughout the basin.

### 1.3.4 Relationship to the Groundwater Sustainability Act of 2014

As a result of the requirements of the Groundwater Sustainability Act of 2014, the City is working with County of Sonoma, the Sonoma County Water Agency and other cities and districts that are eligible to form

[1] Water Code Section 10652

a Groundwater Sustainability Agency to develop a single Groundwater Sustainability Agency for the Santa Rosa Plain Groundwater Basin. This work will be completed by June 2017 and builds on the solid foundation of the adopted Groundwater Management Plan.

## 1.4 UWMP ORGANIZATION

The outline of this UWMP generally follows the *2015 Urban Water Management Plans Guidebook for Urban Water Suppliers.* This document is organized into the 10 chapters outlined on Table 1-1. The table also includes a description of the key elements in the sections.

**TABLE 1-1 PLAN ORGANIZATION**

| Table 1-1: Plan Organization | | |
|---|---|---|
| Chapter | Title | Key Elements |
| 1 | Introduction & Overview | Water Code Requirements for the Plan and Description of Regional Water Management Efforts |
| 2 | Plan Preparation | Basis for Preparing the Plan, Regional Planning and Compliance, Calendar Year and Acre-Foot Basis, Coordination and Outreach |
| 3 | System Description | General Description, Boundaries, Maps, Climate and Demographics |
| 4 | System Water Use | Potable and Recycled Water Demands, Water Use by Sector, Losses, Estimated Future Savings, Lower Income Households, Climate Change |
| 5 | SBx7-7 Baseline and Targets | Updated Calculations, Baselines, Targets, Compliance, Regional Alliance |
| 6 | System Supplies | Imported Water, Groundwater, Recycled Water, Future Water Projects, Summary of Supplies, Climate Change Impact to Supply |
| 7 | Water Supply Reliability Assessment | Constraints, Reliability by Type of Year, Supply and Demand Assessment, Regional Reliability |
| 8 | Water Shortage Contingency Planning | Stages, Prohibitions, Enforcement, Consumption Reduction Methods, Determining Reductions, Revenue and Expenditure Impacts, Authority, Catastrophic Interruption, Minimum Supply for Next Three Years |
| 9 | Demand Management Measures | Planned Implementation to Achieve Targets, California Urban Water Conservation Council Reports |
| 10 | Plan Adoption, Submittal and Implementation | Summary of Adoption Process |

# 2 PLAN PREPARATION

## 2.1 BASIS FOR PREPARING A PLAN

As described in Chapter 1, the City is a municipal water supplier providing service to approximately 9,000 water connections including single and multi-family residences, commercial, industrial and institutional customers and irrigation connections. Under normal hydrologic conditions, the City's potable water deliveries vary between 4,500 and 6,000 acre feet annually (AFA). The City meets the definition of an "urban water supplier" under the California Water Code and prepared Urban Water Management Plans in 2005 and 2010. Prior to that time, the City adopted the regional Urban Water Management Plans prepared by the Agency. Table 2-1 below provides the City's Public Water System information.

**TABLE 2-1 PUBLIC WATER SYSTEM INFORMATION**

| Table 2-1 Retail Only: Public Water Systems | | | |
|---|---|---|---|
| Public Water System Number | Public Water System Name | Number of Municipal Connections 2015 | Volume of Water Supplied 2015 |
| 4910014 | City of Rohnert Park | 9,060 | 4,277 |
| | | | |
| | | | |
| | **TOTAL** | 9,060 | 4,277 |
| NOTES: | | | |

## 2.2 REGIONAL PLANNING

The cities of Santa Rosa, Rohnert Park, Sonoma, Cotati, and Petaluma, the Town of Windsor, North Marin and Valley of the Moon Water Districts, California-American Water Company and the Agency formed the Sonoma-Marin Saving Water Partnership (Partnership) in 2010. The purpose of the Partnership is to establish financial obligations for conservation activities, to identify and recommend implementation of water conservation projects and to maximize implementation of cost-effective projects for the Partnership members. The Partnership coordinates all water use efficiency focused media buys in the region and provides support to members that need additional assistance with implementing local programs and/or meeting conservation targets. The Partnership also serves as a "regional alliance" for the purpose of reporting baseline and targets under the Water Conservation Act of 2009.

The Partnership has received notable recognition for effective collaboration and program implementation including:

- EPA Water Sense Partner of the Year 2015
- EPA Water Sense Partner of the Year 2014
- EPA Water Sense Excellence Award 2013

## 2.3 Individual or Regional Planning and Compliance

While the City participates in regional water planning efforts and is part of regional alliance for reporting under the Water Conservation Act of 2009, the City is preparing an individual UWMP in order to better support its land use goals and the review of development proposals within its sphere of influence. Table 2-2 summarizes the City's approach to regional planning and compliance.

**TABLE 2-2 PLAN IDENTIFICATION**

| Table 2-2: Plan Identification | | | |
|---|---|---|---|
| **Select Only One** | **Type of Plan** | | **Name of RUWMP or Regional Alliance** *if applicable* *drop down list* |
| ☑ | **Individual UWMP** | | |
| | ☐ | Water Supplier is also a member of a RUWMP | |
| | ☑ | Water Supplier is also a member of a Regional Alliance | North Marin-Sonoma Alliance |
| ☐ | **Regional Urban Water Management Plan (RUWMP)** | | |
| NOTES: | | | |

## 2.4 Fiscal or Calendar Year and Unit of Measure

In this 2015 UWMP, the City is reporting water use by calendar year and in acre feet (AF). Table 2-3 summarizes this reporting standard.

**TABLE 2-3 AGENCY IDENTIFICATION**

| Table 2-3: Agency Identification | |
|---|---|
| Type of Agency (select one or both) | |
| ☐ | Agency is a wholesaler |
| ☑ | Agency is a retailer |
| Fiscal or Calendar Year (select one) | |
| ☑ | UWMP Tables Are in Calendar Years |
| ☐ | UWMP Tables Are in Fiscal Years |
| If Using Fiscal Years Provide Month and Date that the Fiscal Year Begins (mm/dd) | |
| | |
| Units of Measure Used in UWMP (select from Drop down) | |
| Unit | AF |
| NOTES: | |

## 2.5 Coordination and Outreach

In accordance with California Water Code Section 10631(j), the City has provided water use projections to both its wholesale potable water supplier, the Agency, and its wholesale recycled water supplier, the Subregional System. Table 2-4 summarizes this coordination.

**TABLE 2-4 WATER SUPPLIER INFORMATION EXCHANGE**

| Table 2-4 Retail: Water Supplier Information Exchange |
|---|
| The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631. |
| Wholesale Water Supplier Name *(Add additional rows as needed)* |
| Sonoma County Water Agency |
| Santa Rosa Subregional System |
| NOTES: |

The City meets at least monthly with its water wholesaler, the Agency, and with other water contractors who purchase water from the Agency. This monthly coordination has been instrumental in coordinating water supply and demand analyses for the preparation of this document. The City and the other water contractors have worked together to prepare a regional water demand and conservation analysis (see Chapter 4) as well as the regional alliance work around water use targets (see Chapter 5).

Chapter 10 provides more description of the public notification and outreach efforts that took place during the development and adoption of this 2015 UWMP.

# 3 SYSTEM DESCRIPTION

## 3.1 GENERAL DESCRIPTION

The water service area under consideration in this 2015 UWMP is bounded by the City's Sphere of Influence as outlined in its General Plan 2020. 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 and Northwest SPAs have been approved and annexed. The Northeast SPA currently has no active development proposal. The Canon Manor Specific Plan Area has contracted with the Penngrove Water Company for water supply, so its demands are not considered demands on the City supply. Additionally, the City's Sphere of Influence includes Sonoma State University, which has its own water system and is not served by the City.

This UWMP also takes into account three major infill planned development (PD or PDA) projects: the Stadium Lands PD, the Sonoma Mountain Village PD and the Central Rohnert Park PDA. The City has approved Master Plans and Environmental Documents for each of these planned developments.

The City does not have outside service area connections.

Figure 3-1 (included in Section 3.2) illustrates the City's water service area which is the current City Limit and also illustrates the Specific and Planned Development Areas. Table 3-1 provides a summary of the planned growth within each of the SPAs and PDs. This 2015 UWMP includes build out of these areas and will be used to support Water Supply Assessments (WSAs) and Water Supply Verifications (WSVs) for this planned growth.

**TABLE 3-1 SUMMARY OF PLANNED DEVELOPMENT**

| Table 3-1: Summary of Planned Development | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Northeast | Northwest | Southeast | University District | Wilfred Dowdell | Stadium Area | Sonoma Mountain Village | Central Rohnert Park |
| Total Acres | 215.7 | 90.0 | 80.0 | 297.0 | 24.8 | 30.0 | 175.0 | 330.0 |
| | | | | | | | | |
| Residential Units | | | | | | | | |
| Single Family | 890 | | 394 | 1,277 | | 338 | 700 | 835 |
| High Density | 200 | | | 218 | | | 994 | |
| Mixed Use | | 398 | 81 | 150 | | | | |
| Second Units | | | | | | | 198 | |
| **Total** | **1,090** | **398** | **475** | **1,645** | **-** | **338** | **1,892** | **835** |
| **Total Affordable** | **163** | | **72** | **218** | **-** | **13** | **248** | **125** |
| Commercial Sq Ft | | 458,700 | 10,000 | 100,000 | 302,114 | 140,000 | 290,000 | 429,936 |
| Office Sq Ft | | | | | | | 234,000 | 268,039 |
| Industrial Sq Ft | | 218,200 | | | | | | 129,315 |
| Mixed Use Sq Ft | | 58,400 | | | | | | |
| **Status** | no active planning | annexed 2015 | annexed 2011 - 107 lots under construction | annexed 2007 - 399 lots under construction | annexed 2009 | approved 2008 - 338 residences completing construction | approved 2010 | approved 2016 |

The City's water service area is approximately 6.4 square miles and serves residential, commercial, industrial, institutional and irrigation needs. The City is at elevation 106 feet above mean sea level. The distribution system consists of approximately 115 miles of water distribution system mains and two pressure zones. Most of the distribution system mains are 6- to 8-inch diameter pipes with a small number in the 10- to 16-inch diameter range. The City's water system includes seven water storage tanks ranging in size from 300,000 gallons to 1.3 million gallons. The total storage available to the City's system is 4.2 million gallons. Figure 3-2 (included in Section 3.2) illustrates the potable water distribution system

The City also delivers tertiary treated recycled water to customers. The recycled water is produced by the Subregional System and delivered through a low-pressure and a high-pressure distribution system operated and maintained by the City. The low-pressure system includes 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 (AFY) to 5 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. Figure 3-3 (included in Section 3.2) illustrates the recycled water system.

### 3.1.1 Political Characteristics and Governance

The City's retail water systems, including the potable and recycled water system, are governed by a 5-member City Council which includes a mayor. The water and recycled water systems, including the City's groundwater wells, are managed and operated by the Public Works Department.

The Agency system is governed by a Board of Directors, which is composed of the members of the Sonoma County Board of Supervisors. The Agency and its Board of Directors are also the lead agency for the Santa Rosa Plain Watershed Groundwater Management Plan. The relationship between the Agency and its water contractors, including the City, is outlined in the *Restructured Agreement for Water Supply* (Restructured Agreement). The agreement provides for a Water Advisory Committee (WAC) to advise the Agency's Board of Directors on policy issues. The WAC representatives for the City are one Council member and one alternate Council member selected by the Council. The WAC is limited to an advisory role.

The Subregional System, which is the City's wholesale supplier of recycled water, is managed and operated by the City of Santa Rosa. The Subregional System treats, recycles and disposes of wastewater generated in by the cities of Santa Rosa, Cotati, Rohnert Park and Sebastopol and the South Park County Sanitation District. The relationship between the City of Santa Rosa and the other Subregional partners is defined by the *Agreement between the City of Santa Rosa and the City of Rohnert Park, City of Sebastopol, City of Cotati and South Park County Sanitation District for the Use of Santa Rosa Subregional Sewage System* dated April 3, 1975 and subsequently amended on September 1, 1987, October 20, 1987, December 1, 1994, July 1, 2002 and November 19, 2008. The Subregional System governance includes a Technical Advisory Committee (TAC) to the Subregional System. The City Engineer participates in the TAC.

## 3.2 SERVICE AREA

**FIGURE 3-1 WATER SERVICE AREA MAP**

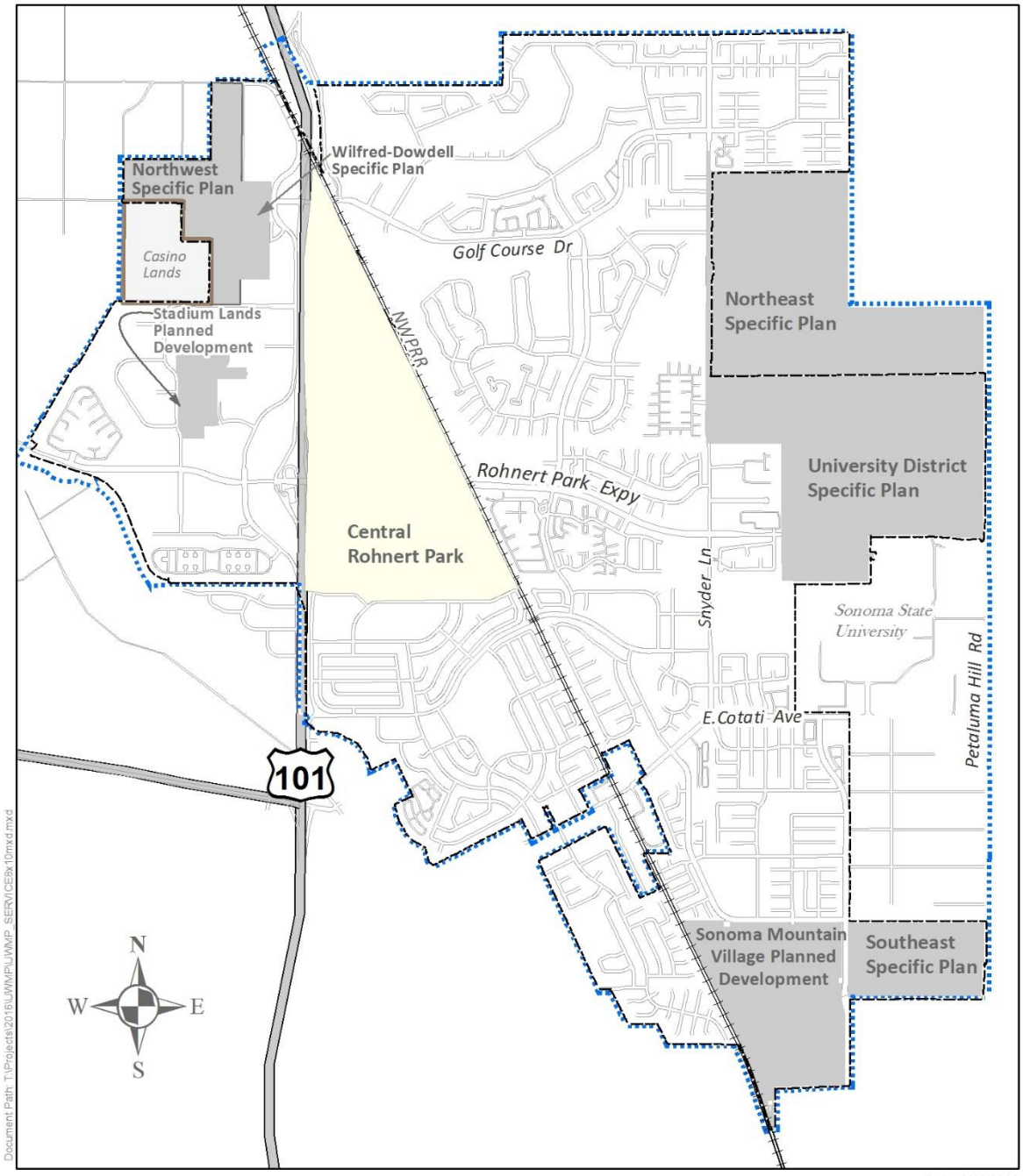


**FIGURE 3-2 POTABLE WATER SYSTEM MAP**

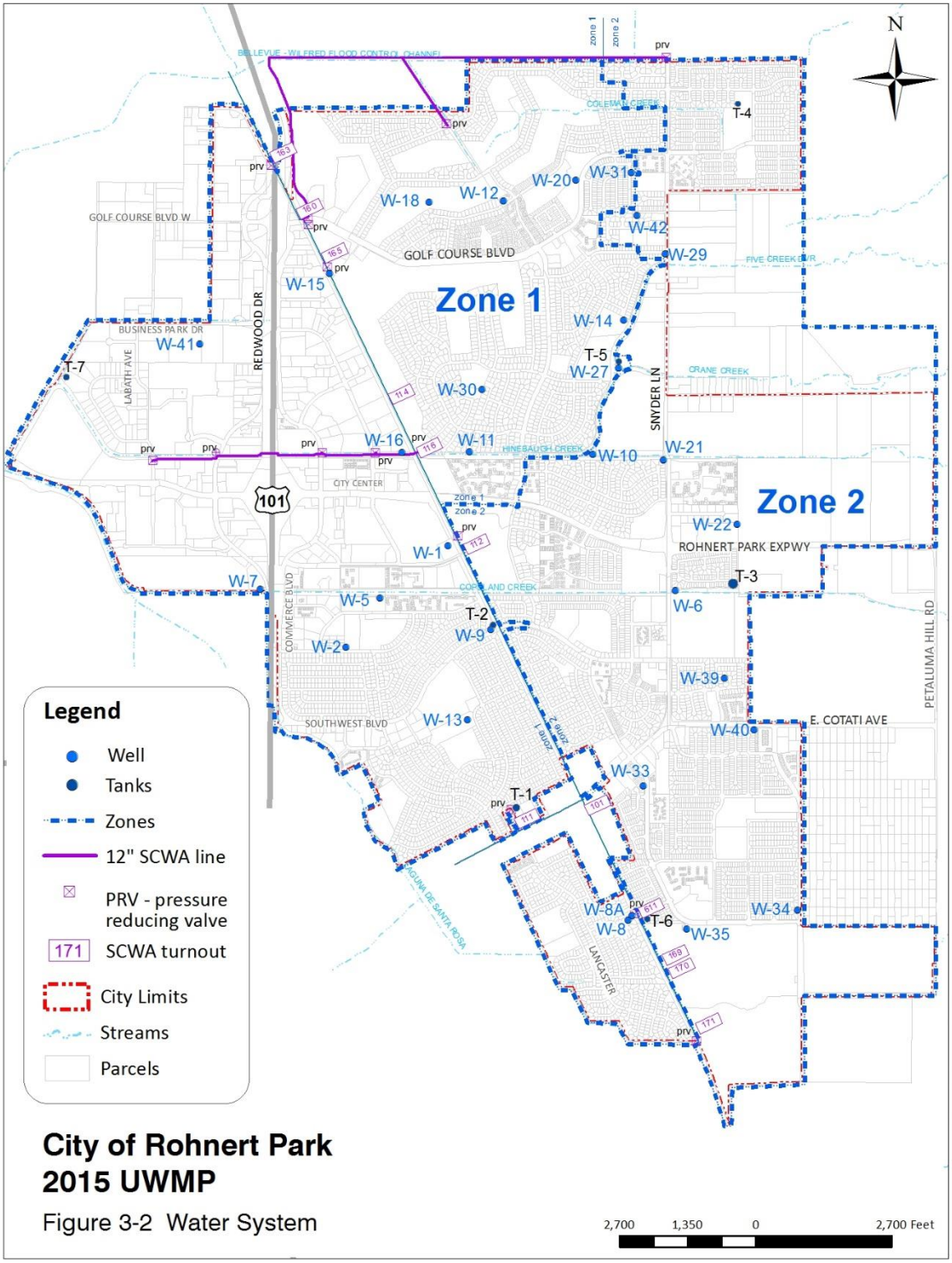
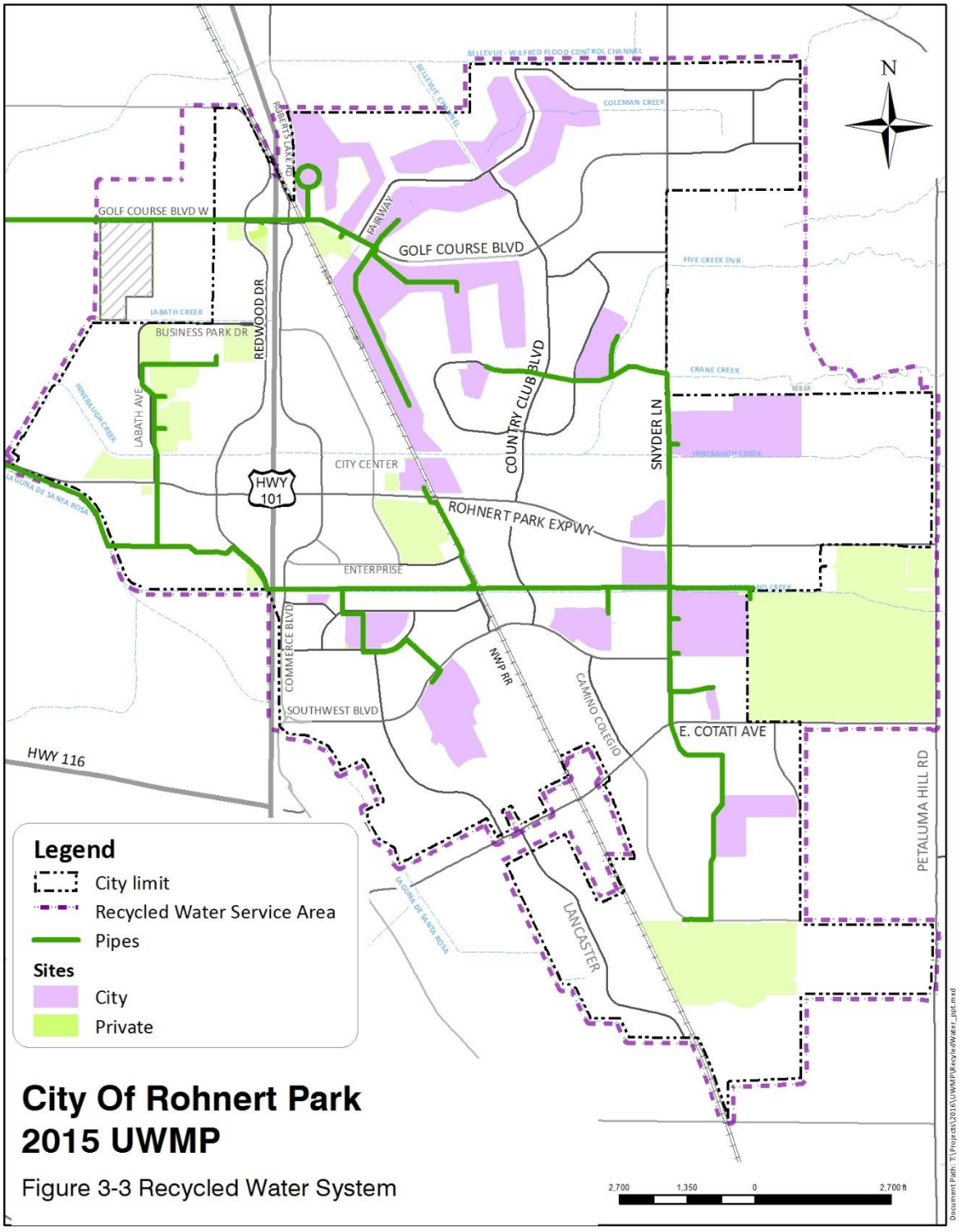


**FIGURE 3-3 RECYCLED WATER SYSTEM MAP**



## 3.3 Service Area 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 the Sonoma County Water Agency 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 for rainfall, temperature and the rate of evapotranspiration of common turf grass (ETo) are summarized in Table 3-2.

**TABLE 3-2 CLIMATE DATA**

**Table 3-2: Climate Data**

| | 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 |
| **Totals** | **42.0** | **30.18** | |

Notes: data from Western Regional Climate Center wrcc@dri.edu for Santa Rosa Station 1902-2010

### 3.3.1 Climate Change

Through its cooperative work with the Agency, particularly the recently adopted Santa Rosa Plain Groundwater Management Plan, the City benefits from ongoing work to understand and mitigate the impacts of climate change on the water supply. Specifically the Groundwater Management Plan notes:

"*The San Francisco Bay Area climates have warmed over the 20th century, as monthly maximum temperatures increased approximately 1°C between 1900 and 2000 (Flint and Flint, 2012). A long-term variability in precipitation is demonstrated by droughts in the 1920s, the 1970s, and the late 1990s. The USGS conducted a regional study of how climate change affects water resources and habitats in the San Francisco Bay area. The study relied on historical climate data and future climate projections, which were downscaled to fine spatial scales for application to a regional water-balance model (Flint and Flint, 2012). Changes in climate, potential evapotranspiration, recharge, runoff, and climatic water deficit modeled for the San Francisco Bay area included detailed studies in the Russian River Valley.*

*Results indicated large spatial variability in climate change and the hydrologic response across the region. Although the model results indicate warming under all projections, the potential precipitation changes by the end of the 21st century differed depending on the model details. Hydrologic models predicted reduced amounts of early and late wet season runoff at the end of the century under both wetter and drier future climate projections, suggesting extended dry seasons. Summers are projected to be longer and drier in the future than in the past regardless of precipitation trends. The greater variations in precipitation could directly affect water supplies and result in reduced reliability. The study also found that water demands are likely to steadily increase because of increased evapotranspiration rates and climatic water deficit during the extended summers. The study concluded that extended dry season conditions and greater potential for drought, combined with increases in precipitation over shorter periods of time, could serve as additional stressors on water quality and habitat. "*[2]

The City has completed the Climate Change Vulnerability Assessment included as Appendix I to DWR's guidebook. The completed checklist is included as Appendix 1. Of the forty questions posed, the City answered eight affirmatively. The City's reliance on rainfall-based water supplies that are not connected to the Sacramento Bay Delta supply or Colorado River supply gives it some insulation from large scale climate risks to its water supply. One of the largest areas of vulnerability to the region is habitat and ecosystem impacts on the Russian River system which hosts several endangered salmonid species. The Agency has been working actively with resources agencies for over a decade to mitigate the impacts of water supply activities on the ecosystem and is actively implementing a number of habitat improvement projects.

## 3.4 Service Area Population and Demographics

In its 2010 UWMP, the City elected to use population and employment projections based on the 2009 Association of Bay Area Governments (ABAG) data. ABAG published the projections report in 2009, which included population and employment estimates for each city in the Bay Area. Table 3-3 illustrates the population projections used in the 2010 UWMP, which included the anticipated development in the SPAs and PDs described above.

**TABLE 3-3 POPULATION PROJECTIONS FROM THE 2010 UWMP**

| Table 3-3: 2010 UWMP Population Projections | | | | | | |
|---|---|---|---|---|---|---|
| Population Served | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 |
| | 43,398 | 46,440 | 47,900 | 49,300 | 51,000 | 53,000 |
| NOTES: source is 2009 Association of Bay Area Governments | | | | | | |

As part of preparing this 2015 UWMP, the City developed its population and employment projections based on ABAG's 2013 population report which anticipates the development of the Central Rohnert Park PDA. Table 3-4 illustrates these population projections. The 2013 ABAG projections take into account the slow growth experienced during the recession period. The projections indicate that the City will recover from this slow growth trend by approximately 2030.

[2] Santa Rosa Plain Watershed Groundwater Management Plan, page 2-5

**TABLE 3-4 POPULATION PROJECTIONS - CURRENT AND PROJECTED**

| Table 3-4 (DWR 3-1 Retail): Population - Current and Projected | | | | | | |
|---|---|---|---|---|---|---|
| Population Served | 2015 | 2020 | 2025 | 2030 | 2035 | 2040*(opt)* |
| | 45,465 | 47,232 | 49,045 | 51,060 | 53,232 | 55,524 |
| NOTES: source is 2013 Association of Bay Area Governments -Subregional | | | | | | |

In general the City's development pattern is suburban in nature, with relatively low densities. However, approximately 40 percent of the City's housing stock consists of multi-family units (condominiums and apartments). This land use pattern contributes to the City's relatively low per capita water use.

# 4 System Water Use

This section provides an overview of the City's projected water demands, including the demands associated with the Central Rohnert Park PDA. The City has recently completed its 2015 Urban Water Management Plan Water Demand and Water Conservation Measures Update (2015 Demand Update), which is included as Appendix 2. The 2015 Demand Update is based on the Association of Bay Area Governments population and job projections and includes the recently adopted Central Rohnert Park PDA. The 2015 Demand Update projects that the City's potable water demands through 2040 will range between 5,600 and 6,100 AFY, depending on the level of water conservation undertaken by the City. The 2015 Demand Update indicates that the City has the potential to secure approximately 500 AFY of water supply (the difference between 5,600 and 6,100 AFY) by undertaking more aggressive water conservation activities.

## 4.1 Recycled versus Potable and Raw Water Demand

Chapter 6 provides detail on the City's water supplies which include two potable water sources (Sonoma County Water Agency and local groundwater) and recycled water. The City does not have a raw water supply. The City's tertiary-treated recycled water supply is produced by the Subregional System. The City and the Subregional System have recently entered into a Producer Distributor Agreement that provides the City with access to 1,350 AFY of recycled water. The City uses recycled water primarily for irrigation purposes and recycled water demand has varied between 800 and 1,100 AFY over the past 10 years. Recycled water demand is accounted for separately from irrigation demands served by potable water. Recycled water serves approximately 70% of the irrigation demand served through dedicated irrigation meters.

## 4.2 Water Uses by Sector

To prepare for the submission of its 2015 UWMP, the City contracted with Maddaus Water Management, Inc. (MWM) to prepare the 2015 Demand Update in order to:

1. Update its potable water demand forecast for the years 2015 to 2040; and
2. Update the range of potable water conservation savings that could be achieved and the costs of those savings under three water conservation programs that could be implemented between the years 2015 to 2040.

The 2015 Demand Update focuses specifically on potable water demand and conservation projections. Table 4-1 presents the City's current water use pattern and Table 4-2 presents the projected growth in potable water demand based on full implementation of CalGreen building and plumbing requirements. Table 4-3 presents the City's total water demand, including recycled water demands. As discussed in more detail in Chapter 5, the projected demand pattern will allow the City to continue to meet its adopted water use targets.

**TABLE 4-1- RETAIL DEMANDS FOR POTABLE AND RAW WATER – ACTUAL**

| Table 4-1 Retail: Demands for Potable and Raw Water - Actual | | | |
|---|---|---|---|
| Use Type *(Add additional rows as needed)* | 2015 Actual | | |
| ***Drop down list*** *May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool* | Additional Description | Level of Treatment When Delivered *Drop down list* | Volume |
| Single Family | | Drinking Water | 1,852 |
| Multi-Family | | Drinking Water | 1,676 |
| Commercial | | Drinking Water | 428 |
| Industrial | Includes Institutional/Governmental | Drinking Water | 3 |
| Landscape | | Drinking Water | 397 |
| Groundwater recharge | | | 0 |
| Saline water intrusion barrier | | | 0 |
| Agricultural irrigation | | | 0 |
| Wetlands or wildlife habitat | | | 0 |
| Sales/Transfers/Exchanges to other agencies | | | 0 |
| Losses | | Drinking Water | 601 |
| Other | | Drinking Water | |
| | | **TOTAL** | 4,957 |

NOTES: "Water Losses" included unmetered water that the City delivers to parks, schools and landscape areas. To comply with the requirements of Proposition 218 (California Constitution Articles XIII C and D) the City estimates the water used by these customers and pays for it. The City's Public Works Department is currently undertaking a project to install meters on these unmetered connections and reduce the volume of "unaccounted-for" water in the system.

**TABLE 4-2 DEMANDS FOR POTABLE AND RAW WATER – PROJECTED**

| Table 4-2 Retail: Demands for Potable and Raw Water - Projected | | | | | | |
|---|---|---|---|---|---|---|
| Use Type *(Add additional rows as needed)* | Additional Description *(as needed)* | Projected Water Use *Report To the Extent that Records are Available* | | | | |
| ***Drop down list*** *May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool* | | 2020 | 2025 | 2030 | 2035 | 2040-opt |
| Single Family | | 1,903 | 1,958 | 1,990 | 2,039 | 2,097 |
| Multi-Family | | 1,711 | 1,731 | 1,745 | 1,779 | 1,822 |
| Commercial | | 458 | 467 | 477 | 492 | 507 |
| Industrial | Includes Institutional/Governmental | 501 | 528 | 547 | 574 | 606 |
| Landscape | | 432 | 445 | 459 | 477 | 497 |
| Losses | | 600 | 600 | 600 | 600 | 600 |
| | **TOTAL** | 5,605 | 5,729 | 5,818 | 5,961 | 6,129 |
| NOTES: Totals include projected conservation savings associated with implementation of the plumbing and building codes. The 2015 Demand and Conservation Update, included as Appendix 2, provides significant additional detail on the calculation of these savings. The City has adjusted "losses" projected in the 2015 Demand & Conservation Update to reflect unmetered but billed water sold to parks and schools. This volume counted as "losses" in Appendix 3 is included as Institutional/Governmental use in this report. | | | | | | |

**TABLE 4-3 TOTAL WATER DEMANDS**

| Table 4-3 Retail: Total Water Demands | | | | | | |
|---|---|---|---|---|---|---|
| | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 *(opt)* |
| Potable and Raw Water *From Tables 4-1 and 4-2* | 4,957 | 5,605 | 5,729 | 5,818 | 5,961 | 6,129 |
| Recycled Water Demand* *From Table 6-4* | 1,100 | 1,150 | 1,200 | 1,250 | 1,300 | 1,350 |
| **TOTAL WATER DEMAND** | 6,057 | 6,755 | 6,929 | 7,068 | 7,261 | 7,479 |
| **Recycled water demand fields will be blank until Table 6-4 is complete.* | | | | | | |
| NOTES: | | | | | | |

## 4.3 Distribution System Water Losses

As required by DWR's guidelines, the City has reviewed its water use profile using the American Water Works Association's (AWWA's) Water Audit Model version 5. This audit model indicated that City's water losses are approximately 600 AFA or approximately 12% of its production, which is slightly above industry average. The areas for improvements noted by the model are improving the accuracy of data from the City's production records on its well field and improving on billed but unmetered water used at City parks

and by the school district. The City is undertaking projects both to improve its SCADA system and the data secured from City wells and to install meters at unmetered public sites. Table 4-4 below presents the results of the AWWA model run. The complete model is included as Appendix 3.

**TABLE 4-4 12 MONTH AUDIT LOSS REPORTING**

| Table 4-4 Retail: 12 Month Water Loss Audit Reporting | |
|---|---|
| Reporting Period Start Date (mm/yyyy) | Volume of Water Loss* |
| 01/2014 | 600.618 |
| ** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.* | |
| NOTES: | |

## 4.4 Estimating Future Water Savings

The 2015 Demand Update also modeled additional conservation activities that the City could undertake which would further reduce demands by 384 to 556 AFY. As demonstrated in Chapter 5, the City does not need these additional savings to meets its water use targets. As demonstrated in Chapter 7, the City's supplies are adequate to meet projected demands without these additional conservation savings. However, because the City has identified additional, feasible conservation savings, it has the flexibility to use increased water conservation activity as a strategy for managing planned growth. Appendix 2 provides the detail on this additional modeling effort. Table 4-5 summarizes this in tabular format.

**TABLE 4-5 INCLUSION IN WATER USE PROJECTION**

| Table 4-5 Retail Only: Inclusion in Water Use Projections | |
|---|---|
| Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) *Drop down list (y/n)* | Yes |
| If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, etc… utilized in demand projections are found. | Chapter 3 of Appendix 2 |
| Are Lower Income Residential Demands Included In Projections? *Drop down list (y/n)* | Yes |
| NOTES: | |

## 4.5 Water Use for Lower Income Households

The 2015 Demand Update is based on Association of Bay Area Government's (ABAG's) projection of General Plan build out in Rohnert Park. General Plan build out will be consistent with the City's inclusionary housing ordinance which requires a set aside of 15% of new, for-sale units to serve the needs of low and

very low income residents. Because water projections are based on the City's land use projections and the City's land use projections, by definition, take into account the City's inclusionary housing requirements, the water use projects in this 2015 UWMP include water use by low income households. Table 4-5 (presented above) summarizes this in tabular format.

# 5 BASELINES AND TARGETS

The Water Conservation Act of 2009 required that all urban water suppliers calculate and adopt 2015 and 2020 water use targets as part of their 2010 Urban Water Management Plans. In 2010, the City calculated and adopted a local 2015 target of 140 gallons per capita per day (gpcpd) and a local 2020 target of 119 gpcpd. The City also participated in a "regional alliance" which has adopted a 2015 water use target of 142 gpcpd and a 2020 target of 129 gpcpd. Under the requirements of the Water Conservation Act of 2009, if all members of the regional alliance meet the regional target, the group is in compliance; otherwise the City will need to meet its locally adopted targets.

## 5.1 UPDATING CALCULATIONS FROM THE 2010 UWMP

As part of this 2015 Urban Water Management Plan, the City updated its calculations using the 2010 census data and participated in the update of the targets for its regional alliance. This section summarizes the update effort. The City's detailed updated calculations are included in Appendix 4.

## 5.2 BASELINE PERIODS

As discussed in Chapter 4, there is extensive use of recycled water in the City's service area. In its 2010 UWMP, the City documented that recycled water use exceeded 10% of its total water use in 2008 and used 13-year baseline period.

On SB X7-7 Table 1, included in Appendix 4, the City repeated this calculation and again verified its ability to use a longer baseline period. For the purposes of both the 2010 UWMP and this 2015 UWMP, the City is using a baseline period that begins in 1992 and ends in 2004. It is using a 5-year, target confirmation baseline period that begins in 2003 and ends 2007.

## 5.3 SERVICE AREA POPULATION

The City's water service area is conterminous with its City limits allowing it to use Department of Finance (DOF) data to establish its service area population. This data is presented on SB X7-7 Table 3, included in Appendix 4.

It is important to note that the conformed DOF census used in this 2015 UWMP presents lower population numbers from the year 2000 forward than were used in the 2010 calculations. The City used these lower population numbers to perform the baseline and target calculations in 2015.

## 5.4 GROSS WATER USE

The City has used the gross potable water entering its system to establish its gross water use. Recycled water entering its separate, purple-pipe system has not been included in the calculation. The City does not place water into long term storage or serve other water suppliers or agricultural users so these exclusions have not been applied. SBX7-7 Table 4 and 4A, included in Appendix 4 present the detail of this water use from the City's Sonoma County Water Agency and local groundwater supplies.

In 2010, the City reported is gross water use in million gallons per day (mgd) based on average water use over the course of the year. In this 2015 UWMP, the City is reporting gross water use in acre feet per year, based on actual monthly deliveries from its Agency and groundwater sources. The 2015 reporting standard is more accurate and better conforms to the standard used by its regional alliance partners.

In 2010, the City reported a baseline water use of 162 gpcpd and a 5-year target compliance check of 125 gpcpd.

For this 2015 UWMP, the City recalculated both of these baselines using the 2010 DOF population data and its conformed gross water use data. With these refinements, in 2015, the City is reporting a baseline water use of 161 gpcpd and a 5 year target compliance check of 129 gpcpd. The change in the 5-year target compliance check is a result of the fact that the DOF population data used in this reporting cycle showed lower population totals, beginning in 2000, than the City had estimated in 2010. Because the reported gross water use has not changed but reported population has declined, the per capita water use has increased.

SB X7-7 Table 5, included in Appendix 4, contains the detailed calculations that support these baseline water use numbers. Table 5-1 below summarizes these calculations.

## 5.5 2015 AND 2020 TARGETS

In 2010, the City used Method 1 (80% of baseline use) to establish its 2015 and 2020 targets. At that time, the City adopted a 2020 Water Use Target of 119 gpcpd and a 2015 Interim Target of 140 gpcpd.

In 2015, the City is again electing to use Method 1 but has revised its targets to reflect, primarily, the decreased population reflected in the DOF data. As was the case in 2010, the City's 2020 target is actually established by its 5-year compliance check value of 129 gpcpd. The target is calculated as 95% of 129 gpcpd or 123 gpcpd, slightly higher than when adopted in 2010. The 2015 target is calculated as the midpoint between the baseline of 161 gpcpd and the 2020 target or 142 gpcpd. This is also slightly higher than the interim target adopted in 2010 and this difference is, again, a result of the updated population data.

**TABLE 5-1 BASELINES AND TARGETS SUMMARY**

**Table 5-1 Baselines and Targets Summary**
*Retail Agency or Regional Alliance Only*

| Baseline Period | Start Year | End Year | Average Baseline GPCD* | 2015 Interim Target * | Confirmed 2020 Target* |
|---|---|---|---|---|---|
| 10-15 year | *1992* | *2004* | *161.11* | *142* | *123* |
| 5 Year | *2003* | *2007* | *129.48* | | |

*All values are in Gallons per Capita per Day (GPCD)

NOTES: Reported 5-year baseline GPCD has been affected by the change in population included in DOF data

## 5.6 2015 Compliance Daily Per Capita Water Use

The Water Code allows the City increase its 2015 Interim Target because of certain extraordinary factors. The City will not be taking advantage of this option. The City has been diligent in reducing its 2015 water use by 16% from 2013 levels, in accordance with the Emergency Drought Regulations adopted by the State Water Resources Control Board. The City's 2015 per capita water use is just over 90 gpcpd, well below its interim target. Appendix 4 provides additional detail on these calculations, which are summarized in Table 5-2 below. The table illustrates that the City has meet its local 2015 interim target. In fact, the City's actual 2015 per capita water use is lower than the adopted 2020 target.

**TABLE 5-2 2015 COMPLIANCE**

**Table 5-2: 2015 Compliance**
*Retail Agency or Regional Alliance Only*

| Actual 2015 GPCD* | 2015 Interim Target GPCD* | Optional Adjustments to 2015 GPCD *From Methodology 8* | | | | | 2015 GPCD* *(Adjusted if applicable)* | Did Supplier Achieve Targeted Reduction for 2015? Y/N |
|---|---|---|---|---|---|---|---|---|
| | | Extraordinary Events* | Economic Adjustment* | Weather Normalization* | TOTAL Adjustments* | Adjusted 2015 GPCD* | | |
| 91 | 142 | 0 | 0 | 0 | 0 | 90.5778112 | 90.57781124 | Yes |
| **All values are in Gallons per Capita per Day (GPCD)* | | | | | | | | |
| NOTES: | | | | | | | | |

## 5.7 Regional Alliance

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 Agency 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 City Council approved becoming a member of the regional alliance and using regional targets on April 12, 2011. The region reports under the name of the Sonoma-Marin Saving Water Partnership and includes 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.

In 2010, 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. In 2010, the Alliance established a 2020 Water Use Target of 129 gpcpd and a 2015 Interim Water Use Target of 142 gpcpd. The Alliance updated its calculations for 2015 and again calculated a 2020 target of 129 gpcpd. Its calculated 2015 Interim Target is 143 gpcpd, with the slightly higher number reflecting the adjustments made to population to conform to the 2010 census. Together the Alliance members achieved at 2015 weighted water use of 100 GPCD, exceeding the established target. Appendix 5 includes the detailed calculation tables for the Regional Alliance.

# 6 System Supplies

The City of Rohnert Park has three sources of water: Sonoma County Water Agency supply, local groundwater and recycled water. The City manages these supplies using a "conjunctive use" strategy, drawing on the Agency and recycled water supplies first and utilizing its local groundwater to manage peak demands and in times of water shortages. The total reliable supply available to the City through these three sources is 10,299 AFY, including 8,949 AFY of potable water and 1,350 AFY of recycled water. As discussed in this section, there is some minor hydrologic variability to this supply profile.

## 6.1 Sonoma County Water Agency Supply (Purchased Water)

This section describes the Agency supply, its hydrologic availability and the various contracts that affect this supply. This information is brought forward from the City's previous WSAs and its 2005 and 2010 UWMPs and is used to project the Agency supply that is reasonably available to the City under all hydrologic conditions. The City expects it will receive up to 6,372 AFY under normal hydrologic conditions from the Agency supply.

The City's contract for water supply with Sonoma County Water Agency is the Restructured Agreement for Water Supply. Under this contract the City has access to as much as 7,500 AFY. The City's water supply allocation in the Restructured Agreement, presumes the Agency is able to secure modifications to its water rights permits that will allow it to increase its diversions from 75,000 AFY to 101,000 AFY. (See Sections 6.1.1 and 6.1.2 for additional discussion of the Agency's water rights and contracts). The Agency can also pump 2,300 AFY of groundwater to meet demand. Over the past 10 years, the City has used between 2,500 and 5,000 AFY of Agency supply, which is significantly less than its maximum allocation.

The water supply available to the City from the Agency is measured in two ways, hydrologic availability, and legal availability. Hydrologic availability is a measure of how much water is available because of rainfall, runoff, and storage in the Russian River watershed. Normal Year, Single Dry Year and Multiple Dry Year are ways to describe the hydrologic availability of water supply under a variety of rainfall conditions. The Agency's hydrologic models, (Sonoma County Water Agency 2015 Urban Water Management Plan) indicate that its water supply is most constrained under the Single Dry Year condition when approximately 60,000 AFY is available.

Legal availability is a measure of how much water the Agency is allowed to divert under the water rights permits it receives from the State Water Resources Control Board (SWRCB). The Agency currently has permits to divert and re-divert 75,000 AFY. The Agency has a pending water rights application to increase its diversion and re-diversion rights to 101,000 AFY but this application has not been acted upon. At the present time, legal availability is a large constraint on the Agency supply because it cannot currently diver the full volume of water allocated under the Restructured Agreement.

### 6.1.1 Agency's Water Rights

The Agency currently diverts and re-diverts water from the Russian River System under four permits issued by the SWRCB. These permits (Numbers 12947A, 12949, 12950 and 16596) provide the Agency with the rights to divert and re-divert up to 75,000 AFY, and to store water in Lake Mendocino and Lake Sonoma.

These permits also set minimum in-stream flow requirements to protect fish and wildlife and maintain recreation in the Russian River. The SWRCB's Decision 1610 provides for varying minimum in-stream flow requirements under different hydrologic cycles (i.e., in-stream flow requirements are lower in dry water years than in normal water years). The Agency works with the SWRCB on a regular basis to implement the various in-stream flow requirements of its permits based on hydrologic conditions at the time.

### 6.1.2 The Restructured Agreement for Water Supply

The Restructured Agreement for Water Supply (the Restructured Agreement) is the contractual document that outlines how the Agency's proposed 101,000 AFY water right is allocated among the Agency's Contractors and other customers. The Restructured Agreement was executed on June 20, 2006 and has a term of at least forty years. The Restructured Agreement allocates 7,500 AFY to the City, with an average day maximum month pumping rate of 15.0 million gallons per day (mgd) under Normal Year conditions.

Section 3.5 of the Restructured Agreement (the Water Shortage Provisions) defines how the water supply and transmission system capacity would be allocated in case of shortage. On April 18, 2006, the Agency's Board of Directors adopted a Water Shortage Allocation Methodology that provides a mathematical quantification of the Water Shortage Provisions. This allows the Contractors to calculate their reasonably expected Agency allocation under a range of supply scenarios. Based on the Water Shortage Allocation Methodology, the City expects it can receive up to 6,372 AFY as long as the Agency's water rights are limited to 75,000 AFY.

### 6.1.3 Drought Considerations

The State of California has been experiencing a serious drought with rainfall and especially snowpack being recorded as the lowest on record in 120 years. On January 17, 2014, Governor Brown declared a statewide drought emergency, which has been followed up with several subsequent Executive Orders and two rounds of emergency drought regulations issued by the State Water Resources Control Board. The City has responded to these requirements with its own emergency drought ordinances and is currently exceeding its required conservation savings of 16% over 2013 demands.

While the State Water Project, administered by the Department of Water Resources, is extremely stressed by the lack of snowpack, the Sonoma County Water Agency's rainfall based water system is experiencing significantly less stress. Currently the Agency's primary storage reservoir, Lake Sonoma, is at 97.3% of capacity (www.scwa.ca.gov/currentwatesupplylevels ) The Agency and its contractors are currently finalizing self-verification calculations under the State's emergency drought regulations. These calculations illustrate that a minimum of 3 years of supply is currently available.

## 6.2 Groundwater

This section describes the City's groundwater supply, its hydrologic availability and the policies that affect its use. This 2015 UWMP projects that 2,577 AFY of groundwater will be available to the City.

The City's local groundwater supply is from the Santa Rosa Plain (SRP) Subbasin of the Santa Rosa Valley (SRV) Groundwater Basin. The City has developed 42 groundwater wells, 29 of which are currently active. The active wells have a total rated production capacity of 6.3 mgd. The City's 2010 Urban Water

Management Plan, which is incorporated by reference, provides additional detail on the individual wells and their production capability.

The City manages its groundwater supply in accordance with its 2004 Water Policy Resolution which limits groundwater pumping to 2,577 AFY. A Water Supply Assessment developed by the City in 2004 (the 2004 WSA) provided the technical support for this maximum pumping rate, which can be sustained over all hydrologic conditions. The 2004 WSA is incorporated by reference in this 2015 UWMP. Over the past 10 years the City has used between 350 and 1,600 AFY of groundwater, which is significantly less than the technical and policy limitations on groundwater use.

### 6.2.1 Basin Description

The City is located in the southern portion of the Santa Rosa Valley (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 3-2 included in Section 3.2 illustrates the City's well locations. This section contains a summary of the geology and hydrogeologic conditions in the SRV Groundwater Basin (DWR, 2004).

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).

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 2004-2007, primarily in response to decreased pumping in the subbasin. During the last ten years, the water levels have continued to increase. Even with the drought conditions, monitoring conducted as part of the implementation of the Santa Rosa Plain Groundwater Management Plan demonstrated generally stable groundwater levels. 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 AF 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 AF and average annual pumping during the same time was estimated at 29,700 AF (DWR, 1982a).

### 6.2.2 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.

### 6.2.3 Adjudicated Basins

Neither the SRV Basin nor the SRP Subbasin has been adjudicated.

### 6.2.4 Sufficiency of Groundwater

A full analysis of the water level hydrographs and their relationship to pumpage and sufficiency was evaluated in the 2004 WSA for a time period between 1977 and 2003, where there were several periods of wet, normal, single dry and multiple-dry years. Groundwater recharge was estimated to be about 8,300 acre-feet per year and showed a positive change in groundwater storage through 2003. The observed groundwater level trends indicate stable to continued increasing levels during 2012-2013 and a slight lowering in groundwater levels during the drought period of 2014 and 2015. The City's groundwater supply has not historically been subject to hydrologic variability.

Reliability and Vulnerability of the Groundwater Supply

While the City has imposed policy restraints on its groundwater pumping, 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 2004 WSA included an analysis of the historical groundwater level and pumpage data and presented 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.

### 6.2.5 Groundwater Management

The City supported the development the Santa Rosa Plain Watershed Groundwater Management Plan, which was adopted in the fall of 2014, and participates actively in the implementation of this Plan. Modeling and monitoring data collected by the City and others indicate that groundwater levels are generally rising around the City's well field, an indication of stable supply (Hydrologic and Geochemical characteristic of the Santa Rosa Plain Watershed). Under the auspices of the Groundwater Management Plan, groundwater levels in selected wells are regularly monitored and reported upon.

The California Department of Water Resources defines the Santa Rosa Valley Groundwater Basin as a "medium priority basin". As a result, and in accordance with the requirements of the Groundwater Sustainability Act of 2014, the City is working with the County of Sonoma, the Sonoma County Water Agency, the cities of Cotati, Santa Rosa and Sebastopol and the Town of Windsor to form a Groundwater Sustainability Agency and develop a Groundwater Sustainability Plan. These agencies all expect that the Groundwater Sustainability Plan will build upon the adopted Groundwater Management Plan and continue to provide a strong framework for managing the groundwater supply.

### 6.2.6 Limitations to Groundwater Pumping and Overdraft Conditions

The City has adopted local policies related to groundwater management. Resolution No. 2004-95 (the Water Policy Resolution, see Appendix 6), 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 AFY. The Water 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. The City has operated under the framework of the Water Policy Resolution since 2004 and groundwater pumpage is consistently below 2,577 AFY.

### 6.2.7 Historical Groundwater Pumping (2010-2015)

Table 6-1 illustrates the City's groundwater use for the five-year period from 2011-2015. The City pumped as little as 766 AF in 2012. The City's pumpage increased in 2014 and 2015, to as much as 1,583 AF in 2014. This increase reflects the City's conjunctive use management strategy, which involves maximizing the use

of Agency water during normal years and relying more on groundwater in drought conditions. The amount pumped in 2014 is still well below the 2,577 AFY threshold specified in the City's 2004 Water Policy Resolution. The groundwater pumped was sufficient to meet the City's needs and the City did not encounter any major challenges with regards to obtaining groundwater.

**TABLE 6-1 GROUNDWATER VOLUME PUMPED**

| Table 6-1 Retail: Groundwater Volume Pumped | | | | | | |
|---|---|---|---|---|---|---|
| ☐ | Supplier does not pump groundwater. The supplier will not complete the table below. | | | | | |
| Groundwater Type *Drop Down List* *May use each category multiple times* | Location or Basin Name | 2011 | 2012 | 2013 | 2014 | 2015 |
| *Add additional rows as needed* | | | | | | |
| Alluvial Basin | Santa Rosa Plain Subbasin of the Santa Rosa Valley Groundwater Basin | 821 | 766 | 1343 | 1583 | 1455 |
| | **TOTAL** | 821 | 766 | 1,343 | 1,583 | 1,455 |
| NOTES: | | | | | | |

## 6.3 Surface Water

The City does not utilize an independent surface water supply.

## 6.4 Stormwater

The City does not utilize an independent storm water supply.

## 6.5 Wastewater and Recycled Water

The City's tertiary-treated recycled water supply is produced by the Subregional System. In July of 2015, the City and the Subregional System entered into a Producer Distributor Agreement that made the City the retail recycled water purveyor within its limits and to Sonoma State University and provided the City with access to 1,350 AFY of recycled water. The City and Sonoma State University use recycled water primarily for irrigation purposes and recycled water demand has varied between 800 and 1,100 AFY over the past 10 years. This section provides additional information on the wastewater collection, treatment and recycled water systems.

### 6.5.1 Recycled Water Coordination

As described above the Subregional System is the City's wholesale supplier of recycled water. This UWMP has been coordinated with the Subregional System.

### 6.5.2 Wastewater Collection, Treatment, and Disposal

The City owns and operates the collection system within its corporate limits and also collects and transports wastewater generated by Sonoma State University and within the Canon Manor SPA. The City's collection system consists of 77 miles of gravity sewers, 7.5 miles of force mains, 16 inverted siphons, and three pump stations that convey sewage to the treatment facility. Most facilities were installed between 1956 and 1980 and the average age is estimated to be 30 years. Wastewater is transported to the Subregional System's Laguna Treatment Plant through the City's terminal pump station. Table 6-2 presents the volume of wastewater generated within the City's sewer service are in 2015.

**TABLE 6-2 WASTEWATER COLLECTED WITHIN THE SERVICE AREA IN 2015**

| Table 6-2 Retail: Wastewater Collected Within Service Area in 2015 | | | | | | |
|---|---|---|---|---|---|---|
| ☐ | There is no wastewater collection system. The supplier will not complete the table below. | | | | | |
| 100% | Percentage of 2015 service area covered by wastewater collection system *(optional)* | | | | | |
| 100% | Percentage of 2015 service area population covered by wastewater collection system *(optional)* | | | | | |
| **Wastewater Collection** | | | **Recipient of Collected Wastewater** | | | |
| Name of Wastewater Collection Agency | Wastewater Volume Metered or Estimated? *Drop Down List* | Volume of Wastewater Collected from UWMP Service Area 2015 | Name of Wastewater Treatment Agency Receiving Collected Wastewater | Treatment Plant Name | Is WWTP Located Within UWMP Area? *Drop Down List* | Is WWTP Operation Contracted to a Third Party? *(optional)* *Drop Down List* |
| *Add additional rows as needed* | | | | | | |
| City of Rohnert Park | Metered | 3,330 | City of Santa Rosa | Laguna Wastewater Treatment Plant | No | No |
| **Total Wastewater Collected from Service Area in 2015:** | | 3,330 | | | | |
| NOTES: | | | | | | |

Wastewater treatment and disposal is provided by the Subregional System, which also serves the cities of Santa Rosa, Sebastopol, and Cotati. Wastewater from the Subregional System is treated at the Laguna Water Reclamation Plant, located about 2 miles northwest of Rohnert Park. The City owns capacity rights to 3.43 million gallons per day (MGD) at the Laguna Water Reclamation Plant and has an agreement with the City of Santa Rosa to use up to 4.46 MGD of capacity rights. Under the Subregional System's approved Incremental Recycled Water Program, Rohnert Park can acquire up to 5.15 MGD of capacity. Rohnert Park's current capacity needs are approximately 3.0 MGD.

The Subregional System treats wastewater to Title 22 tertiary recycled water standards as discussed in Section 6.5.2. 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). Although the City is part of the Subregional System no wastewater is treated or disposed of within city limits.

While the Laguna Treatment Plant is not the City's service area, the City has coordinated with the Subregional System and completed Table 6-3 in order to provide a clear picture of the recycled water used in its service area.

**TABLE 6-3 WASTEWATER TREATMENT AND DISCHARGE WITHIN THE SERVICE AREA 2015**

| Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2015 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ☑ | No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below. | | | | | | | | | |
| Wastewater Treatment Plant Name | Discharge Location Name or Identifier | Discharge Location Description | Wastewater Discharge ID Number *(optional)* | Method of Disposal *Drop down list* | Does This Plant Treat Wastewater Generated Outside the Service Area? | Treatment Level *Drop down list* | 2015 volumes | | | |
| | | | | | | | Wastewater Treated | Discharged Treated Wastewater | Recycled Within Service Area | Recycled Outside of Service Area |
| *Add additional rows as needed* | | | | | | | | | | |
| Laguna Wastewater Treatment Plant | Laguna de Santa Rosa | Flows to Russian River | | River or creek outfall | Yes | Tertiary | 17,493 | 0 | 798 | 16,695 |
| | | | | | | | | | | |
| | | | | | | **Total** | 17,493 | 0 | 798 | 16,695 |
| NOTES: The City is part of the Subregional System that maintains a dishcrage permit to the Russian River but takes place outside the city service area. | | | | | | | | | | |

### 6.5.3 Recycled Water System

As described earlier in this report, the City owns and operates a purple-pipe recycled water system. The City's wholesale supplier of recycled water is the Subregional System. The recycled water system is illustrated in Figure 3-3 (Section 3.2). The City's recycled water system was installed in the 1990s and recycled water is used for irrigation of large landscapes in the City including 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. Recycled water use averages between 800 and 1,100 AFY. 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.

The Subregional System has prepared and adopted its Incremental Recycled Water Master Plan (IRWP Master Plan located at http://ci.santa-rosa.ca.us/departments/utilities/irwp/Pages/default.aspx. The IRWP Master Plan outlines the long term strategy for expansions to the recycled water system.

### 6.5.4 Recycled Water Beneficial Uses

Recycled water is currently used to irrigate 450 acres of land within the City. This includes two City-owned 18-hole golf courses, Roberts Lake Park, Roberts Lake Road and the Park 'n Ride lot landscaped area, City parks, school grounds, and many sites with significant lawn and landscaped areas. Consistent with IRWP Master Plan, its General Plan and the environmental documents for proposed new development, the City is working with the Subregional System to incrementally expand the recycled water system within its service area in order to provide recycled water for irrigation and other non-potable uses. This expansion will provide up to 1,350 AFY of additional supply. All environmental clearances are complete for this expansion. The City will be constructing recycled water main extensions with developers over the next 10 years. The actually timing of the expansion is dependent on the timing of new development. The projected recycled water directs beneficial uses within the service area is shown in Table 6-4 below. Table 6-5 compares actual use in 2015 to the estimates made in the City's 2010 Urban Water Management Plan.

**TABLE 6-4 CURRENT AND PROJECTED RECYCLED WATER DIRECT BENEFICIAL USES WITHIN SERVICE AREA**

**Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area**

☐ Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.

| | |
|---|---|
| Name of Agency Producing (Treating) the Recycled Water: | City of Santa Rosa Subregional System |
| Name of Agency Operating the Recycled Water Distribution System: | City of Rohnert Park |
| Supplemental Water Added in 2015 | 0 |
| Source of 2015 Supplemental Water | 0 |

| Beneficial Use Type | General Description of 2015 Uses | Level of Treatment *Drop down list* | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 (opt) |
|---|---|---|---|---|---|---|---|---|
| Agricultural irrigation | | | | | | | | |
| Landscape irrigation (excludes golf courses) | Commercial landscapes and SSU | Tertiary | 462 | | | | | |
| Golf course irrigation | FoxTail Golf Course | Tertiary | 336 | | | | | |
| Commercial use | | | | | | | | |
| Industrial use | | | | | | | | |
| Geothermal and other energy production | | | | | | | | |
| Seawater intrusion barrier | | | | | | | | |
| Recreational impoundment | | | | | | | | |
| Wetlands or wildlife habitat | | | | | | | | |
| Groundwater recharge (IPR)* | | | | | | | | |
| Surface water augmentation (IPR)* | | | | | | | | |
| Direct potable reuse | | | | | | | | |
| Other *(Provide General Description)* | | | | | | | | |
| | | **Total:** | 798 | 1,150 | 1,200 | 1,250 | 1,300 | 1,350 |

**IPR - Indirect Potable Reuse*

NOTES:

**TABLE 6-5 2010 UWMP RECYCLED WATER USE PROJECTIONS COMPARED TO 2015 ACTUAL**

| Table 6-5 Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual | | | |
|---|---|---|---|
| ☐ | Recycled water was not used in 2010 nor projected for use in 2015. The supplier will not complete the table below. | | |
| **Use Type** | | **2010 Projection for 2015** | **2015 Actual Use** |
| Agricultural irrigation | | | |
| Landscape irrigation (excludes golf courses) | | 1,300 | 462 |
| Golf course irrigation | | | 336 |
| Commercial use | | | |
| Industrial use | | | |
| Geothermal and other energy production | | | |
| Seawater intrusion barrier | | | |
| Recreational impoundment | | | |
| Wetlands or wildlife habitat | | | |
| Groundwater recharge (IPR) | | | |
| Surface water augmentation (IPR) | | | |
| Direct potable reuse | | 0 | |
| Other | *Type of Use* | | |
| **Total** | | 1,300 | 798 |
| NOTES: City's 2010 projections did not differentiate Golf Course Use from other Landscape Use | | | |

### 6.5.5 Actions to Encourage and Optimize Future Recycled Water Use

The City has an adopted recycled water use ordinance (Section 13.62.040 of the Rohnert Park Municipal Code). The City uses its regulatory to authority under this ordinance to require extension of recycled water mains and connection of new landscapes to recycled water, when feasible. Since the adoption of its 2010 Urban Water Management Plan, the City has connected one new commercial customer, and one new multi-family residential customer and has extended approximately one-half mile of recycled water main to serve a planned new park. The City estimates that, over time, its recycled water use will grow by 300 AFY as its General Plan build out continues and new customers are added. Table 6-6 summarizes this information.

**TABLE 6-6 METHODS TO EXPAND RECYCLED WATER USE**

| Table 6-6 Retail: Methods to Expand Future Recycled Water Use | | | |
|---|---|---|---|
| ☐ | Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation. | | |
| | Provide page location of narrative in UWMP | | |
| Name of Action | Description | Planned Implementation Year | Expected Increase in Recycled Water Use |
| *Add additional rows as needed* | | | |
| Mandatory Use Ordinance and System Expansion to Serve Development | Extend recycled water mains as necessary to provide supply to new development | Varies | 300 |
| | | **Total** | 300 |
| NOTES: | | | |

## 6.6 Desalinated Water Opportunities

The City does not have any current or future desalination water supply plans due to the City's locations in relation to sea water, as well as the water quality of the Santa Rosa Plain Subbasin.

## 6.7 Exchanges or Transfers

Water transfers are authorized between the Agency's water contractors under the Restructured Agreement. The City does not anticipate any transfers or exchanges.

## 6.8 Future Water Projects

The City's water supply is not dependent on future expansions to meet projected demand. The City is planning two future capital improvement projects to extend the life of its groundwater well system and to reduce its "unaccounted for" water by installing meters at school and park properties. These are described below.

- 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 supplementing its local groundwater supply well system.
- Water Meter Installation Project. The City is currently paying for irrigating some school properties since one meter is shared between school and park irrigation. The project would separate these shared connections by installing meters on un-metered City properties in order to accurately account for water consumed and reduce apparent water losses.

Because the City is not relying on expansion projects to meet its existing or future water demand, it has not entered data in Table 6-7.

**TABLE 6-7 EXPECTED FUTURE WATER SUPPLY PROJECTS OR PROGRAMS**

| Table 6-7 Retail: Expected Future Water Supply Projects or Programs | | | | | | |
|---|---|---|---|---|---|---|
| ☑ | No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below. | | | | | |
| ☐ | Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format. | | | | | |
| | Provide page location of narrative in the UWMP | | | | | |
| Name of Future Projects or Programs | Joint Project with other agencies? | | Description (if needed) | Planned Implementation Year | Planned for Use in Year Type *Drop Down List* | Expected Increase in Water Supply to Agency *This may be a range* |
| | *Drop Down List (y/n)* | *If Yes, Agency Name* | | | | |
| *Add additional rows as needed* | | | | | | |
| | | | | | | |
| NOTES: | | | | | | |

## 6.9 Summary of Existing and Planned Sources of Water

The water supply for the City consists of three components: purchased water from the Agency, pumped groundwater from City owned wells, and recycled water produced by the Subregional System. Table 6-8 presents the City's utilization of each supply source in 2015, Table 6-9 presents the City's projected supply from each source for the planning period from 2015 through 2040.

**TABLE 6-8 WATER SUPPLIED- ACTUAL**

**Table 6-8 Retail: Water Supplies — Actual**

| Water Supply | Additional Detail on Water Supply | 2015 | | |
|---|---|---|---|---|
| ***Drop down list*** *May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool* | | Actual Volume | Water Quality *Drop Down List* | Total Right or Safe Yield *(optional)* |
| *Add additional rows as needed* | | | | |
| Purchased or Imported Water | Sonoma County Water Agency | 2,774 | Drinking Water | 6,372 |
| Groundwater | City Owned Wells | 1,455 | Drinking Water | 2,577 |
| Recycled Water | Santa Rosa Subregional System | 798 | Recycled Water | 1,350 |
| | | | | |
| | **Total** | 5,026 | | 10,299 |

NOTES: Agency Supply volume is the City's estimated safe yield. The Restructured Agreement provides the City with contractual rights to 7,500 AFY

**TABLE 6-9 WATER SUPPLIES- PROJECTED**

| Table 6-9 Retail: Water Supplies — Projected | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Water Supply | Additional Detail on Water Supply | Projected Water Supply *Report To the Extent Practicable* | | | | | | | | | |
| ***Drop down list*** *May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool* | | **2020** | | **2025** | | **2030** | | **2035** | | **2040** *(opt)* | |
| | | Reasonably Available Volume | Total Right or Safe Yield *(optional)* | Reasonably Available Volume | Total Right or Safe Yield *(optional)* | Reasonably Available Volume | Total Right or Safe Yield *(optional)* | Reasonably Available Volume | Total Right or Safe Yield *(optional)* | Reasonably Available Volume | Total Right or Safe Yield *(optional)* |
| *Add additional rows as needed* | | | | | | | | | | | |
| Purchased or Imported Water | | 6,372 | 6,372 | 6,372 | 6,372 | 6,372 | 6,372 | 6,372 | 6,372 | 6,372 | 6,372 |
| Groundwater | | 2,577 | 2,577 | 2,577 | 2,577 | 2,577 | 2,577 | 2,577 | 2,577 | 2,577 | 2,577 |
| Recycled Water | | 1,350 | 1,350 | 1,350 | 1,350 | 1,350 | 1,350 | 1,350 | 1,350 | 1,350 | 1,350 |
| **Total** | | 10,299 | 10,299 | 10,299 | 10,299 | 10,299 | 10,299 | 10,299 | 10,299 | 10,299 | 10,299 |
| NOTES: | | | | | | | | | | | |

## 6.10 Climate Change Impacts to Supply

Impacts to the City's water supplies due to climate change are as follows:

- Agency Supply: At this time climate change impacts to the Water Agency's water supply is unknown, although the Agency is working with the US Geological Survey to analyze potential long-term impacts. However, because the Water Agency's water supply is rainfall-driven climate change is expected to affect supply in that timing of runoff is expected to shit to earlier in the year. This will affect reservoir storage, especially in spring and summer months. Annual precipitation is expected to vary with vulnerability to droughts and dry periods.
- Groundwater: Climate change can affect the availability and yield from groundwater aquifers. Groundwater levels in the area fluctuate depending on precipitation, aquifer recharge, and pumping. As is the case with the Agency supply, long-term studies and adopted management plan are focused on minimizing this impact.
- Recycled Water: Recycled water is relatively resistant to climate change. However, long-term conservation efforts, which reduce discharge to the Laguna Treatment Plant, may ultimately impact the City's recycled water supply.

As discussed earlier in this UWMP, the City has completed the Climate Change Vulnerability Assessment and its rainfall-based supply system is less vulnerable to the impacts of climate change than other types of supply. The City is among the nine cities and County of Sonoma's collaborative effort to develop a Community Climate Action Plan to reduce greenhouse gas (GHG) emissions and respond to the impacts of climate change.

# 7 WATER SYSTEM RELIABILITY

## 7.1 CONSTRAINTS ON WATER SOURCES

The City has three sources of water supply: Agency supply, groundwater, and recycled water. The City's supply projections indicate that its long term water supply portfolio is composed of the following:

- Sixty-two percent Agency water;
- Twenty-five percent local groundwater;
- Thirteen percent recycled water.

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

The Agency'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 Agency'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; and the City has adopted development impact fee programs to fund the construction of the expanded system. Since 2010, the recycled water system has been extended to serve the Stadium Lands PDA and the University District SPA. An extension to serve the Southeast SPA is currently entering the construction phase.

### 7.1.1 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.

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.

## 7.2 CONSTRAINTS ON THE AGENCY SUPPLY

### 7.2.1 HYDROLOGIC CONSTRAINTS

The Agency has developed a model of its water system, including storage available in Lake Mendocino and Lake Sonoma, in order to project hydrologic reliability. This model, which is described in detail in the Agency's Urban Water Management Plan, is based on the water year types presented in Table 7-1, below.

The Agency's model indicates that its system is not impaired by hydrology in normal and multiple dry years. However, in single dry years the system's reliability is reduced slightly. Based on the Agency's analysis for the single-dry year, it can deliver the following percentages of its supply to its customers (see Agency 2010 UWMP Tables 6-2 and 6-3):

- 2020: 100 percent
- 2025: 90 percent
- 2030: 92 percent
- 2035: 94 percent

Section 3.5 of the Restructured Agreement for Water Supply includes an allocation methodology that is used in the case of water supply shortages. This allocation methodology takes into account each water 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 Agency'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.

The Agency 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, 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 7-1 (Agency), 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 Agency and other contractors to appropriately implement the provisions of Section 3.5 of the Restructured Agreement.

**TABLE 7-1 (AGENCY) BASIS OF WATER YEAR DATA**

| Table 7-1 Retail: Basis of Water Year Data | | | |
|---|---|---|---|
| **Year Type** | **Base Year** *If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000* | **Available Supplies if Year Type Repeats** | |
| | | ☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____ | |
| | | ☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both. | |
| | | **Volume Available** | **% of Average Supply** |
| Average Year | 1962 | 6,372 | 100% |
| Single-Dry Year | 1977 | 5,735 | 90% |
| Multiple-Dry Years 1st Year | 1988 | 6,372 | 100% |
| Multiple-Dry Years 2nd Year | 1989 | 6,372 | 100% |
| Multiple-Dry Years 3rd Year | 1990 | 6,372 | 100% |
| Multiple-Dry Years 4th Year *Optional* | 1991 | 6,372 | 100% |
| NOTES: Because the City's supplies are all from the same Russian River watershed and subject to the same hydrologic events, the base year used is the same for all supplies. | | | |

### 7.2.2 Legal & Environmental Constraints

There are also legal and environmental factors that have the potential to constrain the Agency water supply. As described in Section 6, while the City's contract with the Agency is premised on Agency supply rights of 101,000 AFY, four State Water Resources Control Board (SWRCB) permits currently govern the Agency's system and limit diversions to 75,000 AFY.

In addition, a final Biological Opinion (BO) from the National Marine Fisheries Service (NMFS) constrains the Agency's Russian River operations in order to protect state and federal endangered species (steelhead trout, and coho and Chinook salmon). 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 Russian River and its estuary;
- 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.

The Agency is currently completing an environmental impact report that documents both operational modifications and habitat restoration project that it will undertake to comply with the BO. These activities are expected to mitigate impacts to salmonids from the current water supply operations and minimize legal and environmental constraints on the Agency's currently permitted supply.

## 7.3 Constraints on Groundwater Supply

As described in Section 6 and its 2004 WSA, the City analyzed groundwater trends in order to develop a groundwater pumping rate of 2,577 AFY that is sustainable under all hydrologic conditions. While the City meets all water quality standards with its groundwater supply. It has taken some of its wells off line because of arsenic levels that exceed standards.

## 7.4 Recycled Water Supply

The City has a contract for a recycled water supply of 1,350 AFA. This supply is reliable under all hydrologic conditions. While the City's recycled water supply meets all water quality standards for unrestricted nonpotable use, it cannot be used to meet potable demands.

## 7.5 Supply and Demand Assessment

In accordance with the California Water Code, the following tables compare the water supply available to the City under normal, single dry and multiple dry year conditions in five year increments from 2020 to 2040.

**TABLE 7-2 NORMAL YEAR WATER SUPPLY AND DEMAND COMPARISON**

| Table 7-2 Retail: Normal Year Supply and Demand Comparison | | | | | |
|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 *(Opt)* |
| Supply totals *(autofill from Table 6-9)* | 10,299 | 10,299 | 10,299 | 10,299 | 10,299 |
| Demand totals *(autofill from Table 4-3)* | 6,755 | 6,929 | 7,068 | 7,261 | 7,479 |
| Difference | 3,544 | 3,370 | 3,231 | 3,038 | 2,820 |
| NOTES: | | | | | |

**TABLE 7-3 SNGLE DRY YEAR SUPPLY AND DEMAND COMPARISON**

| Table 7-3 Retail: Single Dry Year Supply and Demand Comparison | | | | | |
|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 (Opt) |
| Supply totals | 9,662 | 9,662 | 9,662 | 9,662 | 9,662 |
| Demand totals | 6,755 | 6,929 | 7,068 | 7,261 | 7,479 |
| Difference | 2,907 | 2,733 | 2,594 | 2,401 | 2,183 |
| NOTES: | | | | | |

**TABLE 7-4 MULTIPLE DRY YEAR SUPPLY AND DEMAND COMPARISON**

| Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison | | | | | | |
|---|---|---|---|---|---|---|
| | | 2020 | 2025 | 2030 | 2035 | 2040 (Opt) |
| First year | Supply totals | 10,299 | 10,299 | 10,299 | 10,299 | 10,299 |
| | Demand totals | 6,755 | 6,929 | 7,068 | 7,261 | 7,479 |
| | Difference | 3,544 | 3,370 | 3,231 | 3,038 | 2,820 |
| Second year | Supply totals | 10,299 | 10,299 | 10,299 | 10,299 | 10,299 |
| | Demand totals | 6,755 | 6,929 | 7,068 | 7,261 | 7,479 |
| | Difference | 3,544 | 3,370 | 3,231 | 3,038 | 2,820 |
| Third year | Supply totals | 10,299 | 10,299 | 10,299 | 10,299 | 10,299 |
| | Demand totals | 6,755 | 6,929 | 7,068 | 7,261 | 7,479 |
| | Difference | 3,544 | 3,370 | 3,231 | 3,038 | 2,820 |
| Fourth year *(optional)* | Supply totals | 10,299 | 10,299 | 10,299 | 10,299 | 10,299 |
| | Demand totals | 6,755 | 6,929 | 7,068 | 7,261 | 7,479 |
| | Difference | 3,544 | 3,370 | 3,231 | 3,038 | 2,820 |
| NOTES: | | | | | | |

# 8 WATER SHORTAGE CONTINGENCY PLAN

This section provides information required by Water Code Section 10632. The City's complete Water Shortage Contingency Plan, as updated for this 2015 UWMP, is included in Appendix 7.

## 8.1 STAGES OF ACTION

The City's Water Shortage Contingency Plan includes an analysis of the demand reductions required to meet certain levels of supply reductions. Because the City's water supply is robust and reliable, it can expect to manage supply reductions of as much as 30%, without needing to require demand reductions. However, while the City's supply is highly reliable, there have been instances, such as the most recent Statewide Emergency Regulations, where the City was required to achieve certain demand reduction targets, even with water supply available. As such in the Water Contingency Plan, the City has developed rationing stages that allow it to respond to both true supply emergencies and regulatory mandates with a program of increasingly voluntary and mandatory actions. Table 8-1 summarizes the City's stages of action.

**TABLE 8-1 STAGES OF WATER SHORTAGE CONTINGENCY PLAN**

**Table 8-1 Retail**
**Stages of Water Shortage Contingency Plan**

| Stage | Complete Both | |
|---|---|---|
| | Percent Supply Reduction[1] *Numerical value as a percent* | Water Supply Condition (*Narrative description*) |
| *Add additional rows as needed* | | |
| 1 - Voluntary | up to 15% | Under this voluntary stage, the City will requesting up to 10% reduction in demand which is suffient to meet a 15% reduction in supply |
| 1 - Mandatory | 15% to 30% | Under this first mandatory stage, the City will require up to 20% reduction in demand which is sufficient to meet a 30% reduction in supply |
| 2- Mandatory | 30% to 45% | Under this second mandatory stage, the City will require up to a 25% reduction in demand which is sufficient to meet nearly a 50% reduction in supply |
| 3 - Mandatory | 50% | Under this final mandatory stage, the City will require a partial offset of new development demands. |

[1] *One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.*

NOTES: The City may also use stages of its water shortage contingency plan to respond to regulatory requirements for reduction in demand even in the absense of a locally declared supply shortage

## 8.2 Prohibition on End Uses

Since 2013, the City has worked through a series of interim urgency ordinances in order to respond to the State's emergency regulations and required prohibitions on end uses. As part of this 2015 UWMP cycle the City is working to update its Municipal Code to better conform to the most recently promulgated state regulations. Table 8-2 includes the prohibitions that are part of the City's Water Shortage Contingency Plan.

**TABLE 8-2 RESTRICTIONS AND PROHIBITIONS ON END USES**

| Table 8-2 Retail Only: Restrictions and Prohibitions on End Uses | | | |
|---|---|---|---|
| Stage | Restrictions and Prohibitions on End Users<br>***Drop down list***<br>*These are the only categories that will be accepted by the WUEdata online submittal tool* | Additional Explanation or Reference<br>*(optional)* | Penalty, Charge, or Other Enforcement?<br>*Drop Down List* |
| *Add additional rows as needed* | | | |
| 1 - Voluntary | Landscape - Restrict or prohibit runoff from landscape irrigation | | Yes |
| | Other - Require automatic shut of hoses | | Yes |
| | Other - Prohibit use of potable water for washing hard surfaces | | Yes |
| | Water Features - Restrict water use for decorative water features, such as fountains | | Yes |
| | Landscape - Other landscape restriction or prohibition | Prohibtion of watering within 48 hours of measurable rainfall | Yes |
| | Landscape - Other landscape restriction or prohibition | Compliance with code requirements for new landscapes | Yes |
| | CII - Lodging establishment must offer opt out of linen service | | Yes |
| | CII - Restaurants may only serve water upon request | | Yes |
| 1 - Mandatory | Landscape - Limit landscape irrigation to specific times | Landscape irrigation between 8 pm and 6 am | Yes |
| | Other | Require nonpotable water use for construction where feasible | Yes |
| 2 - Mandatory | Other water feature or swimming pool restriction | Prohibit filling of new pools and topping off existing pools | Yes |
| | Landscape - Other landscape restriction or prohibition | Prohibit installation of landscaping in new construction | Yes |
| NOTES: | | | |

## 8.3 Penalties, Charges, Other Enforcement of Prohibitions

Section 13.66.070 of the Municipal Code outlines the City's enforcement process when its water waste prohibitions or stages of actions are violated. These actions include

- Personal contact with the customer
- Delivery of written notice
- Installation of a flow-restricting device.

The City also has the authority to abate water waste under the nuisance provisions of its Municipal Code. These provisions include the authority to impose fines ranging from $100 to $500 per occurrence.

## 8.4 Consumption Reduction Methods

In addition to prohibitions and restrictions, the City initiates actions to help with consumption reduction efforts. The City's actions are generally accomplished as part of the Sonoma Marin Water Saving Partnership, with a goal of having a well-coordinated and consistent regional conservation message at all times. Table 8-3 summarizes the City's actions.

**TABLE 8-3 STAGES OF WATER SHORTAGE CONTINGENCY PLAN – CONSUMPTION REDUCTION METHODS**

| **Table 8-3 Retail Only: Stages of Water Shortage Contingency Plan - Consumption Reduction Methods** | | |
|---|---|---|
| Stage | Consumption Reduction Methods by Water Supplier<br>***Drop down list***<br>*These are the only categories that will be accepted by the WUEdata online submittal tool* | Additional Explanation or Reference<br>*(optional)* |
| *Add additional rows as needed* | | |
| 1 - Voluntary | Provide Rebates on Plumbing Fixtures and Devices | |
| | Offer Water Use Surveys | |
| 1 - Mandatory | Expand Public Information Campaign | |
| | Increase Water Waste Patrols | |
| 3 - Mandatory | Other | New development required to offset 50% of its demands |
| NOTES: | | |

## 8.5 Determining Water Shortage Reductions

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.

## 8.6 Revenue and Expenditure Impacts

The Water Code requires the City to analyze the impacts on revenue from a 50% reduction in supplies. As outlined above, a 50% reduction in water supply will require a 25% reduction in water use. Therefore, the City' analysis is based on a 25% reduction in demand and the revenue associated with that demand. This reduced revenue would be balanced by some reduction in costs, since the City would be purchasing less water from the Sonoma County Water Agency. 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 are currently approximately 50% of its annual operating costs, or approximately $3.9 million.

Appendix 7 includes a detailed analysis of the City's costs, rates and reserve balances in order to assess the impacts of water shortages. This analysis concluded that the City would need to use approximately $400,000 of its reserves to cover revenue shortfalls associated with a 15% reduction in supply. This draw on reserves would increase to nearly $1 million to cover 50% reduction in supply. The City has adequate reserves to manage these impacts

## 8.7 Resolution or Ordinance

The City has the authority to declare a water shortage emergency by resolution. A draft of this resolution is included in the Water Shortage Contingency Plan (Appendix 7).

## 8.8 Catastrophic Supply Interruption

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 Agency and neighboring water purveyors. The catastrophic events and planned actions included in the City's EOP are listed below and will be used to manage interruptions to the Agency supply, the groundwater supply or both.

- Earthquake
    - Use shutoff valves and spare piping to manage ruptured mains
    - Storage available to provide emergency supply
    - Implement procedures for assessing quality, notifying the public and flushing and disinfecting the system if necessary because of flood water contamination
    - Use portable and emergency generators
- Flooding
    - Storage available to provide emergency supply
    - Implement procedures for assessing quality, notifying the public and flushing and disinfecting the system if necessary because of flood water contamination
    - Use portable and emergency generators
- Toxic Spills (effects Agency Supply)
    - Use local groundwater

  - Implement procedures for assessing quality, notifying the public and flushing and disinfecting the system
- Fire
  - Storage available to provide fire Flows
  - Implement Mutual Aid Plans
  - Use portable and emergency generators
- Power Outage or Grid Failure
  - Use portable and emergency generators
- Severe Winter Storms
  - Use portable and emergency generators
- Hot Weather
  - Use portable and emergency generators

## 8.9 Minimum Supply Next Three Years

As discussed in Chapters 6 and 7, the City has three water supply sources that it used conjunctively in order to achieve a robust and reliable supply strategy. Table 8-4 provides the City's estimated water supply available for the next three years based on the driest three-year historic sequence for the Agency's water supply. No water shortages are anticipated.

**TABLE 8-4 MINIMUM SUPPLY NEXT THREE YEARS**

| Table 8-4 Retail: Minimum Supply Next Three Years | | | |
|---|---|---|---|
| | 2016 | 2017 | 2018 |
| Available Water Supply | 10,299 | 10,299 | 10,299 |
| NOTES: As outlined in the Agency's UWMP, its supply is not reduced under a multiple dry year scenario | | | |

While the City's supply is reliable, the City has been required to implement its water contingency plans as a result of regulatory requirements imposed upon the Agency, the City or both.

# 9 DEMAND MANAGEMENT MEASURES

The City is a member of the California Urban Water Conservation Council and is submitting its annual reports, found in Appendix 8, as documentation of implementation of demand management measures.

# 10 Plan Adoption Submittal and Implementation

This section describes City's process for adopting this 2015 UWMP including the various agencies and stakeholders with which the City communicated in order to obtain input and information.

Table 10-1 identifies the various agencies that the City is coordinating with during the UWMP preparation process. The City's 60-day notice is included as Appendix 9.

**TABLE 10-1 NOTIFICATION TO CITIES AND COUNTIES**

| Table 10-1 Retail: Notification to Cities and Counties | | |
|---|---|---|
| City Name | 60 Day Notice | Notice of Public Hearing |
| *Add additional rows as needed* | | |
| City of Cotati | ☑ | ☑ |
| City of Petaluma | ☑ | ☑ |
| City of Santa Rosa | ☑ | ☑ |
| City of Sonoma | ☑ | ☑ |
| City of Sebastopol | ☑ | ☑ |
| Town of Windsor | ☑ | ☑ |
| Interested Entity | 60 Day Notice | Notice of Public Hearing |
| North Marin Water District | ☑ | ☑ |
| Valley of the Moon Water District | ☑ | ☑ |
| Penngrove Water Company | ☑ | ☑ |
| Sonoma State University | ☑ | ☑ |
| County Name *Drop Down List* | 60 Day Notice | Notice of Public Hearing |
| *Add additional rows as needed* | | |
| Sonoma County | ☑ | ☑ |
| | ☑ | ☑ |

The findings of the Draft UWMP were presented to the City Council's Water Issues Subcommittee and at a Public Hearing before the City Council on June 28, 2016. The public hearing 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 hearing notices and City Council resolution of adoption is also included in Appendix 9.

The UWMP was adopted by the City Council on June 28, 2016. 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 Sonoma County Water Agency 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 2015 Final UWMP will be the responsibility of the City Engineer and Director of Public Works.

# 11 REFERENCES

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# APPENDICES

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# APPENDIX 1

# CLIMATE VULNERABILITY ASSESSMENT

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**The Climate Change Vulnerability Assessment is taken from the Climate Change Handbook for Regional Water Planning, USEPA and DWR, 2011. The vulnerability assessment highlights those water-related resources that are important to a region and are sensitive to climate change.**

## I. Water Demand

☐ *Are there major industries that require cooling/process water in your planning region?*

- As average temperatures increase, cooling water needs may also increase.
- Identify major industrial water users in your region and assess their current and projected needs for cooling and process water.

☑ *Does water use vary by more than 50% seasonally in parts of your region?*

- Seasonal water use, which is primarily outdoor water use, is expected to increase as average temperatures increase and droughts become more frequent.
- Where water use records are available, look at total monthly water uses averaged over the last five years (if available). If maximum and minimum monthly water uses vary by more than 25%, then the answer to this question is "yes"
- Where no water use records exist, is crop irrigation responsible for a significant (say >50%) percentage of water demand in parts of your region?

mitigated by availability of recycled water in the city

☐ *Are crops grown in your region climate-sensitive? Would shifts in daily heat patterns, such as how long heat lingers before night-time cooling, be prohibitive for some crops?*

- Fruit and nut crops are climate-sensitive and may require additional water as the climate warms.

☐ *Do groundwater supplies in your region lack resiliency after drought events?*

- Droughts are expected to become more frequent and more severe in the future. Areas with a more hardened demand may be particularly vulnerable to droughts and may become more dependent on groundwater pumping.

active planning place to protect the groundwater basin

☑ *Are water use curtailment measures effective in your region?*

- Droughts are expected to become more frequent and more severe in the future. Areas with a more hardened demand may be particularly vulnerable to droughts.

☐ *Are some instream flow requirements in your region either currently insufficient to support aquatic life, or occasionally unmet?*

- Changes in snowmelt patterns in the future may make it difficult to balance water demands. Vulnerabilities for ecosystems and municipal/agricultural water needs may be exacerbated by instream flow requirements that are:
    1. not quantified,
    2. not accurate for ecosystem needs under multiple environmental conditions including droughts, and
    3. not met by regional water managers.

## II. Water Supply

☐ *Does a portion of the water supply in your region come from snowmelt?*

- Snowmelt is expected to decrease as the climate warms. Water systems supplied by snowmelt are therefore potentially vulnerable to climate change.
- Where watershed planning documents are available, refer to these in identifying parts of your region that rely on surface water for supplies; if your region contains surface water supplies originating in watersheds where snowpack accumulates, the answer to this question is "Yes."
- Where planning documents are not available, identify major rivers in your region with large users. Identify whether the river's headwaters are fed by snowpack.

☐ *Does part of your region rely on water diverted from the Delta, imported from the Colorado River, or imported from other climate-sensitive systems outside your region?*

- Some imported or transferred water supplies are sources from climate-sensitive watersheds, such as water imported from the Delta and the Colorado River.

☐ *Does part of your region rely on coastal aquifers? Has salt intrusion been a problem in the past?*

- Coastal aquifers are susceptible to salt intrusion as sea levels rise, and many have already observed salt intrusion due to over-extraction, such as the West Coast Basin in southern California.

☐ *Would your region have difficulty in storing carryover supply surpluses from year to year?*

- Droughts are expected to become more severe in the future. Systems that can store more water may be more resilient to droughts.

☐ *Has your region faced a drought in the past during which it failed to meet local water demands?*

- Droughts are expected to become more severe in the future. Systems that have already come close to their supply thresholds may be especially vulnerable to droughts in the future.

☑ *Does your region have invasive species management issues at your facilities, along conveyance structures, or in habitat areas?*

- As invasive species are expected to become more prevalent with climate change, existing invasive species issues may indicate an ecological vulnerability to climate change.

Biological opinion has been issued. Active mitigation activities occurring

## III. Water Quality

☑ *Are increased wildfires a threat in your region? If so, does your region include reservoirs with fire-susceptible vegetation nearby which could pose a water quality concern from increased erosion?*

- Some areas are expected to become more vulnerable to wildfires over time. To identify whether this is the case for parts of your region, the California Public Interest Energy Research (PIER)Program has posted wildfire susceptibility projections as a Google Earth application at: http://cal-adapt.org/fire/. These projections are only the results of a single study and are not intended for analysis, but can aid in qualitatively answering this question. Read the application's disclaimers carefully to be aware of its limitations.

☐ *Does part of your region rely on surface water bodies with current or recurrent water quality issues related to eutrophication, such as low dissolved oxygen or algal blooms? Are there other water quality constituents potentially exacerbated by climate change?*

- Warming temperatures will result in lower dissolved oxygen levels in water bodies, which are exacerbated by algal blooms and in turn enhance eutrophication. Changes in streamflows may alter pollutant concentrations in water bodies.

☐ *Are seasonal low flows decreasing for some waterbodies in your region? If so, are the reduced low flows limiting the waterbodies' assimilative capacity?*

- In the future, low flow conditions are expected to be more extreme and last longer. This may result in higher pollutant concentrations where loadings increase or remain constant.

☐ *Are there beneficial uses designated for some water bodies in your region that cannot always be met due to water quality issues?*

- In the future, low flows are expected decrease, and to last longer. This may result in higher pollutant concentrations where loadings increase or remain constant.

☐ *Does part of your region currently observe water quality shifts during rain events that impact treatment facility operation?*

- While it is unclear how average precipitation will change with temperature, it is generally agreed that storm severity will probably increase. More intense, severe storms may lead to increased erosion, which will increase turbidity in surface waters. Areas that already observe water quality responses to rainstorm intensity may be especially vulnerable.

## IV. Sea Level Rise

☐ *Has coastal erosion already been observed in your region?*

- Coastal erosion is expected to occur over the next century as sea levels rise.

☐ *Are there coastal structures, such as levees or breakwaters, in your region?*

- Coastal structures designed for a specific mean sea level may be impacted by sea level rise.

☐ *Is there significant coastal infrastructure, such as residences, recreation, water and wastewater treatment, tourism, and transportation) at less than six feet above mean sea level in your region?*

- Coastal flooding will become more common, and will impact a greater extent of property, as sea levels rise. Critical infrastructure in the coastal floodplain may be at risk.
- Digital elevation maps should be compared with locations of coastal infrastructure.

☐ *Are there climate-sensitive low-lying coastal habitats in your region?*

- Low-lying coastal habitats that are particularly vulnerable to climate change include estuaries and coastal wetlands that rely on a delicate balance of freshwater and salt water.

☐ *Are there areas in your region that currently flood during extreme high tides or storm surges?*

- Areas that are already experiencing flooding during storm surges and very high tides, are more likely to experience increased flooding as sea levels rise.

☐ *Is there land subsidence in the coastal areas of your region?*

- Land subsidence may compound the impacts of sea level rise.

☐ *Do tidal gauges along the coastal parts of your region show an increase over the past several decades?*

- Local sea level rise may be higher or lower than state, national, or continental projections.
- Planners can find information on local tidal gauges at *http://tidesandcurrents.noaa.gov/sltrends/sltrends_states.shtml?region=ca*

## V. Flooding

☐ *Does critical infrastructure in your region lie within the 200-year floodplain? DWR's best available floodplain maps are available at: http://www.water.ca.gov/floodmgmt/lrafmo/fmb/fes/best_available_maps/*

- While it is unclear how average precipitation will change with temperature, it is generally agreed that storm severity will probably increase. More intense, severe storms may lead to higher peak flows and more severe floods.
- Refer to FEMA floodplain maps and any recent FEMA, US Army Corps of Engineers, or DWR studies that might help identify specific local vulnerabilities for your region. Other follow-up questions that might help answer this question:

    1. What public safety issues could be affected by increased flooding events or intensity? For example, evacuation routes, emergency personnel access, hospitals, water treatment and wastewater treatment plants, power generation plants and fire stations should be considered.
    2. Could key regional or economic functions be impacted from more frequent and/or intense flooding?

☐ *Does part of your region lie within the Sacramento-San Joaquin Drainage District?*

- The SSJDD contains lands that are susceptible to overflows from the Sacramento and San Joaquin Rivers, and are a key focus of the Central Valley Flood Protection Plan. (*http://www.water.ca.gov/cvfmp/program.cfm*).

☐ *Does aging critical flood protection infrastructure exist in your region?*

- Levees and other flood protection facilities across the state of California are aging and in need of repair. Due to their overall lowered resiliency, these facilities may be particularly vulnerable to climate change impacts.
- DWR is evaluating more than 300 miles of levees in the San Joaquin and Sacramento Rivers Valleys and the Delta (http://www.water.ca.gov/levees/).

☐ *Have flood control facilities (such as impoundment structures) been insufficient in the past?*

- Reservoirs and other facilities with impoundment capacity may be insufficient for severe storms in the future. Facilities that have been insufficient in the past may be particularly vulnerable.

☐ *Are wildfires a concern in parts of your region?*

- Wildfires alter the landscape and soil conditions, increasing the risk of flooding within the burn and downstream areas. Some areas are expected to become more vulnerable to wildfires over time. To identify whether this is the case for parts of your region, the California Public Interest Energy Research Program (PIER) has posted wildfire susceptibility projections as a Google Earth application at: http://cal-adapt.org/fire/. These projections are the results of only a single study and are not intended for analysis, but can aid in qualitatively answering this question. Read the application's disclaimers carefully to be aware of its limitations.

## VI. Ecosystem and Habitat Vulnerability

☐ *Does your region include inland or coastal aquatic habitats vulnerable to erosion and sedimentation issues?*

- Erosion is expected to increase with climate change, and sedimentation is expected to shift. Habitats sensitive to these events may be particularly vulnerable to climate change.

☐ *Does your region include estuarine habitats which rely on seasonal freshwater flow patterns?*

- Seasonal high and low flows, especially those originating from snowmelt, are already shifting in many locations.

☑ *Do climate-sensitive fauna or flora populations live in your region?*

- Some specific species are more sensitive to climate variations than others.

active biotgt implementation of Biological opinion

☑ *Do endangered or threatened species exist in your region? Are changes in species distribution already being observed in parts of your region?* active implementation of biological opinion

- Species that are already threatened or endangered may have a lowered capacity to adapt to climate change.

☑ *Does the region rely on aquatic or water-dependent habitats for recreation or other economic activities?* active implementation of BO

- Economic values associated with natural habitat can influence prioritization.

☐ *Are there rivers in your region with quantified environmental flow requirements or known water quality/quantity stressors to aquatic life?*

- Constrained water quality and quantity requirements may be difficult to meet in the future.

☐ *Do estuaries, coastal dunes, wetlands, marshes, or exposed beaches exist in your region? If so, are coastal storms possible/frequent in your region?*

- Storm surges are expected to result in greater damage in the future due to sea level rise. This makes fragile coastal ecosystems vulnerable.

☐ *Does your region include one or more of the habitats described in the Endangered Species Coalition's Top 10 habitats vulnerable to climate change http://www.endangered.org/its-getting-hot-out-there/ ?*

- These ecosystems are particularly vulnerable to climate change.

☐ *Are there areas of fragmented estuarine, aquatic, or wetland wildlife habitat within your region? Are there movement corridors for species to naturally migrate? Are there infrastructure projects planned that might preclude species movement?*

- These ecosystems are particularly vulnerable to climate change.

## VII. Hydropower

☑ *Is hydropower a source of electricity in your region?*

- As seasonal river flows shift, hydropower is expected to become less reliable in the future.

☐ *Are energy needs in your region expected to increase in the future? If so, are there future plans for hydropower generation facilities or conditions for hydropower generation in your region?*

- Energy needs are expected to increase in many locations as the climate warms. This increase in electricity demand may compound decreases in hydropower production, increasing its priority for a region.

# APPENDIX 2

# 2015 URBAN WATER MANAGEMENT PLAN DEMAND ANALYSIS AND CONSERVATION MEASURES UPDATE

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# City of Rohnert Park

# 2015 Urban Water Management Plan Water Demand Analysis and Water Conservation Measures Update

## FINAL

**July 10, 2015**


MADDAUS
WATER
MANAGEMENT INC.

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| | |
|---|---|
| AB | Assembly Bill |
| ABAG | Association of Bay Area Governments |
| ACS | American Community Survey |
| AF | acre-foot/acre-feet |
| AFY | acre-foot/acre-feet per year |
| AMI | Automated Meter Infrastructure |
| AWWA | American Water Works Association |
| AWWARF | American Water Works Association Research Foundation |
| BMP | Best Management Practice |
| CCR | California Code of Regulations |
| CII | Commercial, Industrial, and Institutional |
| CPI | Consumer Price Index |
| CUWCC | California Urban Water Conservation Council |
| DWR | Department of Water Resources |
| DSS | Decision Support System |
| FY | Fiscal Year |
| GPCD | Gallons per capita per day |
| gpf | Gallons per flush |
| HE | High Efficiency |
| HEU | High Efficiency Urinal |
| ILI | Infrastructure Leakage Index |
| IRR | Irrigation |
| MF | Multi-family |
| MG | Million gallons |
| MMDD | Master measure design database |
| MMWD | Marin Municipal Water District |
| MWM | Maddaus Water Management, Inc. |
| ND | New Development |
| NMWD | North Marin Water District |
| NRW | Non-revenue water |
| PV | Present value |
| PWSS | Public Water System Statistics |
| SB | Senate Bill |
| SCWA | Sonoma County Water Agency |
| SF | Single Family |
| SMSWP | Sonoma-Marin Saving Water Partnership |
| UHET | Ultra High Efficiency Toilet |
| ULFT | Ultra Low Flow Toilet |
| UWMP | Urban Water Management Plan |
| WF | Water factor |
| WSA | Water Supply Assessment |

# EXECUTIVE SUMMARY

## Introduction

To prepare for the submission of the 2015 Urban Water Management Plan, a demand and conservation technical analysis was conducted by Maddaus Water Management, Inc. (MWM) for all of the water suppliers in Sonoma and Marin Counties (Water Contractors) that receive water from the Sonoma County Water Agency (Agency). The purpose of this analysis was to:

1. Calculate a potable water demand forecast for the years 2015 to 2040.
2. Calculate the range of potable water conservation savings that could be achieved and the costs of those savings under three water conservation programs that could be implemented between the years 2015 to 2040. This effort included:
    - Evaluating twenty-five existing and new conservation programs that can reduce future water demand;
    - Estimating the costs and water savings of these measures in each water supplier's service area; and
    - Combining the measures into increasingly more aggressive programs and evaluating the costs and water savings of these programs.

The analysis focuses specifically on potable water demand and conservation projections. The impacts of existing local recycled water programs are "implicit" in this analysis in that the base water demands used for the analysis take into account the potable water offset provided by recycled water. The impacts of planned recycled water programs or program expansions will need to be analyzed by the individual Water Contractors.

This report presents the results for the City of Rohnert Park, generally referred to throughout as the "Water Contractor" or the "City".

## Long-Term Demand and Conservation Program Analysis Results

The project for the Water Contractors included two parts: (1) create a demand and conservation analysis for 2015 to 2040, and (2) evaluate conservation savings potential for the years 2015 to 2040 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. Building on MWM's previous year 2010 demand and conservation technical analysis effort, for most Water Contractors, billing data was provided for the years 2010 to 2014. The data was graphically analyzed and discussed with the individual Water Contractors.

The historical water use, the selected population and employment projections, the plumbing code information, and discussions with the Water Contractors were used to create a demand forecast for the years 2015 to 2040, as further described in Section 3.

Once the demand forecasts were completed, a conservation analysis was developed based on combinations of the 25 conservations measures presented in Table ES-1. The conservation analysis included all the measures selected by the Water Contractors via electronic survey. The following important assumptions about the conservation measures were included in this analysis:

1. The measures reviewed for each Water Contractor are listed in Table ES-1 and described in Section 4.
2. The impacts of new development on water demands were updated to reflect changes to local ordinances, changes to the Model Water Efficient Landscape Ordinance, and the requirements of the CALGreen building code (as of May 1, 2015). Detailed information on the assumptions regarding codes can be found in Appendix A.

The following tables and figures present the water demands and conservation savings for the City of Rohnert Park's analysis. Projected growth in population and/or jobs will cause water demand to increase. The requirements of the Plumbing Code, together with local conservation programs, will serve to save water. The savings projected from

Plumbing Code implementation include the requirements of new California State Law, specifically Assembly Bill 715, which requires installation of High Efficiency Toilets and High Efficiency Urinals as of 2014, and SB 407, which requires:
(1) Any toilet manufactured to use more than 1.6 gallons of water per flush.
(2) Any urinal manufactured to use more than one gallon of water per flush.
(3) Any showerhead manufactured to have a flow capacity of more than 2.5 gallons of water per minute.
(4) Any interior faucet that emits more than 2.2 gallons of water per minute
for all new construction and replacements as of 2017 for single family and 2019 for multi-family and commercial properties.

For each Water Contractor the three conservation program scenarios were developed:

- **Program A "Existing Program":** includes the measures that the Water Contractor currently offers. These measures are not necessarily designed the way they are currently implemented, having, in some cases, more aggressive annual account targets planned for the future.
- **Program B "Optimized Program":** includes measures that the Water Contractor currently implements or is interested in implementing. Current measures are not necessarily designed the way they are currently implemented, having, in some cases, more aggressive annual account targets.
- **Program C "All Measures Analyzed":** presents a scenario where all 25 measures are implemented.

Table ES-1 presents the conservation measures modeled in this analysis. The table is organized to illustrate measures targeted at the water utility, the Commercial/Industrial/Institutional (CII) sector, the landscape sector, and the residential sector. This organization is intended to assist Water Contractors in selecting the combination of measures best suited to the service area demographics.

**Table ES-1 Conservation Measures Evaluated**

| Utility Measures | CII Measures | Landscape Measures | Residential Measures |
|---|---|---|---|
| Water Loss | Indoor and Outdoor Surveys - CII | Outdoor Large Landscape Audits & Water Budgeting/Monitoring | HE Faucet Aerator / Showerhead Giveaway - SF, MF |
| AMI | Replace CII Inefficient Equipment | Landscape Rebates and Incentives for Equipment Upgrade | Indoor and Outdoor Surveys - SF, MF |
| Pricing | Efficient Toilet Replacement Program - CII | Turf Removal - MF, CII | Efficient Toilet Replacement Program – SF |
| Public Info & School Education through Sonoma Marin Saving Water Partnership (SMSWP) | Urinal Rebates – CII | Turf Removal - SF | Direct Install UHET, Showerheads, and Faucet Aerators - SF, MF |
| Public Info & School Education - Water Contractor | Plumber Initiated UHET & HEU Retrofit Program | Water Conserving Landscape and Irrigation Codes | HE Clothes Washer Rebate - SF, MF |
| Prohibit Water Waste | Require <0.25 gal/flush Urinals in New Development | Require Smart Irrigation Controllers and Rain Sensors in New Development | Submeters Incentive |
| | HE Faucet Aerator / Showerhead Giveaway – CII | | |

Sonoma Marin Saving Water Partnership (SMSWP) program includes all Sonoma and Marin County Water Contractors receiving water from Sonoma County Water Agency (SCWA). The conservation programs implemented in 2015 do vary among the individual Water Contractors.

Figure ES-1 presents the collective Water Contractors' conservation measure program scenarios, indicating which measures have been selected by the City of Rohnert Park for implementation within each program.

**Figure ES-1. Conservation Measure Program Scenarios**

| Program Scenarios | | | | |
|---|---|---|---|---|
| | Measures | Program A | Program B | Program C |
| Program Scenarios | Water Loss | ☑ | ☑ | ☑ |
| | AMI | ☐ | ☑ | ☑ |
| | Pricing | ☑ | ☑ | ☑ |
| | Public Info & School Education - SMWSP | ☑ | ☑ | ☑ |
| | Public Info & School Education - Water Contractor | ☐ | ☐ | ☑ |
| | Prohibit Water Waste | ☑ | ☑ | ☑ |
| | Indoor and Outdoor Surveys - CII | ☐ | ☐ | ☑ |
| | Replace CII Inefficient Equipment | ☐ | ☐ | ☑ |
| | Efficient Toilet Replacement Program - CII | ☑ | ☑ | ☑ |
| | Urinal Rebates – CII | ☐ | ☐ | ☑ |
| | Plumber Initiated UHET & HEU Retrofit Program | ☐ | ☐ | ☑ |
| | Require <0.125 gal/flush Urinals in New Development | ☑ | ☑ | ☑ |
| | HE Faucet Aerator / Showerhead Giveaway – CII | ☑ | ☑ | ☑ |
| | HE Faucet Aerator / Showerhead Giveaway - SF, MF | ☑ | ☑ | ☑ |
| | Indoor and Outdoor Surveys - SF, MF | ☑ | ☑ | ☑ |
| | Efficient Toilet Replacement Program – SF | ☑ | ☑ | ☑ |
| | Direct Install UHET, Showerheads, and Faucet Aerators - SF, MF | ☐ | ☐ | ☑ |
| | HE Clothes Washer Rebate - SF, MF | ☑ | ☑ | ☑ |
| | Submeters Incentive | ☐ | ☑ | ☑ |
| | Outdoor Large Landscape Audits & Water Budgeting/Monitoring | ☐ | ☐ | ☑ |
| | Landscape Rebates and Incentives for Equipment Upgrade | ☐ | ☐ | ☑ |
| | Turf Removal - MF, CII | ☐ | ☑ | ☑ |
| | Turf Removal - SF | ☐ | ☑ | ☑ |
| | Water Conserving Landscape and Irrigation Codes | ☐ | ☑ | ☑ |
| | Require Smart Irrigation Controllers and Rain Sensors in New Development | ☑ | ☑ | ☑ |

Table ES-2 presents the City of Rohnert Park's potable water use projections without Plumbing Code savings, with only Plumbing Code savings and no active conservation activity, and with Plumbing Code savings and Program A, Program B, and Program C active conservation program implementation savings.

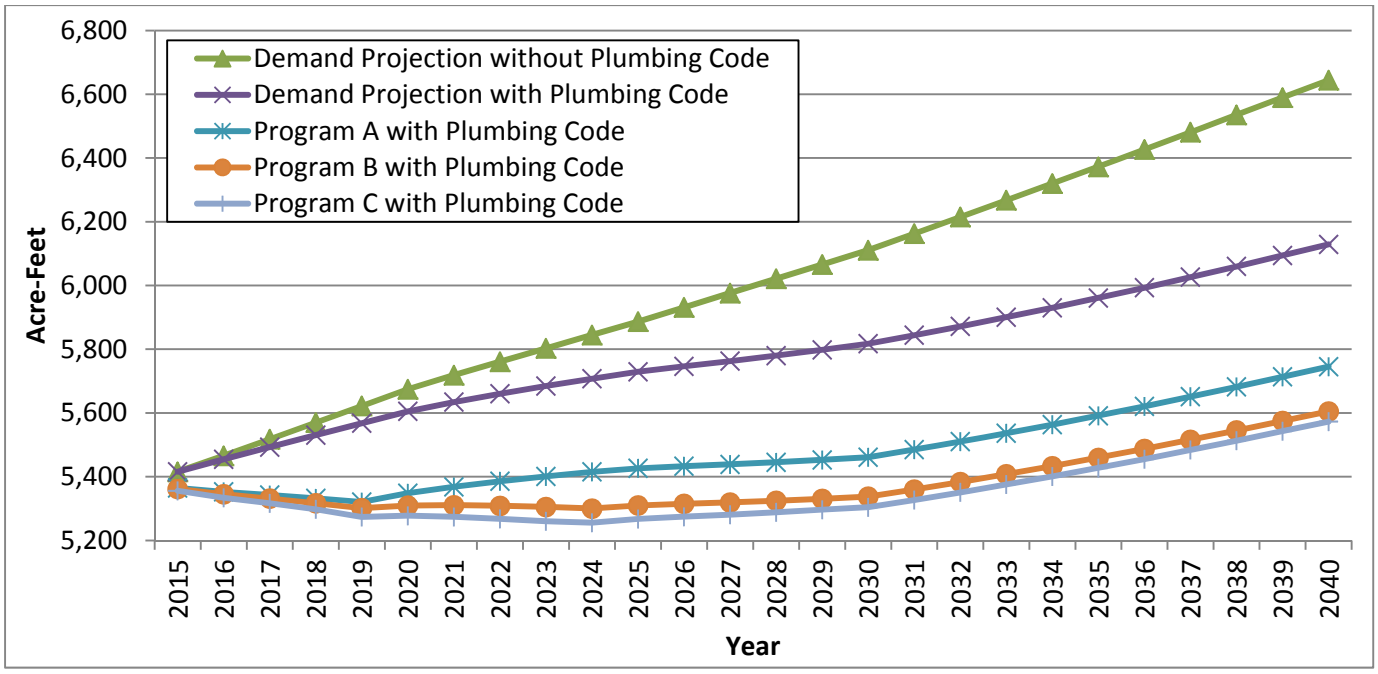
**Table ES-2. Potable Water Use Projections (Acre-Feet/Year)***

| | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|
| Demand without Plumbing Code (AFY) | 5,415 | 5,675 | 5,887 | 6,111 | 6,372 | 6,644 |
| Demand with Plumbing Code (AFY) | 5,415 | 5,605 | 5,729 | 5,817 | 5,960 | 6,129 |
| Demand with Plumbing Code and Program A | 5,365 | 5,348 | 5,426 | 5,461 | 5,591 | 5,745 |
| Demand with Plumbing Code and Program B | 5,361 | 5,309 | 5,310 | 5,337 | 5,459 | 5,605 |
| Demand with Plumbing Code and Program C | 5,356 | 5,277 | 5,268 | 5,304 | 5,427 | 5,573 |

*Data is not weather normalized. Total water use is potable only. Does not include recycled water use.

Figure ES-2 illustrates the same data in graphical form. Both the Table and Figure illustrate that the majority of the projected demand reduction occurs as a result of the Plumbing Code requirements and the City's existing conservation program.

**Figure ES-2. Long Term Demands with Conservation Programs***




Note: All line types shown in the legend are presented in the graph.

Table ES-3 illustrates projected water savings for Plumbing Code implementation and Plumbing Code implementation with each water conservation program scenario in five-year increments. The benefit to cost ratio for each conservation program from the perspective of the Water Contractor (water utility) and the perspective of the Water Contractors and customers (community) is also presented. The table illustrates that while all proposed programs are technically "cost effective" (the benefit cost ratio exceeds 1.0), the City of Rohnert Park's existing program incorporates the most cost effective combination of conservation measures.

**Table ES-3. Water Demand Program Savings Projections**

| Conservation Program Water Savings (AFY) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | Water Utility Benefit to Cost Ratio | Community Benefit to Cost Ratio |
|---|---|---|---|---|---|---|---|---|
| Plumbing Code | - | 69 | 157 | 293 | 412 | 515 | N/A | N/A |
| Program A with Plumbing Code | 51 | 326 | 460 | 650 | 781 | 899 | 2.89 | 1.79 |
| Program B with Plumbing Code | 54 | 365 | 577 | 773 | 913 | 1,039 | 2.20 | 1.15 |
| Program C with Plumbing Code | 60 | 397 | 619 | 807 | 945 | 1,071 | 1.91 | 1.10 |

Table ES-4 presents the gallons per capita per day (GPCD) targets that the City of Rohnert Park adopted in 2011 as required by the Water Conservation Act of 2009 (SB X7-7), as well as projected GPCD demand estimates for the City with Plumbing Code implementation alone and with Plumbing Code implementation plus each of the conservation programs.

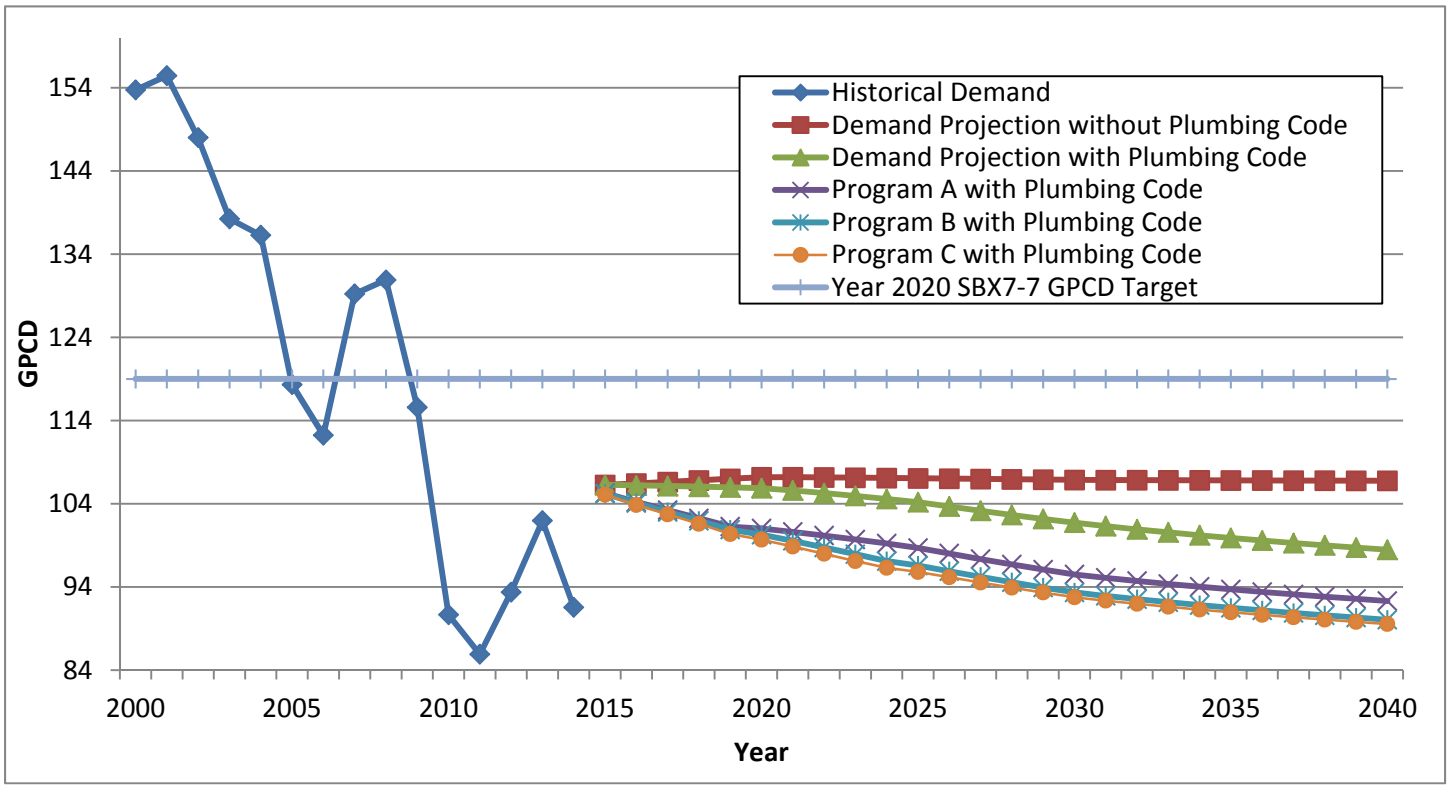
The Table illustrates that the City is projected to meet its conservation target under all modeled programs. The relationship of projected water demands to the adopted 2020 GPCD target is illustrated in Figure ES-3.

**Table ES-4. Adopted Water Conservation Target Compared to Projected Program Savings (in GPCD)**

| | 2015 | 2020 |
|---|---|---|
| Local Target (GPCD) | 140.0 | 119.0 |
| Regional Target (GPCD) | 142.0 | 129.0 |
| GPCD Projection with Plumbing Code | * | 106.0 |
| GPCD Projection with Plumbing Code and Program A | * | 101.0 |
| GPCD Projection with Plumbing Code and Program B | * | 100.3 |
| GPCD Projection with Plumbing Code and Program C | * | 99.7 |

Note: 2015 Actual per capita use will be provided by the Water Contractor at the time the 2015 UWMP is prepared.

**Figure ES-3. Water Conservation Program Savings Projections – SB X7-7 Target, GPCD**




Notes:

1. All line types shown in the legend are presented in the graph. The following demand scenarios, Program B and Program C, are close in value and may be indistinguishable in the figure.
2. Note the decline in water use in the 2014 dry year and 2008-2011 economic recession.

Table ES-5 shows the year 2040 indoor and outdoor water savings for the three conservation programs modeled; the present value of water savings and the present value of costs to the utility and community are also displayed. The cost of utility savings per unit volume of water is shown in the far-right column. The assumptions and methodology used in the economic analysis are described in Sections 4.4 through 4.7 and in Appendix A Sections A.3 through A.4.

**Table ES-5. Economic Analysis of Alternative Programs**

| | 2040 Indoor Water Savings (AFY) | 2040 Outdoor Water Savings (AFY) | 2040 Total Water Savings (AFY) | Present Value of Water Savings ($) | Present Value of Utility Costs ($) | Present Value of Community Costs ($) | Cost of Utility Savings per Unit Volume ($/AF) |
|---|---|---|---|---|---|---|---|
| **Program A with Plumbing Code** | 538 | 361 | 899 | $7,107,384 | $2,460,754 | $4,362,913 | $315 |
| **Program B with Plumbing code** | 583 | 456 | 1,039 | $9,271,830 | $4,206,847 | $9,057,957 | $409 |
| **Program C with Plumbing Code** | 612 | 459 | 1,071 | $10,045,098 | $5,267,908 | $10,594,602 | $474 |

# 1. INTRODUCTION

This section provides an overview of the goals and objectives for the water demand and conservation analysis, the methodology and approach used to collect and analyze data, and an overview of the content of the report.

In this report, demand management and water conservation are used interchangeably.

## 1.1 Goals and Objectives

The purpose of this report is to present an overview of the demand and conservation evaluation process which has been completed specifically for the City of Rohnert Park through a cooperative and collaborative process undertaken by the cities of Cotati, Petaluma, Rohnert Park, Santa Rosa and Sonoma, the Marin Municipal, North Marin and Valley of the Moon Water Districts and the Town of Windsor, collectively known as the Water Contractors. The goal was to develop forecasts of demand and conservation savings for the 2015 Urban Water Management Plan that can be used by each of the Water Contractors and by the Sonoma County Water Agency.

The goal of this Project was to develop transparent, defensible, and uniform demand and conservation projections for the nine Water Contractors using a common methodology that can be used to support regional planning efforts as well as individual Water Contractor work. Pursuant to this goal, the specific objectives of the Project were as follows:

(1) Quantify the total average-year water demand for each Water Contractor to the year 2040;
(2) Quantify the passive and active conservation water savings potential for each individual Water Contractor through 2040;
(3) Identify conservation programs that could be considered for implementation by the Water Contractors either individually or through their regional partnership, the Sonoma Marin Saving Water Partnership (SMSWP); and
(4) Provide each Water Contractor with a user-friendly model that can be used to support ongoing demand and conservation planning efforts.

## 1.2 Approach and Methodology

To accomplish the above goal and objectives, each Water Contractor's water demands and conservation savings were forecasted through 2040 using the Demand Side Management Least Cost Planning Decision Support System (DSS Model). The DSS Model prepares long-range, detailed water demand and conservation savings projections to enable a more accurate assessment of the impact of water use efficiency programs on demand. The DSS Model can use either a statistical approach to forecast demands (e.g., an econometric model), or it can use forecasted increases in population and employment to evaluate future demands. Furthermore, the DSS Model evaluates conservation measures using benefit cost analysis with the present value of the cost of water saved and benefit-to-cost ratio as economic indicators. The analysis is performed from various perspectives including the utility and community. The DSS Model was used to forecast demands for the Water Contractors in prior planning efforts in 2005 and 2009 (except the City of Petaluma in 2009) and as a result contains a significant, robust data set on demographics and water use for each Water Contractor.

## 1.3 Collaboration between SMSWP, Water Contractors and SCWA

This report was completed as a collaborative effort between the Water Contractors, the Sonoma County Water Agency (including Agency staff that are part of the SMSWP), and the consulting team from Maddaus Water Management, Inc. Over the course of this report's development, input was solicited from the aforementioned groups (Project Team) through multiple forums, including workshops, one-on-one meetings, and web-based meetings.

## 1.4 Content of Report

This report provides a detailed description of 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:

- Section 2 - Data Collection and Verification Process
- Section 3 - Demand Projections
- Section 4 - Comparison of Individual Conservation Measures
- Section 5 - Results of Conservation Program Evaluation
- Section 6 - Conclusions
- Appendix A - Assumptions for the DSS Model
- Appendix B - Water Use Graphs for Production and Customer Categories
- Appendix C - Measure Screening Process and Results
- Appendix D - Assumptions for Water Conservation Measures Evaluated in the DSS Model
- Appendix E – List of Contacts
- Appendix F – References

# 2. DATA COLLECTION AND VERIFICATION PROCESS

This section presents an overview of the long term demand and conservation evaluation process including the initial data collection steps.

## 2.1 Data Collection Process

The initial phase of this effort included a data collection process using a Data Collection and Verification File (Data File). The quantitative Data File was developed in Microsoft Excel to collect, organize, and verify the necessary input data for the DSS Model. The data required for the demand and conservation projections was organized into the Data Files (one per Water Contractor). This task was streamlined by populating the Data Files using a variety of existing data sources based on previous project collaborations and readily available information. The Data Files were then distributed to the individual Water Contractors for review, verification, and updates. Key sources for existing data were:

- the California Urban Water Conservation Council (CUWCC) database – each Water Contractor is a CUWCC member and reports to CUWCC on water demands and conservation efforts;
- the Sonoma-Marin Saving Water Partnership Conservation Reports, which again reflect data that the Water Contractors report annually;
- Sonoma County Water Agency Water Deliveries Annual Reports and Temporary Urgency Change Order (TUCO) reporting, which include significant information on Agency and local water supply production;
- the Water Contractor's 2010 Urban Water Management Plan;
- Department of Water Resources Public Water System Statistics (DWR PWSS) Reports;
- 2013 Association of Bay Area Governments (ABAG) Projections (population and employment forecasts); and
- Local General Plan information.

The Data File was completed and verified by the member Water Contractors through the following steps:

(1) **Distribution of Files to Individual Water Contractors**: The files were distributed to the individual Water Contractors in January 2015 via the Project's ftp site.
(2) **Instructional Meetings**: A kick off meeting with the Water Contractors was held on January 21, 2015 to disseminate information related to the data collection process. During the meeting, the Project Team reviewed the Data File contents with the Water Contractors and provided instructions for completing the files.
(3) **Data File Completion by Water Contractors**: Each Water Contractor reviewed and completed its individual Data File, which required:
    - Verification of the data that was pre-populated in the file by the Project Team
    - Data entry of missing information into the Data File as needed
(4) **Data File Submission by Water Contractors**: Water Contractors submitted the files via the Project ftp site between the end of February and early March 2015 after completing Step 3.
(5) **Data File Review and Refinement**: The Project Team reviewed the individual data files in the order submitted. If further data and refinement were required, the Project Team contacted the individual Water Contractor to obtain the necessary information.
(6) **Data Signature Forms**: Once the data was submitted by each Water Contractor and deemed to be complete, the Water Contractor signed a data verification form to acknowledge the data was ready for the demand analysis portion of the project.

## 2.2 Types of Data Collected

The data needs of the DSS Model drove the data collection effort. The individual data elements within each category are documented in Table 2-1. Specific data for the Water Contractor is provided in Section 3. Data including water use and total employment (jobs) were collected to evaluate the historical growth and future growth in the service area. The service area data was used for both of the demand forecasting tools in the DSS Model and for the conservation analysis.

Service area demographic data such as the number of dwelling units were collected from the 2010 U.S. Census data and 2011-2013 American Community Survey (ACS) 3-Year Estimates. Population sources include the 2010 UWMPs, the 2013 ABAG Projections (population and employment forecasts), SMSWP conservation reports, prior DSS Models, and Water Contractor provided projections. Again, Water Contractor specific data is included in Section 3. The service area demographics were used for future demand forecasting.

Historical conservation data from the SMSWP and CUWCC conservation activity databases was incorporated into the Project for a review of future conservation program levels of saturation and as a benchmark of reasonable levels of implementation for future conservation programs.

The analysis focuses specifically on potable water demand and conservation projections. Data on recycled water use was not collected or analyzed. The impacts of existing local recycled water programs are “implicit” in this analysis in that the base water demands used for this analysis take into account the potable water offset provided by existing recycled water programs. The impacts of planned recycled water programs or program expansions will need to be analyzed by the individual Water Contractors.

**Table 2-1. Data Collected for Water Contractors**

| Model Input Parameter | Time Period | Units | Source(s) |
|---|---|---|---|
| **Service Area Data** | | | |
| **Agency Info** | Current | NA | Water Contractor Provided |
| **Contact Info** | Current | Name, number, email | Water Contractor Provided |
| **Planning Documents** | Varies | NA | 2010 UWMP<br>Water Contractor Provided |
| **Abnormal Years** | Varies | Years | Water Contractor Provided |
| **Customer Classes** | Varies | NA | Water Contractor Provided |
| **System Input Volume (Water Production)** | 1997-2014 or longer if provided | Volume | Previous DSS Models<br>SMSWP & CUWCC Conservation Database<br>2010 UWMPs<br>DWR PWSS Reports |
| **Consumption and Accounts** | 1997-2014 or longer if provided | Volume | |
| **Cost of Water** | Varies | $ / Volume | Water Contractor provided |
| **Maximum Day Demand** | Varies | Date & Volume | Water Contractor provided |
| **Water System Audits** | 2010 to 2014 if available | NA | Water Contractor Provided<br>American Water Works Association (AWWA) Methodology |
| **Service Area Demographics** | | | |
| **Historical Service Area Population** | 2000-2014 | People | Water Contractor Provided |
| **Projected Population** | 2015-2040 | People | ABAG 2013<br>2010 UWMP<br>Prior DSS Models<br>Water Contractor Provided |
| **DP-1 General Profile and Housing Characteristics** | 2010 | Various units | 2010 US Census<br>2013 ACS 3-yr |
| **DP04 Selected Housing Characteristics** | 2010 | Various units | 2010 US Census<br>2013 ACS 3-yr |
| **B25033 Population in Housing Units** | 2010 | Dwelling units | 2010 US Census<br>2013 ACS 3-yr |
| **Economy** | | | |
| **Historical Service Area Employment** | 2000-2014 | Jobs | ABAG 2013<br>2010 UWMP<br>Prior DSS Models<br>Water Contractor Provided |
| **Projected Jobs** | 2015-2040 | Jobs | ABAG 2013<br>DSS Models<br>Water Contractor Provided |
| **Conservation** | | | |
| **Historical Conservation** | Program Inception to 2014 | Various units | SMSWP and CUWCC Database<br>Prior DSS Models<br>Water Contractor Provided |
| **Conservation Targets** | 2015, 2018, 2020 or other | GPCD | SMSWP and CUWCC Database<br>Water Contractor Provided |

# 3. DEMAND PROJECTIONS

The purpose of Section 3 is to document the demand projections developed for the Water Contractor. This section presents:

- Demand methodology overview,
- Population and employment projections,
- Water use data analysis inputs and key assumptions for the DSS Model,
- Water use targets
- Water demand projections with and without the Plumbing Code savings through 2040 (this is the demand before incorporating planned water savings from future active conservation efforts), and
- Water demand projections in the 2010 Urban Water Management Plan (UWMP) format in preparation for the 2015 UWMP

## 3.1 Demand Methodology Overview

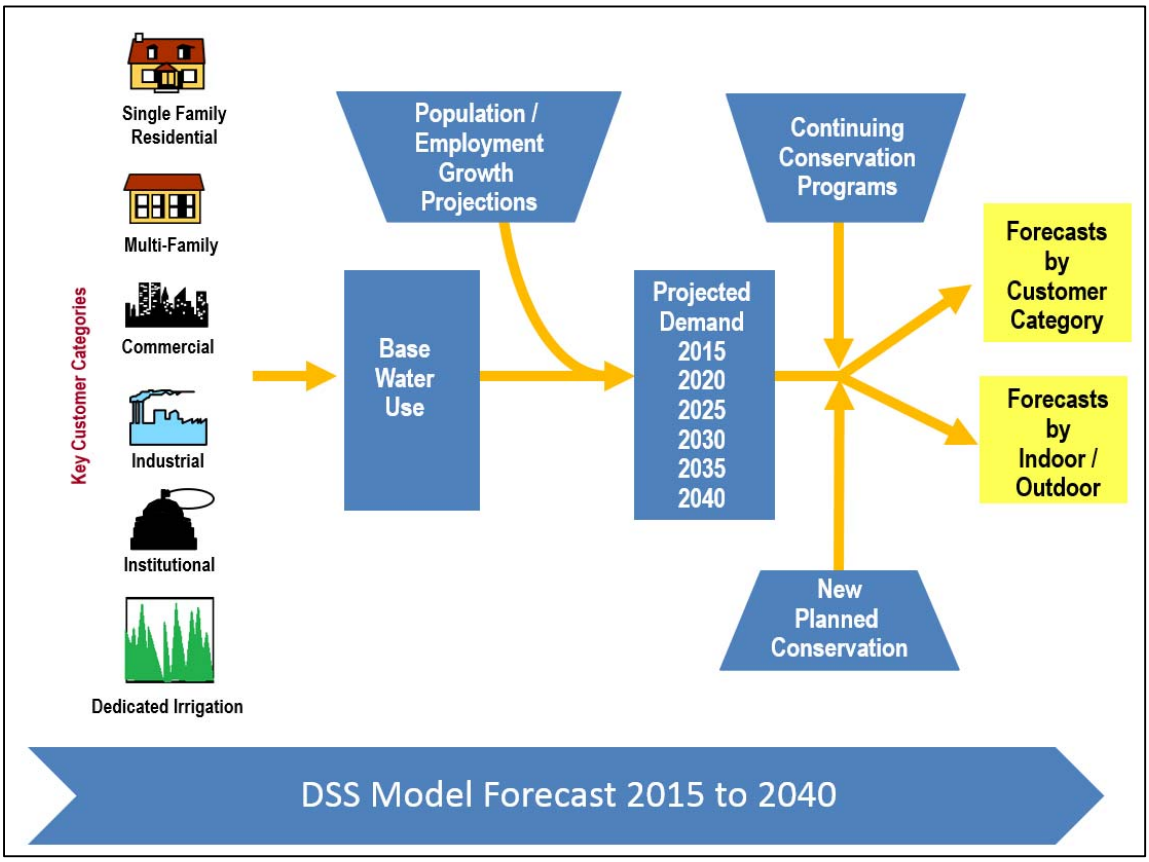
Each Water Contractor's water demand (i.e., average year demand before additional active conservation savings were incorporated) was forecasted through 2040 using the DSS Model. The demand analysis process included forecasting future water demand (2015-2040) by customer category based upon forecasted increases in population and employment. Average water use per customer category account was based on an analysis of historical data between 2005 and 2014 (which reflects the data set available for the City). The City's dataset reflects the fact that residential water meters were installed in the early 2000s. To forecast water demands, the DSS Model relies on demographic and employment projections, combined with the effects of natural fixture replacement due to the implementation of plumbing codes to forecast future demands. Natural fixture replacement due to the implementation of plumbing codes is part of passive conservation savings. Passive conservation refers to water savings resulting from actions and activities that do not depend on direct financial assistance or educational programs from Water Contractors. These savings result primarily from (1) the natural replacement of existing plumbing fixtures with water-efficient models required under current plumbing code standards and (2) the installation of water-efficient fixtures and equipment in new buildings and retrofits as required under CALGreen Building Code Standards. The DSS Model evaluated water savings associated with these codes and standards to project passive conservation savings. Section 3 of this report presents the DSS Model's demand estimates taking into account savings only from passive conservation.

### 3.1.1 DSS Model Methodology

For the demand projections (2015 through 2040), the DSS Model was used to forecast water demand for each Water Contractor. The DSS Model also includes a conservation component that quantifies savings from passive conservation (e.g. plumbing codes) and active conservation programs. The DSS Model's conservation component covers the entire forecast period, 2015-2040. Quantification of water savings potential from active conservation programs is presented in Sections 4 and 5.

The DSS Model prepares long-range, water demand and conservation water savings projections. The DSS Model is an end-use model that breaks down total water production (i.e., water demand in the service area) into specific water end uses, such as toilets, faucets, irrigation, etc. This "bottom-up" approach allows for detailed criteria to be considered when estimating future demands, such as the effects of natural fixture replacement, plumbing codes, and conservation efforts. The purpose of using end use data is to enable a more accurate assessment of the impact of water efficiency programs on demand and to provide a rigorous and defensible modeling approach necessary for projects subject to regulatory or environmental review.

**Figure 3-1. DSS Model Flow Diagram**




The first step for forecasting water demands using the DSS Model was to gather customer category billing data from each Water Contractor. The next step was to check the model by comparing water use data with available demographic data to characterize water usage for each customer category (single family, multi-family, commercial, industrial, and institutional) in terms of number of users per account and per capita water use. During the model calibration process data were further analyzed to approximate the indoor/outdoor split by customer category. The indoor/outdoor water usage was also further divided into typical end uses for each customer category. Published data on average per-capita indoor water use and average per-capita end use were combined with the number of water users to verify that the volume of water allocated to specific end uses in each customer category is consistent with social norms from end use studies on water use behavior (e.g., for flushes per person per day).

### 3.1.2 Water Contractor Input and Review

As part of the Project's collaborative approach, an instructional webinar conference call was held in April 2015 to facilitate the participating Water Contractors understanding of and involvement in the development of the demand projections. During the webinar, the Project Team reviewed the methodology using a real example with preliminary results from one of the Water Contractors. The goals of the webinar were: (1) to review the demand modeling approach and results and (2) to answer Water Contractor questions.

The Water Contractors had the opportunity to review the demand modeling results and to provide questions and comments at the one-on-one calls and emails with MWM. In addition, individual in-person meetings were held between MWM modeling staff and Water Contractor representatives to review the draft demand projections in May 2015.

## 3.2 Future Population and Employment Projections

Each Water Contractor's future population and employment projections were incorporated into each DSS Model to project future demand. Population and employment projections through 2040 were provided or confirmed by each Water Contractor through the data collection process described in Section 2. These growth projections were used to develop a projected demand through the year 2040. Population projections were obtained from one of the following sources:

- Local General Plan (population and employment) – Typically these plans, depending upon when they were published, have a population and jobs forecast for 2040 and build out.
- Association of Bay Area Governments (ABAG) (population and employment) – ABAG recently published a new projections report in 2013 that includes population and employment estimates for each city in the San Francisco Bay Area. The ABAG projections report provides population and employment estimates for 2000, 2005, 2010, 2015, 2020, 2025, 2030, 2035, and 2040. ABAG now publishes its projections report every four years consistent with the Sustainable Community Strategies time line. The previous DSS Model projections and ABAG Projections for 2013 were reviewed to determine the most appropriate data set to use in this DSS Model update.

At the City's request, the population and employment projections were based on 2013 ABAG Subregional estimates, to be consistent with the planning projections in prior reports prepared by MWM. Population and Employment projections are shown in Figure 3-2 and Table 3-1.

**Figure 3-2. Historical and Projected Population and Employment**

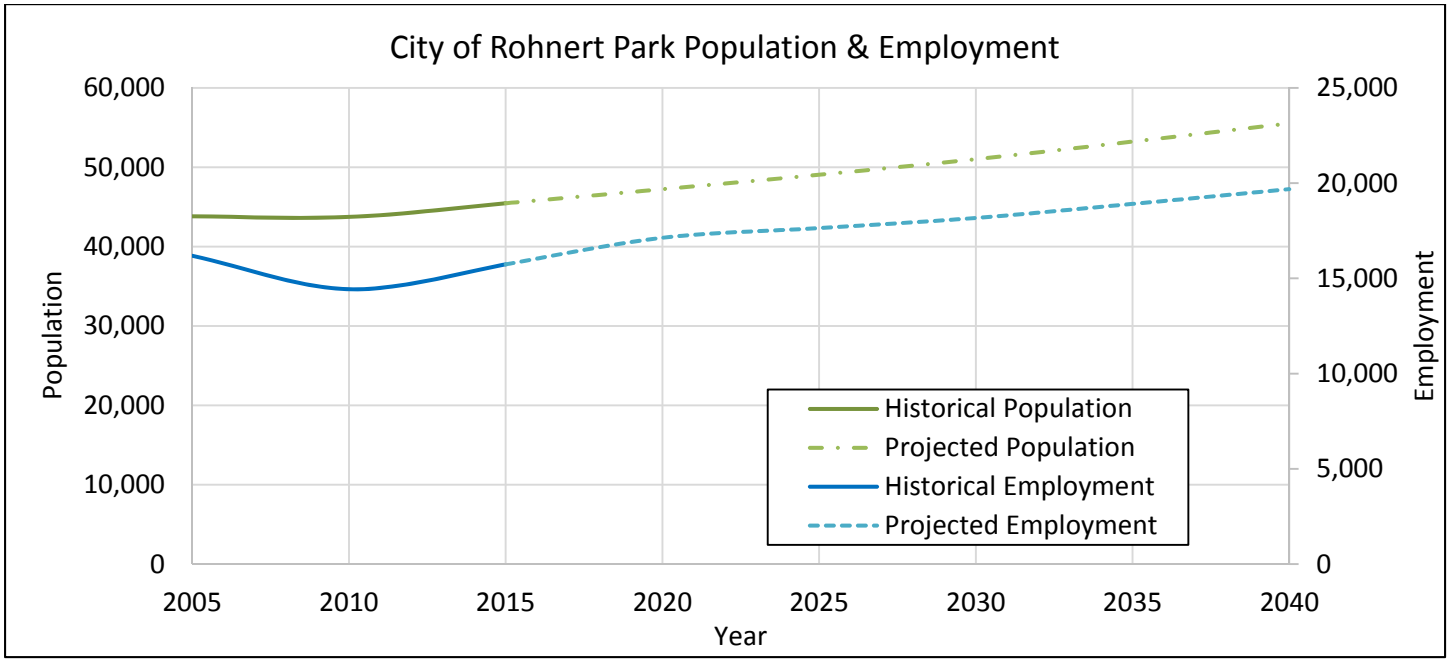


**Table 3-1. Historical and Projected Population and Employment**

| Year | Population[1] | Employment[2] |
|---|---|---|
| **2005** | 43,828 | 16,185 |
| **2010** | 43,730 | 14,429 |
| **2015** | 45,465 | 15,735 |
| **2020** | 47,232 | 17,129 |
| **2025** | 49,054 | 17,640 |
| **2030** | 51,016 | 18,171 |
| **2035** | 53,232 | 18,910 |
| **2040** | 55,524 | 19,684 |

1. Source: Association of Bay Area Governments. *Draft Preferred Scenario of the Sustainable Communities Strategy (Jobs-Housing Connection Strategy)*, file name: ABAG Preferred Scenario v20_May 24 2013_Output.xls, worksheet name: SSA Totals, row 121, columns G-L, (ABAG, 2013).
2. Source: Association of Bay Area Governments. *Draft Preferred Scenario of the Sustainable Communities Strategy (Jobs-Housing Connection Strategy)*, file name: ABAG Preferred Scenario v20_May 24 2013_Output.xls, worksheet name: SSA Totals, row 121, columns BU-BZ, (ABAG, 2013).

## 3.3 Water Use Data Analysis and Key Inputs to the DSS Model

The demand analysis process includes using baseline average water use per customer to forecast water demands by customer category based upon forecasted increases in population and employment to predict customer category account growth. Average water use per customer category account was based on a water use data analysis investigating historical and current water use data and demographic data. This analysis includes the following elements:

- *Model Start Year* – This is the starting year for the analysis. For this project, the start year for the model is 2015. The DSS Model includes 25 years of data projecting information until the year 2040.
- *Base Year for Future Water Factors* – Based on an analysis of historical water billing data, each Water 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 City chose to average water use over the years 2008, 2009, 2010, 2012 and 2013. The data set for 2011 had significant anomalies, making the data suspect. Also, the City had drought restrictions in place in 2014, which resulted in an abnormal reduction in demand. The City chose to average demands over these years to help normalize weather related impacts on demand. Appendix B presents historical customer category water use graphs. Historical water use was provided by the City of Rohnert Park, taken from DWR's annual PWSS reports, or taken from previous modeling efforts conducted by MWM. The data was reviewed and confirmed by the City. Units shown are average gallons of water per account per day. These graphs were reviewed to better identify outlier data points and years so that a representative baseline water use value (of average account water use by category) could be determined. The effects of drought, economic recessions, service line failures, and meter inaccuracies are typically evident in these figures.
- *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.
- *Non-Revenue Water (NRW)* – This is the sum of all water input to the 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 another more accurate value from the AWWA M36 Water Loss reports was provided.

- *Census Data* – The 2010 Census data or 2013 American Community Survey 3-year data was used as a general reference when determining population, housing units and household sizes for each individual city (and/or unincorporated area) serviced by the Water Contractors. Housing units and household sizes were used to estimate water use per person in the service area as well as individual residential customer categories.
- *Current Service Area Population* – The 2015 total population for the Water Contractors was taken directly from the selected population projection source shown in Table 3-1.
- *Employment data* – The employment figures were obtained from the selected source as discussed earlier in this report.

The following Table 3-2 shows the key inputs and 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 non-revenue water. More details on these assumptions, including screenshots of where they are incorporated into the DSS Model, can be found in Appendix A.

**Table 3-2. Water Use Data Analysis and DSS Model Key Assumptions**

| Parameter | Model Input Value, Assumptions, and Key References | | | | |
|---|---|---|---|---|---|
| **Model Start Year** | 2015 | | | | |
| **Water Demand Factor Year(s) [Base Year(s)]** | 2008, 2009, 2010, 2012, 2013.<br>2011 was not used because it was an abnormal year. 2014 was not used since it was a drought year. | | | | |
| **Non-Revenue Water in Start Year** | 19.9% | | | | |
| | This value can be found in the green NRW section of each Water Contractor's DSS Model. | | | | |
| **Population Projection Source** | 2013 ABAG Subregional estimates. | | | | |
| **Employment Projection Source** | | | | | |
| **Avoided Cost of Water** | $1,368.55/AF ($4,200/MG). This value reflects the cost of purchasing water from the Sonoma County Water Agency. | | | | |
| **Base Year Water Use Profile (average of years 2008, 2009, 2010, 2012, 2013)** | | | | | |
| **Customer Categories** | **Start Year Accounts** | **Total Water Use Distribution** | **Demand Factors (gal/day/acct)** | **Indoor Use %** | **Residential Indoor Water Use (gpcd)** |
| **Single Family** | 7,647 | 43% | 216 | 69% | 55 |
| **Multi-family** | 535 | 38% | 2,794 | 74% | 45 |
| **Commercial** | 479 | 10% | 797 | 75% | N/A |
| **Institutional/Industrial** | 2 | 0.1% | 1,410 | 4% | N/A |
| **Irrigation** | 331 | 9% | 1,070 | 0% | N/A |
| **Total** | 8,994 | 100% | N/A | N/A | N/A |
| **Parameter** | Model Input Values and Key References | | | | |
| **Residential End Uses** | Model Input Values are found in the "End Uses" section of their DSS Model on the "Breakdown" worksheet.<br>Key References: CA DWR Report "California Single Family Water Use Efficiency Study," 2011 Page 28 Figure 3: Comparison of household end-uses, AWWARF Report "Residential End Uses of Water" (DeOreo, 1999 Page 108 Table 5.9 "Percentage of average indoor gallons per capita per day usage, (Update of this AWWARF Residential End Use Study report is pending in 2015). | | | | |

| Parameter | Model Input Value, Assumptions, and Key References |
|---|---|
| **Non-Residential End Uses, %** | Model Input Values are found in the "End Uses" section of their DSS Model on the "Breakdown" worksheet.<br>Key Reference: AWWARF Report "Commercial and Institutional End Uses of Water" Appendix D: Details of Commercial and Industrial Assumptions, by End Use (Dziegielewski, 2000). |
| **Efficiency Residential Fixture Current Installation Rates** | Model Input Values are found in the "Codes and Standards" green section of each Water Contractor's DSS Model by customer category fixtures.<br>U.S. Census, Housing age by type of dwelling plus natural replacement plus rebate program (if any).<br>Key Reference: California Urban Water Conservation Council Potential Best Management Practice Report (PBMP) "High Efficiency Plumbing Fixtures - Toilets and Urinals" : Residential toilet installation rates in California Page 42 Table 8 and 9 Table (Koeller & Company, 2005).<br>Key Reference: Consortium for Efficient Energy (www.cee1.org) |
| **Water Savings for Fixtures, gal/capita/day** | Model Input Values are found in the "Codes and Standards" green section on the "Fixtures" worksheet of each Water Contractor's DSS Model.<br>Key Reference: AWWARF Report "Residential End Uses of Water" 1999, Page 99 Table 5.5 Toilet flush volume, per capita use, and utilization, 12 study sites, Page 102 Table 5.6 Shower per capita use, volume, duration, and flow rate, 12 study sites,<br>CA DWR Report "California Single Family Water Use Efficiency Study", 2011, Water Contractor supplied data on costs and savings, professional judgment where no published data available. |
| **Non-Residential Fixture Efficiency Current Installation Rates** | Model Input Values are found in the "Codes and Standards" green section of each Water Contractor's DSS Model by customer category fixtures.<br>Key Reference: 2010 U.S. Census, Housing age by type of dwelling plus natural replacement plus rebate program (if any). Assume commercial establishments built at same rate as housing, plus natural replacement. |
| **Residential Frequency of Use Data, Toilets, Showers, Washers, Uses/user/day** | Model Input Values are found in the "Codes and Standards" green section on the "Fixtures" worksheet of each Water Contractor's DSS Model, and confirmed in each "Service Area Calibration End Use" worksheet by customer category.<br>Key Reference: Falls within ranges in AWWARF Report "Residential End Uses of Water" 1999. Page 99 Table 5.5 Toilet flush volume, per capita use, and utilization, 12 study sites, Page 102 Table 5.6 Shower per capita use, volume, duration, and flow rate, 12 study sites, |
| **Non-Residential Frequency of Use Data, Toilets and Urinals, Uses/user/day** | Model Input Values are found in the "Codes and Standards" green section on the "Fixtures" worksheet of each Water Contractor's DSS Model, and confirmed in each "Service Area Calibration End Use" worksheet by customer category.<br>Key References: Estimated based using AWWARF Report "Commercial and Institutional End Uses of Water" Appendix D: Details of Commercial and Industrial Assumptions, by End Use (Dziegielewski, 2000).<br>Based on three studies of office buildings in which the numbers varied from 2.0 to 3.45 toilet flushes per employee per day (Darell Rogers cited in Schultz Communications (1999); Konen cited in A and N Technical Services, Inc. (1994); and Eva Opitz cited in PMCL (1996)). |

| Parameter | Model Input Value, Assumptions, and Key References |
|---|---|
| **Natural Replacement Rate of Fixtures** | Model Input Value Residential Toilets 2%/year (1.28 gpf and 1.6 gpf toilets), 2.5% (3.5 gpf and higher toilets) |
| | Model Input Value Commercial Toilets 2% (1.28 gpf and 1.6 gpf toilets), 2.5% (3.5 gpf and higher toilets) |
| | Model Input Value: Residential Showers 4% |
| | Model Input Value: Residential Clothes washers 10% |
| | Model Input Value: 4% replacement rate corresponds to 25 year life of a new fixture. |
| | Model Input Value: 10% replacement rate corresponds to 10 year washer life based on 2014<br>Key References: AWWARF Report "Residential End Uses of Water" and "Bern Clothes Washer Study," Final Report, Energy Division, Oak Ridge National Laboratory, for U.S. Department of Energy, March 1998. Online: www.energystar.gov |
| | Model Input Value is found the "Codes and Standards" green section on the "Fixtures" worksheet of each Water Contractor's DSS Model. |
| **Future Residential Water Use** | Increases Based on Population Growth and Demographic Forecast |
| **Future Non-Residential Water Use** | Increases Based on Employment Growth and Demographic Forecast |

## 3.4 Water Use Targets

"The Water Conservation Act of 2009" (SB X7-7) required urban water agencies, within their 2010 Urban Water Management Plans, to adopt 2015 and 2020 water use targets that would result in 15% and 20% reductions from a "baseline" year by 2015 and 2020 respectively. The targets are set in gallons per capita per day, which in its simplest form reflects total water use divided by service area population. (However, there are provisions for adjusting water use if a service includes non-urban uses.) The law provided urban water suppliers with several methods for computing baselines and targets. The law also provided water suppliers with the option of establishing regional targets and working together to reduce water use. Because each service area is different and because there are various methods that could be employed, each Water Contractor has a different per capita consumption baseline value and year 2020 water use target. The Water Contractors also adopted a regional target and continue to work towards that target.

The City of Rohnert Park's 2020 target is 119 GPCD[1] and the Regional Alliance target is 129 GPCD. The City has also elected to track their year 2018 CUWCC GPCD target of 123.5. The City's GPCD use, based on 2014 data, is approximately 92 gpcd (note 2014 was a drought year so water use was influenced by state mandated restrictions.

## 3.5 Water Demand Projections With and Without the Plumbing Code

Water demand projections were developed to the year 2040 using the DSS Model. Table 3-3 shows projected demands in 5-year increments with and without plumbing codes. The demand projections reflect average water use assuming average weather conditions and **do not** reflect drier and hotter drought conditions. Likewise, climate change (which might alter weather patterns), increased or decreased rainfall, and possibly increased irrigation demand in the spring and fall due to a warmer climate have **NOT** been addressed in this analysis.

[1] Source: City of Rohnert Park 2010 Urban Water Management Plan page 3-3 and 3-4.

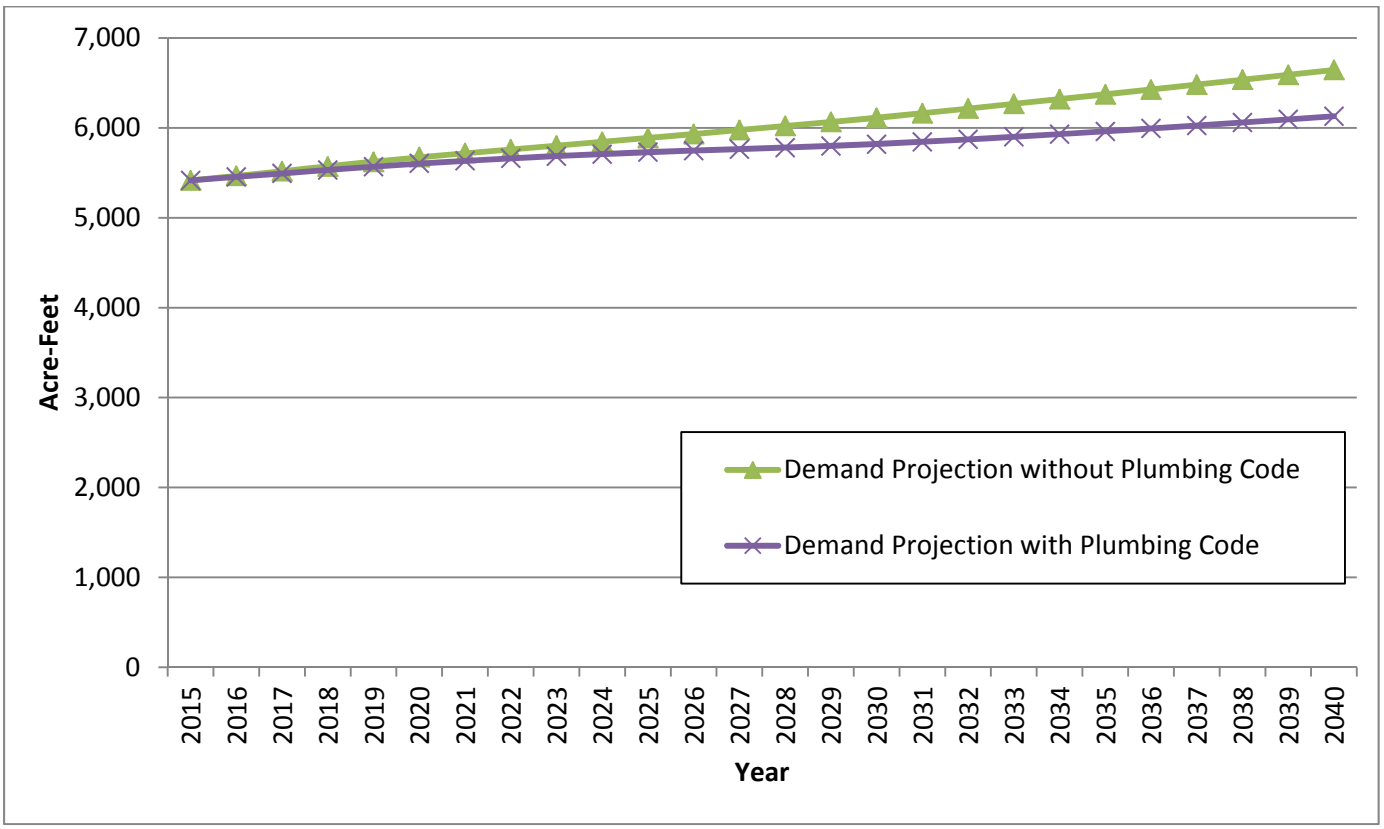
**Table 3-3. Potable Water Use Projections (Acre-Feet/Year)***

| | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|
| Demand without Plumbing Code (AFY) | 5,415 | 5,675 | 5,887 | 6,111 | 6,372 | 6,644 |
| Demand with Plumbing Code (AFY) | 5,415 | 5,605 | 5,729 | 5,817 | 5,960 | 6,129 |

*Data is not weather normalized. Total water use is potable only. Does not include recycled water use. Values include NRW.

Figure 3-3 shows the potable water demand projections with and without the plumbing code through 2040.

**Figure 3-3. Potable Water Use Projections for City of Rohnert Park (AFY)**




## 3.6 Water Demand Projections – 2015 Urban Water Management Plan (UWMP) Format

The draft 2015 Urban Water Management Plan Guidance Document from the California Department of Water Resources (CA DWR) was released in April 2015 and the final guidance document is not planned to be released until after July 1, 2015. Without the final guidance document, the exact formatting of the tables for the 2015 UWMP are not known. Therefore, it was elected to place the demand data into the draft 2015 UWMP format.

The 2015 draft Urban Water Management Plan Guidance Document from the California Department of Water Resources requests that future demand information be in a specific format. The following tables are the 2015 draft UWMP tables relating to population and demand that are requested. The demand projection shown is the "with Plumbing Code" demands and is otherwise the same as Table 3-3 and Figure 3-3.

Table 3-4 below provides population projections for the service area.

**Table 3-4. (DWR Table 2-2) Population – Current and Projected**

| | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|
| Population Served | 45,465 | 47,232 | 49,054 | 51,016 | 53,232 | 55,524 |

The current and projected number of connections and deliveries to the Water Contractor's water distribution system, by sector, are identified in the following Table 3-5 and Table 3-6. Deliveries include plumbing code savings but do not include non-revenue water (NRW).

**Table 3-5. Demands and Accounts by Customer Category***

| | | Single Family | Multi-family | Commercial | Institutional/ Industrial | Irrigation | Total (no NRW) |
|---|---|---|---|---|---|---|---|
| 2015 | # of accounts | 7,647 | 535 | 479 | 2 | 331 | 8,994 |
| | Deliveries AFY | 1,852 | 1,676 | 428 | 3 | 397 | 4,356 |
| 2020 | # of accounts | 7,944 | 556 | 521 | 2 | 360 | 9,384 |
| | Deliveries AFY | 1,903 | 1,711 | 458 | 3 | 432 | 4,508 |
| 2025 | # of accounts | 8,251 | 577 | 537 | 2 | 371 | 9,738 |
| | Deliveries AFY | 1,958 | 1,731 | 467 | 3 | 445 | 4,604 |
| 2030 | # of accounts | 8,581 | 600 | 553 | 2 | 382 | 10,119 |
| | Deliveries AFY | 1,990 | 1,745 | 477 | 4 | 459 | 4,674 |
| 2035 | # of accounts | 8,953 | 626 | 576 | 2 | 398 | 10,556 |
| | Deliveries AFY | 2,039 | 1,779 | 492 | 4 | 477 | 4,790 |
| 2040 | # of accounts | 9,339 | 653 | 599 | 2 | 414 | 11,008 |
| | Deliveries AFY | 2,097 | 1,822 | 507 | 4 | 497 | 4,927 |

*Based on Demand WITH Plumbing Code, excluding NRW.

**Table 3-6. (DWR Table 3-1) Retail Uses of Potable and Raw Water - Actual and Projected (Acre-Feet/Year)**

| Use Type | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|
| Single Family | 1,852 | 1,903 | 1,958 | 1,990 | 2,039 | 2,097 |
| Multi-family | 1,676 | 1,711 | 1,731 | 1,745 | 1,779 | 1,822 |
| Commercial | 428 | 458 | 467 | 477 | 492 | 507 |
| Institutional/Industrial | 3 | 3 | 3 | 4 | 4 | 4 |
| Irrigation | 397 | 432 | 445 | 459 | 477 | 497 |
| **Total** | **4,356** | **4,508** | **4,604** | **4,674** | **4,790** | **4,927** |

For this project, losses or non-revenue water (NRW) is defined as the difference between total water produced and water sold to customers. Non-revenue 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. Non-revenue water can also result from meter inaccuracies. The total current and future water losses for the system are shown in Table 3-7.

**Table 3-7. (DWR Table 3-4) Losses from Potable Water System (Acre-Feet/Year)**

| | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|
| Potable System | 1,060 | 1,098 | 1,125 | 1,143 | 1,170 | 1,202 |

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

**Table 3-8. (DWR Table 3-6) Total Potable Water Use (Acre-Feet/Year)***

| | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|
| Retail Uses | 4,356 | 4,508 | 4,604 | 4,674 | 4,790 | 4,927 |
| Losses | 1,060 | 1,098 | 1,125 | 1,143 | 1,170 | 1,202 |
| Total | 5,415 | 5,605 | 5,729 | 5,817 | 5,960 | 6,129 |

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

Passive savings due to plumbing codes and standards are presented in Table 3-9. These savings include the effects of any historical investments the Water Contractor has made in water efficient toilets, urinals, showerheads, and clothes washers that currently exist in the service area. Table 3-9 does not include the impacts of continuing retrofit and incentive programs in the future.

**Table 3-9. (DWR Table 3-8) Passive Savings (Acre-Feet/Year)***

| | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|
| Total Passive Savings | - | 69 | 157 | 293 | 412 | 515 |

*Passive savings **are** accounted for in the water use projections in DWR Table 3-1.

# 4. COMPARISON OF INDIVIDUAL CONSERVATION MEASURES

This section presents the conservation measure screening process, a description of the measures selected to be analyzed in the Water Contractor's DSS Model, measure design assumptions and modeling methodology, and a comparison of the individual conservation measure costs and savings.

## 4.1 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. New measures were designed with an implementation schedule reflecting dates sometime in the future when the Water Contractor might begin such programs. The first step in the conservation analysis was to review historical water conservation activity and savings. The purpose of this review was to look at historically successful programs, past penetration rates (activity levels) for individual measures, and the types of programs that were implemented (and for which customers – single family, multi-family, commercial, etc.) by each of the Water Contractors since the 2010 UWMP. The participation rates were incorporated into the design of each of the 25 conservation measure activity levels in the DSS Model analysis.

Following the review of the historical conservation efforts, a list of over 50 potential conservation measures was provided to each Water Contractor to be considered for further evaluation in the DSS Model. This list of measures was then screened by the Water Contractors to: (1) identify those measures with the highest level of interest and potential for implementation within the region and (2) identify which entity (SMSWP or individual Water Contractors) would be best suited to implement each measure. Through this process, a total of 25 measures were selected for analysis in the individual Water Contractor DSS models. The screening process and results are described in Appendix C. Once the 25 measures were selected for analysis, a master measure design database (MMDD) was created to streamline the individual measure design process. The MMDD served as a consistent starting point for all the Water Contractor's measures so that measure design parameters such as target end uses, customer classes, unit costs, and savings would initially align.

## 4.2 Conservation Measures Evaluated

Table 4-1 includes the 25 water use efficiency measures that were included in the DSS Model analysis. The table includes measures, devices and programs (e.g., direct install high efficiency toilets) that can be used to achieve water use efficiency, methods through which the device or program will be implemented and what distribution method, or mechanism, can be used to activate the device or program. The list of potential measures was drawn from MWM and Water Contractor general experience and review of local Water Contractor's water use efficiency programs. The measure descriptions apply generally to each Water Contractor. Water Contractor-specific measure descriptions can be found in Appendix D where screen shots of every conservation measure's inputs from each Water Contractor's DSS Model are presented.

Water use efficiency savings due to plumbing codes such as CALGreen (California Statewide New Development Building Code), SB 407 (Plumbing Fixture Retrofit on Resale or Remodel), and any new development ordinances specific to each individual Water Contractor are included in the DSS Model and presented in Appendix A.

**Table 4-1. Water Use Efficiency Measure Descriptions**

| No. | Measure Name | Measure Description |
|---|---|---|
| 1 | Water Loss | WATER CONTRACTOR MEASURE: Maintain a thorough annual accounting of water production, sales by customer class and quantity of water produced and billed consumption (to define non-revenue water). In conjunction with system accounting, include water system audits that identify and quantify known legitimate uses of non-revenue water in order to determine remaining potential for reducing real (physical) water losses. Goal would be to lower the Infrastructure Leakage Index (ILI) and real water losses water every year by a pre-determined amount based on cost-effectiveness. These programs typically pay for themselves based on savings in operational costs (and saved rate revenue can be directed more to system repairs/replacement and other costs) and recovered revenue through addressing apparent losses. Specific goals and methods to be developed by Utility. May include accelerated main and service line replacement. Enhanced real loss reduction may include more ambitious main replacement and active leak detection and/or capture water from water main flushing and hydrant flow testing for reuse. |
| 2 | AMI | WATER CONTRACTOR MEASURE: Retrofit system with AMI meters and associated network capable of providing continuous consumption data to Utility offices. Improved identification of system and customer leaks is a major conservation benefit. Some costs of these systems are offset by operational efficiencies and reduced staffing, as regular meter reading and opening and closing accounts are accomplished without the need for a site visit. Also enables enhanced billing options and ability to monitor unauthorized usage, such as use/tampering with closed accounts or irrigation when time of day or days per week are regulated. Customer service is improved as staff can quickly access continuous usage records to address customer inquiries. Optional features include online customer access to their usage, which has been shown to improve accountability and reduce water use. A five-year change-out would be a reasonable objective and may take longer if coupled with a full meter replacement program (on the order of 10 years). Require that new, larger or irrigation customers install such AMI meters as described above and possibly purchase means of viewing daily consumption inside their home, business, or by their landscape/property managers, either through the Internet (if available) or separate device. The AMI system would, on demand, indicate to the customer and Utility where and how their water is used, facilitating water use reduction and prompt leak identification. This would require Utility to install an AMI system. |
| 3 | Pricing | WATER CONTRACTOR MEASURE: Assumes average annual price increase of 5% for the next 25 years unless otherwise specified by the Water Contractors. Measure converts price increases to real price increases net of inflation; Annual increase must be above user set threshold (such as assuming a 2% inflation) to trigger a demand reduction. |
| 4 | Public Info & School Education - SMSWP | REGIONAL MEASURE: Continue with regional public information and school education campaign. School education includes: school assembly program, classroom presentations, and other options for school education. |
| 5 | Public Info & School Education - Water Contractor | WATER CONTRACTOR MEASURE: Public information dissemination and school education initiatives beyond those conducted by SMSWP. |
| 6 | Prohibit Water Waste | WATER CONTRACTOR OR REGIONAL MEASURE: Adopt or modify ordinance that prohibits the waste of water defined as gutter flooding, restrictions on watering days and failure to repair leaks in a timely manner. |
| 7 | Indoor and Outdoor | WATER CONTRACTOR OR REGIONAL MEASURE: Top water customers from each CII |

| No. | Measure Name | Measure Description |
|---|---|---|
| | Surveys - CII | category would be offered a professional water survey that would evaluate ways for the business to save water and money. The surveys would be for targeted to large users (accounts that use more than 5,000 gallons of water per day) such as hotels, restaurants, large stores and schools. Emphasis will be on supporting the top users in each customer category. |
| 8 | Replace CII Inefficient Equipment | WATER CONTRACTOR OR REGIONAL MEASURE: Provide a rebate or voucher for certain CII equipment. Program to provide rebates 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, replacing once through cooling, and adding conductivity controller on cooling towers. After a free water use survey, analyze options to replace inefficient equipment including available incentives. Provide customer with findings report and incentive upon completing work. Measure assumes a 50/50 cost share with an average cost per customer of $3,000 of utility funding. |
| 9 | Efficient Toilet Replacement Program - CII | WATER CONTRACTOR MEASURE: Efficient Toilet Replacement Program - CII. Provide a rebate or voucher for the installation of a high efficiency flushometer toilet - toilets flushing 1.28 gpf or less. Rebate amounts reflect the incremental purchase cost. |
| 10 | Urinal Rebates – CII | WATER CONTRACTOR MEASURE: Provide a rebate or voucher for the installation of a high efficiency urinals. WaterSense standard is 0.5 gpf or less, though models flushing as low as 0.125 gpf (1 pint) are available and function well, so could be specified. Rebate amounts would reflect the incremental purchase cost. |
| 11 | Plumber Initiated UHET & HEU Retrofit Program | WATER CONTRACTOR MEASURE: Plumber Initiated Ultra High Efficiency Toilet (UHET) and/or Urinal Retrofit Program. The Water Contractor could subsidize the installation cost of a new UHET or High Efficiency Urinal (HEU) purchased by the Water Contractor Licensed plumbers, pre-qualified by the Water Contractor would solicit customers directly. |
| 12 | Require <0.125 gal/flush Urinals in New Development | WATER CONTRACTOR MEASURE: Require that new buildings be fitted with .125 gpf (1 pint) or less urinals rather than the current standard of 0.5 gal/flush models. |
| 13 | HE Faucet Aerator / Showerhead Giveaway – CII | WATER CONTRACTOR MEASURE: High Efficiency Faucet Aerator / Showerhead Giveaway – CII. Utility would buy showerheads and faucet aerators in bulk and give them away at Utility office or community events. |
| 14 | HE Faucet Aerator / Showerhead Giveaway - SF, MF | WATER CONTRACTOR MEASURE: High Efficiency Faucet Aerator / Showerhead Giveaway - SF, MF. Utility would buy showerheads and faucet aerators in bulk and give them away at Utility office or community events. Need to coordinate this program with the School Education measure on retrofit kit giveaways to the same customer categories. |
| 15 | Indoor and Outdoor Surveys - SF, MF | REGIONAL OR WATER CONTRACTOR MEASURE: Indoor and outdoor water surveys for existing residential customers. Target those with high water use and provide a customized report to owner. May include give-away of efficient shower heads, aerators, and toilet devices. Customer leaks can go uncorrected at properties where owners are least able to pay costs of repair. These programs may require that customer leaks be repaired, with either part of the repair subsidized and/or the cost paid with revolving funds paid back with water bills over time. May also include an option to replace inefficient plumbing fixtures at low-income residences. May include adjustments to irrigation schedules on automatic irrigation controllers. Provide incentive to install pressure regulating valve on existing properties with pressure exceeding 80 psi. |

| No. | Measure Name | Measure Description |
|---|---|---|
| 16 | Efficient Toilet Replacement Program – SF | WATER CONTRACTOR MEASURE: Provide a rebate or voucher for the installation of an ultra-high efficiency toilet (UHET). UHET toilets flush 1.28 gpf or less and include dual flush technology. Rebate amounts would reflect the incremental purchase cost. Replacement program can be either a direct install or rebate program. Includes replacement of 1.6 gpf that are not well functioning. |
| 17 | Direct Install UHET, Showerheads, and Faucet Aerators - SF, MF | WATER CONTRACTOR OR REGIONAL MEASURE: Direct Install High Efficiency Toilets, Showerheads, and Faucet Aerators in Residential Buildings. Utility would subsidize installation cost of a new UHET purchased by the utility. Licensed plumbers, pre-qualified by the Utility would solicit customers directly. Customers would get a new UHET and showerheads and faucet aerators installed at a discounted price. |
| 18 | HE Clothes Washer Rebate - SF, MF | WATER CONTRACTOR MEASURE: Provide a rebate for efficient washing machines to residential customers. It is assumed that the rebates would remain consistent with relevant state and federal regulations (Department of Energy, Energy Star) and only offer the best available technology. |
| 19 | Submeters Incentive | WATER CONTRACTOR MEASURE: Require or provide a partial cost rebate to meter facilities that are currently master metered (e.g., multifamily dwelling units, mobile home parks, commercial centers) but not separately metered. |
| 20 | Outdoor Large Landscape Audits & Water Budgeting/Monitoring | WATER CONTRACTOR OR REGIONAL MEASURE: Outdoor water audits offered for existing large landscape customers. Normally those with high water use are targeted and provided a customized report on how to save water. All large multi-family residential, CII, and public irrigators of large landscapes would be eligible for free landscape water audits upon request. Website will provide feedback on irrigation water use (budget vs. actual). May include the cost for dedicated meter conversion. |
| 21 | Landscape Rebates and Incentives for Equipment Upgrade | WATER CONTRACTOR MEASURE: For SF, MF, CII, and IRR customers with landscape, provide a Smart Landscape Rebate Program with rebates for substantive landscape retrofits or installation of water efficient upgrades; Rebates contribute towards the purchase and installation of water-wise plants, compost, mulch and selected types of irrigation equipment upgrades including: Large Rainwater Catchment Systems, Rain Barrels, Rain Sensors, Rotating Sprinkler Nozzles, Drip Irrigation Equipment, Weather Based Irrigation Controllers and Gray Water Systems. |
| 22 | Turf Removal - MF, CII | WATER CONTRACTOR MEASURE: Provide a per square foot incentive to remove turf and replace with low water use plants or hardscape. Rebate is based on price per square foot removed, and capped at an upper limit for multi-family or commercial residence. |
| 23 | Turf Removal - SF | WATER CONTRACTOR MEASURE: Provide a per square foot incentive to remove turf and replace with low water use plants or permeable hardscape. Rebate based on dollars per square foot removed and capped at an upper limit for single family residences. |
| 24 | Water Conserving Landscape and Irrigation Codes | WATER CONTRACTOR MEASURE: Develop and enforce Water Efficient Landscape Design Standards. Standards specify that development projects subject to design review be landscaped according to climate appropriate principals, with appropriate turf ratios, plant selection, efficient irrigation systems and smart irrigation controllers. The ordinance could require certification of landscape professionals. |
| 25 | Require Smart Irrigation Controllers and Rain Sensors in New Development | WATER CONTRACTOR MEASURE: Require Weather Adjusting Smart Irrigation Controllers per CALGreen on New Development. It is optional to require Rain Sensors in CALGreen for New Development. Require developers for all properties (100%) of greater than four residential units and all commercial development to install the weather based irrigation controllers. May require landscaper training. |

## 4.3 Water Reduction Methodology

Each conservation measure targets a particular water use such as indoor single family water use. Targeted water uses are categorized by water user group and by end use. Targeted water user groups include single family residential, multi-family residential, commercial, industrial, and institutional (CII), etc. Measures may apply to more than one water user group. Targeted end uses include indoor and outdoor use. The targeted water use is important to identify because the water savings are generated from reductions in water use for the targeted end use. For example, a residential retrofit conservation measure targets single family and multi-family residential indoor use, and in some cases specifically shower use. When considering the water savings potential generated by a residential retrofit one considers the water saved by installing low-flow showerheads in single family and multi-family homes.

The market penetration goal for a measure is the extent to which the product or service related to the conservation measure occupies the potential market. In essence, the market penetration goal identifies how many fixtures, rebates, surveys, etc. the wholesale customer would have to offer or conduct over a period of time to reach its water savings goal for that conservation measure. This is often expressed in terms of the number of fixtures, rebates, surveys, etc. offered or conducted per year.

The potential for errors in market penetration goal estimates for each measure can be significant because they are based on previous experience, chosen implementation methods, projected utility effort, and funds allocated to implement the measure. The potential error can be corrected through re-evaluation of the measure as the implementation of the measure progresses. For example, if the market penetration required to achieve specific water savings turns out to be more or less than predicted, adjustments to the implementation efforts can be made. Larger rebates or additional promotions are often used to increase the market penetration. The process is iterative to reflect actual conditions and helps to ensure that market penetration and needed savings are achieved regardless of future variances between estimates and actual conditions.

In contrast, market penetration for mandatory ordinances can be more predictable with the greatest potential for error occurring in implementing the ordinance change. For example, requiring dedicated irrigation meters for new accounts through an ordinance can assure an almost 100 percent market penetration for affected properties.

Water contractors are constantly looking at when a measure reaches saturation. Baseline surveys are the best approach to having the most accurate information on market saturation. This was taken into account when analyzing individual conservation measures where best estimates were made. MWM was not provided with any baseline surveys for this analysis, but discussions were held with the individual Water Contractors on what their best estimates were for saturation for their service area.

## 4.4 Description of Benefits and Costs

The determination of the economic feasibility of water conservation programs involves comparing the costs of the programs to the benefits provided. This analysis was performed using the DSS Model developed by MWM. The DSS Model has received the endorsement of the California Urban Water Conservation Council and calculates cost effectiveness of conservation measure 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. Additional detail on the DSS Model and assumptions can be found in Appendix A.

## 4.5 Present Value Parameters

The time value of money is explicitly considered. The value of all future costs and benefits is discounted to 2015 (the model start year) at the real interest rate of 3.01%. 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%). The formula to calculate the real interest rate is: (nominal interest rate – assumed rate of inflation)/ (1 + assumed rate of inflation). Cash flows discounted in this manner are subsequently referred to as “Present Value” sums. If the interest rates were

lowered it would decrease the discounting of the cash flows or costs of the conservation measures. Additional information on Present Value referenced in Appendix A.

## 4.6 Measure Assumptions including Unit Costs and Water Savings

Appendix D presents the assumptions and inputs used in the Water Contractor's DSS Model to evaluate each water conservation measure. Assumptions regarding the following variables were made for each measure:

- 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 – Cost of rebates, incentives, and contractors hired (by Water Contractor or SMSWP) to implement measures. The assumed dollar values for the measure unit costs were closely reviewed by staff and are found to be adequate for each individual measure. The values in the majority of cases are in the range of what is currently offered by other water utilities in the region.
- 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 for administering the measure, including consultant contract administration, marketing, and participant tracking. The mark-up is sufficient (in total) to cover conservation staff time and general expenses and overhead.

Costs are determined for each of the measures based on industry knowledge, past experience and data provided by the Water Contractor. 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 are used in marketing the measure. Measure costs are estimated each year between 2015 and 2040. Costs are 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 as necessary to meet fixed cost obligations.

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.

The unit costs vary according to the type of customer 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 an ordinance requirement or a direct installation implementation method. Typically water utilities have found there are increased costs associated with achieving higher market saturation, such as more surveys per year. The DSS Model calculates the annual costs based on the number of participants each year. The general formula for calculating annual utility costs is:

- Annual Utility Cost = Annual market penetration rate x total accounts in category x unit cost per account x (1+administration and marketing markup percentage)
- Annual Customer Cost = Annual number of participants x unit customer cost
- Annual Community Cost = Annual utility cost + annual customer cost

## 4.7 Assumptions about Avoided Costs

The most expensive source of water for almost all of the Water Contractors, and in some cases the only source of water, is the SCWA Russian River Supply. The price of the water to the Water Contractors is set by SCWA every year and varies by Water Contractor location, depending upon which aqueduct they draw from. Since 1990, the annual price of water

has increased significantly. The annual rate of increase from 1989/90 to 2013/14 has varied from 4.0 to 5.1% per year, depending upon the aqueduct.

Since 1990, the annual rate of inflation has been 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 are escalated from the 2014 value to a projected 2030 value (16 years). The total avoided cost of water escalated is the 2014 current SCWA price of water plus the chemical/treatment and pumping and distribution costs. The chemical/treatment and pumping and distribution costs were provided by the Water Contractors in their data collection workbooks.

The net increase and the water production avoided costs used in this evaluation are provided in the following table. The 2014 SCWA cost of water is escalated to a 2030 projected value using a 4% per year rate increase. The cost of treatment distribution and pumping is escalated at 2% per year.

**Table 4-2. Water Contractor Avoided Costs of Water**

| Water Contractor | Rate Basis | SCWA FY 2014-15 Water Rates (per AF) | Estimated SCWA 2030 Water Rates (per AF) | 2014 Treatment, Distribution and Pumping Costs (per AF) | Estimated 2030 Treatment, Distribution and Pumping Costs (per AF) | Total Estimated 2030 Water Production Operational Costs (per AF)[1] |
|---|---|---|---|---|---|---|
| City of Santa Rosa | Santa Rosa Aqueduct | $ 730.68 | $ 1,368.55 | $0.00[2] | $0.00 | $1,368.55 |
| City of Petaluma | Petaluma Aqueduct | $ 730.68 | $ 1,368.55 | $0.23 | $0.32 | $1,368.87 |
| City of Rohnert Park | | $ 730.68 | $ 1,368.55 | $0.00[2] | $0.00 | $1,368.55 |
| City of Cotati | | $ 730.68 | $ 1,368.55 | $0.00[2] | $0.00 | $1,368.55 |
| Valley of the Moon Water District | Sonoma Aqueduct | $ 793.24 | $ 1,485.72 | $0.00[2] | $0.00 | $1,485.72 |
| City of Sonoma | | $ 793.24 | $ 1,485.72 | $0.00[2] | $0.00 | $1,485.72 |
| Town of Windsor | Individual Rate | $ 876.81 | $ 1,368.55[3] | $0.00[2] | $0.00 | $1,368.55 |
| North Marin Water District | Individual Rate | $ 741.78 | $ 1,389.34 | $29.09 | $39.93 | $1,429.27 |
| Marin Municipal Water District | Individual Rate for first 4,300 acre-feet from SCWA | $ 786.91 | $ 1,473.87 | $65.65 | $90.12 | $1,563.99 |

[1] This value is used in each Water Contractor's DSS Model.

[2] Water Contractors did not provide specific energy/cost quantities, or else the Water Contractor's cost is zero for SCWA-supplied water. Therefore, the distribution cost is shown at zero, which as an avoided cost will produce a more conservative estimate for the value of conserved water.
[3] Town of Windsor water rates in 2022 will change to Santa Rosa Aqueduct rates. Therefore, the Santa Rosa Aqueduct rate will be in effect in 2030.

For those Water Contractors with wastewater operation costs including chemical, treatment, energy, and transport costs, a 2% per year escalation was used to a projected 2030 value. These values can be found in each Water Contractor's data collection workbook and DSS Model.

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

## 4.8 Comparison of Individual Measures

Table 4-3 presents how much water the measures will save through 2040, how much they will cost, and what the cost of saved water will be per unit volume *if the measures are implemented on a stand-alone basis (i.e. without interaction or overlap from other measures that might address the same end use(s)).* Thus, savings from measures which address the same end use(s) are not additive. The model uses impact factors to avoid double counting in estimating the water savings from programs of measures. For example, if two measures are planned to address the same end use and both save 10% of the prior water use then the net effect is not the simple sum (20%). Rather it is the cumulative impact of the first measure reducing the use to 90% of what it was without the first measure in place and then reducing the use another 10% to result in the use being 81% of what it was originally. In this example the net savings is 19%, not 20%. Using impact factors, the model computes the reduction as follows, 0.9 x 0.9 = 0.81 or 19% water savings.

Since interaction between measures has **not** been accounted for in Table 4-3, it is **not** appropriate to include totals at the bottom of the table. However, the table is useful to give a close approximation of the cost effectiveness of each individual measure.

Cost categories are defined below:

- Utility Costs - those costs that the Water Contractor as a water utility will incur to operate the measure including administrative costs.
- Utility Benefits - the avoided cost of producing water.
- Customer Costs - those costs customers will incur to implement a measure in the Water Contractor's service area and maintain its effectiveness over the life of the measure.
- Customer Benefits - the savings other than from reduced water/sewer utility bills, such as energy savings resulting from reduced use of hot water. Conservation program participants will see lower water and sewer bills but overall there will be no net customer benefit.
- Community Costs and Benefits - Community Costs and Benefits include Utility Costs plus Customer Costs, and Utility Benefits plus Customer Benefits, respectively.

The column headings in Table 4-3 are defined as follows:

- Present Value (PV) of Utility and Community Costs and Benefits ($) = the present value of the 25-year time stream of annual costs or benefits, discounted to the base year.
- Utility Benefit-Cost ratio = PV of Utility Costs divided by PV of Utility Benefits over 25 years.

- Community Benefit-Cost ratio = (PV of Utility Benefits plus PV of customer energy savings) divided by (sum of PV of Utility Costs plus PV of Customer Costs), over 25 years.
- Five Years Total Cost to Utility ($) = the sum of the annual Utility Costs for years 2015 through 2019. Only those measures that are run between 2015 and 2020 will have a cost. The measures start in the years as specified for each measure shown in Appendix D.
- Water Savings in 2020 (AFY) = water saved in acre-feet per year. The year 2020 is provided as this information is helpful as relates to the Water Contractor's adopted target under the Water Conservation Act of 2009.
- Utility Cost of Water Saved per Unit Volume ($/AF) = PV of Utility Costs over 25 years divided by the 25-Year Water Savings. This value is compared to the utility's avoided cost of water as one indicator of the cost effectiveness of conservation efforts. It should be noted that the value somewhat undervalues the cost of savings because program costs are discounted to present value and the water benefit is not.

**Table 4-3. Conservation Measure Cost and Savings**

| Measure | Present Value of Water Utility Benefits | Present Value of Community Benefits | Present Value of Water Utility Costs | Present Value of Community Costs | Water Utility Benefit to Cost Ratio | Community Benefit to Cost Ratio | Five Years of Water Utility Costs 2015-2020[1] | Water Savings in 2020 (AFY) | Cost of Savings per Unit Volume ($/AF) |
|---|---|---|---|---|---|---|---|---|---|
| Water Loss | $3,785,674 | $3,785,674 | $1,037,622 | $1,037,622 | 3.65 | 3.65 | $375,000 | 159 | $254 |
| AMI | $1,637,256 | $1,637,256 | $1,080,947 | $1,080,947 | 1.51 | 1.51 | $0 | 20 | $571 |
| Pricing | $192,235 | $192,235 | $319,813 | $319,813 | 0.60 | 0.60 | $50,000 | 49 | $129 |
| Public Info & School Education - SMSWP | $276,479 | $458,917 | $264,484 | $264,484 | 1.05 | 1.74 | $66,981 | 11 | $911 |
| Public Info & School Education - Water Contractor | $138,240 | $229,458 | $132,242 | $132,242 | 1.05 | 1.74 | $33,490 | 5.5 | $911 |
| Prohibit Water Waste | $24,943 | $24,943 | $148,485 | $247,476 | 0.17 | 0.10 | $31,747 | 1.1 | $5,438 |
| Indoor and Outdoor Surveys - CII | $164,399 | $336,238 | $372,550 | $620,917 | 0.44 | 0.54 | $93,376 | 7.0 | $2,107 |
| Replace CII Inefficient Equipment | $23,920 | $60,313 | $43,747 | $77,399 | 0.55 | 0.78 | $19,920 | 1.4 | $1,897 |
| Efficient Toilet Replacement Program - CII | $83,568 | $83,568 | $158,613 | $229,003 | 0.53 | 0.36 | $168,326 | 3.8 | $1,793 |
| Urinal Rebates – CII | $10,758 | $10,758 | $65,158 | $76,741 | 0.17 | 0.14 | $56,504 | 0.6 | $5,698 |
| Plumber Initiated UHET & HEU Retrofit Program | $51,970 | $51,970 | $92,968 | $114,972 | 0.56 | 0.45 | $21,759 | 1.3 | $1,585 |
| Require <0.25 gal/flush Urinals in New Development | $30,106 | $30,106 | $27,467 | $127,349 | 1.10 | 0.24 | $21,046 | 1.5 | $847 |
| HE Faucet Aerator / Showerhead Giveaway – CII | $9,982 | $26,365 | $17,598 | $46,927 | 0.57 | 0.56 | $18,675 | 1.3 | $2,144 |
| HE Faucet Aerator / Showerhead Giveaway - SF, MF | $56,761 | $124,355 | $28,112 | $74,967 | 2.02 | 1.66 | $29,817 | 7.5 | $603 |
| Indoor and Outdoor Surveys - SF, MF | $167,107 | $246,030 | $198,683 | $239,696 | 0.84 | 1.03 | $50,317 | 7.1 | $1,107 |
| Efficient Toilet Replacement Program – SF | $10,180 | $10,180 | $12,081 | $21,746 | 0.84 | 0.47 | $12,814 | 0.5 | $1,122 |

| Measure | Present Value of Water Utility Benefits | Present Value of Community Benefits | Present Value of Water Utility Costs | Present Value of Community Costs | Water Utility Benefit to Cost Ratio | Community Benefit to Cost Ratio | Five Years of Water Utility Costs 2015-2020[1] | Water Savings in 2020 (AFY) | Cost of Savings per Unit Volume ($/AF) |
|---|---|---|---|---|---|---|---|---|---|
| Direct Install UHET, Showerheads, and Faucet Aerators - SF, MF | $447,214 | $794,662 | $155,226 | $193,435 | 2.88 | 4.11 | $36,514 | 10 | $306 |
| HE Clothes Washer Rebate - SF, MF | $365,103 | $921,332 | $73,444 | $390,724 | 4.97 | 2.36 | $77,899 | 18 | $193 |
| Submeters Incentive | $213,737 | $347,432 | $206,385 | $275,180 | 1.04 | 1.26 | $44,177 | 3.9 | $812 |
| Outdoor Large Landscape Audits & Water Budgeting/Monitoring | $19,429 | $19,429 | $27,249 | $31,286 | 0.71 | 0.62 | $28,918 | 2.6 | $1,706 |
| Landscape Rebates and Incentives for Equipment Upgrade | $139,208 | $139,208 | $171,921 | $289,652 | 0.81 | 0.48 | $182,377 | 12 | $1,399 |
| Turf Removal - MF, CII | $257,066 | $257,066 | $202,343 | $1,447,531 | 1.27 | 0.18 | $112,454 | 7.8 | $712 |
| Turf Removal - SF | $179,066 | $179,066 | $225,539 | $1,613,473 | 0.79 | 0.11 | $126,196 | 5.5 | $1,140 |
| Water Conserving Landscape and Irrigation Codes | $463,232 | $463,232 | $30,879 | $277,914 | 15.00 | 1.67 | $11,580 | 12 | $58 |
| Require Smart Irrigation Controllers and Rain Sensors in New Development | $438,861 | $438,861 | $174,351 | $1,363,108 | 2.52 | 0.32 | $49,010 | 8.9 | $337 |

[1]Some measures have no Water Utility Costs from 2015 to 2020, indicated by a dash (-) in the table. This means that there are no costs for these five years only, from 2015, inclusive, up to 2020, exclusive. It is not indicative of any activity before 2015 or during and/or after 2020. This column is meant to be helpful for budgeting purposes only.

# 5. RESULTS OF CONSERVATION PROGRAM EVALUATION

This section describes the process of selecting conservation measures for developing alternative conservation program scenarios and various cost, savings, and target results.

## 5.1 Selection of Measures for Programs

The 25 conservation measures were incorporated into each Water Contractor's DSS Model for cost-benefit analysis and selection of a conservation program to meet the Water Contractor's goals. Included in each Water Contractor's DSS Model was a list of measures in each of three alternative conservation programs (Programs A, B, and C), which were designed to illustrate a range of various measure combinations and resulting water savings. Four key items were taken into consideration during measure selection for Programs A, B, and C:

- Existing Water Contractor water use efficiency measures;
- Programs run by SMSWP;
- Measures focused on Programmatic BMP defined by the CUWCC's Memorandum of Understanding if the individual Water Contractor had reported on a measure; and
- New and innovative measures.

These programs are not intended to be rigid frameworks but rather to demonstrate the range in savings that could be generated if selected measures were run together. For each Water Contractor the three program scenarios are organized as follows:

- **Program A**: "Existing Program" option includes the measures that the Water Contractor currently offers. These measures are not necessarily designed the way they are currently implemented having, in some cases, more aggressive annual account targets. Again, though Program A represents the conservation measures each Water Contractor is currently implementing, it is important to note that these measures are designed in each Water Contractor's DSS Model to represent how the measure will be implemented in the future and not necessarily how it has historically been implemented.
- **Program B**: "Optimized Program" includes measures that the Water Contractor currently implements or is interested in implementing. Current measures are not necessarily designed the way they are currently implemented having, in some cases, more aggressive annual account targets. Measures are typically cost-effective and save significant amounts of water. Key benchmarks for the proposed strategies include: (1) cost-effectiveness, (2) compliance with CUWCC's BMPs, (3) ability to help achieve water use reduction targets by 2020 (SB X7-7) if applicable for the individual Water Contractor, (4) reflects reasonable predicted annual water contract budget allocations for water conservation activities.
- **Program C**: "All Measures Analyzed" presents a scenario where all 25 measures are implemented. Though it is unlikely that the Water Contractor would elect to implement all the measures, this program offers the opportunity to explore what the water savings (and costs) would potentially be should the Water Contractor implement such an extensive conservation program.

The Water Contractor's DSS Model presents estimated average per capita per day savings with the plumbing codes only, and each of the alternative programs (Program A, B, and C). Plumbing code includes current state and federal standards (including CALGreen, Senate Bill 407 and Assembly Bill 715) for items such as toilets, showerheads, faucets, pre-rinse spray valves. SB 407 and AB 715 require the replacement of non-water conserving plumbing fixtures with water-conserving fixtures.

The Water Contractor was provided a copy of the DSS Model to review the conservation program options, tailor the programs to meet its needs, and select the program that fit its individual water savings goals and budgets. The reasons

that each member Water Contractor selected a particular suite of measures varied and included the following consideration:

- Measure cost-effectiveness to Water Contractor
- Applicability to service area
- Amount of water savings generated
- Cost to Water Contractor
- Ease of implementation for Water Contractor and staffing required
- Whether the measure was being run by SCWA or SMSWP
- Local preferences

Table 5-1 displays which measures are in each program.

**Figure 5-1. Conservation Measures Selected for Programs**

| Program Scenarios | | | | |
|---|---|---|---|---|
| Program Scenarios | Measures | Program A | Program B | Program C |
| | Water Loss | ☑ | ☑ | ☑ |
| | AMI | ☐ | ☑ | ☑ |
| | Pricing | ☑ | ☑ | ☑ |
| | Public Info & School Education - SMWSP | ☑ | ☑ | ☑ |
| | Public Info & School Education - Water Contractor | ☐ | ☐ | ☑ |
| | Prohibit Water Waste | ☑ | ☑ | ☑ |
| | Indoor and Outdoor Surveys - CII | ☐ | ☐ | ☑ |
| | Replace CII Inefficient Equipment | ☐ | ☐ | ☑ |
| | Efficient Toilet Replacement Program - CII | ☑ | ☑ | ☑ |
| | Urinal Rebates – CII | ☐ | ☐ | ☑ |
| | Plumber Initiated UHET & HEU Retrofit Program | ☐ | ☐ | ☑ |
| | Require <0.125 gal/flush Urinals in New Development | ☑ | ☑ | ☑ |
| | HE Faucet Aerator / Showerhead Giveaway – CII | ☑ | ☑ | ☑ |
| | HE Faucet Aerator / Showerhead Giveaway - SF, MF | ☑ | ☑ | ☑ |
| | Indoor and Outdoor Surveys - SF, MF | ☑ | ☑ | ☑ |
| | Efficient Toilet Replacement Program – SF | ☑ | ☑ | ☑ |
| | Direct Install UHET, Showerheads, and Faucet Aerators - SF, MF | ☐ | ☐ | ☑ |
| | HE Clothes Washer Rebate - SF, MF | ☑ | ☑ | ☑ |
| | Submeters Incentive | ☐ | ☑ | ☑ |
| | Outdoor Large Landscape Audits & Water Budgeting/Monitoring | ☐ | ☐ | ☑ |
| | Landscape Rebates and Incentives for Equipment Upgrade | ☐ | ☐ | ☑ |
| | Turf Removal - MF, CII | ☐ | ☑ | ☑ |
| | Turf Removal - SF | ☐ | ☑ | ☑ |
| | Water Conserving Landscape and Irrigation Codes | ☐ | ☑ | ☑ |
| | Require Smart Irrigation Controllers and Rain Sensors in New Development | ☑ | ☑ | ☑ |

## 5.2 Results of Program Evaluation

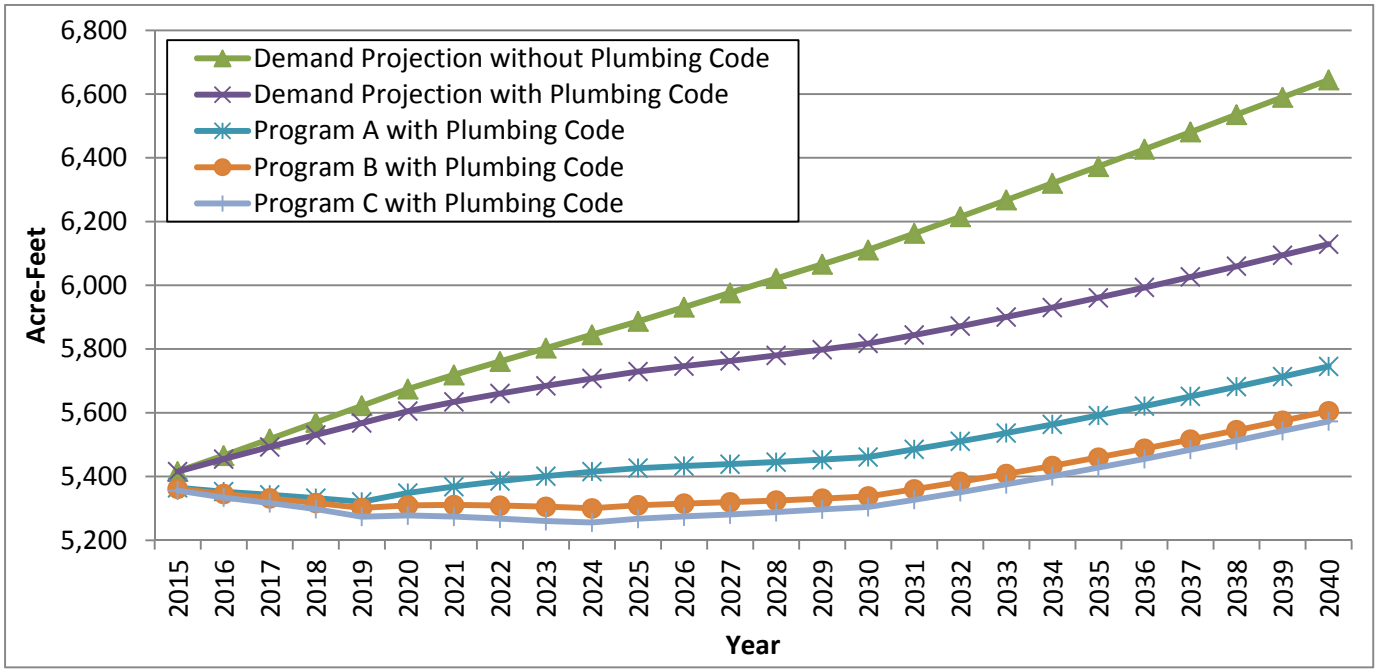
The following table and Figure 5-2 shows annual water demand with no conservation (plumbing code only) and the three conservation programs. The table and figure illustrate that savings associated with plumbing code implementation and Program A are the most significant savings predicted by the model. Implementation of Programs B and C result in marginal additional savings.

**Table 5-1. Potable Water Use Projections (Acre-Feet/Year)***

| | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|
| Demand without Plumbing Code (AFY) | 5,415 | 5,675 | 5,887 | 6,111 | 6,372 | 6,644 |
| Demand with Plumbing Code (AFY) | 5,415 | 5,605 | 5,729 | 5,817 | 5,960 | 6,129 |
| Demand with Plumbing Code and Program A | 5,365 | 5,348 | 5,426 | 5,461 | 5,591 | 5,745 |
| Demand with Plumbing Code and Program B | 5,361 | 5,309 | 5,310 | 5,337 | 5,459 | 5,605 |
| Demand with Plumbing Code and Program C | 5,356 | 5,277 | 5,268 | 5,304 | 5,427 | 5,573 |

*Data is not weather normalized. Total water use is potable only. Does not include recycled water use.

**Figure 5-2. Long Term Demands with Conservation Programs**




Note: All line types shown in the legend are presented in the graph.

Table 5-1 shows the savings in 5-year increments for all three conservation programs; these are from the conservation programs alone and 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 variation in individual measures selected for each individual Program A, B, and C. Table 5-2 illustrates that all the programs modeled are at least marginally cost effective although the overall cost benefit ratio for the conservation program is reduced as more measures are implemented.

**Table 5-2. Long Term Conservation Program Savings**

| Conservation Program Water Savings (AFY) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | Water Utility Benefit to Cost Ratio | Community Benefit to Cost Ratio |
|---|---|---|---|---|---|---|---|---|
| Plumbing Code | - | 69 | 157 | 293 | 412 | 515 | N/A | N/A |
| Program A with Plumbing Code | 51 | 326 | 460 | 650 | 781 | 899 | 2.89 | 1.79 |
| Program B with Plumbing Code | 54 | 365 | 577 | 773 | 913 | 1,039 | 2.20 | 1.15 |
| Program C with Plumbing Code | 60 | 397 | 619 | 807 | 945 | 1,071 | 1.91 | 1.10 |

Figure 5-3 shows how marginal returns change as more money is spent to achieve savings. The slope of the line on the graph illustrates cost-effectiveness: the steeper the slope of the line, the more cost effective the program is to implement.

**Figure 5-3. Present Value of Utility Costs versus Cumulative Water Saved**

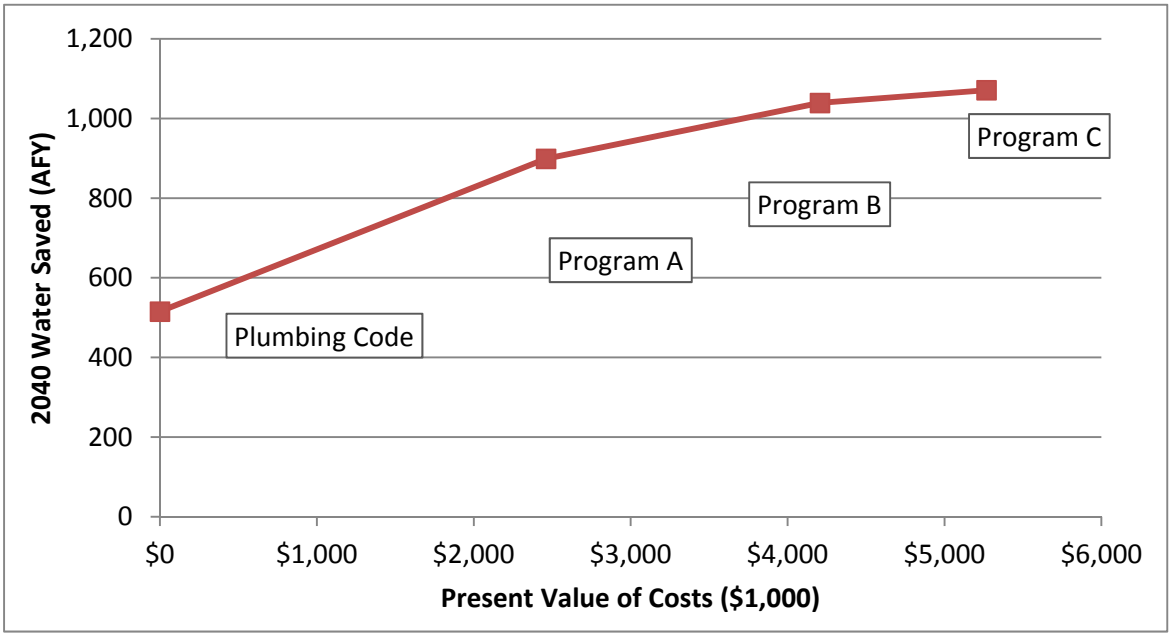



Table 5-3 presents key evaluation statistics compiled from the DSS Model. Assuming each program's measures are successfully implemented, projected indoor, outdoor and total water savings for 2040 in AFY are shown; these savings do include plumbing code savings. Savings and costs in the following table are a result of each program's conservation measures and any plumbing codes. Total present value costs and savings are estimated over the 25 year analysis period using an interest rate of 3%. The cost of water saved is presented for the utility. These cost parameters are derived from the annual time stream of utility, customer, and community costs.

**Table 5-3. Comparison of Long-Term Conservation Programs – Utility Costs and Savings**

| | 2040 Indoor Water Savings (AFY) | 2040 Outdoor Water Savings (AFY) | 2040 Total Water Savings (AFY) | Present Value of Water Savings ($) | Present Value of Utility Costs ($) | Present Value of Community Costs ($) | Cost of Utility Savings per Unit Volume ($/AF) |
|---|---|---|---|---|---|---|---|
| Program A with Plumbing Code | 538 | 361 | 899 | $7,107,384 | $2,460,754 | $4,362,913 | $315 |
| Program B with Plumbing code | 583 | 456 | 1,039 | $9,271,830 | $4,206,847 | $9,057,957 | $409 |
| Program C with Plumbing Code | 612 | 459 | 1,071 | $10,045,098 | $5,267,908 | $10,594,602 | $474 |

The following table presents the year 2020 GPCD target and Program A, B, and C GPCD estimates for the Water Contractor.

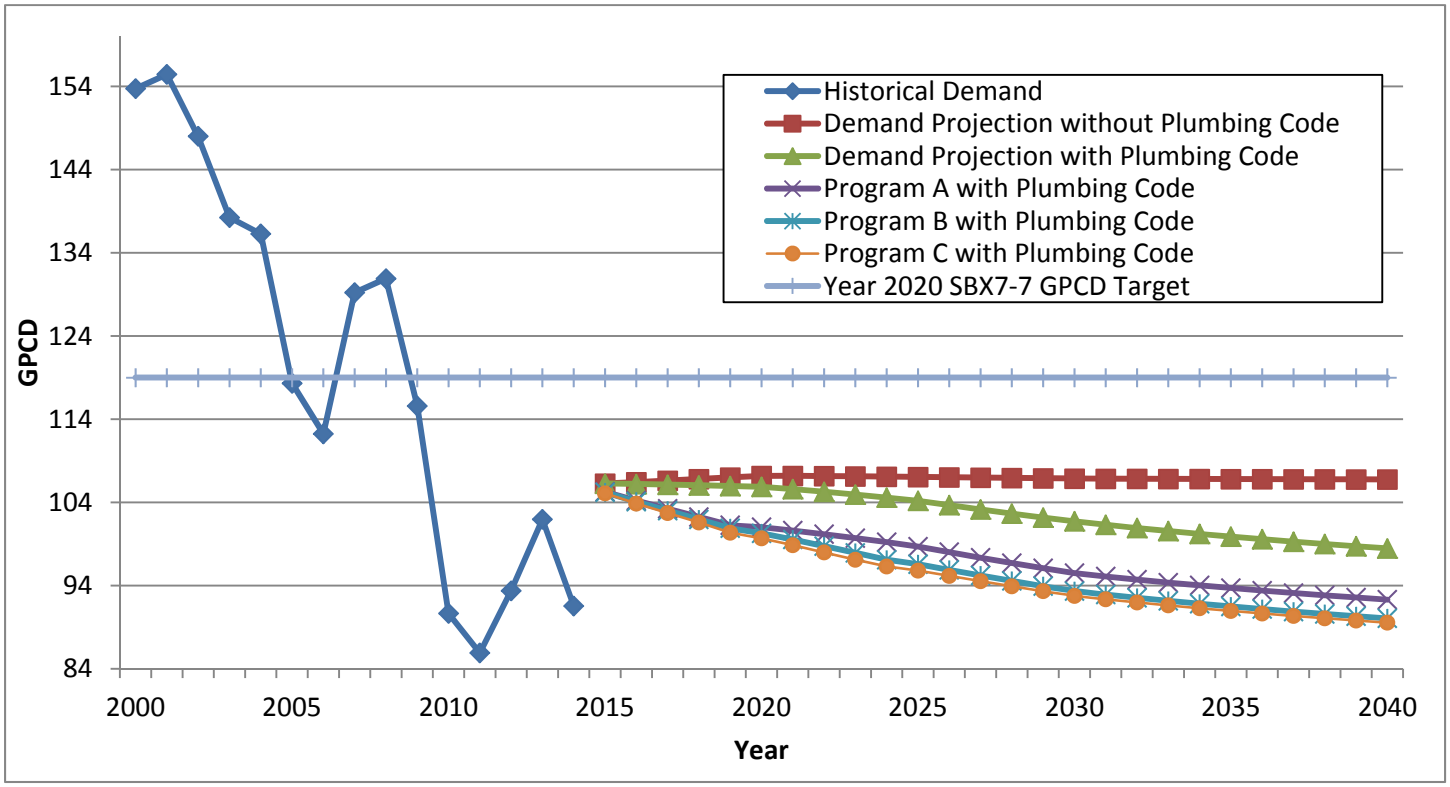
**Table 5-4. Adopted Water Conservation Target Compared to Projected Program Savings (in GPCD)**

| | 2015 | 2020 |
|---|---|---|
| Local Target (GPCD) | 140.0 | 119.0 |
| Regional Target (GPCD) | 142.0 | 129.0 |
| GPCD Projection with Plumbing Code | * | 106.0 |
| GPCD Projection with Plumbing Code and Program A | * | 101.0 |
| GPCD Projection with Plumbing Code and Program B | * | 100.3 |
| GPCD Projection with Plumbing Code and Program C | * | 99.7 |

Note: 2015 Actual per capita use will be provided by the Water Contractor at the time the 2015 UWMP is prepared.

The following figure presents the year 2020 GPCD target and historical and projected GPCD estimates with plumbing codes and Program A, B, and C savings.

**Figure 5-4. Water Conservation Program Savings Projections – SB X7-7 Target, GPCD**




Notes:

1. All line types shown in the legend are presented in the graph. The following demand scenarios, Program B and Program C, are close in value and therefore indistinguishable in the figure.
2. Note the decline in water use in the 2014 dry year and 2008-2011 economic recession.

# 6. CONCLUSIONS

This section presents a discussion of the relative savings and cost-effectiveness of the Water Contractor's alternative conservation programs.

The City of Rohnert Park's service area has a relatively high portion of residential water use and a significant amount of outdoor water use. Consequently, residential and irrigation conservation programs produce the most savings. The City'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 water, water conservation programs are cost-effective, although the most aggressive program provides relatively little additional savings at a relatively high cost. Overall conclusions are as follows:

- The change in water demands from years 2015 to 2040 are projected to increase. The following projected demand scenarios have been analyzed for the 25-year study period:
- Significant water savings will occur from the implementation of the Plumbing Codes in the Water Contractor's service area.
- Water savings from implementation of Program A, Program B, and Program C conservation programs would reduce water needs in 2040 by approximately 6.3%, 8.5% and 9.1% respectively when compared to 2040 potable water demand with the plumbing code.
- For Program A, B, and C measures, approximately 88% of the active conservation water savings potential in 2040 (or 42% of the water savings total if the plumbing code is included) 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.
- Water savings contributed by Program A measures alone are 384 acre-feet in 2040 (active program savings).
- Water savings contributed by the Program B measures alone are 524 acre-feet in 2040 (active program savings).
- Benefit-cost ratios of Program A, Program B, and Program C conservation alternatives are 2.9, 2.2, and 1.9 respectively, indicating that all program combinations are cost-effective from the utility standpoint.

**Table 6-1. Potable Water Use Projections (Acre-Feet/Year)***

| | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|
| Demand without Plumbing Code (AFY) | 5,415 | 5,675 | 5,887 | 6,111 | 6,372 | 6,644 |
| Demand with Plumbing Code (AFY) | 5,415 | 5,605 | 5,729 | 5,817 | 5,960 | 6,129 |
| Demand with Plumbing Code and Program A | 5,365 | 5,348 | 5,426 | 5,461 | 5,591 | 5,745 |
| Demand with Plumbing Code and Program B | 5,361 | 5,309 | 5,310 | 5,337 | 5,459 | 5,605 |
| Demand with Plumbing Code and Program C | 5,356 | 5,277 | 5,268 | 5,304 | 5,427 | 5,573 |

*Data is not weather normalized. Base year water demand is based on 2008, 2009, 2010, 2012, and 2013 years. 2014 was not used since it was a drought year. Total water use is potable only. Does not include recycled water use.

# APPENDIX A - ASSUMPTIONS FOR THE DSS MODEL

The following section presents the key assumptions used in the DSS 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 real water losses. This section presents DSS Model assumptions regarding plumbing code water savings, present value parameters, and active conservation measure costs and savings.

## A.1 Plumbing Codes and Legislation

The DSS Model incorporates the following three items as a "code" meaning that the savings are assumed to occur and are therefore "passive" savings.

1. National Plumbing Code
2. CALGreen
3. AB 715
4. AB 407

Each of the three items is described below. In the sections following the descriptions is information on how the DSS Model handles these items and what information is needed for input.

### 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 (since 2006). 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 manufactures to dramatically reduce the amount of water these efficient machines use. Generally, front loading washing machines use 30 to 50% less water than conventional models (which are still available). In a typical analysis the DSS Model forecasts a gradual transition to high efficiency clothes washers (using 12 gallons or less) so that by the year 2025 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 10 years, eventually all machines will be of this type. In 2012, the United States Environmental Protection Agency estimated the Energy Star clothes washer market share in the US in 2011 to be over 60%. Energy Star washing machines have a water factor (WF) of 6.0 or less. A WF of 6.0 is the equivalent of using 3.1 cubic feet or 23.2 gallons of water per load.

### State Building Code – CALGreen

The CALGreen requirements effect all new development in the State of California after January 1, 2011. The new development requirements under CALGreen are listed in the following figure. MWM added the CALGreen requirements that effect all new development in the State of California after January 1, 2011. MWM modeled water savings from the CALGreen building code by adding Multi-family and Commercial customer categories as appropriate to applicable conservation measures.

**Table A-1. CALGreen Building Code Summary Table**

| CALGreen Building Code | | | | | | |
|---|---|---|---|---|---|---|
| **Building Class** | **Component** | **Effective Date*** | **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 |

* Effective date is 7/1/2011 for toilets.

### New Development Ordinances – Water Contractor-Specific

The new development ordinances for each Water Contractor are listed in the following Table A-2 below.

**Table A-2. New Development Ordinances**

| New Development (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 | Marin Municipal Water District | City of Petaluma | CALGreen Requirement |
|---|---|---|---|---|---|---|---|---|---|---|
| Applicability (Customer Classes) | All | All | 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 | 2000 | Yes | No |
| ND2-Smart Irrigation Controller | 2005 | Yes | 2010 | 2010 | 2010 (SF>4 lots) & >2,500 sq ft/lot | No | 2010, SF>5,000 sq ft | 2011 | Yes | Yes |
| ND3- High Efficiency Toilets | 2005 | Yes | 2009 | 2011 | 2011 | No | No | 2011 | Yes | Yes |
| ND4-Dishwasher New Efficient | 2005 | No | 2009 | No | No | No | No | 2012 | Yes | No |
| ND5-Clothes Washing Machine Requirement | 2000 | No | 2009 | No | No | No | No | 2011 | Yes | No |
| ND6-Hot Water on Demand | No | No | No | No | No | No | No | No | No | No |
| ND7-High Efficiency Faucets and Showerheads | 2006 | Yes | 2009 | 2011 | 2011 | No | No | 2011 | Yes | Yes |
| ND8-Landscape and Irrigation Requirements | 2004 | 2010 (State ordinance) | 2010 | SF since 2007. All other since 1993 | 2010 for landscapes > 2,500 sq ft (applies | 2010 (adopted ordinance planned to | 2010 for All except SF<5,000 sq. ft. and | 1994 | Yes | Yes |

| New Development (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 | Marin Municipal Water District | City of Petaluma | CALGreen Requirement |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | to all but SF<5 lots) | be adopted September 1, 2010, budgets w/ 60% ET | turf<600 sq ft | | | |
| Urinals | 2008 | No | No | 2011 | 2011 | 2009 | No | 2011 | Yes | Yes |
| Source | NMWD Reg 15 | Measure is mandatory under CALGreen. City adopted CALGreen effective January 2011. | Use Build it Green Checklist (Mandatory) | Adopting CALGreen 2010 | Adopted WELO June 2010, CALGreen + Tier 1 January 2011 | Use Build it Green Checklist (Mandatory) | County ordinance effective Jan 1, 2010 | MMWD Title 13 Water Service Conditions | City ordinance 2009 | State Reqmt; May take effect 2012 |

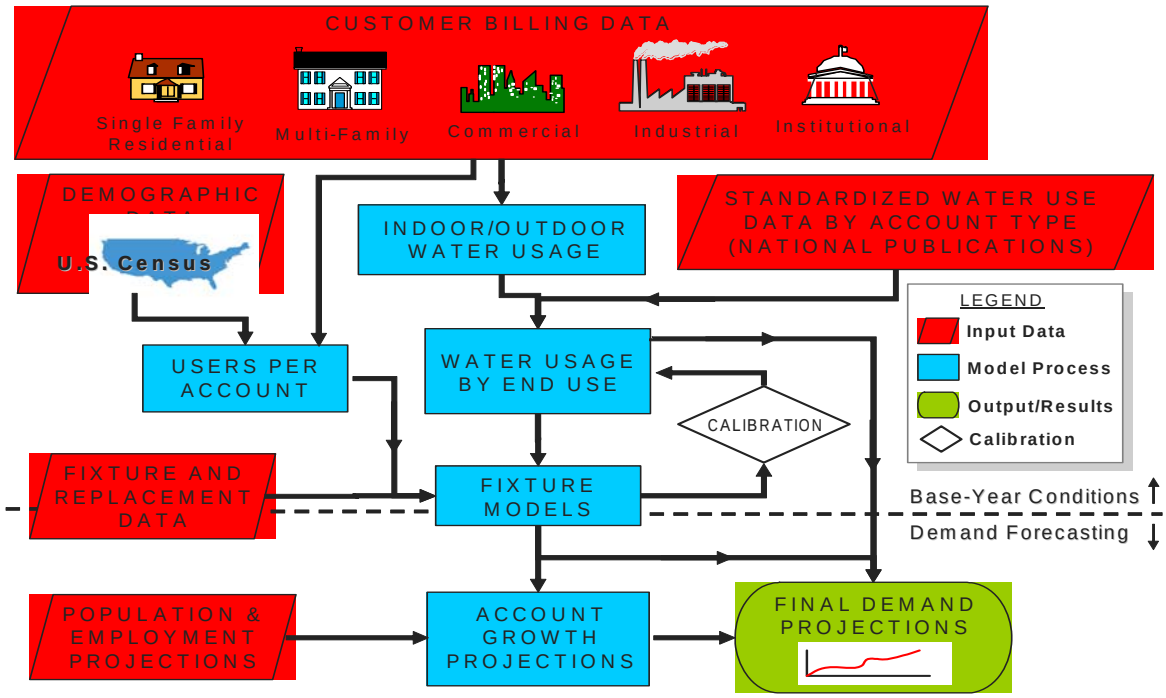
[1]City of Rohnert Park has extensive green building ordinance requiring developers to select from a set of green building measures including some of the listed measures.
[2]City of Cotati ND-3 confirmed to start in 2009 based on July 27, 2010 with City of Cotati at the request of Damien O'Bid. Build 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.

## State Plumbing Code – AB 715

The Plumbing Code includes the new CCR Title 20 California State Law (AB 715) requiring High Efficiency Toilets and High Efficiency Urinals be exclusively sold in the state by 2014.

The following figure conceptually describes how the National plumbing code, CALGreen and AB 715 are incorporated into the flow of information in the DSS Model.

**Figure A-1. DSS Model Overview Used to Make Potable Water Demand Projections**




## California State Law – SB 407

SB 407 (Plumbing Fixture Retrofit on Resale or Remodel): The DSS Model carefully takes into account the overlap with SB 407, the plumbing code (natural replacement), CALGreen, AB 715 and rebate programs (such as toilet rebates). SB 407 begins from the year 2017 in residential and 2019 in commercial properties. SB 407 program length is variable and continues until all the older high flush toilets have been replaced the service area. The number of accounts with high flow fixtures is tracked to make sure that the situation of replacing more high flow fixtures than actually exist does not occur.

## DSS Model Fixture Replacement

The DSS Model is capable of modeling multiple types of fixtures, including fixtures with slightly different design standards. For example currently toilets can be purchased that can flush at a rate of 0.8 gallons per flush, 1.0 gallon per flush or 1.28 gallons per flush. The 1.6 gpf and higher gallons per flush toilets still exist but no longer can be purchased in California and cannot therefore be used for a replacement or new installation. So the DSS Model utilizes a fixture replacement table to decide what type of fixture is installed when a fixture is replaced or a new fixture is installed. The replacement of the fixtures is listed as a percentage as shown in the following figure. For example, a value of 100% would represent that all the toilets sold would be of one particular flush volume. A value of 75% means that three out of every four toilets installed would be of that particular flush volume type. The DSS Model contains a pair of replacement tables for each fixture type and customer category combination. For example, the DSS Model will contain a

pair of replacement tables for Residential Single Family toilets, Residential Multi-family toilets, Commercial toilets, Residential clothes washing machines, Commercial washing machines, etc.

**Figure A-2. Example Toilet Replacement Percentages by Type of Toilet**

| Replacement Appliance Market Shares | | | | |
|---|---|---|---|---|
| Year | 1.28 gpf HET | 1.6 gpf ULFT | High Use Toilet | Total |
| 2012 | 75% | 25% | 0% | 100% |
| 2014 | 100% | 0% | 0% | 100% |
| 2020 | 100% | 0% | 0% | 100% |
| 2030 | 100% | 0% | 0% | 100% |
| 2050 | 100% | 0% | 0% | 100% |
| | | | | |
| **New Appliance Market Shares** | | | | |
| Year | 1.28 gpf HET | 1.6 gpf ULFT | High Use Toilet | Total |
| 2012 | 100% | 0% | 0% | 100% |
| 2014 | 100% | 0% | 0% | 100% |
| 2020 | 100% | 0% | 0% | 100% |
| 2030 | 100% | 0% | 0% | 100% |
| 2050 | 100% | 0% | 0% | 100% |

In the previous example, the DSS Model combines the effects of the following for the toilet fixture type:

- Federal Policy Act
  - Determines the "saturation" of 1.6 gpf toilets as it was in effect from 1992-2014 for toilet replacements.
- CALGreen
  - Determines that all "new appliance market share" toilets in "new" development will be 1.28 gpf
  - The year 2012 was selected as the beginning of the toilet portion of the code did not go into effect until July 1, 2011 and it also takes a while to get a permit, build the facility or residence, and have the toilets functioning with the building occupied, such that the savings would not actually occur until the year 2012 rather than the year 2011.
- AB 715
  - Determines that the "replacement appliance market" and "new appliance market" toilets will all be 1.28 gpf toilets or lower.

### DSS Model Initial Fixture Proportions

The DSS Model also needs a place to start when it comes to fixture replacement. It needs to know what the initial proportions (or percentages) of each type of fixture that are currently installed (also known as fixture saturation rate) in the modeled service area for each customer class.

Figure A-3 presents an example of the initial proportions determined for residential toilets in the year 2010. In the following **example** the model started in 2010, therefore it is assumed the initial proportions of the 1.28 gallon per flush type toilets is 0% as they were not readily available at that time. Then using the 2010 DP-04 census data, which shows the age of houses in the service area, it is calculated that 39.3% of the total current homes were built since 1992 when 1.6 gallon per flush toilets where required to be installed in new homes. Then an average natural replacement rate (rate of broken or remodeled toilet) of 2.5% per year for higher flush volume toilets is assumed. Then, in this example, a 3.96% replacement rate is calculated due to a rebate program that was raising the replacement rate of toilets. This gives the initial proportion of 1.6 gallon per flush (gpf) toilets to be 90.0%, and 1.28 gpf toilets 3.3%. In this case the initial proportion of high flush toilets is assumed to be the remainder of 6.7%. This figure shows an example of a toilet fixture model and how it incorporates the changes from each of these legislative items. There are similar fixture models for showers, clothes washers, and urinals. There is one fixture model for each of the following categories:

- Single family toilets
- Multi-family toilets

- Commercial toilets
- Commercial urinals
- Single family showers
- Multi-family showers
- Single Family clothes washers
- Multi-family clothes washers

**Figure A-3. Example Residential Toilet Initial Proportions from Fixture Analysis used for DSS Fixture Model**

| **Fixture Model:** | **Residential** | | ***Toilets*** | | | | | |
|---|---|---|---|---|---|---|---|---|
| Appliance Data | | | | | | Comments | Replacement Data | |
| Fixture Type | Volume per Use (Gallons)[1] | Proportion of Homes by Age[2] | Net Change due to Natural Replacement | Net Change due to Rebate Program[3] | Initial Proportions[4] | | Fixture Type | Percent Annual Replacement[5] |
| 1.28 gal/flush High Efficiency Toilets (HET) | 1.3 | 0.0% | 0.0% | 3.30% | 3.3% | 3.4% as these toilets were not very prelevant in the start year. | 1.28 gal/flush High Efficiency Toilets (HET) | 2.0% |
| 1.6 gal/flush Ultra Low Flow Toilets (ULFT) | 1.8 | 39.3% | 50.0% | 0.66% | 90.0% | 39.3% new homes since 1990 + 50% natural replacement +15% retrofit program | 1.6 gal/flush Ultra Low Flow Toilets (ULFT) | 2.0% |
| High Flush and 3.5 gal/flush | 4.0 | 60.7% | -50.00% | -3.96% | 6.7% | Remainder | High Flush and 3.5 gal/flush | 2.5% |
| | | | | | | | | |
| NOTES: | | | | | | | | |
| 1a. Volumes-per-use are based on average flush volumes for age of toilet. New toilets when out of adjustment flush at an average of 1.8 gpf instead of 1.6 gpf. | | | | | | | | |
| 1b. Initial proportions of fixtures installed in homes are based on the age of homes as provided in the 2010 Census. | | | | | | | | |
| 2. Assume homes constructed after 1992 installed ULFTs. | | | | | | | | |
| 3. Net change due to rebate program is based on historical active conservation activity. | | | | | | | | |
| 4. The initial proportions are fundamentally calculated by taking the initial proportions of homes by age (corresponding to efficiency levels) and adding the net change due to natural replacement and adding change due to rebate program minus the "free rider effect." No fixture % can exceed 90%. | | | | | | | | |
| 5a. Assume a 2.5% replacement rate for older toilets to the ULFTs over the 17 years since they where required. | | | | | | | | |
| 5b. Assume a future annual replacement rate of 2.0% for high efficiency fixtures, 2.0% for medium efficiency fixtures and 2.5% for low efficiency fixtures. 2.0% corresponds to a 50 year fixture life. 2.5% corresponds with a 40 year fixture life. | | | | | | | | |

These initial proportions determine in the fixture model and found in each Water Contractor's Water Use Data Analysis workbook, are then entered into the DSS Model for each fixture's "Codes and Standards" worksheet. A screenshot of the single family toilets codes and standards worksheet is shown in the following figure. Most DSS Models include fixture models for SF and MF toilets, showers, and clothes washers; and commercial toilets and urinals.

**Figure A-4. Example Residential Toilet Fixture Screenshot from DSS Model**

**Single Family Toilets**

Categories

| General | |
|---|---|
| Measure Category | Default Plumbing Code |
| Start Year | 2012 |
| Description | The DSS Model is capable of modeling multiple types of fixtures, including fixtures with slightly different design standards. For example currently toilets can be purchased that can flush at 1.28 gallons per flush or 1.6 gallons per flush. The higher flush toilets (3.5gpf) still exist but no longer can be purchased in California and cannot therefore be used for a replacement or new installation. The DSS Model utilizes a fixture replacement table to decide what type of toilet is installed when a fixture is replaced or a new fixture is installed. The replacement of the fixtures is listed as a percentage. For example, a value of 100% would represent that all the toilets sold would be of one particular flush volume. A value of 75% means that three out of every four toilets installed would be of that particular flush volume type.<br>The DSS Model combines the effects of the following for the toilet fixture type:<br>• Federal Policy Act: Determines the "saturation" of 1.6 gpf toilets as it was in effect from 1992-2014 for toilet replacements.<br>• Cal Green: Determines that all "new appliance market share" toilets in "new" development will be 1.28 gpf. The year 2012 was selected for the model input as the toilet portion of the code did not go into effect until July 1, 2011 and it also takes a while to get a permit, build the facility or residence, and have the toilets functioning with the building occupied, such that the savings would not actually occur until the year 2012 rather than the year 2011.<br>• AB 715: Determines that the "replacement appliance market" and "new appliance market" toilets will all be 1.28 gpf toilets.<br>An additional input to the DSS Model is the natural replacement rate of fixtures due to breakage, remodeling or other reason for replacement over time. To do this the DSS Model uses a percentage value for each fixture type that becomes the assumed natural replacement rate for that fixture. For example, a natural replacement rate of 2.5% is used for older toilets. This value can be modified by the user as shown on the previous worksheet. Each year the number of remaining accounts with old toilets is calculated as 0.975 times the prior year's value. |
| Comments | 1. Volumes-per-use are based on average flush volumes for age of toilet. New toilets when out of adjustment flush at an average of 1.8 gpf instead of 1.6 gpf.<br>2. Initial proportions of fixtures installed in homes are based on the age of homes as provided in the 2010 Census.<br>3. Assume homes constructed after 1992 installed ULFTs.<br>4. Net change due to rebate program is based on historical active conservation activity.<br>5. The initial proportions are fundamentally calculated by taking the initial proportions of homes by age (corresponding to efficiency levels) and adding the net change due to natural replacement and adding change due to rebate program minus the "free rider effect." No fixture % can exceed 90%.<br>6. Assume a 2.5% replacement rate for older toilets to the ULFTs over the 17 years since they where required.<br>7. Assume a future annual replacement rate of 2.0% for high efficiency fixtures, 2.0% for medium efficiency fixtures and 2.5% for low efficiency fixtures. 2.0% corresponds to a 50 year fixture life. 2.5% corresponds with a 40 year fixture life. |
| Customer Category | Single Family |
| End Use | Toilets |

| Effected Fixtures | |
|---|---|
| 1.28 gpf HET | ☑ |
| 1.6 gpf ULFT | ☑ |
| High Use Toilet | ☑ |

| Initial Fixture Proportions | |
|---|---|
| 1.28 gpf HET | 2.7% |
| 1.6 gpf ULFT | 90.0% |
| High Use Toilet | 7.3% |
| Total | 100.0% |

## DSS Model Fixture Replacement Rates

An additional input to the DSS Model is the natural replacement rate of fixtures due to breakage, remodeling or other reason for replacement over time. To do this the DSS Model uses an percentage value for each fixture type that becomes the assumed natural replacement rate for that fixture. For example, high flush toilets have a replacement rate value of 2.5%. Each year the number of remaining accounts with old toilets is calculated as 0.975 times the prior year's value. This value can be modified by the user for any fixture as shown in Figure A-5 below.

Also included in the following figure are example fixture efficiencies, which can be adjusted to any desired level based on service area characteristics. MWM can update data on efficiency levels found in the field and the 2011 California Single Family Water Use Efficiency Study (DeOreo) or other recent information related to fixture saturation rates.

**Figure A-5. Example Future Replacement Rates of Fixtures from DSS Model**

| Fixtures | | | | | |
|---|---|---|---|---|---|
| Fixture Name | End Use | Average Water Use | Units | Fixture Life (yrs) | Replacement Rate |
| 1.28 gpf HET | Toilets | 1.30 | gpf | 50 | 2.0% |
| 1.6 gpf ULFT | Toilets | 1.80 | gpf | 50 | 2.0% |
| High Use Toilet | Toilets | 3.50 | gpf | 40 | 2.5% |
| 1 gpf Urinal | Urinals | 1.00 | gpf | 50 | 2.0% |
| 0.5 gpf Urinal | Urinals | 0.50 | gpf | 50 | 2.0% |
| Waterless Urinal | Urinals | 0.00 | gpf | 50 | 2.0% |
| High Use Urinals | Urinals | 3.00 | gpf | 40 | 2.5% |
| Quart Urinals | Urinals | 0.25 | gpf | 50 | 2.0% |
| High Efficiency 2 gpm | Showers | 13.92 | gal per use | 25 | 4.0% |
| Low Flow 2.5 gpm | Showers | 18.27 | gal per use | 25 | 4.0% |
| High Flow > 3 gpm | Showers | 23.49 | gal per use | 25 | 4.0% |
| Efficient | Clothes Washers | 12.00 | gal per use | 10 | 10.0% |
| Medium Efficiency | Clothes Washers | 19.20 | gal per use | 10 | 10.0% |
| Top Loader | Clothes Washers | 34.20 | gal per use | 10 | 10.0% |

## DSS Model End Uses

Indoor and outdoor residential and non-residential end use breakdowns can be found in the “End Uses” section of each Water Contractor’s DSS Model on the “Breakdown” worksheet. As screenshot example of this worksheet is shown in Figure A-6. The source of these values is the California DWR Report "California Single Family Water Use Efficiency Study", 2011, AWWARF’s Report “Residential End Uses of Water” 2015 (pending), and Water Contractor supplied data on costs and savings. AWWARF’s 2000 "Commercial and Institutional End Uses of Water” is also used.

**Figure A-6. End Use Breakdown Example Screenshot**

**Breakdown**

**Indoor**

| End Use Name | SF | MF | COM | IND | INST | IRR | OTH |
|---|---|---|---|---|---|---|---|
| Toilets | 16.0% | 18.0% | 16.5% | 12.0% | 18.0% | | |
| Urinals | | | 4.0% | 3.0% | 5.0% | | |
| Faucets | 21.0% | 12.0% | 13.0% | 14.0% | 14.0% | | |
| Showers | 24.0% | 28.0% | 8.0% | 8.0% | 8.0% | | |
| Dishwashers | 2.0% | 5.0% | 6.0% | 6.0% | 6.0% | | |
| Clothes Washers | 13.0% | 16.5% | 15.0% | 15.0% | 15.0% | | |
| Process | | | 23.0% | 27.0% | | | |
| Kitchen Spray Rinse | | | 5.0% | 5.0% | 5.0% | | |
| Internal Leakage | 7.0% | 5.0% | 9.5% | 10.0% | 10.0% | | |
| Baths | 2.5% | 1.5% | | | | | |
| Other | 14.5% | 14.0% | 0.0% | 0.0% | 19.0% | | |
| Total | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 0.0% | 0.0% |

**Outdoor**

| End Use Name | SF | MF | COM | IND | INST | IRR | OTH |
|---|---|---|---|---|---|---|---|
| Irrigation | 80.0% | 83.0% | 95.0% | 95.0% | 95.0% | 95.0% | |
| Pools | 1.0% | 2.0% | | | | | |
| Wash Down | 7.0% | 4.0% | | | | | |
| Car Washing | 7.0% | 4.0% | | | | | |
| External Leakage | 5.0% | 7.0% | 5.0% | 5.0% | 5.0% | 5.0% | 5.0% |
| Outdoor | | | | | | | 95.0% |
| Total | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

End use breakdown values will differ slightly between Water Contractors due to differing demographics of their service area population. Residential frequency of use information for toilets, showers, and washers, and non-residential frequency of use of toilets and urinals is included in the "Codes and Standards" green section on the "Fixtures" worksheet of each Water Contractor's DSS Model, and then confirmed in each "Service Area Calibration End Use. Calculated frequencies of use in uses/user/day for customer end uses are presented in each customer category's "Service Area Calibration End Use" worksheet and compared to an industry-accepted use range based on AWWARF's residential, commercial and institutional end use reports mentioned previously. An example of this calibration sheet is shown in the screenshot in Figure A-7 below.

**Figure A-7. Single Family End Use Breakdown and Fixture Use Frequency Example Screenshot**

**Single Family**

| End Use | Use Percentage | Uses/User/Day | Lower | Upper | State | Fixture Model |
|---|---|---|---|---|---|---|
| Toilets | 16.0% | 4.76 | 4.5 | 5.6 | Calibrated | Edit |
| Faucets | 21.0% | | | | | |
| Showers | 24.0% | 0.73 | 0.6 | 0.9 | Calibrated | Edit |
| Dishwashers | 2.0% | | | | | |
| Clothes Washers | 13.0% | 0.32 | 0.3 | 0.42 | Calibrated | Edit |
| Internal Leakage | 7.0% | | | | | |
| Baths | 2.5% | | | | | |
| Other | 14.5% | | | | | |
| Total | 100.0% | | | | | |

## A.2 Present Value Parameters

Present value analysis using constant FY 2014 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 the multiple measures.

Economic analysis can be performed from several different perspectives, based on which party is affected. For planning water use efficiency programs for utilities, the perspectives most commonly used for benefit-cost analyses are the "utility" perspective and the "community" perspective. 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. 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 versus supplying increased quantities of water. Second, revenue shifts are treated as transfer payments, which means program participants will have lower water bills and non-participants will have slightly higher water bills so that the utility's revenue needs continue to be met. Therefore, the analysis is not complicated with uncertainties associated with long-term rate projections and retail rate design assumptions. It should be noted that there is a significant difference between the utility's savings from the avoided cost of procurement and delivery of water and the reduction in retail revenue that results from reduced water sales due to water use efficiency. This budget impact occurs slowly, and can be accounted for in water rate planning. Because it is the water provider's role in developing a water use efficiency plan that is vital in this study, the utility perspective was primarily used to evaluate elements of this report.

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 water use efficiency programs are considered, as well as the benefits received in terms of reduced energy bills (from water heating costs) and wastewater savings, among others. Water bill savings are not a customer benefit in the aggregate for reasons described above. Other factors external to the utility, such as environmental effects, are often difficult to quantify or are not necessarily under the control of the utility. They are therefore frequently excluded from economic analyses, including this one.

The time value of money is explicitly considered. Typically the costs to save water occur early in the planning period whereas the benefits usually extend to the end of the planning period. A long planning period of 30-40 years is typically used because costs and benefits that occur beyond 2050 years have very little influence on the total present value of the costs and benefits. The value of all future costs and benefits is discounted to the first year in the DSS Model (the base year, which in this case is 2015), at the real interest rate of 3.01%. 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%). The formula to calculate the real interest rate is: (nominal interest rate – assumed rate of inflation)/ (1 + assumed rate of inflation). Cash flows discounted in this manner are herein referred to as "Present Value" sums.

## A.3 Assumptions about Measure Costs

Costs were determined for each of the measures based on industry knowledge, past experience and data provided by the individual Water Contractors. 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. The model was run for 36 years (each year between FY 2014 and FY 2050). Costs were spread over the time period depending on the length of the implementation period for the measure and estimated voluntary customer participation levels.

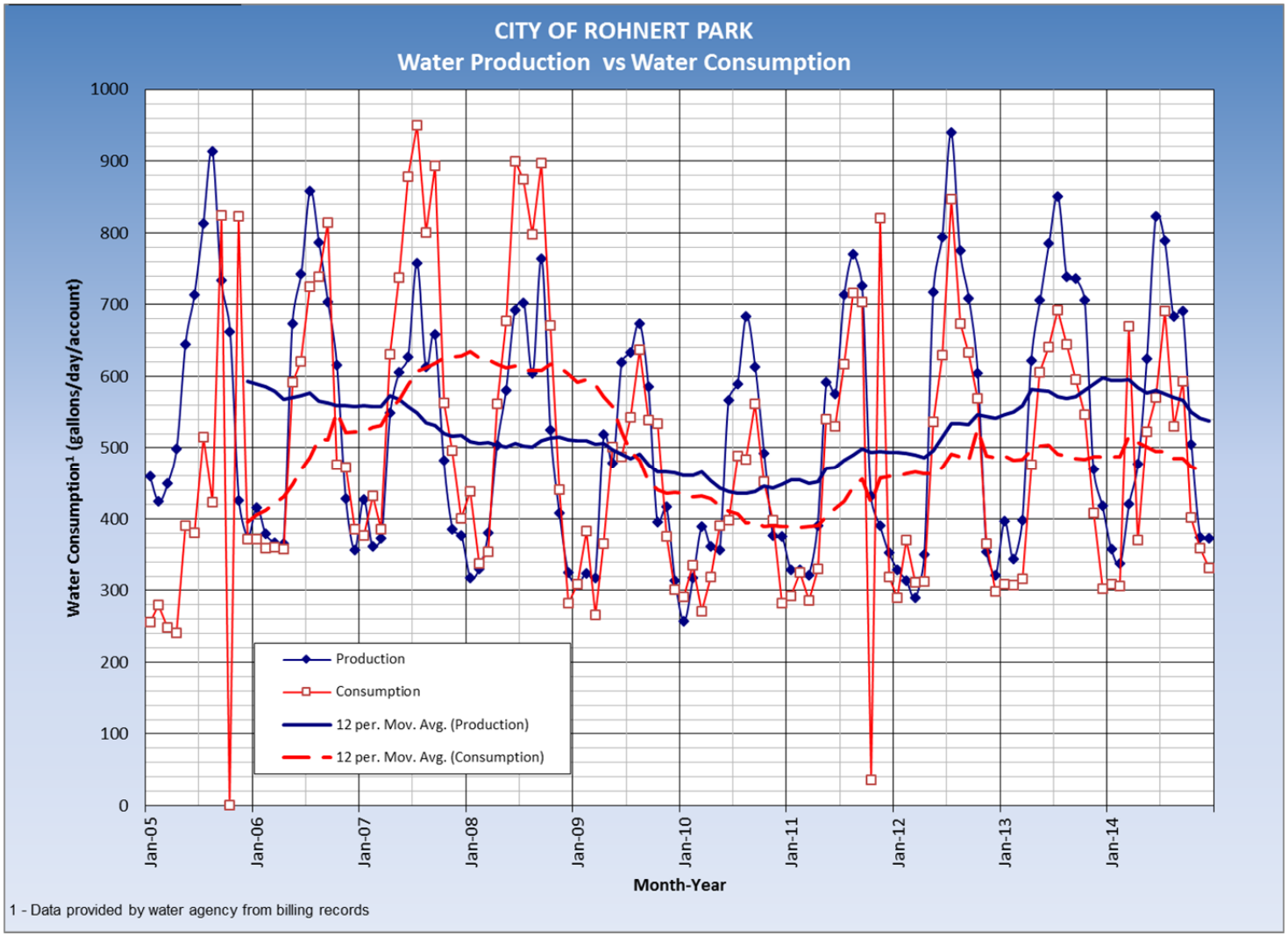
Lost revenue due to reduced water sales is not included as a cost because the water use efficiency measures evaluated herein generally take effect over a long span of time that is sufficient to enable timely rate adjustments, if necessary, to meet fixed cost obligations and savings on variable costs such as energy and chemicals.

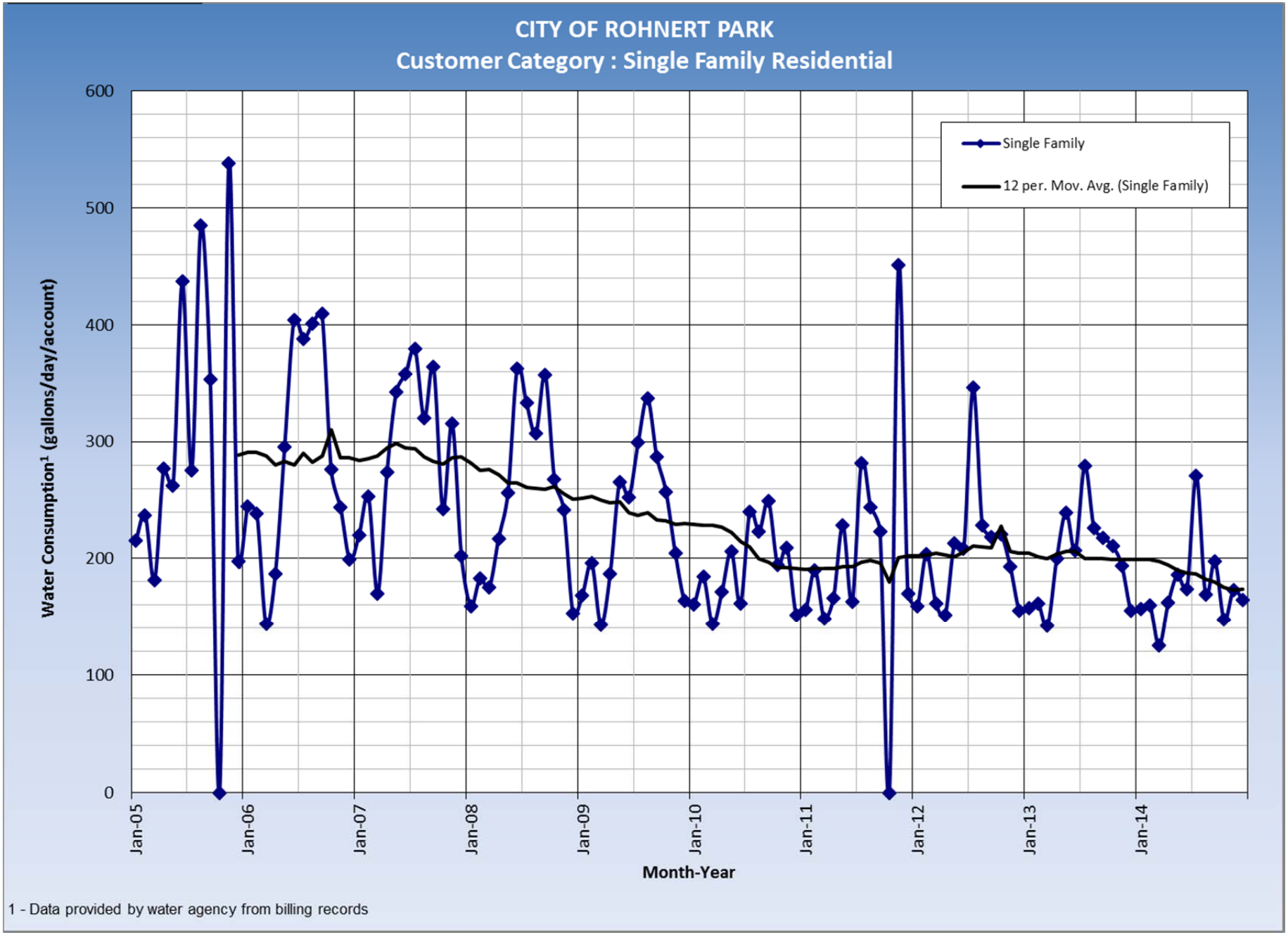
## A.4 Assumptions about Measure Savings

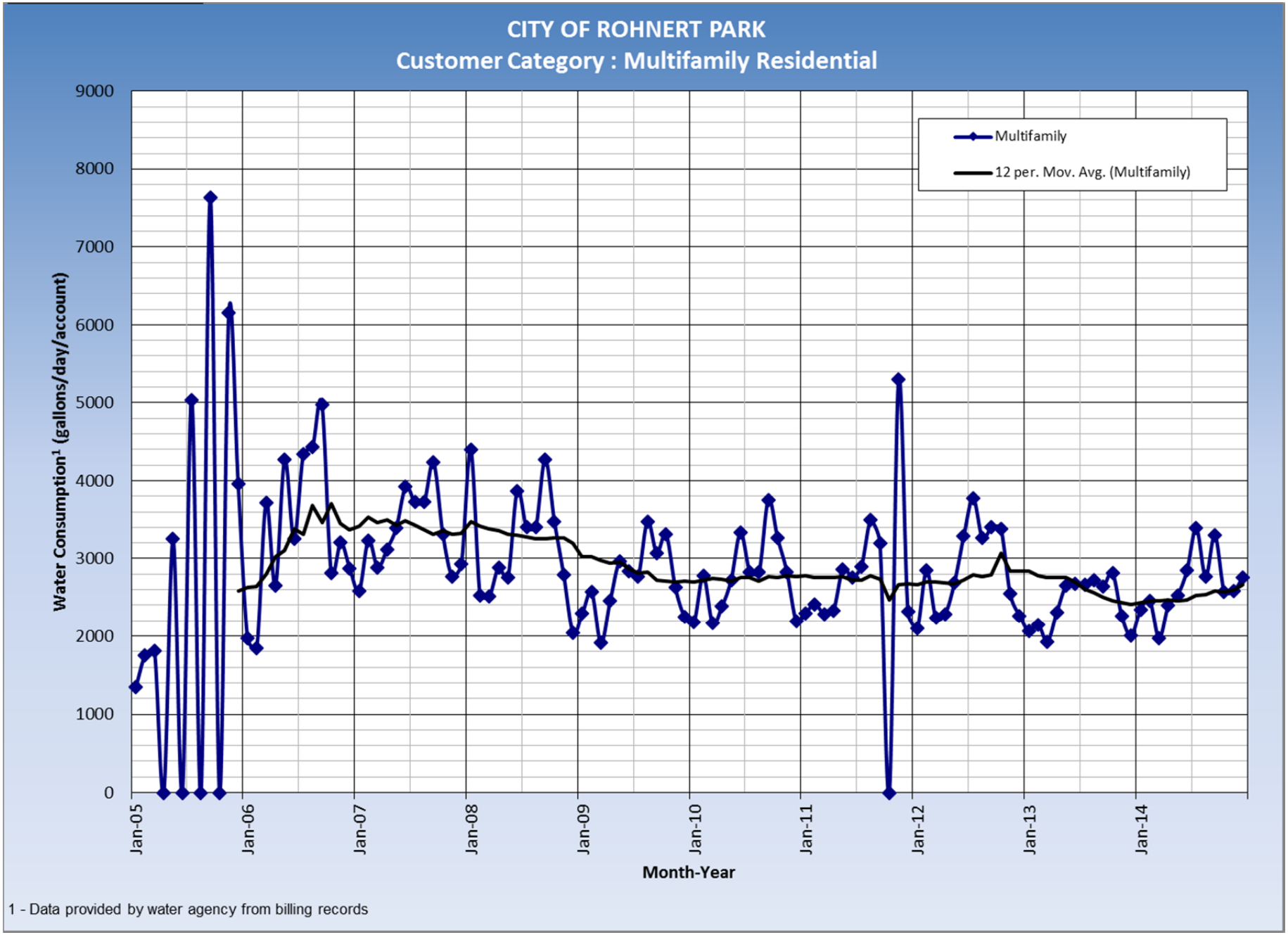
Data necessary to forecast water savings of measures include specific data on water use, demographics, market penetration, and unit water savings. Savings normally develop at a measured and predetermined pace, reaching full maturity after full market penetration is achieved. This may occur three to seven years after the start of implementation, depending upon the implementation schedule. For every water use efficiency activity or replacement with more efficient devices, there is a useful life. The useful life is called the "Measure Life" and is defined to be how long water use efficiency measures stay in place and continue to save water. It is assumed that measures implemented because of codes, standards or ordinances, like toilets for example, would be "permanent" and not revert to an old inefficient level of water use if the device needed to be replaced. However, some measures that are primarily behavioral based, such as residential surveys, are assumed to need to be repeated on an ongoing basis to retain the water savings (e.g., homeowners move away and new homeowners may have less efficient water using practices around the home). Surveys typically have a measure life on the order of five years.

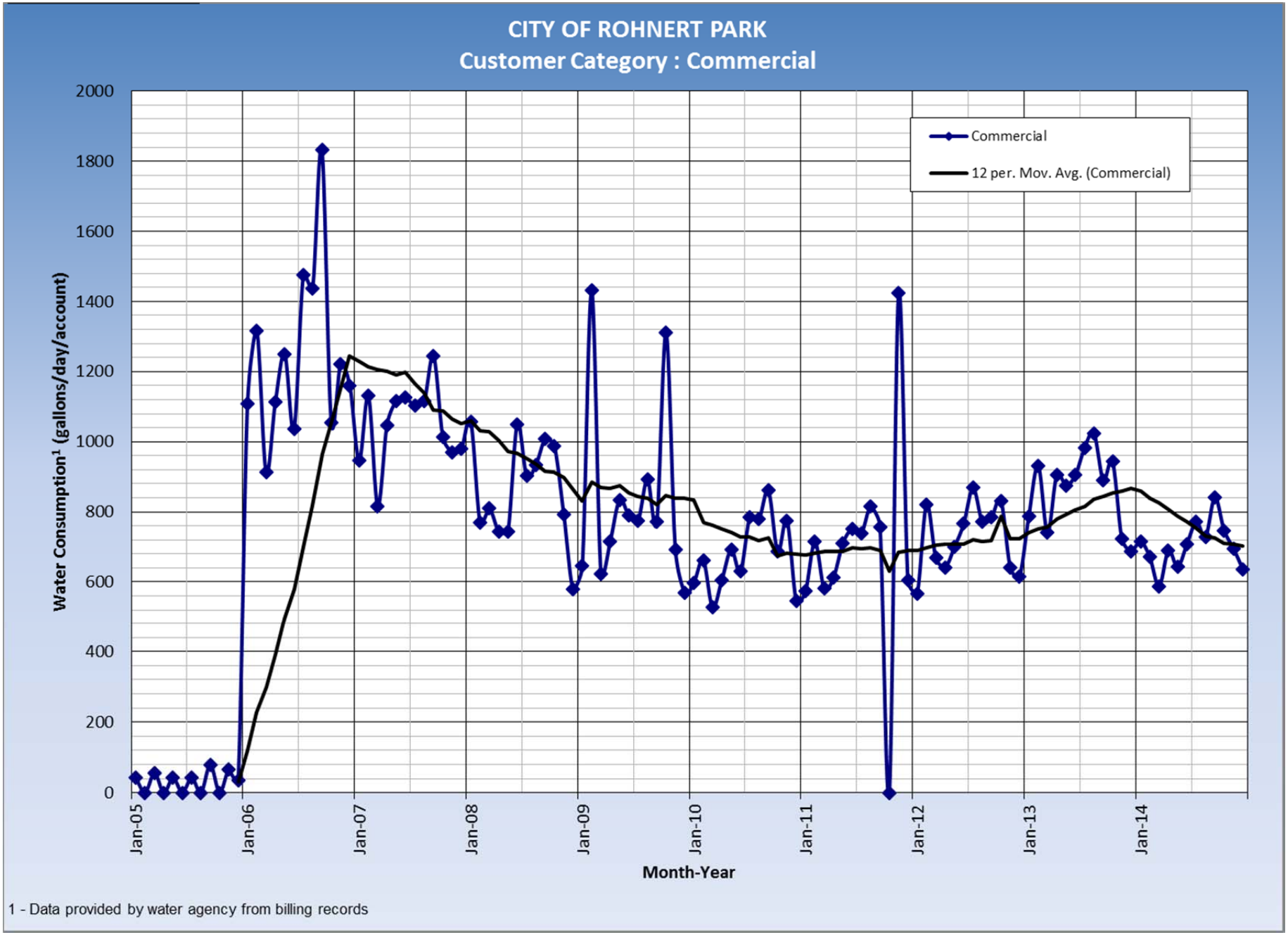
# APPENDIX B - WATER USE GRAPHS FOR PRODUCTION AND CUSTOMER CATEGORIES

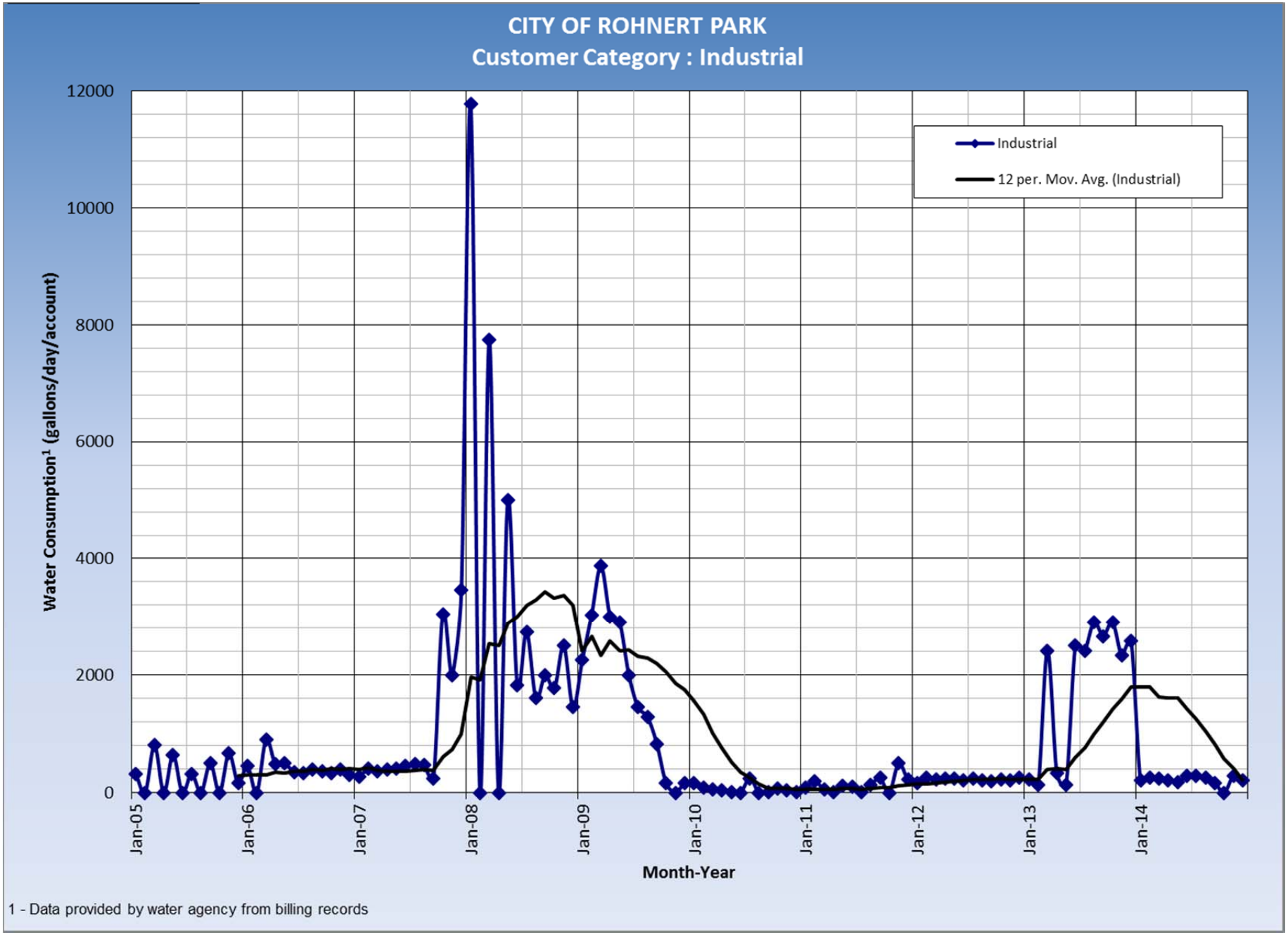
As initially presented in Section 3 of this report, this appendix presents historical customer category water use graphs. Units shown are average gallons of water per account per day. These graphs were reviewed to better identify outlier data points and years so that a representative baseline water use value (of average account water use by category) could be determined. The effects of drought, economic recessions, service line failures, and meter inaccuracies are typically evident in these figures.

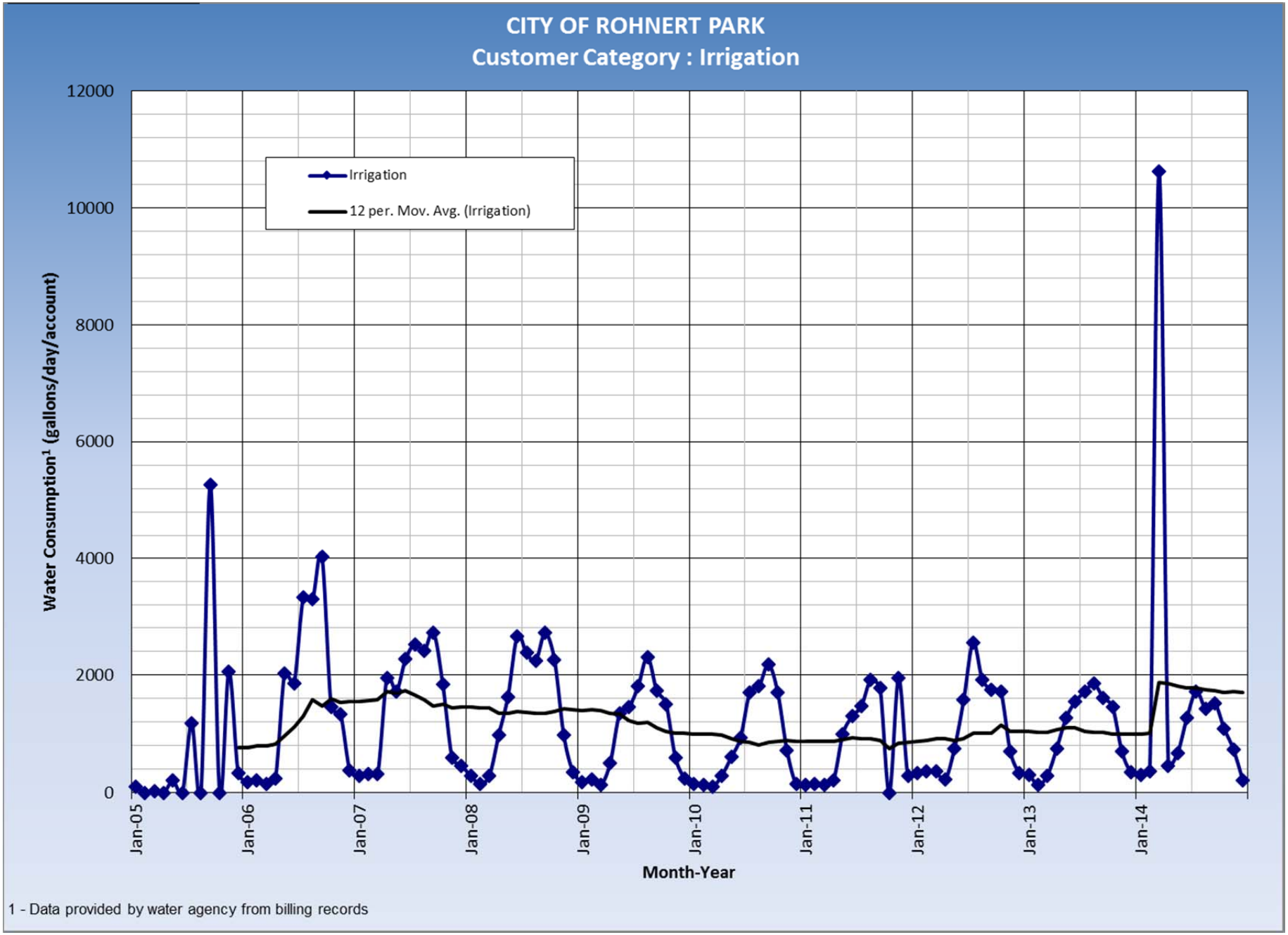



CITY OF ROHNERT PARK
Customer Category : Single Family Residential
Single Family
12 per. Mov. Avg. (Single Family)
Water Consumption[1] (gallons/day/account)
600
500
400
300
200
100
0
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Month-Year
1 - Data provided by water agency from billing records


CITY OF ROHNERT PARK
Customer Category : Multifamily Residential
Multifamily
12 per. Mov. Avg. (Multifamily)
Water Consumption[1] (gallons/day/account)
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Month-Year
1 - Data provided by water agency from billing records


CITY OF ROHNERT PARK
Customer Category : Commercial
Commercial
12 per. Mov. Avg. (Commercial)
Water Consumption[1] (gallons/day/account)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Month-Year
1 - Data provided by water agency from billing records


CITY OF ROHNERT PARK
Customer Category : Industrial
Industrial
12 per. Mov. Avg. (Industrial)
Water Consumption[1] (gallons/day/account)
12000
10000
8000
6000
4000
2000
0
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Month-Year
1 - Data provided by water agency from billing records


CITY OF ROHNERT PARK
Customer Category : Irrigation
Irrigation
12 per. Mov. Avg. (Irrigation)
Water Consumption[1] (gallons/day/account)
12000
10000
8000
6000
4000
2000
0
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Month-Year
1 - Data provided by water agency from billing records

# APPENDIX C - MEASURE SCREENING PROCESS AND RESULTS

In order to start the cost effectiveness analysis and build a water use efficiency model for each Water Contractor, the SMSWP Water Contractors decided on the list of conservation measures to be analyzed that, once modeled, would serve as the menu to build conservation program scenarios. To this end, two web-based webinars were conducted in February and March 2015 to review and select conservation measures together with staff representatives from each Water Contractor. The library of conservation measure opportunities had more than 50 measures and various implementation strategies (having different unit costs, participation levels and/or unit water savings which must be modeled individually). In order to maximize efficiency and productivity at the workshop, each Water Contractor developed two "top 10" lists of active conservation measures that they wanted to evaluate in order to eventually decide if their Water Contractor would include the measure in their DSS Model:

1. *Regional "Top 10" list* – a suite of measures each Water Contractor wanted to be analyzed for the SMSWP to implement.
2. *Water Contractor "Top 10" list* – a suite of measures that each Water Contractor representative selected for their own Water Contractor to possibly implement individually without SMSWP support.

Furthermore, to help facilitate input and combine results most easily, each Water Contractor completed an online survey to help identify their ideal "top 10" potential conservation measures for both the regional and Water Contractor programs. Water Contractors collaborated internally with others in their Water Contractor as necessary. The results of the survey were treated as the input from each Water Contractor's perspective.

Based on this initial Water Contractor input, subsequent workshop calls were structured to focus on a discussion of measures that received mixed interest from the group, rather than those measures that the group already had consensus on. This approach led to a decision on which measures should initially be included in the DSS Models. Additionally, each Water Contractor also had the ability to add unique measures for their individual DSS Model.

Once finalized, the selected measures on both the SMSWP-led and Water Contractor-led lists were inserted into each Water Contractor's DSS Model, along with the standard utility operations (e.g., water loss control programs) and education measures in order to have a complete standard menu of 25 measures in each Water Contractor's DSS Model. Next, the Project Team worked with each Water Contractor to more specifically analyze measures (participation rates, Water Contractor unit costs and unit water savings, etc.), and build conservation program scenarios. The number of measures, twenty-five, comes from the consultant's past experience on having enough measures to choose from to (a) build program scenarios that are able to meet SB X7-7 water use targets, and (b) still be feasible to be successfully implemented between SMSWP and Water Contractor combined efforts.

The following figures present the regional and Water Contractor measure rankings resulting from this screening process. Measures with the highest priority for being included in the cost effectiveness analysis were ranked with number 1 representing the most important. Note that selections for the top 1-5 measures likely "passed" the screening; measures showing ranking 5-10 received the most debate at the workshop.

**Figure C-1. Water Contractor-Only Measures Screening Ranking**

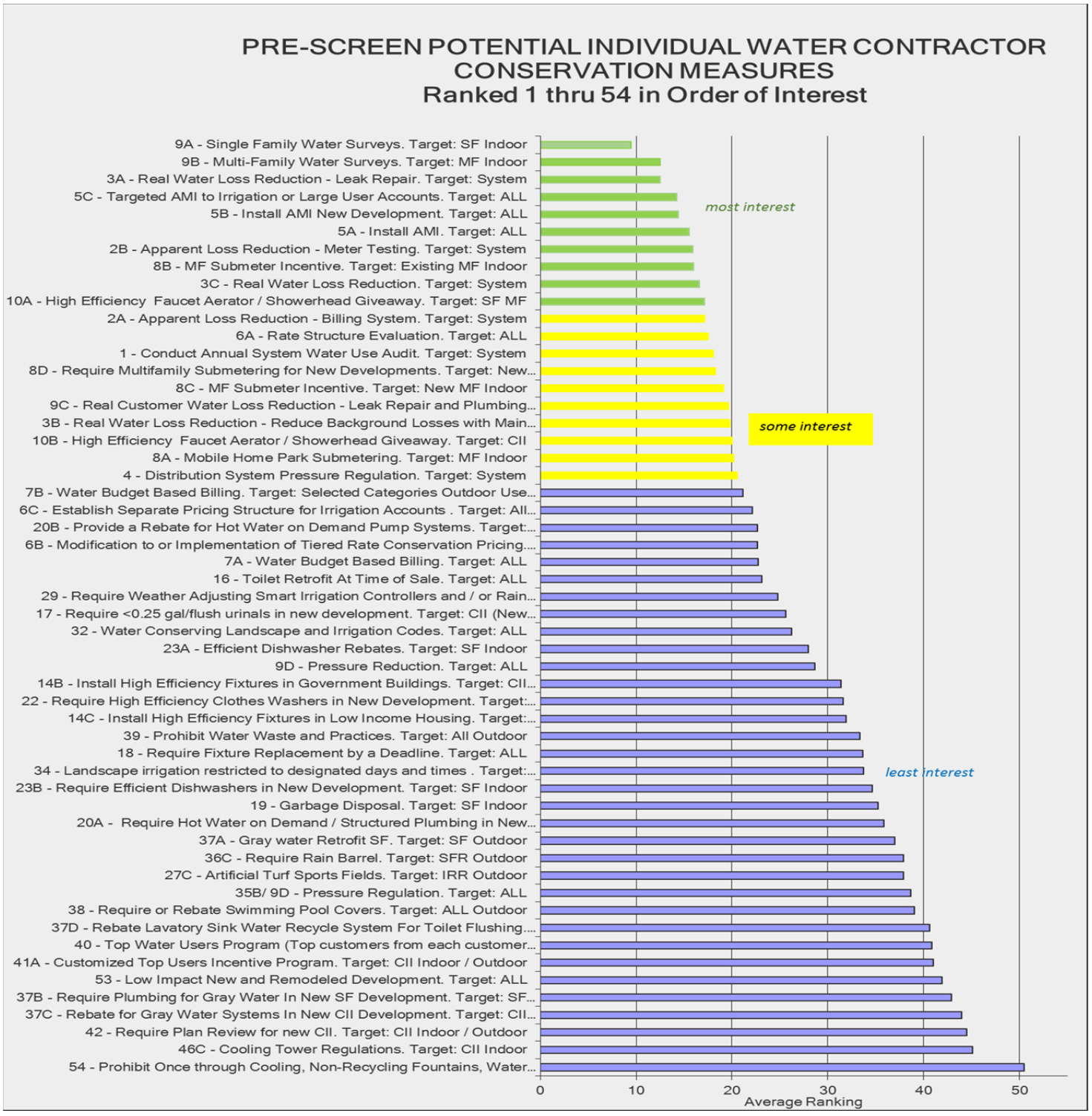
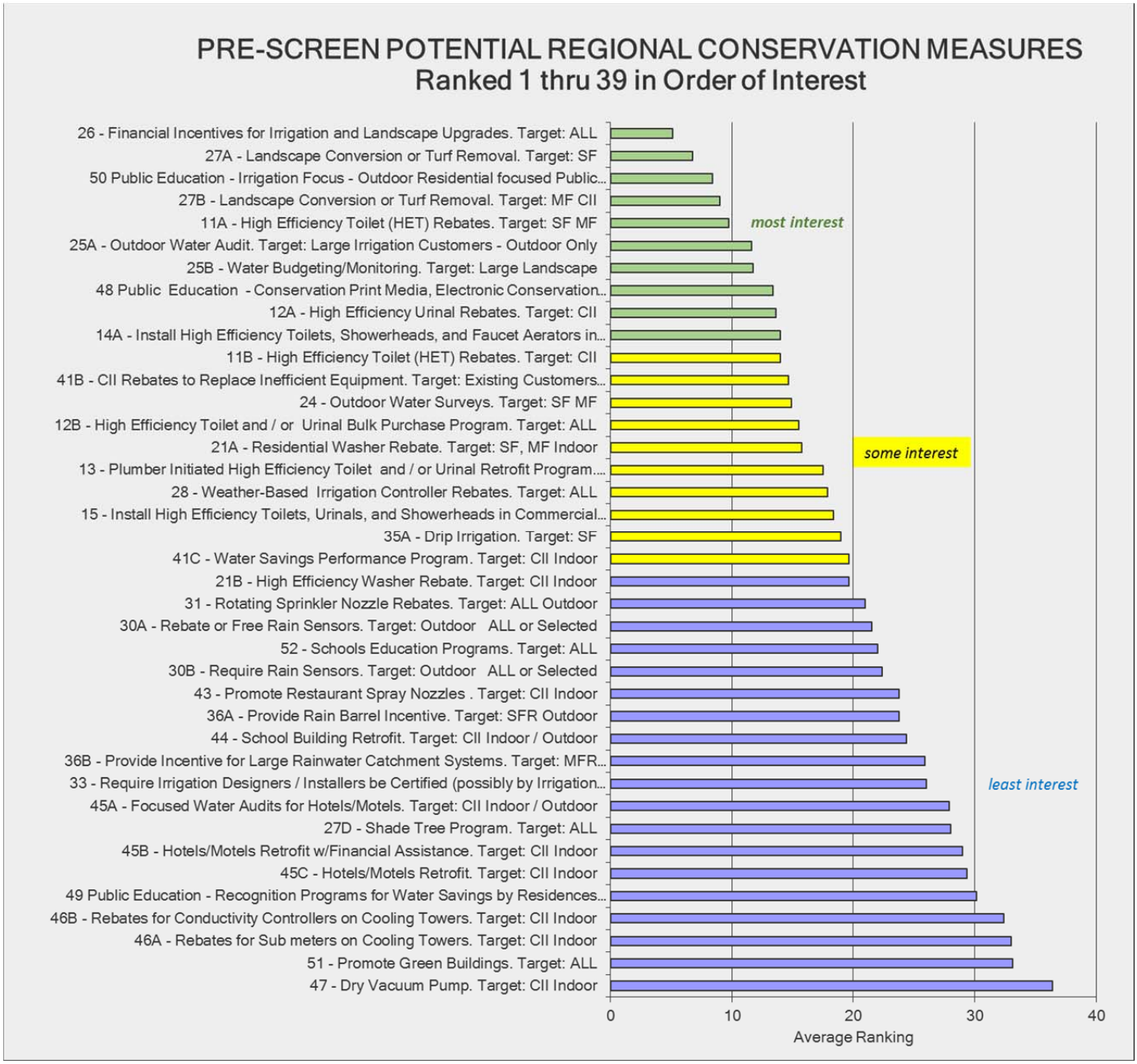


**Figure C-2. Regional Measures Screening Ranking**




The general discussion screening criteria included:

- **Technology/Market Maturity** – Refers to whether the technology needed to implement the water use efficiency measure, such as an irrigation control device, is commercially available and supported by the local service industry. A measure was more likely to be included if the technology was widely available in the service area and less likely to be included if the technology was not commercially available or not supported by the local service industry.
- **Service Area Match** – Refers to whether the measure or related technology is appropriate for the area's climate, building stock, and lifestyle. For example, promoting native and/or water efficient landscaping may not be appropriate where water use analysis indicates little outdoor irrigation. Thus, a measure was not included if it

was not well suited for the area's characteristics and could not save water; and was more highly considered to be included if it was well suited for the area and could save water.

- **Customer Acceptance/Equity** – Refers to whether retail customers within the service area would be willing to implement and accept the water use efficiency 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 considers retail customer equity where 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, and/or aesthetics.

Based on the survey results and previously listed criteria, MWM and Water Contractor staff decided if a measure was a "Yes" or "No". Measures with a "No" were eliminated from further consideration, while those with a "Yes" passed into the next evaluation phase: cost-effectiveness analysis using the DSS Model.

Below was the schedule of measure screening tasks:

- January 2015 - Survey Monkey survey #1 distributed
- February 2015 – Screening web-based workshop with Water Contractors and SMSWP and SCWA representatives
- February 2015 - Survey Monkey survey #2 distributed
- March 2015 – Screening web-based workshop call with Water Contractors and SMSWP and SCWA representatives
- March 2015 – Measure list finalized

# APPENDIX D - ASSUMPTIONS FOR WATER CONSERVATION MEASURES EVALUATED IN THE DSS MODEL

This appendix presents various parameter inputs as well as cost and savings results for the conservation measures evaluated in the Water Contractor's DSS Model. Annual utility costs, targets, and water savings were provided for each individual measure for the first 5 years to the year 2020. The actual DSS Model runs measures to the year 2040.

**Water Loss**

| Overview | |
|---|---|
| Name | Water Loss |
| Abbr | 1 |
| Category | |
| Measure Type | Water Loss Measure |

| Time Period | |
|---|---|
| First Year | 2015 |

| Backlog Costs | |
|---|---|
| Total Backlog Work Costs | $375,000 |
| Years to Complete Backlog | 5 |

| Maintenance Costs | |
|---|---|
| Annual Maintenance Costs | $50,000 |

| Target | |
|---|---|
| Total GPCD Reduction | 3.0 |

**Description**

CONTRACTOR MEASURE: Maintain a thorough annual accounting of water production, sales by customer class and quantity of water produced and billed consumption (to define non-revenue water). In conjunction with system accounting, include water system audits that identify and quantify known legitimate uses of non-revenue water in order to determine remaining potential for reducing real (physcial) water losses. Goal would be to lower the Infrastructure Leakage Index (ILI) and real water losses water every year by a pre-determined amount based on cost-effectiveness. These programs typically pay for themselves based on savings in operational costs (and saved rate revenue can be directed more to system repairs/replacement and other costs) and recovered revenue through addressing apparent losses. Specific goals and methods to be developed by Utility. May include accelerated main and service line replacement. Enhanced real loss reduction may include more ambitious main replacement and active leak detection. Capture water from water main flushing and hydrant flow testing for reuse.

| Results | |
|---|---|
| Average Water Savings (mgd) | |
| 0.140077 | |
| Lifetime Savings - Present Value ($) | |
| Utility | $3,785,674 |
| Community | $3,785,674 |
| Lifetime Costs - Present Value ($) | |
| Utility | $1,037,622 |
| Community | $1,037,622 |
| Benefit to Cost Ratio | |
| Utility | 3.65 |
| Community | 3.65 |
| Cost of Savings per Unit Volume ($/mg) | |
| Utility | $780 |

**Comments**

Savings is calculated over the life of the program which is tied to the Contractor's current Non Revenue Water percentage which can be found in the GREEN "Non Revenue Water" portion of the DSS Model. All programs are advised to have "Annual Maintenance Costs" inputted to allow for budget estimates for complete program. Additional water savings of "Non-Revenue Water" real water losses may be available when technically feasible. Typical target is minimum system losses based on percent of water system input volume down to approximately 6% (as defined as the difference between production and consumption or alternatively as a percent of System Input Volume using AWWA Water System Audit definitions). For NRW below 6% (which can be found in the GREEN "Non Revenue Water" portion of the DSS Model), input "0%" for new real water savings and "$0" in the Backlog Cost section. For NRW above 6%, a GPCD savings input volume can be computed (an estimate of annual savings volume divided by total population). For example a 4.0 GPCD is equivalent to a 2% reduction for the system with a 150 GPCD water use. Additional Water Loss Control Program budget to achieve these water savings is inputted into the "Backlog Cost" section along with the duration of the years to accomplish the estimated reduction. In other words, $250,000 over 5 years would add $50,000 per year to assist with meeting NRW reduction goals.

**Costs**

| | Utility |
|---|---|
| 2015 | $75,000 |
| 2016 | $75,000 |
| 2017 | $75,000 |
| 2018 | $75,000 |
| 2019 | $75,000 |
| 2020 | $50,000 |

**Targets**

| | Projected NRW Percent |
|---|---|
| 2015 | 19.0% |
| 2016 | 18.4% |
| 2017 | 17.9% |
| 2018 | 17.3% |
| 2019 | 16.7% |
| 2020 | 16.7% |

**Water Savings**

| | Total Savings |
|---|---|
| 2015 | 0.027279 |
| 2016 | 0.054982 |
| 2017 | 0.083109 |
| 2018 | 0.111660 |
| 2019 | 0.140636 |
| 2020 | 0.141696 |

AMI

| Overview | |
|---|---|
| Name | AMI |
| Abbr | 2 |
| Category | |
| Measure Type | Standard Measure |

| Time Period | |
|---|---|
| First Year | 2020 |
| Last Year | 2024 |
| Measure Length | 5 |

| Measure Life | |
|---|---|
| Permanent | ☑ |

| Fixture Costs | Utility | Customer | Fix/Acct |
|---|---|---|---|
| SF | $160.00 | $0.00 | 1 |
| MF | $160.00 | $0.00 | 2 |
| COM | $160.00 | $0.00 | 3 |
| IRR | $160.00 | $0.00 | 3 |

| Administration Costs | |
|---|---|
| Markup Percentage | 40% |

**Description**

CONTRACTOR MEASURE: Retrofit system with AMI meters and associated network capable of providing continuous consumption data to Utility offices. Improved identification of system and customer leaks is a major conservation benefit. Some costs of these systems are offset by operational efficiencies and reduced staffing, as regular meter reading and opening and closing accounts are accomplished without the need for a site visit. Also enables enhanced billing options and ability to monitor unauthorized usage, such as use/tampering with closed accounts or irrigation when time of day or days per week are regulated. Customer service is improved as staff can quickly access continuous usage records to address customer inquiries. Optional features include online customer access to their usage, which has been shown to improve accountability and reduce water use. A five-year change-out would be a reasonable objective and may take longer if coupled with a full meter replacment program (on the order of 10 years). Require that new, larger or irrigation customers install such AMI meters as described above and possibly purchase means of viewing daily consumption inside their home, business, or by their landscape/property managers, either through the Internet (if available) or separate device. The AMI system would, on demand, indicate to the customer and Utility where and how their water is used, facilitating water use reduction and prompt leak identification. This would require Utility to install an AMI system.

| Customer Classes | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| | ☑ | ☑ | ☑ | ☐ | ☑ |

| End Uses | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| Toilets | ☐ | ☐ | ☐ | | ☐ |
| Urinals | | | ☐ | | ☐ |
| Faucets | ☐ | ☐ | ☐ | | ☐ |
| Showers | ☐ | ☐ | ☐ | | ☐ |
| Dishwashers | ☐ | ☐ | ☐ | | ☐ |
| Clothes Washers | ☐ | ☐ | ☐ | | ☐ |
| Process | | | ☐ | | ☐ |
| Kitchen Spray Rinse | | | ☐ | | ☐ |
| Internal Leakage | ☑ | ☑ | ☑ | | ☑ |
| Baths | ☐ | ☐ | | | ☐ |
| Other | ☐ | ☐ | ☐ | | ☐ |
| Irrigation | ☑ | ☑ | ☑ | | ☑ |
| Pools | ☐ | ☐ | | | |
| Wash Down | ☐ | ☐ | | | |
| Car Washing | ☐ | ☐ | | | |
| External Leakage | ☑ | ☑ | ☑ | | ☑ |
| Outdoor | | | | | |
| Cooling | | | ☐ | | |

**Comments**

Basis for the starting value cost estimate is $160 per AMI unit (Data provided by Santa Rosa $90 per meter, $70 endpoint) where assumes (a) does not include any partial % cost share for the "Utility" of estimated AMI (automatic meter infrastructure) for meter replacement with other water utility departments responsible for the Capital Improvement Plan (CIP) such as engineering and/or operations; and (b) Cost estimate does not include service leak repair (assume included in Water Loss Control program). Program and Costs include provisions to act on "continuous flow" reading that indicate presence of a potential leak including contacting customer, plumber, referal, etc.

| Results | |
|---|---|
| Average Water Savings (mgd) | |
| 0.064993 | |
| Lifetime Savings - Present Value ($) | |
| Utility | $1,637,256 |
| Community | $1,637,256 |
| Lifetime Costs - Present Value ($) | |
| Utility | $1,080,947 |
| Community | $1,080,947 |
| Benefit to Cost Ratio | |
| Utility | 1.51 |
| Community | 1.51 |
| Cost of Savings per Unit Volume ($/mg) | |
| Utility | $1,751 |

| End Use Savings Per Replacement | % Savings per Account |
|---|---|
| SF Internal Leakage | 20.0% |
| SF Irrigation | 5.0% |
| SF External Leakage | 20.0% |
| MF Internal Leakage | 20.0% |
| MF Irrigation | 5.0% |
| MF External Leakage | 20.0% |
| COM Internal Leakage | 20.0% |
| COM Irrigation | 5.0% |
| COM External Leakage | 20.0% |
| IRR Internal Leakage | 20.0% |
| IRR Irrigation | 5.0% |
| IRR External Leakage | 20.0% |

| Targets | |
|---|---|
| Target Method | Percentage |
| % of Accts Targeted / yr | 10.000% |
| Only Effects New Accts | ☐ |

**Costs** — View: Summary

| | Utility | Customer | Total |
|---|---|---|---|
| 2015 | $0 | $0 | $0 |
| 2016 | $0 | $0 | $0 |
| 2017 | $0 | $0 | $0 |
| 2018 | $0 | $0 | $0 |
| 2019 | $0 | $0 | $0 |
| 2020 | $262,104 | $0 | $262,104 |

**Targets** — View: Accounts

| | SF | MF | COM | IRR | Total |
|---|---|---|---|---|---|
| 2015 | 0 | 0 | 0 | 0 | 0 |
| 2016 | 0 | 0 | 0 | 0 | 0 |
| 2017 | 0 | 0 | 0 | 0 | 0 |
| 2018 | 0 | 0 | 0 | 0 | 0 |
| 2019 | 0 | 0 | 0 | 0 | 0 |
| 2020 | 794 | 56 | 52 | 36 | 938 |

**Water Savings (mgd)**

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.000000 |
| 2016 | 0.000000 |
| 2017 | 0.000000 |
| 2018 | 0.000000 |
| 2019 | 0.000000 |
| 2020 | 0.017545 |

**Pricing**

| Overview | |
|---|---|
| Name | Pricing |
| Abbr | 3 |
| Category | |
| Measure Type | Pricing Measure |

| Customer Class | |
|---|---|
| Customer Class | Single Family |

| Time Period | |
|---|---|
| First Year | 2015 |

**Description**

CONTRACTOR MEASURE: Assumes average annual price increase of 5% for the next 25 years. Measure converts price increases to real price increases net of inflation; Annual increase must be above user set threshold (such as assuming a 2% inflation) to trigger a demand reduction.

**Comments**

A conservative industry estimate for 5-year rate studies and price elasticities are assumed.
The pricing measure only addresses SF customers.

**Planned Rate Increases**

Add Rate Increase

| Change Year | Price Incr (%) | Price Incr Adjusting for Inflation | |
|---|---|---|---|
| 2015 | 5.0% | 3.0% | Delete |
| 2016 | 5.0% | 3.0% | Delete |
| 2017 | 5.0% | 3.0% | Delete |
| 2018 | 5.0% | 3.0% | Delete |
| 2019 | 5.0% | 3.0% | Delete |
| 2020 | 5.0% | 3.0% | Delete |
| 2021 | 5.0% | 3.0% | Delete |
| 2022 | 5.0% | 3.0% | Delete |
| 2023 | 5.0% | 3.0% | Delete |
| 2024 | 5.0% | 3.0% | Delete |
| 2025 | 5.0% | 3.0% | Delete |
| 2026 | 5.0% | 3.0% | Delete |
| 2027 | 5.0% | 3.0% | Delete |
| 2028 | 5.0% | 3.0% | Delete |
| 2029 | 5.0% | 3.0% | Delete |
| 2030 | 5.0% | 3.0% | Delete |

**Results**

| Average Water Savings (mgd) | |
|---|---|
| 0.084999 | |
| **Lifetime Savings - Present Value ($)** | |
| Utility | $192,235 |
| Community | $192,235 |
| **Lifetime Costs - Present Value ($)** | |
| Utility | $319,813 |
| Community | $319,813 |
| **Benefit to Cost Ratio** | |
| Utility | 0.60 |
| Community | 0.60 |
| **Cost of Savings per Unit Volume ($/mg)** | |
| Utility | $396 |

**Price Elasticity**

| Overall | Indoor | Outdoor |
|---|---|---|
| -0.12 | -0.05 | -0.26 |

**Utility Costs**

| | |
|---|---|
| Rate Study Cost | $50,000 |
| Rate Study Frequency (every # yrs) | 5 |
| First Year of Rate Study | 2021 |
| Annual Maintenance Cost | $10,000 |

**Consumer Price Index**

| | |
|---|---|
| First Year Index | 100.0 |
| Annual Increase | 2% |

**Costs**

| | Utility | Customer | Total (Community) |
|---|---|---|---|
| 2015 | $10,000 | $0 | $10,000 |
| 2016 | $10,000 | $0 | $10,000 |
| 2017 | $10,000 | $0 | $10,000 |
| 2018 | $10,000 | $0 | $10,000 |
| 2019 | $10,000 | $0 | $10,000 |
| 2020 | $10,000 | $0 | $10,000 |

**Projected Price Index**

| | Price Index | Cummulative Index Increase |
|---|---|---|
| 2015 | 100.0 | 0% |
| 2016 | 102.0 | 2% |
| 2017 | 104.0 | 4% |
| 2018 | 106.1 | 6% |
| 2019 | 108.2 | 8% |
| 2020 | 110.4 | 10% |

**Water Savings**

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.007196 |
| 2016 | 0.014443 |
| 2017 | 0.021742 |
| 2018 | 0.029090 |
| 2019 | 0.036489 |
| 2020 | 0.043936 |

**Public Info & School Education - SMWSP**

| Overview | |
|---|---|
| Name | Public Info & School Education - S |
| Abbr | 4 |
| Category | |
| Measure Type | Standard Measure |

| Time Period | |
|---|---|
| First Year | 2015 |
| Last Year | 2040 |
| Measure Length | 26 |

| Measure Life | |
|---|---|
| Permanent | ☐ |
| Years | 2 |
| Repeat | ☐ |

| Fixture Costs | Utility | Customer | Fix/Acct |
|---|---|---|---|
| SF | $3.00 | $0.00 | 1 |

| Administration Costs | |
|---|---|
| Markup Percentage | 15% |

**Description**

REGIONAL MEASURE: Continue with regional public information and school education campaign. School education includes: school assembly program, classroom presentations, other options for school education.

| Customer Classes | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| | ☑ | ☐ | ☐ | ☐ | ☐ |

| End Uses | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| Toilets | ☑ | | | | |
| Urinals | | | | | |
| Faucets | ☑ | | | | |
| Showers | ☑ | | | | |
| Dishwashers | ☑ | | | | |
| Clothes Washers | ☑ | | | | |
| Process | | | | | |
| Kitchen Spray Rinse | | | | | |
| Internal Leakage | ☑ | | | | |
| Baths | ☑ | | | | |
| Other | ☐ | | | | |
| Irrigation | ☑ | | | | |
| Pools | ☑ | | | | |
| Wash Down | ☑ | | | | |
| Car Washing | ☑ | | | | |
| External Leakage | ☑ | | | | |
| Outdoor | | | | | |
| Cooling | | | | | |

**Comments**

Cost assumes SF category but impacts all customer classes. SMWSP public info budget of $160,000 annually for all water contractors is spent on QWEL, Water Wise Gardening Online, Garden Sense, and the Eco-Friendly Garden Tour. Based on 153,770 single family accounts for water contractors in 2014, the expenditures per SF account is approximately $1.00. SMWSP school education is $300,000 per year for all the water contractors which equates to $2.00 per account. The education annual budget is for 20,000 students and 24,000 ciriculum materials distributed. In summary, the total cost of $3.00 per SF account includes $1.00 for public information and $2.00 per SF account for school education.

| Results | |
|---|---|
| Average Water Savings (mgd) | |
| 0.009960 | |
| Lifetime Savings - Present Value ($) | |
| Utility | $276,479 |
| Community | $458,917 |
| Lifetime Costs - Present Value ($) | |
| Utility | $264,484 |
| Community | $264,484 |
| Benefit to Cost Ratio | |
| Utility | 1.05 |
| Community | 1.74 |
| Cost of Savings per Unit Volume ($/mg) | |
| Utility | $2,796 |

| End Use Savings Per Replacement | % Savings per Account |
|---|---|
| SF Toilets | 0.5% |
| SF Faucets | 0.5% |
| SF Showers | 0.5% |
| SF Dishwashers | 0.5% |
| SF Clothes Washers | 0.5% |
| SF Baths | 0.5% |
| SF Internal Leakage | 0.5% |
| SF Irrigation | 0.5% |
| SF Pools | 0.5% |
| SF Wash Down | 0.5% |
| SF Car Washing | 0.5% |
| SF External Leakage | 0.5% |

| Targets | |
|---|---|
| Target Method | Percentage |
| % of Accts Targeted / yr | 50.000% |
| Only Effects New Accts | ☐ |

**Costs** — View: Summary

| | Utility | Customer | Total |
|---|---|---|---|
| 2015 | $13,191 | $0 | $13,191 |
| 2016 | $13,294 | $0 | $13,294 |
| 2017 | $13,396 | $0 | $13,396 |
| 2018 | $13,499 | $0 | $13,499 |
| 2019 | $13,601 | $0 | $13,601 |
| 2020 | $13,704 | $0 | $13,704 |

**Targets** — View: Accounts

| | SF | Total |
|---|---|---|
| 2015 | 3,824 | 3,824 |
| 2016 | 3,853 | 3,853 |
| 2017 | 3,883 | 3,883 |
| 2018 | 3,913 | 3,913 |
| 2019 | 3,942 | 3,942 |
| 2020 | 3,972 | 3,972 |

**Water Savings (mgd)**

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.004757 |
| 2016 | 0.009532 |
| 2017 | 0.009586 |
| 2018 | 0.009641 |
| 2019 | 0.009697 |
| 2020 | 0.009752 |

**Public Info & School Education - Water Contractor**

| Overview | |
|---|---|
| Name | Public Info & School Education - V |
| Abbr | 5 |
| Category | |
| Measure Type | Standard Measure |

| Time Period | |
|---|---|
| First Year | 2015 |
| Last Year | 2040 |
| Measure Length | 26 |

| Measure Life | |
|---|---|
| Permanent | ☐ |
| Years | 2 |
| Repeat | ☐ |

| Fixture Costs | Utility | Customer | Fix/Acct |
|---|---|---|---|
| SF | $3.00 | $0.00 | 1 |

| Administration Costs | |
|---|---|
| Markup Percentage | 15% |

**Description**

CONTRACTOR MEASURE: Public information dissemination and school education initiatives beyond those conducted by SMWSP.

| Customer Classes | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| | ☑ | ☐ | ☐ | ☐ | ☐ |

| End Uses | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| Toilets | ☑ | | | | |
| Urinals | | | | | |
| Faucets | ☑ | | | | |
| Showers | ☑ | | | | |
| Dishwashers | ☑ | | | | |
| Clothes Washers | ☑ | | | | |
| Process | | | | | |
| Kitchen Spray Rinse | | | | | |
| Internal Leakage | ☑ | | | | |
| Baths | ☑ | | | | |
| Other | ☐ | | | | |
| Irrigation | ☑ | | | | |
| Pools | ☑ | | | | |
| Wash Down | ☑ | | | | |
| Car Washing | ☑ | | | | |
| External Leakage | ☑ | | | | |
| Outdoor | | | | | |
| Cooling | | | | | |

**Comments**

Cost assumes SF category but impacts all customer classes. Public info budget of $2 per SF account is assumed.

School education Assumes Average cost per student is $1 per SF account.

| Results | |
|---|---|
| Average Water Savings (mgd) | |
| 0.004980 | |
| Lifetime Savings - Present Value ($) | |
| Utility | $138,240 |
| Community | $229,458 |
| Lifetime Costs - Present Value ($) | |
| Utility | $132,242 |
| Community | $132,242 |
| Benefit to Cost Ratio | |
| Utility | 1.05 |
| Community | 1.74 |
| Cost of Savings per Unit Volume ($/mg) | |
| Utility | $2,796 |

| End Use Savings Per Replacement | % Savings per Account |
|---|---|
| SF Toilets | 0.5% |
| SF Faucets | 0.5% |
| SF Showers | 0.5% |
| SF Dishwashers | 0.5% |
| SF Clothes Washers | 0.5% |
| SF Baths | 0.5% |
| SF Internal Leakage | 0.5% |
| SF Irrigation | 0.5% |
| SF Pools | 0.5% |
| SF Wash Down | 0.5% |
| SF Car Washing | 0.5% |
| SF External Leakage | 0.5% |

| Targets | |
|---|---|
| Target Method | Percentage |
| % of Accts Targeted / yr | 25.000% |
| Only Effects New Accts | ☐ |

**Costs** — View: Summary

| | Utility | Customer | Total |
|---|---|---|---|
| 2015 | $6,596 | $0 | $6,596 |
| 2016 | $6,647 | $0 | $6,647 |
| 2017 | $6,698 | $0 | $6,698 |
| 2018 | $6,749 | $0 | $6,749 |
| 2019 | $6,801 | $0 | $6,801 |
| 2020 | $6,852 | $0 | $6,852 |

**Targets** — View: Accounts

| | SF | Total |
|---|---|---|
| 2015 | 1,912 | 1,912 |
| 2016 | 1,927 | 1,927 |
| 2017 | 1,941 | 1,941 |
| 2018 | 1,956 | 1,956 |
| 2019 | 1,971 | 1,971 |
| 2020 | 1,986 | 1,986 |

**Water Savings (mgd)**

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.002379 |
| 2016 | 0.004766 |
| 2017 | 0.004793 |
| 2018 | 0.004821 |
| 2019 | 0.004848 |
| 2020 | 0.004876 |

**Prohibit Water Waste**

| Overview | |
|---|---|
| Name | Prohibit Water Waste |
| Abbr | 6 |
| Category | |
| Measure Type | Standard Measure |

| Time Period | |
|---|---|
| First Year | 2016 |
| Last Year | 2040 |
| Measure Length | 25 |

| Measure Life | |
|---|---|
| Permanent | ☐ |
| Years | 5 |
| Repeat | ☐ |

| Fixture Costs | Utility | Customer | Fix/Acct |
|---|---|---|---|
| SF | $50.00 | $50.00 | 1 |
| MF | $100.00 | $100.00 | 1 |
| COM | $100.00 | $100.00 | 1 |
| INDINST | $100.00 | $100.00 | 1 |
| IRR | $100.00 | $100.00 | 1 |

| Administration Costs | |
|---|---|
| Markup Percentage | 50% |

**Description**

CONTRACTOR OR REGIONAL MEASURE: Adopt or modify ordinance that prohibits the waste of water defined as gutter flooding, restrictions on watering days and failure to repair leaks in a timely manner.

| Customer Classes | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| | ☑ | ☑ | ☑ | ☑ | ☑ |

| End Uses | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| Toilets | ☐ | ☐ | ☐ | ☐ | ☐ |
| Urinals | | | ☐ | ☐ | ☐ |
| Faucets | ☐ | ☐ | ☐ | ☐ | ☐ |
| Showers | ☐ | ☐ | ☐ | ☐ | ☐ |
| Dishwashers | ☐ | ☐ | ☐ | ☐ | ☐ |
| Clothes Washers | ☐ | ☐ | ☐ | ☐ | ☐ |
| Process | | | ☐ | ☐ | ☐ |
| Kitchen Spray Rinse | | | ☐ | ☐ | ☐ |
| Internal Leakage | ☑ | ☑ | ☑ | ☑ | ☑ |
| Baths | ☐ | ☐ | | | ☐ |
| Other | ☐ | ☐ | ☐ | ☐ | ☐ |
| Irrigation | ☑ | ☑ | ☑ | ☑ | ☑ |
| Pools | ☐ | ☐ | | ☐ | |
| Wash Down | ☐ | ☐ | | | |
| Car Washing | ☐ | ☐ | | | |
| External Leakage | ☑ | ☑ | ☑ | ☑ | ☑ |
| Outdoor | | | | | |
| Cooling | | | ☐ | ☐ | |

**Comments**

Utility costs based on 1 hour of staff time for residential contact and 2 hours for MF and CII enforcement. Assume $50 customer cost to fix irrigation water waste/leak - most visible water waste is irrigation. Savings assumes 6% of accounts have a leak of 33 gallons per day. Assumed 1% water savings per account to be conservative. Adminisration cost is to cover staff to help find and investiage the water waste calls / leaks.

| Results | |
|---|---|
| Average Water Savings (mgd) | |
| 0.000937 | |
| Lifetime Savings - Present Value ($) | |
| Utility | $24,943 |
| Community | $24,943 |
| Lifetime Costs - Present Value ($) | |
| Utility | $148,485 |
| Community | $247,476 |
| Benefit to Cost Ratio | |
| Utility | 0.17 |
| Community | 0.10 |
| Cost of Savings per Unit Volume ($/mg) | |
| Utility | $16,687 |

| End Use Savings Per Replacement | % Savings per Account |
|---|---|
| SF Internal Leakage | 1.0% |
| SF Irrigation | 1.0% |
| SF External Leakage | 1.0% |
| MF Internal Leakage | 1.0% |
| MF Irrigation | 1.0% |
| MF External Leakage | 1.0% |
| COM Internal Leakage | 1.0% |
| COM Irrigation | 1.0% |
| COM External Leakage | 1.0% |
| NDINST Internal Leakag | 1.0% |
| INDINST Irrigation | 1.0% |
| NDINST External Leakag | 1.0% |
| IRR Internal Leakage | 1.0% |
| IRR Irrigation | 1.0% |
| IRR External Leakage | 1.0% |

| Targets | |
|---|---|
| Target Method | Percentage |
| % of Accts Targeted / yr | 1.000% |
| Only Effects New Accts | ☐ |

**Costs** — View: Summary

| | Utility | Customer | Total |
|---|---|---|---|
| 2015 | $0 | $0 | $0 |
| 2016 | $7,828 | $5,219 | $13,047 |
| 2017 | $7,900 | $5,267 | $13,167 |
| 2018 | $7,973 | $5,315 | $13,288 |
| 2019 | $8,045 | $5,363 | $13,409 |
| 2020 | $8,118 | $5,412 | $13,529 |

**Targets** — View: Accounts

| | SF | MF | COM | INDINST | IRR | Total |
|---|---|---|---|---|---|---|
| 2015 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2016 | 77 | 5 | 5 | 0 | 3 | 91 |
| 2017 | 78 | 5 | 5 | 0 | 3 | 91 |
| 2018 | 78 | 5 | 5 | 0 | 3 | 92 |
| 2019 | 79 | 6 | 5 | 0 | 4 | 93 |
| 2020 | 79 | 6 | 5 | 0 | 4 | 94 |

**Water Savings (mgd)**

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.000000 |
| 2016 | 0.000193 |
| 2017 | 0.000388 |
| 2018 | 0.000585 |
| 2019 | 0.000784 |
| 2020 | 0.000985 |

**Indoor and Outdoor Surveys - CII**

| Overview | |
|---|---|
| Name | Indoor and Outdoor Surveys - CII |
| Abbr | 7 |
| Category | |
| Measure Type | Standard Measure |

| Time Period | |
|---|---|
| First Year | 2015 |
| Last Year | 2040 |
| Measure Length | 26 |

| Measure Life | |
|---|---|
| Permanent | ☐ |
| Years | 5 |
| Repeat | ☐ |

| Fixture Costs | Utility | Customer | Fix/Acct |
|---|---|---|---|
| COM | $3,000.00 | $2,500.00 | 1 |
| INDINST | $3,000.00 | $2,500.00 | 1 |

| Administration Costs | |
|---|---|
| Markup Percentage | 25% |

**Description**

CONTRACTOR OR REGIONAL MEASURE: Top water customers from each CII category would be offered a professional water survey that would evaluate ways for the business to save water and money. The surveys would be for targeted to large users (accounts that use more than 5,000 gallons of water per day) such as hotels, restaurants, stores and schools. Emphasis will be on supporting the top users in each customer category.
After the free water use survey has been completed at site, SMWSP will analyze the recommendations on the provided findings report and determine if the site qualifies for a financial incentive.

| Customer Classes | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| | ☐ | ☐ | ☑ | ☑ | ☐ |

| End Uses | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| Toilets | | | ☑ | ☑ | |
| Urinals | | | ☑ | ☑ | |
| Faucets | | | ☑ | ☑ | |
| Showers | | | ☑ | ☑ | |
| Dishwashers | | | ☑ | ☑ | |
| Clothes Washers | | | ☑ | ☑ | |
| Process | | | ☑ | ☑ | |
| Kitchen Spray Rinse | | | ☑ | ☑ | |
| Internal Leakage | | | ☑ | ☑ | |
| Baths | | | | | |
| Other | | | ☑ | ☑ | |
| Irrigation | | | ☑ | ☑ | |
| Pools | | | | ☑ | |
| Wash Down | | | | | |
| Car Washing | | | | | |
| External Leakage | | | ☑ | ☑ | |
| Outdoor | | | | | |
| Cooling | | | ☑ | ☑ | |

**Comments**

Utility costs represent staff site survey time and reporting. Customer costs estimate any costs to implement survey recommendations. Overall average savings for the targeted large customers are per end use since fixture and appliance recommendations will vary. It is recommended target this program to start with the top users in the service area. (an helps to explain why the target percentage is only 1% since targeting the largest users).

| Results | |
|---|---|
| Average Water Savings (mgd) | |
| 0.006067 | |
| Lifetime Savings - Present Value ($) | |
| Utility | $164,399 |
| Community | $336,238 |
| Lifetime Costs - Present Value ($) | |
| Utility | $372,550 |
| Community | $620,917 |
| Benefit to Cost Ratio | |
| Utility | 0.44 |
| Community | 0.54 |
| Cost of Savings per Unit Volume ($/mg) | |
| Utility | $6,466 |

| End Use Savings Per Replacement | % Savings per Account |
|---|---|
| COM Toilets | 25.0% |
| COM Urinals | 25.0% |
| COM Faucets | 25.0% |
| COM Showers | 25.0% |
| COM Dishwashers | 25.0% |
| COM Clothes Washers | 25.0% |
| COM Process | 25.0% |
| OM Kitchen Spray Rins | 25.0% |
| COM Internal Leakage | 25.0% |
| COM Other | 25.0% |
| COM Cooling | 25.0% |
| COM Irrigation | 25.0% |
| COM External Leakage | 25.0% |
| INDINST Toilets | 25.0% |
| INDINST Urinals | 25.0% |
| INDINST Faucets | 25.0% |
| INDINST Showers | 25.0% |
| INDINST Dishwashers | 25.0% |
| NDINST Clothes Washer | 25.0% |
| INDINST Process | 25.0% |
| DINST Kitchen Spray Ri | 25.0% |
| NDINST Internal Leakag | 25.0% |
| INDINST Other | 25.0% |
| INDINST Cooling | 25.0% |
| INDINST Irrigation | 25.0% |
| INDINST Pools | 25.0% |
| NDINST External Leakag | 25.0% |

| Targets | |
|---|---|
| Target Method | Percentage |
| % of Accts Targeted / yr | 1.000% |
| Only Effects New Accts | ☐ |

**Costs** — View: Summary

| | Utility | Customer | Total |
|---|---|---|---|
| 2015 | $18,038 | $12,025 | $30,063 |
| 2016 | $18,356 | $12,238 | $30,594 |
| 2017 | $18,675 | $12,450 | $31,125 |
| 2018 | $18,994 | $12,663 | $31,657 |
| 2019 | $19,313 | $12,875 | $32,188 |
| 2020 | $19,632 | $13,088 | $32,720 |

**Targets** — View: Accounts

| | COM | INDINST | Total |
|---|---|---|---|
| 2015 | 5 | 0 | 5 |
| 2016 | 5 | 0 | 5 |
| 2017 | 5 | 0 | 5 |
| 2018 | 5 | 0 | 5 |
| 2019 | 5 | 0 | 5 |
| 2020 | 5 | 0 | 5 |

**Water Savings (mgd)**

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.001195 |
| 2016 | 0.002405 |
| 2017 | 0.003629 |
| 2018 | 0.004869 |
| 2019 | 0.006123 |
| 2020 | 0.006212 |

**Replace CII Inefficient Equipment**

| Overview | |
|---|---|
| Name | Replace CII Inefficient Equipment |
| Abbr | 8 |
| Category | |
| Measure Type | Standard Measure |

| Time Period | |
|---|---|
| First Year | 2018 |
| Last Year | 2022 |
| Measure Length | 5 |

| Measure Life | |
|---|---|
| Permanent | ☐ |
| Years | 10 |
| Repeat | ☐ |

| Fixture Costs | Utility | Customer | Fix/Acct |
|---|---|---|---|
| COM | $3,000.00 | $3,000.00 | 1 |
| INDINST | $3,000.00 | $3,000.00 | 1 |

| Administration Costs | |
|---|---|
| Markup Percentage | 30% |

**Description**

CONTRACTOR OR REGIONAL MEASURE: After undergoing a free water use survey, SMWSP will analyze the recommendations on the provided findings report and determine if the site qualifies for a financial incentive. Financial incentives will be provided after analyzing the cost benefit ratio of each proposed project. Incentives are tailored to each individual site as each site has varying water savings potentials. Incentives will be granted at the sole discretion of SMWSP while funding lasts.
Program to provide rebates 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, replacing once through cooling, and adding conductivity controller on cooling towers.

| Customer Classes | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| | ☐ | ☐ | ☑ | ☑ | ☐ |

| End Uses | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| Toilets | | | ☑ | ☑ | |
| Urinals | | | ☑ | ☑ | |
| Faucets | | | ☑ | ☑ | |
| Showers | | | ☑ | ☑ | |
| Dishwashers | | | ☑ | ☑ | |
| Clothes Washers | | | ☑ | ☑ | |
| Process | | | ☑ | ☑ | |
| Kitchen Spray Rinse | | | ☑ | ☑ | |
| Internal Leakage | | | ☐ | ☐ | |
| Baths | | | | | |
| Other | | | ☐ | ☐ | |
| Irrigation | | | ☐ | ☐ | |
| Pools | | | | ☐ | |
| Wash Down | | | | | |
| Car Washing | | | | | |
| External Leakage | | | ☐ | ☐ | |
| Outdoor | | | | | |
| Cooling | | | ☐ | ☐ | |

**Comments**

Estimated Utility/Customer 50/50 cost sharing. Ice machines and food steamers are new and just getting started. Limited on any water-cooled ice machines. This measure can be adjusted to incorporate any CII techology that is deemed appropriate by the program participants to allow flexiblity to adapt to new technology advancements.

| Results | |
|---|---|
| Average Water Savings (mgd) | |
| 0.000791 | |
| Lifetime Savings - Present Value ($) | |
| Utility | $23,920 |
| Community | $60,313 |
| Lifetime Costs - Present Value ($) | |
| Utility | $43,747 |
| Community | $77,399 |
| Benefit to Cost Ratio | |
| Utility | 0.55 |
| Community | 0.78 |
| Cost of Savings per Unit Volume ($/mg) | |
| Utility | $5,822 |

| End Use Savings Per Replacement | % Savings per Account |
|---|---|
| COM Toilets | 25.0% |
| COM Urinals | 25.0% |
| COM Faucets | 25.0% |
| COM Showers | 25.0% |
| COM Dishwashers | 25.0% |
| COM Clothes Washers | 25.0% |
| COM Process | 25.0% |
| COM Kitchen Spray Rins | 25.0% |
| INDINST Toilets | 25.0% |
| INDINST Urinals | 25.0% |
| INDINST Faucets | 25.0% |
| INDINST Showers | 25.0% |
| INDINST Dishwashers | 25.0% |
| INDINST Clothes Washer | 25.0% |
| INDINST Process | 25.0% |
| INDINST Kitchen Spray Ri | 25.0% |

| Targets | |
|---|---|
| Target Method | Percentage |
| % of Accts Targeted / yr | 0.500% |
| Only Effects New Accts | ☐ |

**Costs** — View: Summary

| | Utility | Customer | Total |
|---|---|---|---|
| 2015 | $0 | $0 | $0 |
| 2016 | $0 | $0 | $0 |
| 2017 | $0 | $0 | $0 |
| 2018 | $9,877 | $7,598 | $17,475 |
| 2019 | $10,043 | $7,725 | $17,768 |
| 2020 | $10,209 | $7,853 | $18,061 |

**Targets** — View: Accounts

| | COM | INDINST | Total |
|---|---|---|---|
| 2015 | 0 | 0 | 0 |
| 2016 | 0 | 0 | 0 |
| 2017 | 0 | 0 | 0 |
| 2018 | 3 | 0 | 3 |
| 2019 | 3 | 0 | 3 |
| 2020 | 3 | 0 | 3 |

**Water Savings (mgd)**

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.000000 |
| 2016 | 0.000000 |
| 2017 | 0.000000 |
| 2018 | 0.000408 |
| 2019 | 0.000820 |
| 2020 | 0.001235 |

**Efficient Toilet Replacement Program - CII**

| Overview | |
|---|---|
| Name | Efficient Toilet Replacement Prog |
| Abbr | 9 |
| Category | |
| Measure Type | Standard Measure |

| Time Period | |
|---|---|
| First Year | 2015 |
| Last Year | 2019 |
| Measure Length | 5 |

| Measure Life | |
|---|---|
| Permanent | ☑ |

| Fixture Costs | Utility | Customer | Fix/Acct |
|---|---|---|---|
| COM | $260.00 | $150.00 | 10 |
| INDINST | $260.00 | $150.00 | 10 |

| Administration Costs | |
|---|---|
| Markup Percentage | 30% |

**Description**

CONTRACTOR MEASURE: Efficient Toilet Replacement Program - CII. Provide a rebate or voucher for the installation of a high efficiency flushometer toilet - toilets flushing 1.28 gpf or less. Rebate amounts reflect the incremental purchase cost.

| Customer Classes | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| | ☐ | ☐ | ☑ | ☑ | ☐ |

| End Uses | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| Toilets | | | ☑ | ☑ | |
| Urinals | | | ☐ | ☐ | |
| Faucets | | | ☐ | ☐ | |
| Showers | | | ☐ | ☐ | |
| Dishwashers | | | ☐ | ☐ | |
| Clothes Washers | | | ☐ | ☐ | |
| Process | | | ☐ | ☐ | |
| Kitchen Spray Rinse | | | ☐ | ☐ | |
| Internal Leakage | | | ☐ | ☐ | |
| Baths | | | | | |
| Other | | | ☐ | ☐ | |
| Irrigation | | | ☐ | ☐ | |
| Pools | | | | ☐ | |
| Wash Down | | | | | |
| Car Washing | | | | | |
| External Leakage | | | ☐ | ☐ | |
| Outdoor | | | | | |
| Cooling | | | ☐ | ☐ | |

**Comments**

Current outreach is regional and these costs are included in the public outreach measure. Form processing and check cutting are managed by the water contractor. Rebate for contractor is $260 premium (less than 1.0 gpf) toilet purchase. The $150 customer cost is for installation. Assumes 10 toilets per CII account. Savings are conservative and assume 50% of replaced toilets using 1.6 gpf and 50% using 3.5 gpf or more are replaced with 1.28 gpf fixtures.

| Results | |
|---|---|
| Average Water Savings (mgd) | |
| 0.003035 | |
| Lifetime Savings - Present Value ($) | |
| Utility | $83,568 |
| Community | $83,568 |
| Lifetime Costs - Present Value ($) | |
| Utility | $158,613 |
| Community | $229,003 |
| Benefit to Cost Ratio | |
| Utility | 0.53 |
| Community | 0.36 |
| Cost of Savings per Unit Volume ($/mg) | |
| Utility | $5,502 |

| End Use Savings Per Replacement | % Savings per Account |
|---|---|
| COM Toilets | 42.0% |
| INDINST Toilets | 42.0% |

| Targets | |
|---|---|
| Target Method | Percentage |
| % of Accts Targeted / yr | 2.000% |
| Only Effects New Accts | ☐ |

**Costs** — View: Summary

| | Utility | Customer | Total |
|---|---|---|---|
| 2015 | $32,516 | $14,430 | $46,946 |
| 2016 | $33,090 | $14,685 | $47,776 |
| 2017 | $33,665 | $14,940 | $48,606 |
| 2018 | $34,240 | $15,195 | $49,435 |
| 2019 | $34,815 | $15,450 | $50,265 |
| 2020 | $0 | $0 | $0 |

**Targets** — View: Accounts

| | COM | INDINST | Total |
|---|---|---|---|
| 2015 | 10 | 0 | 10 |
| 2016 | 10 | 0 | 10 |
| 2017 | 10 | 0 | 10 |
| 2018 | 10 | 0 | 10 |
| 2019 | 10 | 0 | 10 |
| 2020 | 0 | 0 | 0 |

**Water Savings (mgd)**

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.000689 |
| 2016 | 0.001378 |
| 2017 | 0.002068 |
| 2018 | 0.002760 |
| 2019 | 0.003454 |
| 2020 | 0.003429 |

**Urinal Rebates – CII**

| Overview | |
|---|---|
| Name | Urinal Rebates – CII |
| Abbr | 10 |
| Category | |
| Measure Type | Standard Measure |

| Time Period | |
|---|---|
| First Year | 2016 |
| Last Year | 2020 |
| Measure Length | 5 |

| Measure Life | |
|---|---|
| Permanent | ☑ |

| Fixture Costs | Utility | Customer | Fix/Acct |
|---|---|---|---|
| COM | $450.00 | $100.00 | 10 |
| INDINST | $450.00 | $100.00 | 10 |

| Administration Costs | |
|---|---|
| Markup Percentage | 25% |

**Description**

CONTRACTOR MEASURE: Provide a rebate or voucher for the installation of a high efficiency urinals. WaterSense standard is 0.5 gpf or less, though models flushing as low as 0.125 gpf (1 pint) are available and function well, so could be specified. Rebate amounts would reflect the incremental purchase cost.

| Customer Classes | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| | ☐ | ☐ | ☑ | ☑ | ☐ |

| End Uses | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| Toilets | | | ☐ | ☐ | |
| Urinals | | | ☑ | ☑ | |
| Faucets | | | ☐ | ☐ | |
| Showers | | | ☐ | ☐ | |
| Dishwashers | | | ☐ | ☐ | |
| Clothes Washers | | | ☐ | ☐ | |
| Process | | | ☐ | ☐ | |
| Kitchen Spray Rinse | | | ☐ | ☐ | |
| Internal Leakage | | | ☐ | ☐ | |
| Baths | | | | | |
| Other | | | ☐ | ☐ | |
| Irrigation | | | ☐ | ☐ | |
| Pools | | | | ☐ | |
| Wash Down | | | | | |
| Car Washing | | | | | |
| External Leakage | | | ☐ | ☐ | |
| Outdoor | | | | | |
| Cooling | | | ☐ | ☐ | |

**Comments**

Per Santa Rosa's current program, rebate amount is up to $450 per urinal. Water savings of 75% is based on replacing a 1.0 gpf or more urinal and a 0.25 gpf to 0.125 gpf (1 pint) urinal. Assumes 10 urinals per CII account. Customer cost reflects installation and fixture costs.

| Results | |
|---|---|
| Average Water Savings (mgd) | |
| 0.000392 | |
| Lifetime Savings - Present Value ($) | |
| Utility | $10,758 |
| Community | $10,758 |
| Lifetime Costs - Present Value ($) | |
| Utility | $65,158 |
| Community | $76,741 |
| Benefit to Cost Ratio | |
| Utility | 0.17 |
| Community | 0.14 |
| Cost of Savings per Unit Volume ($/mg) | |
| Utility | $17,486 |

| End Use Savings Per Replacement | % Savings per Account |
|---|---|
| COM Urinals | 75.0% |
| INDINST Urinals | 75.0% |

| Targets | |
|---|---|
| Target Method | Percentage |
| % of Accts Targeted / yr | 0.500% |
| Only Effects New Accts | ☐ |

**Costs** — View: Summary

| | Utility | Customer | Total |
|---|---|---|---|
| 2015 | $0 | $0 | $0 |
| 2016 | $13,767 | $2,448 | $16,215 |
| 2017 | $14,006 | $2,490 | $16,496 |
| 2018 | $14,246 | $2,533 | $16,778 |
| 2019 | $14,485 | $2,575 | $17,060 |
| 2020 | $14,724 | $2,618 | $17,342 |

**Targets** — View: Accounts

| | COM | INDINST | Total |
|---|---|---|---|
| 2015 | 0 | 0 | 0 |
| 2016 | 2 | 0 | 2 |
| 2017 | 2 | 0 | 2 |
| 2018 | 3 | 0 | 3 |
| 2019 | 3 | 0 | 3 |
| 2020 | 3 | 0 | 3 |

**Water Savings (mgd)**

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.000000 |
| 2016 | 0.000106 |
| 2017 | 0.000210 |
| 2018 | 0.000311 |
| 2019 | 0.000409 |
| 2020 | 0.000504 |

**Plumber Initiated UHET & HEU Retrofit**

## Overview

| | |
|---|---|
| Name | Plumber Initiated UHET & HEU Re |
| Abbr | 11 |
| Category | |
| Measure Type | Standard Measure |

## Time Period

| | |
|---|---|
| First Year | 2019 |
| Last Year | 2023 |
| Measure Length | 5 |

## Measure Life

Permanent ☑

## Fixture Costs

| | Utility | Customer | Fix/Acct |
|---|---|---|---|
| COM | $325.00 | $100.00 | 10 |
| INDINST | $325.00 | $100.00 | 10 |

## Administration Costs

| | |
|---|---|
| Markup Percentage | 30% |

## Description

CONTRACTOR MEASURE: Plumber Initiated High Efficiency Toilet and / or Urinal Retrofit Program. SMWSP would subsidize installation cost of a new UHET/ HEU purchased by SMWSP. Licensed plumbers, pre-qualified by SMWSP would solicit customers directly. Customers would get a new UHET and HEU installed at a discounted price.

## Customer Classes

| SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|
| ☐ | ☐ | ☑ | ☑ | ☐ |

## End Uses

| | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| Toilets | | | ☑ | ☑ | |
| Urinals | | | ☑ | ☑ | |
| Faucets | | | ☐ | ☐ | |
| Showers | | | ☐ | ☐ | |
| Dishwashers | | | ☐ | ☐ | |
| Clothes Washers | | | ☐ | ☐ | |
| Process | | | ☐ | ☐ | |
| Kitchen Spray Rinse | | | ☐ | ☐ | |
| Internal Leakage | | | ☐ | ☐ | |
| Baths | | | | | |
| Other | | | ☐ | ☐ | |
| Irrigation | | | ☐ | ☐ | |
| Pools | | | | ☐ | |
| Wash Down | | | | | |
| Car Washing | | | | | |
| External Leakage | | | ☐ | ☐ | |
| Outdoor | | | | | |
| Cooling | | | ☐ | ☐ | |

## Comments

Utility cost based on installation cost of $325 per Carrie Pollard at SCWA provided costs. Customer cost based on the fixture cost plus reduced installation cost.

Water savings based on the average difference between 1.0 gpf urinal and a 0.25 gpf to 0.125 gpf (1 pint) urinal and a 1.6 gpf toilet and 1.0 gpf toilet. Assumes 10 urinals or toilets per CII account.

## Results

| | |
|---|---|
| Average Water Savings (mgd) | |
| 0.002013 | |
| Lifetime Savings - Present Value ($) | |
| Utility | $51,970 |
| Community | $51,970 |
| Lifetime Costs - Present Value ($) | |
| Utility | $92,968 |
| Community | $114,972 |
| Benefit to Cost Ratio | |
| Utility | 0.56 |
| Community | 0.45 |
| Cost of Savings per Unit Volume ($/mg) | |
| Utility | $4,863 |

## End Use Savings Per Replacement

| | % Savings per Account |
|---|---|
| COM Toilets | 42.0% |
| COM Urinals | 75.0% |
| INDINST Toilets | 42.0% |
| INDINST Urinals | 75.0% |

## Targets

| | |
|---|---|
| Target Method | Percentage |
| % of Accts Targeted / yr | 1.000% |
| Only Effects New Accts | ☐ |

## Costs

View: Summary

| | Utility | Customer | Total |
|---|---|---|---|
| 2015 | $0 | $0 | $0 |
| 2016 | $0 | $0 | $0 |
| 2017 | $0 | $0 | $0 |
| 2018 | $0 | $0 | $0 |
| 2019 | $21,759 | $5,150 | $26,910 |
| 2020 | $22,119 | $5,235 | $27,354 |

## Targets

View: Accounts

| | COM | INDINST | Total |
|---|---|---|---|
| 2015 | 0 | 0 | 0 |
| 2016 | 0 | 0 | 0 |
| 2017 | 0 | 0 | 0 |
| 2018 | 0 | 0 | 0 |
| 2019 | 5 | 0 | 5 |
| 2020 | 5 | 0 | 5 |

## Water Savings (mgd)

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.000000 |
| 2016 | 0.000000 |
| 2017 | 0.000000 |
| 2018 | 0.000000 |
| 2019 | 0.000567 |
| 2020 | 0.001129 |

**Require <0.125 gal/flush Urinals in New Development**

| Overview | |
|---|---|
| Name | Require <0.125 gal/flush Urinals in |
| Abbr | 12 |
| Category | |
| Measure Type | Standard Measure |

| Time Period | |
|---|---|
| First Year | 2017 |
| Last Year | 2021 |
| Measure Length | 5 |

| Measure Life | |
|---|---|
| Permanent | ☑ |

| Fixture Costs | Utility | Customer | Fix/Acct |
|---|---|---|---|
| COM | $75.00 | $300.00 | 10 |
| INDINST | $75.00 | $300.00 | 10 |

| Administration Costs | |
|---|---|
| Markup Percentage | 10% |

**Description**

CONTRACTOR MEASURE: Require that new buildings be fitted with .125 gpf (1 pint) or less urinals rather than the current standard of 0.5 gal/flush models.

| Customer Classes | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| | ☐ | ☐ | ☑ | ☑ | ☐ |

| End Uses | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| Toilets | | | ☐ | ☐ | |
| Urinals | | | ☑ | ☑ | |
| Faucets | | | ☐ | ☐ | |
| Showers | | | ☐ | ☐ | |
| Dishwashers | | | ☐ | ☐ | |
| Clothes Washers | | | ☐ | ☐ | |
| Process | | | ☐ | ☐ | |
| Kitchen Spray Rinse | | | ☐ | ☐ | |
| Internal Leakage | | | ☐ | ☐ | |
| Baths | | | | | |
| Other | | | ☐ | ☐ | |
| Irrigation | | | ☐ | ☐ | |
| Pools | | | | ☐ | |
| Wash Down | | | | | |
| Car Washing | | | | | |
| External Leakage | | | ☐ | ☐ | |
| Outdoor | | | | | |
| Cooling | | | ☐ | ☐ | |

**Comments**

Utility costs of $75 reflects inspection costs. Customer costs represent the incremental cost of the more efficient fixture.

Savings assumes 0.5 gpf urinals are being replaced with .125 gpf urinals. Assume 10 fixtures per CII account.

| Results | |
|---|---|
| Average Water Savings (mgd) | |
| 0.001112 | |
| Lifetime Savings - Present Value ($) | |
| Utility | $30,106 |
| Community | $30,106 |
| Lifetime Costs - Present Value ($) | |
| Utility | $27,467 |
| Community | $127,349 |
| Benefit to Cost Ratio | |
| Utility | 1.10 |
| Community | 0.24 |
| Cost of Savings per Unit Volume ($/mg) | |
| Utility | $2,600 |

| End Use Savings Per Replacement | % Savings per Account |
|---|---|
| COM Urinals | 75.0% |
| INDINST Urinals | 75.0% |

| Targets | |
|---|---|
| Target Method | Percentage |
| % of Accts Targeted / yr | 100.000% |
| Only Effects New Accts | ☑ |

**Costs** — View: Summary

| | Utility | Customer | Total |
|---|---|---|---|
| 2015 | $0 | $0 | $0 |
| 2016 | $0 | $0 | $0 |
| 2017 | $7,015 | $25,511 | $32,526 |
| 2018 | $7,015 | $25,511 | $32,526 |
| 2019 | $7,015 | $25,511 | $32,526 |
| 2020 | $7,015 | $25,511 | $32,526 |

**Targets** — View: Accounts

| | COM | INDINST | Total |
|---|---|---|---|
| 2015 | 0 | 0 | 0 |
| 2016 | 0 | 0 | 0 |
| 2017 | 8 | 0 | 9 |
| 2018 | 8 | 0 | 9 |
| 2019 | 8 | 0 | 9 |
| 2020 | 8 | 0 | 9 |

**Water Savings (mgd)**

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.000000 |
| 2016 | 0.000000 |
| 2017 | 0.000362 |
| 2018 | 0.000708 |
| 2019 | 0.001040 |
| 2020 | 0.001358 |

**HE Faucet Aerator / Showerhead Giveaway – CII**

| Overview | |
|---|---|
| Name | HE Faucet Aerator / Showerhead ( |
| Abbr | 13 |
| Category | |
| Measure Type | Standard Measure |

| Time Period | |
|---|---|
| First Year | 2015 |
| Last Year | 2019 |
| Measure Length | 5 |

| Measure Life | |
|---|---|
| Permanent | ☐ |
| Years | 5 |
| Repeat | ☐ |

| Fixture Costs | Utility | Customer | Fix/Acct |
|---|---|---|---|
| COM | $12.00 | $25.00 | 10 |
| INDINST | $12.00 | $25.00 | 10 |

| Administration Costs | |
|---|---|
| Markup Percentage | 25% |

**Description**

CONTRACTOR MEASURE: High Efficiency Faucet Aerator / Showerhead Giveaway – CII. Utility would buy showerheads and faucet aerators in bulk and give them away at Utility office or community events.

| Customer Classes | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| | ☐ | ☐ | ☑ | ☑ | ☐ |

| End Uses | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| Toilets | | | ☐ | ☐ | |
| Urinals | | | ☐ | ☐ | |
| Faucets | | | ☑ | ☑ | |
| Showers | | | ☑ | ☑ | |
| Dishwashers | | | ☐ | ☐ | |
| Clothes Washers | | | ☐ | ☐ | |
| Process | | | ☐ | ☐ | |
| Kitchen Spray Rinse | | | ☐ | ☐ | |
| Internal Leakage | | | ☐ | ☐ | |
| Baths | | | | | |
| Other | | | ☐ | ☐ | |
| Irrigation | | | ☐ | ☐ | |
| Pools | | | | ☐ | |
| Wash Down | | | | | |
| Car Washing | | | | | |
| External Leakage | | | ☐ | ☐ | |
| Outdoor | | | | | |
| Cooling | | | ☐ | ☐ | |

**Comments**

Assumes 10 bathrooms per CII account. Utility cost for 1.8gpm showerhead and 1.5 gpm aerator kit is $12. Customer cost $25 is to repair leaks or other minor costs. Assume kits save 27.6% (reduced to be conservative) by assuming only 25% of kits are actually installed in the businesses and yield water savings. Petaluma provided actual cost data: 2.0GPM SH, 1.0 and 0.5 GPM FA. Unit cost per 1.0GPM FA - $0.78 per 2.0GPM SH - $3.51. Or just over $4 per kit. The $12 per kit cost assumes that only 25% are actually installed. ($4 times 4 kits to obtain one installation).

| Results | |
|---|---|
| Average Water Savings (mgd) | |
| 0.000282 | |
| Lifetime Savings - Present Value ($) | |
| Utility | $9,982 |
| Community | $26,365 |
| Lifetime Costs - Present Value ($) | |
| Utility | $17,598 |
| Community | $46,927 |
| Benefit to Cost Ratio | |
| Utility | 0.57 |
| Community | 0.56 |
| Cost of Savings per Unit Volume ($/mg) | |
| Utility | $6,581 |

| End Use Savings Per Replacement | % Savings per Account |
|---|---|
| COM Faucets | 6.9% |
| COM Showers | 6.9% |
| INDINST Faucets | 6.9% |
| INDINST Showers | 6.9% |

| Targets | |
|---|---|
| Target Method | Percentage |
| % of Accts Targeted / yr | 5.000% |
| Only Effects New Accts | ☐ |

**Costs** — View: Summary

| | Utility | Customer | Total |
|---|---|---|---|
| 2015 | $3,608 | $6,013 | $9,620 |
| 2016 | $3,671 | $6,119 | $9,790 |
| 2017 | $3,735 | $6,225 | $9,960 |
| 2018 | $3,799 | $6,331 | $10,130 |
| 2019 | $3,863 | $6,438 | $10,300 |
| 2020 | $0 | $0 | $0 |

**Targets** — View: Accounts

| | COM | INDINST | Total |
|---|---|---|---|
| 2015 | 24 | 0 | 24 |
| 2016 | 24 | 0 | 24 |
| 2017 | 25 | 0 | 25 |
| 2018 | 25 | 0 | 25 |
| 2019 | 26 | 0 | 26 |
| 2020 | 0 | 0 | 0 |

**Water Savings (mgd)**

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.000283 |
| 2016 | 0.000571 |
| 2017 | 0.000863 |
| 2018 | 0.001161 |
| 2019 | 0.001464 |
| 2020 | 0.001181 |

**HE Faucet Aerator / Showerhead Giveaway - SF, MF**

| Overview | |
|---|---|
| Name | HE Faucet Aerator / Showerhead ( |
| Abbr | 14 |
| Category | |
| Measure Type | Standard Measure |

| Time Period | |
|---|---|
| First Year | 2015 |
| Last Year | 2019 |
| Measure Length | 5 |

| Measure Life | |
|---|---|
| Permanent | ☐ |
| Years | 5 |
| Repeat | ☐ |

| Fixture Costs | Utility | Customer | Fix/Acct |
|---|---|---|---|
| SF | $12.00 | $25.00 | 2 |
| MF | $12.00 | $25.00 | 8 |

| Administration Costs | |
|---|---|
| Markup Percentage | 25% |

**Description**

CONTRACTOR MEASURE: High Efficiency Faucet Aerator / Showerhead Giveaway - SF, MF. Utility would buy showerheads and faucet aerators in bulk and give them away at Utility office or community events. Need to coordinate this program with the School Education measure on retrofit kit giveaways to the same customer categories.

| Customer Classes | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| | ☑ | ☑ | ☐ | ☐ | ☐ |

| End Uses | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| Toilets | ☐ | ☐ | | | |
| Urinals | | | | | |
| Faucets | ☑ | ☑ | | | |
| Showers | ☑ | ☑ | | | |
| Dishwashers | ☐ | ☐ | | | |
| Clothes Washers | ☐ | ☐ | | | |
| Process | | | | | |
| Kitchen Spray Rinse | | | | | |
| Internal Leakage | ☐ | ☐ | | | |
| Baths | ☐ | ☐ | | | |
| Other | ☐ | ☐ | | | |
| Irrigation | ☐ | ☐ | | | |
| Pools | ☐ | ☐ | | | |
| Wash Down | ☐ | ☐ | | | |
| Car Washing | ☐ | ☐ | | | |
| External Leakage | ☐ | ☐ | | | |
| Outdoor | | | | | |
| Cooling | | | | | |

**Comments**

Assumes minimum 2 bathrooms per SF account and 4 units or 8 bathrooms per MF account. Utility cost for 1.8gpm showerhead and 1.5 gpm aerator kit is $12. Customer cost $25 is to repair leaks or other minor costs. Assume kits save 27.6% (reduced to be conservative) by assuming only 25% of kits are actually installed in the homes and yield water savings.

| Results | |
|---|---|
| Average Water Savings (mgd) | |
| 0.001600 | |
| Lifetime Savings - Present Value ($) | |
| Utility | $56,761 |
| Community | $124,355 |
| Lifetime Costs - Present Value ($) | |
| Utility | $28,112 |
| Community | $74,967 |
| Benefit to Cost Ratio | |
| Utility | 2.02 |
| Community | 1.66 |
| Cost of Savings per Unit Volume ($/mg) | |
| Utility | $1,851 |

| End Use Savings Per Replacement | % Savings per Account |
|---|---|
| SF Faucets | 6.9% |
| SF Showers | 6.9% |
| MF Faucets | 6.9% |
| MF Showers | 6.9% |

| Targets | |
|---|---|
| Target Method | Percentage |
| % of Accts Targeted / yr | 2.000% |
| Only Effects New Accts | ☐ |

**Costs** — View: Summary

| | Utility | Customer | Total |
|---|---|---|---|
| 2015 | $5,872 | $9,787 | $15,659 |
| 2016 | $5,918 | $9,863 | $15,781 |
| 2017 | $5,963 | $9,939 | $15,903 |
| 2018 | $6,009 | $10,015 | $16,024 |
| 2019 | $6,055 | $10,091 | $16,146 |
| 2020 | $0 | $0 | $0 |

**Targets** — View: Accounts

| | SF | MF | Total |
|---|---|---|---|
| 2015 | 153 | 11 | 164 |
| 2016 | 154 | 11 | 165 |
| 2017 | 155 | 11 | 166 |
| 2018 | 157 | 11 | 167 |
| 2019 | 158 | 11 | 169 |
| 2020 | 0 | 0 | 0 |

**Water Savings (mgd)**

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.001662 |
| 2016 | 0.003325 |
| 2017 | 0.004987 |
| 2018 | 0.006651 |
| 2019 | 0.008316 |
| 2020 | 0.006656 |

**Indoor and Outdoor Surveys - SF,**

## Overview

| | |
|---|---|
| Name | Indoor and Outdoor Surveys - SF, I |
| Abbr | 15 |
| Category | |
| Measure Type | Standard Measure |

## Time Period

| | |
|---|---|
| First Year | 2015 |
| Last Year | 2040 |
| Measure Length | 26 |

## Measure Life

| | |
|---|---|
| Permanent | ☐ |
| Years | 5 |
| Repeat | ☐ |

## Fixture Costs

| | Utility | Customer | Fix/Acct |
|---|---|---|---|
| SF | $162.00 | $50.00 | 1 |
| MF | $534.00 | $50.00 | 1 |

## Administration Costs

| | |
|---|---|
| Markup Percentage | 30% |

## Description

REGIONAL OR CONTRACTOR MEASURE: Indoor and outdoor water surveys for existing residential customers. Target those with high water use and provide a customized report to owner. May include give-away of efficient shower heads, aerators, and toilet devices. Customer leaks can go uncorrected at properties where owners are least able to pay costs of repair. These programs may require that customer leaks be repaired, with either part of the repair subsidized and/or the cost paid with revolving funds paid back with water bills over time. May also include an option to replace inefficient plumbing fixtures at low-income residences. May include adjustments to irrigation schedules on automatic irrigation controllers. Provide incentive to install pressure regulating valve on existing properties with pressure exceeding 80 psi.

## Customer Classes

| SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|
| ☑ | ☑ | ☐ | ☐ | ☐ |

## End Uses

| | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| Toilets | ☑ | ☑ | | | |
| Urinals | | | | | |
| Faucets | ☑ | ☑ | | | |
| Showers | ☑ | ☑ | | | |
| Dishwashers | ☑ | ☑ | | | |
| Clothes Washers | ☑ | ☑ | | | |
| Process | | | | | |
| Kitchen Spray Rinse | | | | | |
| Internal Leakage | ☑ | ☑ | | | |
| Baths | ☑ | ☑ | | | |
| Other | ☑ | ☑ | | | |
| Irrigation | ☑ | ☑ | | | |
| Pools | ☑ | ☑ | | | |
| Wash Down | ☑ | ☑ | | | |
| Car Washing | ☑ | ☑ | | | |
| External Leakage | ☑ | ☑ | | | |
| Outdoor | | | | | |
| Cooling | | | | | |

## Comments

Utility costs for staff survey time and any giveaway devices. Customer cost reflects Utility costs for staff survey time and any giveaway devices. Customer cost reflects average cost to address report recommendations. Includes $12 per unit for kit giveaways. Assumes 1 kit for SF and 4 kits for MF units (1 per unit not one per bathroom).

Assume 5% savings for indoor suggestions and 10% savings for outdoor suggestions. Savings reflect average values since survey suggestions, device distribution and fixture and appliance recommendations and upgrades will vary.

## Results

| | |
|---|---|
| Average Water Savings (mgd) | |
| 0.006158 | |
| Lifetime Savings - Present Value ($) | |
| Utility | $167,107 |
| Community | $246,030 |
| Lifetime Costs - Present Value ($) | |
| Utility | $198,683 |
| Community | $239,696 |
| Benefit to Cost Ratio | |
| Utility | 0.84 |
| Community | 1.03 |
| Cost of Savings per Unit Volume ($/mg) | |
| Utility | $3,397 |

## End Use Savings Per Replacement

| | % Savings per Account |
|---|---|
| SF Toilets | 5.0% |
| SF Faucets | 5.0% |
| SF Showers | 5.0% |
| SF Dishwashers | 5.0% |
| SF Clothes Washers | 5.0% |
| SF Baths | 5.0% |
| SF Internal Leakage | 5.0% |
| SF Other | 5.0% |
| SF Irrigation | 10.0% |
| SF Pools | 10.0% |
| SF Wash Down | 10.0% |
| SF Car Washing | 10.0% |
| SF External Leakage | 10.0% |
| MF Toilets | 5.0% |
| MF Faucets | 5.0% |
| MF Showers | 5.0% |
| MF Dishwashers | 5.0% |
| MF Clothes Washers | 5.0% |
| MF Baths | 5.0% |
| MF Internal Leakage | 5.0% |
| MF Other | 5.0% |
| MF Irrigation | 10.0% |
| MF Pools | 10.0% |
| MF Wash Down | 10.0% |
| MF Car Washing | 10.0% |
| MF External Leakage | 10.0% |

## Targets

| | |
|---|---|
| Target Method | Percentage |
| % of Accts Targeted / yr | 0.500% |
| Only Effects New Accts | ☐ |

## Costs

View: Summary

| | Utility | Customer | Total |
|---|---|---|---|
| 2015 | $9,909 | $2,046 | $11,955 |
| 2016 | $9,986 | $2,061 | $12,048 |
| 2017 | $10,063 | $2,077 | $12,141 |
| 2018 | $10,140 | $2,093 | $12,234 |
| 2019 | $10,217 | $2,109 | $12,326 |
| 2020 | $10,294 | $2,125 | $12,419 |

## Targets

View: Accounts

| | SF | MF | Total |
|---|---|---|---|
| 2015 | 38 | 3 | 41 |
| 2016 | 39 | 3 | 41 |
| 2017 | 39 | 3 | 42 |
| 2018 | 39 | 3 | 42 |
| 2019 | 39 | 3 | 42 |
| 2020 | 40 | 3 | 42 |

## Water Savings (mgd)

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.001257 |
| 2016 | 0.002519 |
| 2017 | 0.003787 |
| 2018 | 0.005060 |
| 2019 | 0.006337 |
| 2020 | 0.006374 |

**Efficient Toilet Replacement Program – SF**

| Overview | |
|---|---|
| Name | Efficient Toilet Replacement Prog |
| Abbr | 16 |
| Category | |
| Measure Type | Standard Measure |

| Time Period | |
|---|---|
| First Year | 2015 |
| Last Year | 2019 |
| Measure Length | 5 |

| Measure Life | |
|---|---|
| Permanent | ☑ |

| Fixture Costs | Utility | Customer | Fix/Acct |
|---|---|---|---|
| SF | $150.00 | $150.00 | 2 |

| Administration Costs | |
|---|---|
| Markup Percentage | 25% |

**Description**

CONTRACTOR MEASURE: Provide a rebate or voucher for the installation of a ultra high efficiency toilet (UHET). UHET toilets flush 1.28 gpf or less and include dual flush technology. Rebate amounts would reflect the incremental purchase cost. Replacement program can be either a direct install or rebate program. Includes replacement of 1.6 gpf that are not well functioning.

| Customer Classes | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| | ☑ | ☐ | ☐ | ☐ | ☐ |

| End Uses | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| Toilets | ☑ | | | | |
| Urinals | | | | | |
| Faucets | ☐ | | | | |
| Showers | ☐ | | | | |
| Dishwashers | ☐ | | | | |
| Clothes Washers | ☐ | | | | |
| Process | | | | | |
| Kitchen Spray Rinse | | | | | |
| Internal Leakage | ☐ | | | | |
| Baths | ☐ | | | | |
| Other | ☐ | | | | |
| Irrigation | ☐ | | | | |
| Pools | ☐ | | | | |
| Wash Down | ☐ | | | | |
| Car Washing | ☐ | | | | |
| External Leakage | ☐ | | | | |
| Outdoor | | | | | |
| Cooling | | | | | |

**Comments**

Rebate for utility is $150 premium (less than 1.0 gpf) toilet purchase. The $150 customer cost is for installation. Assumes 2 toilets per SF account. Model water savings of 42% and cost/benefits based on MMWD provided data using an average toilet flush volume of 2.2 gpf for existing toilets (weighted average of field measured toilets Sample size=638 toilets.

| Results | |
|---|---|
| Average Water Savings (mgd) | |
| 0.000369 | |
| Lifetime Savings - Present Value ($) | |
| Utility | $10,180 |
| Community | $10,180 |
| Lifetime Costs - Present Value ($) | |
| Utility | $12,081 |
| Community | $21,746 |
| Benefit to Cost Ratio | |
| Utility | 0.84 |
| Community | 0.47 |
| Cost of Savings per Unit Volume ($/mg) | |
| Utility | $3,444 |

| End Use Savings Per Replacement | % Savings per Account |
|---|---|
| SF Toilets | 41.8% |

| Targets | |
|---|---|
| Target Method | Percentage |
| % of Accts Targeted / yr | 0.080% |
| Only Effects New Accts | ☐ |

**Costs** — View: Summary

| | Utility | Customer | Total |
|---|---|---|---|
| 2015 | $2,524 | $2,019 | $4,542 |
| 2016 | $2,543 | $2,035 | $4,578 |
| 2017 | $2,563 | $2,050 | $4,613 |
| 2018 | $2,582 | $2,066 | $4,648 |
| 2019 | $2,602 | $2,082 | $4,684 |
| 2020 | $0 | $0 | $0 |

**Targets** — View: Fixtures

| | SF | Total |
|---|---|---|
| 2015 | 13 | 13 |
| 2016 | 14 | 14 |
| 2017 | 14 | 14 |
| 2018 | 14 | 14 |
| 2019 | 14 | 14 |
| 2020 | 0 | 0 |

**Water Savings (mgd)**

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.000085 |
| 2016 | 0.000170 |
| 2017 | 0.000254 |
| 2018 | 0.000338 |
| 2019 | 0.000422 |
| 2020 | 0.000420 |

**Direct Install UHET, Showerheads, and Faucet Aerators - SF, MF**

## Overview

| | |
|---|---|
| Name | Direct Install UHET, Showerheads, |
| Abbr | 17 |
| Category | |
| Measure Type | Standard Measure |

## Time Period

| | |
|---|---|
| First Year | 2019 |
| Last Year | 2023 |
| Measure Length | 5 |

## Measure Life

Permanent ☑

## Fixture Costs

| | Utility | Customer | Fix/Acct |
|---|---|---|---|
| SF | $325.00 | $100.00 | 2 |
| MF | $325.00 | $100.00 | 4 |

## Administration Costs

| | |
|---|---|
| Markup Percentage | 25% |

## Description

CONTRACTOR OR REGIONAL MEASURE: Direct Install High Efficiency Toilets, Showerheads, and Faucet Aerators in Residential Buildings. Utility would subsidize installation cost of a new UHET purchased by the utility. Licensed plumbers, pre-qualified by the Utility would solicit customers directly. Customers would get a new UHET and showerheads and faucet aerators installed at a discounted price.

## Customer Classes

| SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|
| ☑ | ☑ | ☐ | ☐ | ☐ |

## End Uses

| | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| Toilets | ☑ | ☑ | | | |
| Urinals | | | | | |
| Faucets | ☑ | ☑ | | | |
| Showers | ☑ | ☑ | | | |
| Dishwashers | ☐ | ☐ | | | |
| Clothes Washers | ☐ | ☐ | | | |
| Process | | | | | |
| Kitchen Spray Rinse | | | | | |
| Internal Leakage | ☐ | ☐ | | | |
| Baths | ☐ | ☐ | | | |
| Other | ☐ | ☐ | | | |
| Irrigation | ☐ | ☐ | | | |
| Pools | ☐ | ☐ | | | |
| Wash Down | ☐ | ☐ | | | |
| Car Washing | ☐ | ☐ | | | |
| External Leakage | ☐ | ☐ | | | |
| Outdoor | | | | | |
| Cooling | | | | | |

## Comments

Utility cost of current "on bill payment" direct installation program From Santa Rosa costs: $375 for one package and $649 for two. Research for new grant direct install program costs $530 each package. Assume one unit package includes:

- 1 UHET (0.8 gpf) Includes tank, bowl, seat, wax ring, brass bolts.
- 1 Showerhead (1.5 gpm)
- Bathroom aerator (up to 2) (1.5 gpm)
- 1 Kitchen aerator (1.5 gpm)

Assume 2 units per SF acct and 4 per MF acct. Customer cost based on incremental fixture and installation costs ($100).

Toilet water savings is based on 1.6 gpf and 3.5 gpf toilets being replaced with 1.0 gpf toilets. Showerhead and faucet aerator savings based on the replacement of 2.0 gpm or more showerheads with 1.5 gpm showerheads; and 3.0 gpm or greater faucets with 1.0 gpm faucet aerators.

## Results

| | |
|---|---|
| Average Water Savings (mgd) | |
| 0.017399 | |
| Lifetime Savings - Present Value ($) | |
| Utility | $447,214 |
| Community | $794,662 |
| Lifetime Costs - Present Value ($) | |
| Utility | $155,226 |
| Community | $193,435 |
| Benefit to Cost Ratio | |
| Utility | 2.88 |
| Community | 4.11 |
| Cost of Savings per Unit Volume ($/mg) | |
| Utility | $939 |

## End Use Savings Per Replacement

| | % Savings per Account |
|---|---|
| SF Toilets | 60.0% |
| SF Faucets | 50.0% |
| SF Showers | 50.0% |
| MF Toilets | 60.0% |
| MF Faucets | 50.0% |
| MF Showers | 50.0% |

## Targets

| | |
|---|---|
| Target Method | Percentage |
| % of Accts Targeted / yr | 0.500% |
| Only Effects New Accts | ☐ |

## Costs

View: Summary

| | Utility | Customer | Total |
|---|---|---|---|
| 2015 | $0 | $0 | $0 |
| 2016 | $0 | $0 | $0 |
| 2017 | $0 | $0 | $0 |
| 2018 | $0 | $0 | $0 |
| 2019 | $36,514 | $8,988 | $45,502 |
| 2020 | $36,789 | $9,056 | $45,845 |

## Targets

View: Accounts

| | SF | MF | Total |
|---|---|---|---|
| 2015 | 0 | 0 | 0 |
| 2016 | 0 | 0 | 0 |
| 2017 | 0 | 0 | 0 |
| 2018 | 0 | 0 | 0 |
| 2019 | 39 | 3 | 42 |
| 2020 | 40 | 3 | 42 |

## Water Savings (mgd)

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.000000 |
| 2016 | 0.000000 |
| 2017 | 0.000000 |
| 2018 | 0.000000 |
| 2019 | 0.004662 |
| 2020 | 0.009320 |

**HE Clothes Washer Rebate - SF, MF**

## Overview

| | |
|---|---|
| Name | HE Clothes Washer Rebate - SF, M |
| Abbr | 18 |
| Category | |
| Measure Type | Standard Measure |

## Time Period

| | |
|---|---|
| First Year | 2015 |
| Last Year | 2019 |
| Measure Length | 5 |

## Measure Life

Permanent ☑

## Fixture Costs

| | Utility | Customer | Fix/Acct |
|---|---|---|---|
| SF | $125.00 | $675.00 | 1 |
| MF | $125.00 | $675.00 | 1 |

## Administration Costs

| | |
|---|---|
| Markup Percentage | 25% |

## Description

CONTRACTOR MEASURE: Provide a rebate for efficient washing machines to residential customers. It is assumed that the rebates would remain consistent with relevant state and federal regulations (Department of Energy, Energy Star) and only offer the best available technology.

## Customer Classes

| SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|
| ☑ | ☑ | ☐ | ☐ | ☐ |

## End Uses

| | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| Toilets | ☐ | ☐ | | | |
| Urinals | | | | | |
| Faucets | ☐ | ☐ | | | |
| Showers | ☐ | ☐ | | | |
| Dishwashers | ☐ | ☐ | | | |
| Clothes Washers | ☑ | ☑ | | | |
| Process | | | | | |
| Kitchen Spray Rinse | | | | | |
| Internal Leakage | ☐ | ☐ | | | |
| Baths | ☐ | ☐ | | | |
| Other | ☐ | ☐ | | | |
| Irrigation | ☐ | ☐ | | | |
| Pools | ☐ | ☐ | | | |
| Wash Down | ☐ | ☐ | | | |
| Car Washing | ☐ | ☐ | | | |
| External Leakage | ☐ | ☐ | | | |
| Outdoor | | | | | |
| Cooling | | | | | |

## Comments

Current outreach is regional and these costs are included in the public outreach measure. Form processing and check cutting are managed by the water contractor. Water savings is based on difference between a 34 gallon per load machine compared to a 12 gallon per load CEE Tier 3 machine. Rebate of $125/unit based on current average rebate amount among water contractors. Customer costs include installation.

## Results

| | |
|---|---|
| Average Water Savings (mgd) | |
| 0.013034 | |
| Lifetime Savings - Present Value ($) | |
| Utility | $365,103 |
| Community | $921,332 |
| Lifetime Costs - Present Value ($) | |
| Utility | $73,444 |
| Community | $390,724 |
| Benefit to Cost Ratio | |
| Utility | 4.97 |
| Community | 2.36 |
| Cost of Savings per Unit Volume ($/mg) | |
| Utility | $593 |

## End Use Savings Per Replacement

| | % Savings per Account |
|---|---|
| SF Clothes Washers | 64.7% |
| MF Clothes Washers | 64.7% |

## Targets

| | |
|---|---|
| Target Method | Percentage |
| % of Accts Targeted / yr | 1.200% |
| Only Effects New Accts | ☐ |

## Costs

View: Summary

| | Utility | Customer | Total |
|---|---|---|---|
| 2015 | $15,341 | $66,274 | $81,615 |
| 2016 | $15,460 | $66,789 | $82,250 |
| 2017 | $15,580 | $67,305 | $82,884 |
| 2018 | $15,699 | $67,820 | $83,519 |
| 2019 | $15,818 | $68,335 | $84,153 |
| 2020 | $0 | $0 | $0 |

## Targets

View: Accounts

| | SF | MF | Total |
|---|---|---|---|
| 2015 | 92 | 6 | 98 |
| 2016 | 92 | 6 | 99 |
| 2017 | 93 | 7 | 100 |
| 2018 | 94 | 7 | 100 |
| 2019 | 95 | 7 | 101 |
| 2020 | 0 | 0 | 0 |

## Water Savings (mgd)

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.003254 |
| 2016 | 0.006528 |
| 2017 | 0.009812 |
| 2018 | 0.013094 |
| 2019 | 0.016367 |
| 2020 | 0.016290 |

**Submeters Incentive**

| Overview | |
|---|---|
| Name | Submeters Incentive |
| Abbr | 19 |
| Category | |
| Measure Type | Standard Measure |

| Time Period | |
|---|---|
| First Year | 2016 |
| Last Year | 2040 |
| Measure Length | 25 |

| Measure Life | |
|---|---|
| Permanent | ☑ |

| Fixture Costs | Utility | Customer | Fix/Acct |
|---|---|---|---|
| MF | $120.00 | $50.00 | 50 |

| Administration Costs | |
|---|---|
| Markup Percentage | 25% |

**Description**

CONTRACTOR MEASURE: Require or provide a partial cost rebate to meter all remaining mobile home parks that are currently master metered but not separately metered. Provide a rebate (per unit) to assist MF building owners installing submeters on each existing individual apartment or condominium unit.
Provide a rebate (per unit) to assist MF building owners installing submeters on each new individual apartment unit.
Require the submetering of individual units in new multi-family, condos, townhouses, and mobile-home parks.

| Customer Classes | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| | ☐ | ☑ | ☐ | ☐ | ☐ |

| End Uses | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| Toilets | | ☑ | | | |
| Urinals | | | | | |
| Faucets | | ☑ | | | |
| Showers | | ☑ | | | |
| Dishwashers | | ☑ | | | |
| Clothes Washers | | ☑ | | | |
| Process | | | | | |
| Kitchen Spray Rinse | | | | | |
| Internal Leakage | | ☑ | | | |
| Baths | | ☐ | | | |
| Other | | ☐ | | | |
| Irrigation | | ☑ | | | |
| Pools | | ☐ | | | |
| Wash Down | | ☐ | | | |
| Car Washing | | ☐ | | | |
| External Leakage | | ☑ | | | |
| Outdoor | | | | | |
| Cooling | | | | | |

**Comments**

For Rohnert Park estimated $120 utility cost for rebate and $50 customer cost per meter. Assume a total of 65 rebates per year as requested by Rohnert Park. Assume 50 dwelling units (mobile homes) per account. DU = dwelling unit (i.e., mobile home)."
Consider patterning after Santa Clara Valley Water District program.
http://www.valleywater.org/Programs/SubmeterRebateProgram.aspx

| Results | |
|---|---|
| Average Water Savings (mgd) | |
| 0.008725 | |
| Lifetime Savings - Present Value ($) | |
| Utility | $213,737 |
| Community | $347,432 |
| Lifetime Costs - Present Value ($) | |
| Utility | $206,385 |
| Community | $275,180 |
| Benefit to Cost Ratio | |
| Utility | 1.04 |
| Community | 1.26 |
| Cost of Savings per Unit Volume ($/mg) | |
| Utility | $2,491 |

| End Use Savings Per Replacement | % Savings per Account |
|---|---|
| MF Toilets | 15.0% |
| MF Faucets | 15.0% |
| MF Showers | 15.0% |
| MF Dishwashers | 15.0% |
| MF Clothes Washers | 15.0% |
| MF Internal Leakage | 15.0% |
| MF Irrigation | 15.0% |
| MF External Leakage | 15.0% |

| Targets | |
|---|---|
| Target Method | Percentage |
| % of Accts Targeted / yr | 0.270% |
| Only Effects New Accts | ☐ |

**Costs** — View: Summary

| | Utility | Customer | Total |
|---|---|---|---|
| 2015 | $0 | $0 | $0 |
| 2016 | $10,918 | $3,639 | $14,557 |
| 2017 | $11,002 | $3,667 | $14,670 |
| 2018 | $11,086 | $3,695 | $14,782 |
| 2019 | $11,171 | $3,724 | $14,894 |
| 2020 | $11,255 | $3,752 | $15,006 |

**Targets** — View: Fixtures

| | MF | Total |
|---|---|---|
| 2015 | 0 | 0 |
| 2016 | 73 | 73 |
| 2017 | 73 | 73 |
| 2018 | 74 | 74 |
| 2019 | 74 | 74 |
| 2020 | 75 | 75 |

**Water Savings (mgd)**

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.000000 |
| 2016 | 0.000701 |
| 2017 | 0.001404 |
| 2018 | 0.002107 |
| 2019 | 0.002811 |
| 2020 | 0.003516 |

**Outdoor Large Landscape Audits & Water Budgeting/Monitoring**

### Overview

| | |
|---|---|
| Name | Outdoor Large Landscape Audits & |
| Abbr | 20 |
| Category | |
| Measure Type | Standard Measure |

### Time Period

| | |
|---|---|
| First Year | 2015 |
| Last Year | 2019 |
| Measure Length | 5 |

### Measure Life

| | |
|---|---|
| Permanent | ☐ |
| Years | 5 |
| Repeat | ☐ |

### Fixture Costs

| | Utility | Customer | Fix/Acct |
|---|---|---|---|
| IRR | $2,500.00 | $500.00 | 1 |

### Administration Costs

| | |
|---|---|
| Markup Percentage | 35% |

### Description

CONTRACTOR OR REGIONAL MEASURE: Outdoor water audits offered for existing large landscape customers. Normally those with high water use are targeted and provided a customized report on how to save water. All large multi-family residential, CII, and public irrigators of large landscapes would be eligible for free landscape water audits upon request. Website will provide feedback on irrigation water use (budget vs. actual). May include the cost for dedicated meter conversion.

### Customer Classes

| SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☑ |

### End Uses

| | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| Toilets | | | | | ☐ |
| Urinals | | | | | ☐ |
| Faucets | | | | | ☐ |
| Showers | | | | | ☐ |
| Dishwashers | | | | | ☐ |
| Clothes Washers | | | | | ☐ |
| Process | | | | | ☐ |
| Kitchen Spray Rinse | | | | | ☐ |
| Internal Leakage | | | | | ☐ |
| Baths | | | | | ☐ |
| Other | | | | | ☐ |
| Irrigation | | | | | ☑ |
| Pools | | | | | |
| Wash Down | | | | | |
| Car Washing | | | | | |
| External Leakage | | | | | ☑ |
| Outdoor | | | | | |
| Cooling | | | | | |

### Comments

Regional - Green Business Program and some Contractor (more discussion needed). Assumes all large landscape accounts can apply. Assume an average site is 3 acres and costs $500/acre to survey. Total Utility cost assumes $1,500 per site survey and $1,000 per water budget including some dedicated meter conversions. Savings assumes 15% irrigation and external leakage savings as a result of the survey and an additional 10% savings due to water budgeting and monitoring. Santa Rosa average commercial/irrigation lot size is 33,000 sq feet. Many companies are helping water utilitiles including WaterFluence and Eagleaerial.

### Results

| | |
|---|---|
| Average Water Savings (mgd) | |
| 0.000548 | |
| Lifetime Savings - Present Value ($) | |
| Utility | $19,429 |
| Community | $19,429 |
| Lifetime Costs - Present Value ($) | |
| Utility | $27,249 |
| Community | $31,286 |
| Benefit to Cost Ratio | |
| Utility | 0.71 |
| Community | 0.62 |
| Cost of Savings per Unit Volume ($/mg) | |
| Utility | $5,235 |

### End Use Savings Per Replacement

| | % Savings per Account |
|---|---|
| IRR Irrigation | 25.0% |
| IRR External Leakage | 25.0% |

### Targets

| | |
|---|---|
| Target Method | Percentage |
| % of Accts Targeted / yr | 0.500% |
| Only Effects New Accts | ☐ |

### Costs

View: Summary

| | Utility | Customer | Total |
|---|---|---|---|
| 2015 | $5,586 | $828 | $6,413 |
| 2016 | $5,685 | $842 | $6,527 |
| 2017 | $5,784 | $857 | $6,640 |
| 2018 | $5,883 | $871 | $6,754 |
| 2019 | $5,982 | $886 | $6,868 |
| 2020 | $0 | $0 | $0 |

### Targets

View: Accounts

| | IRR | Total |
|---|---|---|
| 2015 | 2 | 2 |
| 2016 | 2 | 2 |
| 2017 | 2 | 2 |
| 2018 | 2 | 2 |
| 2019 | 2 | 2 |
| 2020 | 0 | 0 |

### Water Savings (mgd)

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.000550 |
| 2016 | 0.001111 |
| 2017 | 0.001681 |
| 2018 | 0.002260 |
| 2019 | 0.002850 |
| 2020 | 0.002299 |

**Landscape Rebates and Incentives for Equipment Upgrade**

| Overview | |
|---|---|
| Name | Landscape Rebates and Incentives for Equipment Upgr |
| Abbr | 21 |
| Category | |
| Measure Type | Standard Measure |

| Time Period | |
|---|---|
| First Year | 2015 |
| Last Year | 2019 |
| Measure Length | 5 |

| Measure Life | |
|---|---|
| Permanent | ☐ |
| Years | 10 |
| Repeat | ☐ |

**Fixture Costs**

| | Utility | Customer | Fix/Acct |
|---|---|---|---|
| SF | $250.00 | $250.00 | 1 |
| MF | $250.00 | $250.00 | 1 |
| COM | $1,000.00 | $500.00 | 1 |
| INDINST | $1,000.00 | $500.00 | 1 |
| IRR | $1,000.00 | $500.00 | 1 |

**Administration Costs**

| | |
|---|---|
| Markup Percentage | 25% |

**Description**

CONTRACTOR MEASURE: For SF, MF, CII, and IRR customers with landscape, provide a Smart Landscape Rebate Program with rebates for substantive landscape retrofits or installation of water efficient upgrades; Rebates contribute towards the purchase and installation of water-wise plants, compost, mulch and selected types of irrigation equipment upgrades including: Large Rainwater Catchment Systems, Rain Barrels, Rain Sensors, Rotating Sprinkler Nozzles, Drip Irrigation Equipment, Weather Based Irrigation Controllers and Gray Water Systems.

**Customer Classes**

| | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| | ☑ | ☑ | ☑ | ☑ | ☑ |

**End Uses**

| | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| Toilets | ☐ | ☐ | ☐ | ☐ | ☐ |
| Urinals | | | ☐ | ☐ | ☐ |
| Faucets | ☐ | ☐ | ☐ | ☐ | ☐ |
| Showers | ☐ | ☐ | ☐ | ☐ | ☐ |
| Dishwashers | ☐ | ☐ | ☐ | ☐ | ☐ |
| Clothes Washers | ☐ | ☐ | ☐ | ☐ | ☐ |
| Process | | | ☐ | ☐ | ☐ |
| Kitchen Spray Rinse | | | ☐ | ☐ | ☐ |
| Internal Leakage | ☐ | ☐ | ☐ | ☐ | ☐ |
| Baths | ☐ | ☐ | | | ☐ |
| Other | ☐ | ☐ | ☐ | ☐ | ☐ |
| Irrigation | ☑ | ☑ | ☑ | ☑ | ☑ |
| Pools | ☐ | ☐ | | ☐ | |
| Wash Down | ☐ | ☐ | | | |
| Car Washing | ☐ | ☐ | | | |
| External Leakage | ☐ | ☐ | ☐ | ☐ | ☐ |
| Outdoor | | | | | |
| Cooling | | | ☐ | ☐ | |

**Comments**

Rebate amounts based on Santa Rosa's current rebate program. Customer costs assume average installation costs and incremental equipment purchase costs. Average savings of 15% assumed since savings can range from 5%-25% per equipment upgrade. This program can potentially be modified to just target the larger accounts.

**Results**

| Average Water Savings (mgd) | |
|---|---|
| 0.004216 | |
| **Lifetime Savings - Present Value ($)** | |
| Utility | $139,208 |
| Community | $139,208 |
| **Lifetime Costs - Present Value ($)** | |
| Utility | $171,921 |
| Community | $289,652 |
| **Benefit to Cost Ratio** | |
| Utility | 0.81 |
| Community | 0.48 |
| **Cost of Savings per Unit Volume ($/mg)** | |
| Utility | $4,294 |

**End Use Savings Per Replacement**

| | % Savings per Account |
|---|---|
| SF Irrigation | 15.0% |
| MF Irrigation | 15.0% |
| COM Irrigation | 15.0% |
| INDINST Irrigation | 15.0% |
| IRR Irrigation | 15.0% |

**Targets**

| | |
|---|---|
| Target Method | Percentage |
| % of Accts Targeted / yr | 1.000% |
| Only Effects New Accts | ☐ |

**Costs**

View: Summary

| | Utility | Customer | Total |
|---|---|---|---|
| 2015 | $35,719 | $24,515 | $60,234 |
| 2016 | $36,097 | $24,746 | $60,843 |
| 2017 | $36,475 | $24,977 | $61,452 |
| 2018 | $36,854 | $25,208 | $62,061 |
| 2019 | $37,232 | $25,438 | $62,671 |
| 2020 | $0 | $0 | $0 |

**Targets**

View: Accounts

| | SF | MF | COM | INDINST | IRR | Total |
|---|---|---|---|---|---|---|
| 2015 | 76 | 5 | 5 | 0 | 3 | 90 |
| 2016 | 77 | 5 | 5 | 0 | 3 | 91 |
| 2017 | 78 | 5 | 5 | 0 | 3 | 91 |
| 2018 | 78 | 5 | 5 | 0 | 3 | 92 |
| 2019 | 79 | 6 | 5 | 0 | 4 | 93 |
| 2020 | 0 | 0 | 0 | 0 | 0 | 0 |

**Water Savings (mgd)**

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.002144 |
| 2016 | 0.004312 |
| 2017 | 0.006504 |
| 2018 | 0.008721 |
| 2019 | 0.010961 |
| 2020 | 0.010961 |

**Turf Removal - MF, CII**

## Overview

| | |
|---|---|
| Name | Turf Removal - MF, CII |
| Abbr | 22 |
| Category | |
| Measure Type | Standard Measure |

## Time Period

| | |
|---|---|
| First Year | 2015 |
| Last Year | 2024 |
| Measure Length | 10 |

## Measure Life

Permanent ☑

## Fixture Costs

| | Utility | Customer | Fix/Acct |
|---|---|---|---|
| MF | $2,500.00 | $20,000.00 | 1 |
| COM | $2,500.00 | $20,000.00 | 1 |
| INDINST | $2,500.00 | $20,000.00 | 1 |
| IRR | $2,500.00 | $20,000.00 | 1 |

## Administration Costs

| | |
|---|---|
| Markup Percentage | 30% |

## Description

CONTRACTOR MEASURE: Provide a per square foot incentive to remove turf and replace with low water use plants or hardscape. Rebate is based on price per square foot removed, and capped at an upper limit for multi-family or commercial residence.

## Customer Classes

| SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|
| ☐ | ☑ | ☑ | ☑ | ☑ |

## End Uses

| | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| Toilets | | ☐ | ☐ | ☐ | ☐ |
| Urinals | | | ☐ | ☐ | ☐ |
| Faucets | | ☐ | ☐ | ☐ | ☐ |
| Showers | | ☐ | ☐ | ☐ | ☐ |
| Dishwashers | | ☐ | ☐ | ☐ | ☐ |
| Clothes Washers | | ☐ | ☐ | ☐ | ☐ |
| Process | | | ☐ | ☐ | ☐ |
| Kitchen Spray Rinse | | | ☐ | ☐ | ☐ |
| Internal Leakage | | ☐ | ☐ | ☐ | ☐ |
| Baths | | ☐ | | | ☐ |
| Other | | ☐ | ☐ | ☐ | ☐ |
| Irrigation | | ☑ | ☑ | ☑ | ☑ |
| Pools | | ☐ | | ☐ | |
| Wash Down | | ☐ | | | |
| Car Washing | | ☐ | | | |
| External Leakage | | ☐ | ☐ | ☐ | ☐ |
| Outdoor | | | | | |
| Cooling | | | ☐ | ☐ | |

## Comments

Utility costs assumes $0.5 per sf per site with an max of 5,000 square-feet replacement reimbursement (per Santa Rosa's current program). Customer costs include incremental landscape square-footage development costs and installation costs. Possible allow permeable landscape.

Savings assume more than 50% of turf replaced with low water-using plants.

## Results

| | |
|---|---|
| Average Water Savings (mgd) | |
| 0.009753 | |
| Lifetime Savings - Present Value ($) | |
| Utility | $257,066 |
| Community | $257,066 |
| Lifetime Costs - Present Value ($) | |
| Utility | $202,343 |
| Community | $1,447,531 |
| Benefit to Cost Ratio | |
| Utility | 1.27 |
| Community | 0.18 |
| Cost of Savings per Unit Volume ($/mg) | |
| Utility | $2,185 |

## End Use Savings Per Replacement

| | % Savings per Account |
|---|---|
| MF Irrigation | 25.0% |
| COM Irrigation | 25.0% |
| INDINST Irrigation | 25.0% |
| IRR Irrigation | 25.0% |

## Targets

| | |
|---|---|
| Target Method | Percentage |
| % of Accts Targeted / yr | 0.500% |
| Only Effects New Accts | ☐ |

## Costs

View: Summary

| | Utility | Customer | Total |
|---|---|---|---|
| 2015 | $21,889 | $134,700 | $156,589 |
| 2016 | $22,190 | $136,553 | $158,743 |
| 2017 | $22,491 | $138,406 | $160,896 |
| 2018 | $22,792 | $140,258 | $163,050 |
| 2019 | $23,093 | $142,111 | $165,204 |
| 2020 | $23,394 | $143,964 | $167,358 |

## Targets

View: Accounts

| | MF | COM | INDINST | IRR | Total |
|---|---|---|---|---|---|
| 2015 | 3 | 2 | 0 | 2 | 7 |
| 2016 | 3 | 2 | 0 | 2 | 7 |
| 2017 | 3 | 2 | 0 | 2 | 7 |
| 2018 | 3 | 3 | 0 | 2 | 7 |
| 2019 | 3 | 3 | 0 | 2 | 7 |
| 2020 | 3 | 3 | 0 | 2 | 7 |

## Water Savings (mgd)

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.001124 |
| 2016 | 0.002262 |
| 2017 | 0.003416 |
| 2018 | 0.004584 |
| 2019 | 0.005768 |
| 2020 | 0.006966 |

**Turf Removal - SF**

| Overview | |
|---|---|
| Name | Turf Removal - SF |
| Abbr | 23 |
| Category | |
| Measure Type | Standard Measure |

| Time Period | |
|---|---|
| First Year | 2015 |
| Last Year | 2024 |
| Measure Length | 10 |

| Measure Life | |
|---|---|
| Permanent | ☑ |

| Fixture Costs | Utility | Customer | Fix/Acct |
|---|---|---|---|
| SF | $250.00 | $2,000.00 | 1 |

| Administration Costs | |
|---|---|
| Markup Percentage | 30% |

**Description**

CONTRACTOR MEASURE: Provide a per square foot incentive to remove turf and replace with low water use plants or permeable hardscape. Rebate based on dollars per square foot removed and capped at an upper limit for single family residences.

| Customer Classes | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| | ☑ | ☐ | ☐ | ☐ | ☐ |

| End Uses | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| Toilets | ☐ | | | | |
| Urinals | | | | | |
| Faucets | ☐ | | | | |
| Showers | ☐ | | | | |
| Dishwashers | ☐ | | | | |
| Clothes Washers | ☐ | | | | |
| Process | | | | | |
| Kitchen Spray Rinse | | | | | |
| Internal Leakage | ☐ | | | | |
| Baths | ☐ | | | | |
| Other | ☐ | | | | |
| Irrigation | ☑ | | | | |
| Pools | ☐ | | | | |
| Wash Down | ☐ | | | | |
| Car Washing | ☐ | | | | |
| External Leakage | ☐ | | | | |
| Outdoor | | | | | |
| Cooling | | | | | |

**Comments**

Utility costs assume based on Santa Rosa program, rebate is $.50 per sf, max is $250 and 500 sf. replacement reimbursement per Santa Rosa's current program. Santa Rosa assumes: 75% removed for residential. Customer costs include incremental landscape square-footage development costs and installation costs. Possible allow permable landscape.

Savings assume more than 100% of turf replaced with low water-using plants.

| Results | |
|---|---|
| Average Water Savings (mgd) | |
| 0.006791 | |
| Lifetime Savings - Present Value ($) | |
| Utility | $179,066 |
| Community | $179,066 |
| Lifetime Costs - Present Value ($) | |
| Utility | $225,539 |
| Community | $1,613,473 |
| Benefit to Cost Ratio | |
| Utility | 0.79 |
| Community | 0.11 |
| Cost of Savings per Unit Volume ($/mg) | |
| Utility | $3,497 |

| End Use Savings Per Replacement | % Savings per Account |
|---|---|
| SF Irrigation | 15.0% |

| Targets | |
|---|---|
| Target Method | Percentage |
| % of Accts Targeted / yr | 1.000% |
| Only Effects New Accts | ☐ |

**Costs** — View: Summary

| | Utility | Customer | Total |
|---|---|---|---|
| 2015 | $24,853 | $152,940 | $177,793 |
| 2016 | $25,046 | $154,129 | $179,175 |
| 2017 | $25,239 | $155,318 | $180,557 |
| 2018 | $25,432 | $156,506 | $181,939 |
| 2019 | $25,625 | $157,695 | $183,321 |
| 2020 | $25,819 | $158,884 | $184,703 |

**Targets** — View: Accounts

| | SF | Total |
|---|---|---|
| 2015 | 76 | 76 |
| 2016 | 77 | 77 |
| 2017 | 78 | 78 |
| 2018 | 78 | 78 |
| 2019 | 79 | 79 |
| 2020 | 79 | 79 |

**Water Savings (mgd)**

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.000796 |
| 2016 | 0.001597 |
| 2017 | 0.002406 |
| 2018 | 0.003220 |
| 2019 | 0.004040 |
| 2020 | 0.004867 |

**Water Conserving Landscape and Irrigation Codes**

| Overview | |
|---|---|
| Name | Water Conserving Landscape and Irrigation ( |
| Abbr | 24 |
| Category | |
| Measure Type | Standard Measure |

| Time Period | |
|---|---|
| First Year | 2015 |
| Last Year | 2040 |
| Measure Length | 26 |

| Measure Life | |
|---|---|
| Permanent | ☑ |

**Fixture Costs**

| | Utility | Customer | Fix/Acct |
|---|---|---|---|
| MF | $100.00 | $1,000.00 | 1 |
| COM | $100.00 | $1,000.00 | 1 |
| INDINST | $100.00 | $1,000.00 | 1 |
| IRR | $100.00 | $1,000.00 | 1 |

| Administration Costs | |
|---|---|
| Markup Percentage | 25% |

**Description**

CONTRACTOR MEASURE: Develop and enforce Water Efficient Landscape Design Standards. Standards specify that development projects subject to design review be landscaped according to climate appropriate principals, with appropriate turf ratios, plant selection, efficient irrigation systems and smart irrigation controllers. The ordinance could require certification of landscape professionals.

**Customer Classes**

| | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| | ☐ | ☑ | ☑ | ☑ | ☑ |

**End Uses**

| | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| Toilets | | ☐ | ☐ | ☐ | ☐ |
| Urinals | | | ☐ | ☐ | ☐ |
| Faucets | | ☐ | ☐ | ☐ | ☐ |
| Showers | | ☐ | ☐ | ☐ | ☐ |
| Dishwashers | | ☐ | ☐ | ☐ | ☐ |
| Clothes Washers | | ☐ | ☐ | ☐ | ☐ |
| Process | | | ☐ | ☐ | ☐ |
| Kitchen Spray Rinse | | | ☐ | ☐ | ☐ |
| Internal Leakage | | ☐ | ☐ | ☐ | ☐ |
| Baths | | ☐ | | | ☐ |
| Other | | ☐ | ☐ | ☐ | ☐ |
| Irrigation | | ☑ | ☑ | ☑ | ☑ |
| Pools | | ☐ | | ☐ | |
| Wash Down | | ☐ | | | |
| Car Washing | | ☐ | | | |
| External Leakage | | ☐ | ☐ | ☐ | ☐ |
| Outdoor | | | | | |
| Cooling | | | ☐ | ☐ | |

**Comments**

All new accounts apply and those that require a landscape permit. Utility cost is an inspection cost. Customer cost assumes incremental cost to comply versus install typical all-turf landscape.

**Results**

| Average Water Savings (mgd) | |
|---|---|
| 0.018398 | |
| **Lifetime Savings - Present Value ($)** | |
| Utility | $463,232 |
| Community | $463,232 |
| **Lifetime Costs - Present Value ($)** | |
| Utility | $30,879 |
| Community | $277,914 |
| **Benefit to Cost Ratio** | |
| Utility | 15.00 |
| Community | 1.67 |
| **Cost of Savings per Unit Volume ($/mg)** | |
| Utility | $177 |

**End Use Savings Per Replacement**

| | % Savings per Account |
|---|---|
| MF Irrigation | 15.0% |
| COM Irrigation | 15.0% |
| INDINST Irrigation | 15.0% |
| IRR Irrigation | 15.0% |

**Targets**

| | |
|---|---|
| Target Method | Percentage |
| % of Accts Targeted / yr | 100.000% |
| Only Effects New Accts | ☑ |

**Costs**

View: Summary

| | Utility | Customer | Total |
|---|---|---|---|
| 2015 | $2,316 | $18,528 | $20,844 |
| 2016 | $2,316 | $18,528 | $20,844 |
| 2017 | $2,316 | $18,528 | $20,844 |
| 2018 | $2,316 | $18,528 | $20,844 |
| 2019 | $2,316 | $18,528 | $20,844 |
| 2020 | $2,316 | $18,528 | $20,844 |

**Targets**

View: Accounts

| | MF | COM | INDINST | IRR | Total |
|---|---|---|---|---|---|
| 2015 | 4 | 8 | 0 | 6 | 19 |
| 2016 | 4 | 8 | 0 | 6 | 19 |
| 2017 | 4 | 8 | 0 | 6 | 19 |
| 2018 | 4 | 8 | 0 | 6 | 19 |
| 2019 | 4 | 8 | 0 | 6 | 19 |
| 2020 | 4 | 8 | 0 | 6 | 19 |

**Water Savings (mgd)**

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.001797 |
| 2016 | 0.003594 |
| 2017 | 0.005390 |
| 2018 | 0.007187 |
| 2019 | 0.008984 |
| 2020 | 0.010781 |

**Require Smart Irrigation Controllers and Rain Sensors in New Development**

| Overview | |
|---|---|
| Name | Require Smart Irrigation Controllers and Rai |
| Abbr | 25 |
| Category | |
| Measure Type | Standard Measure |

| Time Period | |
|---|---|
| First Year | 2015 |
| Last Year | 2040 |
| Measure Length | 26 |

| Measure Life | |
|---|---|
| Permanent | ☑ |

| Fixture Costs | Utility | Customer | Fix/Acct |
|---|---|---|---|
| SF | $100.00 | $750.00 | 1 |
| MF | $100.00 | $750.00 | 1 |
| COM | $100.00 | $750.00 | 3 |
| INDINST | $100.00 | $750.00 | 3 |

| Administration Costs | |
|---|---|
| Markup Percentage | 10% |

**Description**

CONTRACTOR MEASURE: Require Weather Adjusting Smart Irrigation Controllers per Cal Green on New Development. It is optional to require Rain Sensors in Cal Green for New Development. Require developers for all properties of greater than four residential units and all commercial development to install the weather based irrigation controllers. May require landscaper training.

| Customer Classes | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| | ☑ | ☑ | ☑ | ☑ | ☐ |

| End Uses | SF | MF | COM | INDINS | IRR |
|---|---|---|---|---|---|
| Toilets | ☐ | ☐ | ☐ | ☐ | |
| Urinals | | | ☐ | ☐ | |
| Faucets | ☐ | ☐ | ☐ | ☐ | |
| Showers | ☐ | ☐ | ☐ | ☐ | |
| Dishwashers | ☐ | ☐ | ☐ | ☐ | |
| Clothes Washers | ☐ | ☐ | ☐ | ☐ | |
| Process | | | ☐ | ☐ | |
| Kitchen Spray Rinse | | | ☐ | ☐ | |
| Internal Leakage | ☐ | ☐ | ☐ | ☐ | |
| Baths | ☐ | ☐ | | | |
| Other | ☐ | ☐ | ☐ | ☐ | |
| Irrigation | ☑ | ☑ | ☑ | ☑ | |
| Pools | ☐ | ☐ | | ☐ | |
| Wash Down | ☐ | ☐ | | | |
| Car Washing | ☐ | ☐ | | | |
| External Leakage | ☐ | ☐ | ☐ | ☐ | |
| Outdoor | | | | | |
| Cooling | | | ☐ | ☐ | |

**Comments**

Customer cost assumes $700 device unit cost (per RainBird ITC-LX) and $50 unit installation cost per controller with 3 controllers needed for large sites. Utility cost reflects inspection costs.

Savings used in BAWSCA analysis. Valencia Water Company weather-based irrigation controller pilot study in 2014 concluded 15% irrigation savings.

| Results | |
|---|---|
| Average Water Savings (mgd) | |
| 0.017775 | |
| Lifetime Savings - Present Value ($) | |
| Utility | $438,861 |
| Community | $438,861 |
| Lifetime Costs - Present Value ($) | |
| Utility | $174,351 |
| Community | $1,363,108 |
| Benefit to Cost Ratio | |
| Utility | 2.52 |
| Community | 0.32 |
| Cost of Savings per Unit Volume ($/mg) | |
| Utility | $1,033 |

| End Use Savings Per Replacement | % Savings per Account |
|---|---|
| SF Irrigation | 15.0% |
| MF Irrigation | 15.0% |
| COM Irrigation | 15.0% |
| INDINST Irrigation | 15.0% |

| Targets | |
|---|---|
| Target Method | Percentage |
| % of Accts Targeted / yr | 100.000% |
| Only Effects New Accts | ☑ |

**Costs** — View: Summary

| | Utility | Customer | Total |
|---|---|---|---|
| 2015 | $9,802 | $66,832 | $76,634 |
| 2016 | $9,802 | $66,832 | $76,634 |
| 2017 | $9,802 | $66,832 | $76,634 |
| 2018 | $9,802 | $66,832 | $76,634 |
| 2019 | $9,802 | $66,832 | $76,634 |
| 2020 | $9,802 | $66,832 | $76,634 |

**Targets** — View: Accounts

| | SF | MF | COM | INDINST | Total |
|---|---|---|---|---|---|
| 2015 | 59 | 4 | 8 | 0 | 72 |
| 2016 | 59 | 4 | 8 | 0 | 72 |
| 2017 | 59 | 4 | 8 | 0 | 72 |
| 2018 | 59 | 4 | 8 | 0 | 72 |
| 2019 | 59 | 4 | 8 | 0 | 72 |
| 2020 | 59 | 4 | 8 | 0 | 72 |

**Water Savings (mgd)**

| | Total Savings (mgd) |
|---|---|
| 2015 | 0.001327 |
| 2016 | 0.002653 |
| 2017 | 0.003980 |
| 2018 | 0.005307 |
| 2019 | 0.006633 |
| 2020 | 0.007960 |

# APPENDIX E - LIST OF CONTACTS

The following table presents each Water Contractor's contact information.

| Water Contractor | Name | Phone Number | E-mail | Role |
|---|---|---|---|---|
| City of Cotati | Damien O'Bid | 707-665-3620 | dobid@cotaticity.org | City Engineer/Public Works Director |
| City of Petaluma | Nick Crump | 707-778-4487 | ncrump@ci.petaluma.ca.us | Environmental Services Technician |
| | Leah Walker | 707-778-4583 | lwalker@ci.petaluma.ca.us | Environmental Services Manager |
| City of Rohnert Park | Mary Grace Pawson | 707-588-2234 | mpawson@rpcity.org | City Engineer |
| City of Santa Rosa | Rocky Vogler | 707-543-3938 | rvogler@srcity.org | Senior Water Resources Planner |
| | Teresa Gudino | 707-543-3942 | tgudino@srcity.org | Water Resources Analyst |
| City of Sonoma | Dan Takasugi | 707-933-2230 | dtakasugi@sonomacity.org | City Engineer/Public Works Director |
| | Steve MacCarthy | 707-933-2231 | steve@sonomacity.org | Water System Supervisor |
| | Mike Brett | 707-933-2247 | mbrett@sonomacity.org | Water Conservation Specialist |
| Marin Municipal Water District | Carl Gowan | 415-945-1577 | cgowan@marinwater.org | Principal Engineer |
| | Mike Ban | 415-945-1435 | mban@marinwater.org | Environmental & Engineering Services Manager |
| | Oreen Delgado | 415-945-1425 | odelgado@marinwater.org | Finance Manager |
| | Dan Carney | 415-945-1522 | dcarney@marinwater.org | Water Conservation Manager |
| | Alex Anaya | 415-945-1588 | aanaya@marinwater.org | Engineering Technician |
| | Lucy Croy | 415-945-1590 | lcroy@marinwater.org | Assistant Engineer |
| North Marin Water District | Chris DeGabriele | 415-761-8905 | cdegrabriele@nmwd.com | General Manager |
| | Ryan Grisso | 415-761-8933 | rgrisso@nmwd.com | Water Conservation Coordinator |
| | Drew McIntyre | 415-761-8912 | drewm@nmwd.com | Chief Engineer |
| Town of Windsor | James M Smith | 707-838-5343 | jmsmith@Townofwindsor.com | Senior Civil Engineer |
| | Paul Piazza | 707-838-5357 | ppiazza@Townofwindsor.com | Management Analyst/ Water Conservation Analyst |
| | Toni Bertolero | 707-838-5978 | tbertolero@townofwindsor.com | Town Engineer/Public Works Director |
| | Mike Cave | 707-838-5329 | mcave@townofwindsor.com | Utility Systems Superintendent |

| Water Contractor | Name | Phone Number | E-mail | Role |
|---|---|---|---|---|
| Valley of the Moon Water District | Daniel Muelrath | 707-996-1037 | dmuelrath@vomwd.com | General Manager |
| | Shari Walk | 707-996-1037 | swalk@vomwd.com | Admin & Finance Manager |
| Maddaus Water Management | Michelle Maddaus | 925-831-0194 | michelle@maddauswater.com | MWM Project Manager |

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# APPENDIX 3

# AWWA WATER AUDIT MODEL OUTPUT

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# AWWA Free Water Audit Software v5.0



This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format, and is not meant to take the place of a full-scale, comprehensive water audit format.

Auditors are strongly encouraged to refer to the most current edition of AWWA M36 Manual for Water Audits for detailed guidance on the water auditing process and targetting loss reduction levels

The spreadsheet contains several separate worksheets. Sheets can be accessed using the tabs towards the bottom of the screen, or by clicking the buttons below.

**Please begin by providing the following information**

| | |
|---|---|
| Name of Contact Person: | Mary Grace Pawson |
| Email Address: | mpawson@rpcity.org |
| Telephone \| Ext.: | 707 588-2234 |
| Name of City / Utility: | City of Rohnert Park |
| City/Town/Municipality: | City of Rohnert Park |
| State / Province: | California (CA) |
| Country: | USA |
| Year: | 2014 Calendar Year |
| Audit Preparation Date: | 06/012016 |
| Volume Reporting Units: | Acre-feet |
| PWSID / Other ID: | 4910014 |

**The following guidance will help you complete the Audit**

All audit data are entered on the ***Reporting Worksheet***

- Value can be entered by user
- Value calculated based on input data
- These cells contain recommended default values

Use of Option (Radio) Buttons: Pcnt: 0.25% Value:

Select the default percentage by choosing the option button on the left

To enter a value, choose this button and enter a value in the cell to the right

**The following worksheets are available by clicking the buttons below or selecting the tabs along the bottom of the page**

***Instructions***
The current sheet. Enter contact information and basic audit details (year, units etc)

***Reporting Worksheet***
Enter the required data on this worksheet to calculate the water balance and data grading

***Comments***
Enter comments to explain how values were calculated or to document data sources

***Performance Indicators***
Review the performance indicators to evaluate the results of the audit

***Water Balance***
The values entered in the Reporting Worksheet are used to populate the Water Balance

***Dashboard***
A graphical summary of the water balance and Non-Revenue Water components

***Grading Matrix***
Presents the possible grading options for each input component of the audit

***Service Connection Diagram***
Diagrams depicting possible customer service connection line configurations

***Definitions***
Use this sheet to understand the terms used in the audit process

***Loss Control Planning***
Use this sheet to interpret the results of the audit validity score and performance indicators

***Example Audits***
Reporting Worksheet and Performance Indicators examples are shown for two validated audits

***Acknowledgements***
Acknowledgements for the AWWA Free Water Audit Software v5.0

If you have questions or comments regarding the software please contact us via email at: wlc@awwa.org

# AWWA Free Water Audit Software:
## Reporting Worksheet

WAS v5.0



? Click to access definition
+ Click to add a comment

**Water Audit Report for:** #REF!
**Reporting Year:** 4910014 | 1/4910014 - 12/4910014

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

**All volumes to be entered as: ACRE-FEET PER YEAR**

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

### WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

| | | | | | Pcnt: | Value: | |
|---|---|---|---|---|---|---|---|
| Volume from own sources: | 7 | 1,583.223 | acre-ft/yr | 3 | | | acre-ft/yr |
| Water imported: | 10 | 3,041.200 | acre-ft/yr | 6 | | | acre-ft/yr |
| Water exported: | n/a | | acre-ft/yr | | | | acre-ft/yr |

Enter negative % or value for under-registration
Enter positive % or value for over-registration

**WATER SUPPLIED:** 4,624.423 acre-ft/yr

### AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

| | | | Pcnt: | Value: | |
|---|---|---|---|---|---|
| Billed metered: | 5 | 3,960.000 | acre-ft/yr | | | |
| Billed unmetered: | 6 | 6.000 | acre-ft/yr | | | |
| Unbilled metered: | n/a | | acre-ft/yr | | | |
| Unbilled unmetered: | | 57.805 | acre-ft/yr | 1.25% | | acre-ft/yr |

**Default option selected for Unbilled unmetered - a grading of 5 is applied but not displayed**

**AUTHORIZED CONSUMPTION:** 4,023.805 acre-ft/yr

Use buttons to select percentage of water supplied **OR** value

**WATER LOSSES (Water Supplied - Authorized Consumption)** 600.618 acre-ft/yr

**Apparent Losses**

| | | | Pcnt: | Value: | |
|---|---|---|---|---|---|
| Unauthorized consumption: | | 11.561 | acre-ft/yr | 0.25% | | acre-ft/yr |

**Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed**

| | | | | | |
|---|---|---|---|---|---|
| Customer metering inaccuracies: | 6 | 0.000 | acre-ft/yr | | acre-ft/yr |
| Systematic data handling errors: | | 9.900 | acre-ft/yr | 0.25% | acre-ft/yr |

**Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed**

**Apparent Losses:** 21.461 acre-ft/yr

**Real Losses (Current Annual Real Losses or CARL)**

**Real Losses = Water Losses - Apparent Losses:** 579.157 acre-ft/yr

**WATER LOSSES:** 600.618 acre-ft/yr

### NON-REVENUE WATER

**NON-REVENUE WATER:** 658.423 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

### SYSTEM DATA

| | | | |
|---|---|---|---|
| Length of mains: | 5 | 115.0 | miles |
| Number of active AND inactive service connections: | 8 | 8,994 | |
| Service connection density: | | 78 | conn./mile main |

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

**Average length of customer service line has been set to zero and a data grading score of 10 has been applied**

Average operating pressure: 8 | 60.0 psi

### COST DATA

| | | | |
|---|---|---|---|
| Total annual cost of operating water system: | 10 | $7,800,000 | $/Year |
| Customer retail unit cost (applied to Apparent Losses): | 10 | $3.23 | $/1000 gallons (US) |
| Variable production cost (applied to Real Losses): | 6 | | $/acre-ft |

☑ Use Customer Retail Unit Cost to value real losses

### WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 75 out of 100 ***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

### PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Billed metered
2: Volume from own sources
3: Billed unmetered

# APPENDIX 4

# CITY SBX7-7 COMPLIANCE TABLES

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## WUEdata Entry Exceptions

The data from the tables below will not be entered into WUEdata tables (the tabs for these tables' worksheets are colored **purple**). These tables will be submitted as separate uploads, in Excel, to WUEdata.

**Process Water Deduction**

SB X7-7 tables 4-C, 4-C.1, 4-C.2, 4-C.3, 4-C.4 and 4-D A supplier that will use the process water deduction will complete the appropriate tables in Excel, submit them as a separate upload to the WUE data tool, and include them in its UWMP.

**Target Method 2**

SB X7-7 tables 7-B, 7-C, and 7-D

A supplier that selects Target Method 2 will contact DWR (gwen.huff@water.ca.gov) for SB X7-7 tables 7-B, 7-C, and 7-D.

**Target Method 4**

These tables are only available online at http://www.dwr.water.ca.gov/wateruseefficiency/sb7/committees/urban/u4/ptm4.cfm A supplier that selects Target Method 4 will save the tables from the website listed above, complete the tables, submit as a separate upload to WUE data, and include them with its UWMP.

| **SB X7-7 Table 0: Units of Measure Used in UWMP*** *(select one from the drop down list)* |
| --- |
| Acre Feet |
| **The unit of measure must be consistent with Table 2-3* |
| NOTES: |

| SB X7-7 Table-1: Baseline Period Ranges | | | |
|---|---|---|---|
| **Baseline** | **Parameter** | **Value** | **Units** |
| 10- to 15-year baseline period | 2008 total water deliveries | 5,733 | Acre Feet |
| | 2008 total volume of delivered recycled water | 1,113 | Acre Feet |
| | 2008 recycled water as a percent of total deliveries | 19.41% | Percent |
| | Number of years in baseline period[1] | 13 | Years |
| | Year beginning baseline period range | 1992 | |
| | Year ending baseline period range[2] | 2004 | |
| 5-year baseline period | Number of years in baseline period | 5 | Years |
| | Year beginning baseline period range | 2003 | |
| | Year ending baseline period range[3] | 2007 | |

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

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

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

NOTES:

| SB X7-7 Table 2: Method for Population Estimates | |
|---|---|
| **Method Used to Determine Population** (may check more than one) | |
| ☑ | **1. Department of Finance** (DOF)<br>DOF Table E-8 (1990 - 2000) and (2000-2010) and<br>DOF Table E-5 (2011 - 2015) when available |
| ☐ | **2. Persons-per-Connection Method** |
| ☐ | **3. DWR Population Tool** |
| ☐ | **4. Other**<br>DWR recommends pre-review |
| NOTES: | |

| SB X7-7 Table 3: Service Area Population | | |
|---|---|---|
| **Year** | | **Population** |
| 10 to 15 Year Baseline Population | | |
| Year 1 | 1992 | 38,766 |
| Year 2 | 1993 | 39,128 |
| Year 3 | 1994 | 39,056 |
| Year 4 | 1995 | 39,843 |
| Year 5 | 1996 | 40,495 |
| Year 6 | 1997 | 41,314 |
| Year 7 | 1998 | 42,025 |
| Year 8 | 1999 | 42,209 |
| Year 9 | 2000 | 42,046 |
| Year 10 | 2001 | 41,710 |
| *Year 11* | *2002* | 41,687 |
| *Year 12* | *2003* | 41,284 |
| *Year 13* | *2004* | 40,985 |
| *Year 14* | | |
| *Year 15* | | |
| 5 Year Baseline Population | | |
| Year 1 | 2003 | 41,284 |
| Year 2 | 2004 | 40,985 |
| Year 3 | 2005 | 41,290 |
| Year 4 | 2006 | 40,997 |
| Year 5 | 2007 | 41,000 |
| 2015 Compliance Year Population | | |
| **2015** | | 41,675 |
| NOTES: Census data for 1/1 is used as the population on 12/31 of the prior year | | |

12/31/92 = 1/1/93 DOF Data

| SB X7-7 Table 4: Annual Gross Water Use * | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Deductions | | | | | |
| | **Baseline Year** *Fm SB X7-7 Table 3* | **Volume Into Distribution System** *Fm SB X7-7 Table(s) 4-A* | Exported Water | Change in Dist. System Storage (+/-) | Indirect Recycled Water *Fm SB X7-7 Table 4-B* | Water Delivered for Agricultural Use | Process Water *Fm SB X7-7 Table(s) 4-D* | **Annual Gross Water Use** |
| 10 to 15 Year Baseline - Gross Water Use | | | | | | | | |
| Year 1 | 1992 | 6975.957 | 0 | 0 | 0 | 0 | 0 | 6,976 |
| Year 2 | 1993 | 7040.858 | 0 | 0 | 0 | 0 | 0 | 7,041 |
| Year 3 | 1994 | 7510.651 | 0 | 0 | 0 | 0 | 0 | 7,511 |
| Year 4 | 1995 | 7858.063 | 0 | 0 | 0 | 0 | 0 | 7,858 |
| Year 5 | 1996 | 7927.102 | 0 | 0 | 0 | 0 | 0 | 7,927 |
| Year 6 | 1997 | 8094.774 | 0 | 0 | 0 | 0 | 0 | 8,095 |
| Year 7 | 1998 | 7299.066 | 0 | 0 | 0 | 0 | 0 | 7,299 |
| Year 8 | 1999 | 7694.626 | 0 | 0 | 0 | 0 | 0 | 7,695 |
| Year 9 | 2000 | 7332.113 | 0 | 0 | 0 | 0 | 0 | 7,332 |
| Year 10 | 2001 | 7459.38 | 0 | 0 | 0 | 0 | 0 | 7,459 |
| *Year 11* | 2002 | 7141.948 | 0 | 0 | 0 | 0 | 0 | 7,142 |
| *Year 12* | 2003 | 6711.378 | 0 | 0 | 0 | 0 | 0 | 6,711 |
| *Year 13* | 2004 | 6632.265 | 0 | 0 | 0 | 0 | 0 | 6,632 |
| *Year 14* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Year 15* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **10 - 15 year baseline average gross water use** | | | | | | | | **6,379** |
| 5 Year Baseline - Gross Water Use | | | | | | | | |
| Year 1 | 2003 | 6,711 | 0 | 0 | 0 | 0 | 0 | 6,711 |
| Year 2 | 2004 | 6,632 | 0 | 0 | 0 | 0 | 0 | 6,632 |
| Year 3 | 2005 | 5,772 | 0 | 0 | 0 | 0 | 0 | 5,772 |
| Year 4 | 2006 | 5,512 | 0 | 0 | 0 | 0 | 0 | 5,512 |
| Year 5 | 2007 | 5,187 | 0 | 0 | 0 | 0 | 0 | 5,187 |
| **5 year baseline average gross water use** | | | | | | | | **5,963** |
| 2015 Compliance Year - Gross Water Use | | | | | | | | |
| **2015** | | 4,228 | | | 0 | | 0 | 4,228 |

* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3

NOTES:

**SB X7-7 Table 4-A: Volume Entering the Distribution System(s)**

Complete one table for each source.

| **Name of Source** | Sonoma County Water Agency |
|---|---|
| **This water source is:** | |
| ☐ | The supplier's own water source |
| ☑ | A purchased or imported source |

| **Baseline Year** *Fm SB X7-7 Table 3* | | Volume Entering Distribution System | Meter Error Adjustment* *Optional (+/-)* | Corrected Volume Entering Distribution System | |
|---|---|---|---|---|---|
| 10 to 15 Year Baseline - Water into Distribution System | | | | | |
| Year 1 | 1992 | 2420.345 | | 2,420 | Year ending 12/31/92 |
| Year 2 | 1993 | 2092.014 | | 2,092 | |
| Year 3 | 1994 | 2636.630 | | 2,637 | |
| Year 4 | 1995 | 2512.318 | | 2,512 | |
| Year 5 | 1996 | 2555.052 | | 2,555 | |
| Year 6 | 1997 | 2752.340 | | 2,752 | |
| Year 7 | 1998 | 2934.600 | | 2,935 | |
| Year 8 | 1999 | 3006.658 | | 3,007 | |
| Year 9 | 2000 | 2716.065 | | 2,716 | |
| Year 10 | 2001 | 2978.600 | | 2,979 | |
| Year 11 | 2002 | 2869.700 | | 2,870 | |
| Year 12 | 2003 | 3193.600 | | 3,194 | |
| Year 13 | 2004 | 5103.300 | | 5,103 | |
| Year 14 | 0 | | | 0 | |
| Year 15 | 0 | | | 0 | |
| 5 Year Baseline - Water into Distribution System | | | | | |
| Year 1 | 2003 | 3193.600 | | 3,194 | |
| Year 2 | 2004 | 5103.300 | | 5,103 | |
| Year 3 | 2005 | 4966.900 | | 4,967 | |
| Year 4 | 2006 | 5163.300 | | 5,163 | |
| Year 5 | 2007 | 4253.900 | | 4,254 | |
| 2015 Compliance Year - Water into Distribution System | | | | | |
| **2015** | | 2773.52 | | 2,774 | |

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

**SB X7-7 Table 4-A: Volume Entering the Distribution**

| **Name of Source** | Local Groundwater |
|---|---|
| **This water source is:** | |
| ☑ | The supplier's own water source |
| ☐ | A purchased or imported source |

| **Baseline Year** *Fm SB X7-7 Table 3* | | Volume Entering Distribution System | Meter Error Adjustment* *Optional (+/-)* | Corrected Volume Entering Distribution System |
|---|---|---|---|---|
| 10 to 15 Year Baseline - Water into Distribution System | | | | |
| Year 1 | 1992 | 4555.612 | | 4,556 |
| Year 2 | 1993 | 4948.844 | | 4,949 |
| Year 3 | 1994 | 4874.021 | | 4,874 |
| Year 4 | 1995 | 5345.745 | | 5,346 |
| Year 5 | 1996 | 5372.05 | | 5,372 |
| Year 6 | 1997 | 5342.434 | | 5,342 |
| Year 7 | 1998 | 4364.466 | | 4,364 |
| Year 8 | 1999 | 4687.968 | | 4,688 |
| Year 9 | 2000 | 4616.048 | | 4,616 |
| Year 10 | 2001 | 4480.78 | | 4,481 |
| Year 11 | 2002 | 4272.248 | | 4,272 |
| Year 12 | 2003 | 3517.778 | | 3,518 |
| Year 13 | 2004 | 1528.965 | | 1,529 |
| Year 14 | 0 | | | 0 |
| Year 15 | 0 | | | 0 |
| 5 Year Baseline - Water into Distribution System | | | | |
| Year 1 | 2003 | 3517.778 | | 3,518 |
| Year 2 | 2004 | 1528.965 | | 1,529 |
| Year 3 | 2005 | 805.083 | | 805 |
| Year 4 | 2006 | 349.178 | | 349 |
| Year 5 | 2007 | 933.476 | | 933 |
| 2015 Compliance Year - Water into Distribution System | | | | |
| **2015** | | 1,455 | | 1,455 |

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

☐

| SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD) | | | | |
|---|---|---|---|---|
| **Baseline Year** *Fm SB X7-7 Table 3* | | Service Area Population *Fm SB X7-7 Table 3* | Annual Gross Water Use *Fm SB X7-7 Table 4* | Daily Per Capita Water Use (GPCD) |
| 10 to 15 Year Baseline GPCD | | | | |
| Year 1 | 1992 | 38,766 | 6,976 | 161 |
| Year 2 | 1993 | 39,128 | 7,041 | 161 |
| Year 3 | 1994 | 39,056 | 7,511 | 172 |
| Year 4 | 1995 | 39,843 | 7,858 | 176 |
| Year 5 | 1996 | 40,495 | 7,927 | 175 |
| Year 6 | 1997 | 41,314 | 8,095 | 175 |
| Year 7 | 1998 | 42,025 | 7,299 | 155 |
| Year 8 | 1999 | 42,209 | 7,695 | 163 |
| Year 9 | 2000 | 42,046 | 7,332 | 156 |
| Year 10 | 2001 | 41,710 | 7,459 | 160 |
| *Year 11* | 2002 | 41,687 | 7,142 | 153 |
| *Year 12* | 2003 | 41,284 | 6,711 | 145 |
| *Year 13* | 2004 | 40,985 | 6,632 | 144 |
| *Year 14* | 0 | 0 | 0 | |
| *Year 15* | 0 | 0 | 0 | |
| **10-15 Year Average Baseline GPCD** | | | | **161.11** |
| 5 Year Baseline GPCD | | | | |
| **Baseline Year** *Fm SB X7-7 Table 3* | | Service Area Population *Fm SB X7-7 Table 3* | Gross Water Use *Fm SB X7-7 Table 4* | Daily Per Capita Water Use |
| Year 1 | 2003 | 41,284 | 6,711 | 145 |
| Year 2 | 2004 | 40,985 | 6,632 | 144 |
| Year 3 | 2005 | 41,290 | 5,772 | 125 |
| Year 4 | 2006 | 40,997 | 5,512 | 120 |
| Year 5 | 2007 | 41,000 | 5,187 | 113 |
| **5 Year Average Baseline GPCD** | | | | **129.48** |
| 2015 Compliance Year GPCD | | | | |
| **2015** | | 41,675 | 4,228 | 90.58 |
| NOTES: | | | | |

167.0651

| **SB X7-7 Table 6**: Gallons per Capita per Day<br>*Summary From Table SB X7-7 Table 5* | |
|---|---|
| 10-15 Year Baseline GPCD | 161.11 |
| 5 Year Baseline GPCD | 129.48 |
| 2015 Compliance Year GPCD | 90.58 |
| NOTES: | |

| **SB X7-7 Table 7: 2020 Target Method**<br>*Select Only One* | | |
|---|---|---|
| Target Method | | Supporting Documentation |
| ☑ | Method 1 | SB X7-7 Table 7A |
| ☐ | Method 2 | SB X7-7 Tables 7B, 7C, and 7D<br>*Contact DWR for these tables* |
| ☐ | Method 3 | SB X7-7 Table 7-E |
| ☐ | Method 4 | Method 4 Calculator |
| NOTES: | | |

| **SB X7-7 Table 7-A: Target Method 1**<br>20% Reduction | |
|---|---|
| 10-15 Year Baseline GPCD | 2020 Target GPCD |
| 161.11 | 128.89 |
| NOTES: | |

| SB X7-7 Table 7-E: Target Method 3 | | | | |
|---|---|---|---|---|
| Agency May Select More Than One as Applicable | Percentage of Service Area in This Hydrological Region | Hydrologic Region | "2020 Plan" Regional Targets | Method 3 Regional Targets (95%) |
| ☐ | | North Coast | 137 | 130 |
| ☐ | | North Lahontan | 173 | 164 |
| ☐ | | Sacramento River | 176 | 167 |
| ☑ | | San Francisco Bay | 131 | 124 |
| ☐ | | San Joaquin River | 174 | 165 |
| ☐ | | Central Coast | 123 | 117 |
| ☐ | | Tulare Lake | 188 | 179 |
| ☐ | | South Lahontan | 170 | 162 |
| ☐ | | South Coast | 149 | 142 |
| ☐ | | Colorado River | 211 | 200 |
| **Target** *(If more than one region is selected, this value is calculated.)* | | | | **0** |
| NOTES: | | | | |

| SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target | | | |
|---|---|---|---|
| 5 Year Baseline GPCD *From SB X7-7 Table 5* | Maximum 2020 Target* | Calculated 2020 Target *Fm Appropriate Target Table* | Confirmed 2020 Target |
| 129.48 | 123.00 | | 123.00 |
| ** Maximum 2020 Target is 95% of the 5 Year Baseline GPCD* | | | |
| NOTES: | | | |

| SB X7-7 Table 8: 2015 Interim Target GPCD | | |
|---|---|---|
| Confirmed 2020 Target *Fm SB X7-7 Table 7-F* | 10-15 year Baseline GPCD *Fm SB X7-7 Table 5* | 2015 Interim Target GPCD |
| 123.00 | 161.11 | 142.06 |
| NOTES: | | |

| SB X7-7 Table 9: 2015 Compliance | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Actual 2015 GPCD | 2015 Interim Target GPCD | Optional Adjustments *(in GPCD)* | | | | | 2015 GPCD *(Adjusted if applicable)* | Did Supplier Achieve Targeted Reduction for 2015? |
| | | Extraordinary Events | Weather Normalization | Economic Adjustment | TOTAL Adjustments | Adjusted 2015 GPCD | | |
| 91 | 142 | *From Methodology 8 (Optional)* | *From Methodology 8 (Optional)* | *From Methodology 8 (Optional)* | 0 | 90.57781124 | 90.57781124 | YES |
| NOTES: | | | | | | | | |

# APPENDIX 5

# REGIONAL ALLIANCE SBX7-7 COMPLIANCE TABLES

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## Regional Alliance (RA) Submittal to DWR

**RAs will submit all tables to WUEdata as an attachment only (in Excel format).**
**The data from the RA tables will not be entered into the WUEdata tables.**

## Regional Alliance Options

The *Methodologies for Calculating Baseline and Compliance Urban per Capita Water Use,* Methodology 9, provides the required methodology for an RA to calculate baselines, targets, and compliance GPCD.
**There are three approaches for an RA to address the requirements of SB X7-7:**

| | | |
|---|---|---|
| **Option 1*** | Individual agencies calculate their own baseline and target GPCDs.<br>RA calculates the weighted average of each participating agencies' baseline and target GPCDs. | This workbook is for a Regional Alliance using Option 1 (RA1) |
| **Option 2** | Individual agencies calculate their own population and gross water use. RA sums<br>all individual information to obtain regional population and gross water use.<br>RA calculates regional baseline GPCD. RA chooses<br>target method and calculates regional target. | |
| **Option 3** | RA calculates either regional gross water use, or population, or both, directly for the entire regional alliance area.<br>RA calculates regional baseline GPCD. RA chooses<br>target method and calculates regional target. | |

**All participating agencies must submit individual SB X7-7 Tables, as applicable, showing the individual agency's calculations. These tables are: SB X7-7 Tables 0 through 6 , Table 7, any required supporting tables (as stated in SB X7-7 Table 7), and SB X7-7 Table 9, as applicable.These individual agency tables will be submitted with the individual or Regional Urban Water Management Plan.*

| SB X7-7 RA1 - Weighted Baseline | | | | |
|---|---|---|---|---|
| **Participating Member Agency Name** | **10-15 year Baseline GPCD*** | **Average Population During 10-15 Year Baseline Period** | **(Baseline GPCD) X (Population)** | **Regional Alliance Weighted Average 10-15 Year Baseline GPCD** |
| City of Cotati | 159 | 6,559 | 1,043,146 | |
| Marin Municipal Water District | 149 | 178,670 | 26,690,318 | |
| North Marin Water District | 173 | 54,061 | 9,370,435 | |
| City of Petaluma | 180 | 52,622 | 9,491,997 | |
| City of Rohnert Park | 161 | 40,811 | 6,582,847 | |
| City of Santa Rosa | 145 | 143,109 | 20,806,963 | |
| City of Sonoma | 225 | 9,679 | 2,173,212 | |
| Valley of the Moon Water Distict | 146 | 20,969 | 3,058,648 | |
| Town of Windsor | 156 | 24,572 | 3,834,809 | |
| **Regional Alliance Total** | 1,495 | 531,051 | 83,052,375 | **156** |

**All participating agencies must submit individual SB X7-7 Tables, as applicable, showing the individual agency's calculations. These tables are: SB X7-7 Tables 0 through 6 , Table 7, any required supporting tables (as stated in SB X7-7 Table 7), and SB X7-7 Table 9, as applicable.These individual agency tables will be submitted with the individual or Regional Urban Water Management Plan.*

NOTES

| SB X7-7 RA1 - Weighted 2020 Target | | | | |
|---|---|---|---|---|
| **Participating Member Agency Name** | **2020 Target GPCD*** | **2015 Population** | **(Target) X (Population)** | **Regional Alliance Weighted Average 2020 Target** |
| City of Cotati | 130 | 7,288 | 947,440 | |
| Marin Municipal Water District | 124 | 189,000 | 23,436,000 | |
| North Marin Water District | 139 | 61,381 | 8,531,959 | |
| City of Petaluma | 141 | 61,798 | 8,713,518 | |
| City of Rohnert Park | 119 | 41,675 | 4,959,325 | |
| City of Santa Rosa | 126 | 173,071 | 21,806,946 | |
| City of Sonoma | 180 | 11,147 | 2,006,460 | |
| Valley of the Moon Water Distict | 124 | 23,478 | 2,911,272 | |
| Town of Windsor | 130 | 27,486 | 3,573,180 | |
| **Regional Alliance Total** | 1,213 | 596,324 | 76,886,100 | **129** |

**All participating agencies must submit individual SB X7-7 Tables, as applicable, showing the individual agency's calculations. These tables are: SB X7-7 Tables 0 through 6 , Table 7, any required supporting tables (as stated in SB X7-7 Table 7), and SB X7-7 Table 9, as applicable.These individual agency tables will be submitted with the individual or Regional Urban Water Management Plan.*

NOTES

| SB X7-7 RA1 - 2015 Target | | |
|---|---|---|
| Weighted Average 10-15 year Baseline GPCD | Weighted Average 2020 Target | Regional Alliance 2015 Interim Target |
| 156 | 129 | 143 |
| NOTES | | |

| SB X7-7 RA1 - 2015 GPCD (Actual) | | | | |
|---|---|---|---|---|
| **Participating Member Agency Name** | **2015 Actual GPCD[1]** | **2015 Population** | **(2015 GPCD) X (2015 Population)** | **Regional Alliance 2015 GPCD (Actual)** |
| City of Cotati | 93 | 7,288 | 679,016 | |
| Marin Municipal Water District | 110 | 189,000 | 20,715,583 | |
| North Marin Water District | 105 | 61,381 | 6,461,073 | |
| City of Petaluma | 110 | 61,798 | 6,823,500 | |
| City of Rohnert Park | 91 | 41,675 | 3,775,789 | |
| City of Santa Rosa | 85 | 173,071 | 14,765,037 | |
| City of Sonoma | 141 | 11,147 | 1,573,338 | |
| Valley of the Moon Water Distict | 90 | 23,478 | 2,117,236 | |
| Town of Windsor | 99 | 27,486 | 2,720,608 | |
| **Regional Alliance Totals** | 925 | 596,324 | 59,631,180 | 100 |

[*] *All participating agencies must submit individual SB X7-7 Tables, as applicable, showing the individual agency's calculations. These tables are: SB X7-7 Tables 0 through 6 , Table 7, any required supporting tables (as stated in SB X7-7 Table 7), and SB X7-7 Table 9, as applicable.These individual agency tables will be submitted with the individual or Regional Urban Water Management Plan.*

NOTES

## SB X7-7 RA1 - Compliance Verification

| 2015 GPCD (Actual) | 2015 Interim Target GPCD | Economic Adjustment[1] *Enter "0" if no adjustment* | Adjusted 2015 GPCD *(if economic adjustment used)* | Did Alliance Achieve Targeted Reduction for 2015? |
|---|---|---|---|---|
| 100 | 143 | 0 | 100 | YES |

[1] *Adjustments for economic growth can be applied to either the individual supplier's data or to the aggregate regional alliance data (but not both), depending upon availability of suitable data and methods.*

NOTES

# APPENDIX 6

# WATER POLICY RESOLUTION

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CITY OF ROHNERT PARK
OFFICE OF THE CITY MANAGER/CITY CLERK

** * * City Clerk Use Only * * **

# NOTICE OF COUNCIL/CDC MEETING ACTION

**Date:** April 29, 2004

**To:** Toni Bertolero, City Engineer

**For Agenda Title:** Consider and approve the Water Policy Resolution

---

**Meeting Date:** April 27, 2004
**Agenda Item No:** #8
**Council Action:** Approved as Amended
**Vote:** 5 - 0
**Resolution No:**
2004-95 Implementing Requirements Imposed on Specific Plan Areas Outside the City's 1999 Boundaries

---

**The City Council approved the above item authorizing you to proceed with the appropriate follow-up and handling process. The enclosed documents checked ☑ below are provided for this purpose:**

- ☑ **Transmittal Report provided to Council for this agenda item.**
- ☑ **Resolution/executed**
- ☐ **Ordinance/executed**
- ☐ **One set of the fully executed agreement with original signatures for you to forward to the contractor. The second set with original signatures has been retained in the City Manager's Office for the City's Agreement Files.**
- ☐ **Two (2) sets of the Agreement signed by the appropriate City representatives and forwarded to you for signing. When available, please RETURN one set to the City Manager's Office for the City's Agreement Files.**
- ☑ **Other: The adoption of this resolution included amendments as recommended by Interim City Attorney, Michelle Kenyon, to change the word "defined" to "estimated" in 4.b.6, and to make some minor typographical corrections as follows: change 4.b.7 to 4.c; change 4.b.8 to 4.d; and change 4.b.9 to 4.e**

**Thank you,**

**Judy Hauff, City Clerk**
**For Carl Eric Leivo, City Manager**

**cc: Gabrielle Whelan, Interim City Attorney**
**Mike Bracewell, PW Utilities Services Supervisor**
**Engineering Staff: Darrin Jenkins, Civil Engineer; Rick Pedroncelli, Sr. Eng. Tech.; Eydie Tacata, Admin. Asst.**
**FILE – ENGINEERING DEPT. – Water Policy Resolution**
**FILE – CROSS REFERENCE – Water Policy Resolution [SEE: ENGINEERING DEPT.]**
**FILE - Council Agenda Chron File/ADD TO: Agreement File List**

JH/cam-M:2004 Council Agenda Action

FOR RESO. NO. 2004 - 95

**CITY OF ROHNERT PARK**
**COUNCIL AGENDA ITEM TRANSMITTAL REPORT**

Meeting Date: April 27, 2004

Department: Engineering

Submitted By: Toni Bertolero, City Engineer
*(Name & Title)*

Submittal Date: April 20, 2004

Agenda Title: Water Policy Resolution

| | |
|---|---|
| Council: | X |
| Miscellaneous | |
| Communications | |
| Agenda 4/27/04 | X |
| Copy to: | |
| Copy to: | |

4/21/04 asm

**Requested Council Action:** Consider and approve the Water Policy Resolution

Summary:
The Water Policy Resolution implements a provision of the Judgement entered by the Sonoma County Superior Court in *South County Resource Preservation Committee v. City of Rohnert Park* (Case No. 224976 – the "Penngrove litigation"). That provision prevents the City from approving development within the specific plan areas identified in the General Plan if the development's "net consumptive use impact" causes the City to exceed an average annual groundwater pumping rate of 2.3 mgd. The purpose of this resolution is to set forth the procedure the City will follow to implement this provision of the Judgement.

This resolution was first presented to Council on February 24, 2004. Three letters of opposition to the resolution were received at the meeting. In an effort to consider the comments and to make appropriate changes, the resolution was continued until such changes were made. Staff has attempted, on several occasions, to meet with John King and his attorney but was unsuccessful in meeting to discuss their concerns. Nevertheless, the attached resolution has been revised from the version presented on February 24, 2004 in an effort to address concerns stated in the letters that were submitted.

**CITY MANAGER'S RECOMMENDATION:** ( ) Consent Item (✓) Regular Time
(✓) Approval ( ) Public Hearing Required
( ) Not Recommended ( ) Submitted with Comment
( ) Policy Determination by Council
( ) City Comments:

City Manager's Signature: _____ Date: 4/21/04

Resolution No. 2004-95

**A Resolution of the City Council of the City of Rohnert Park Implementing Requirements Imposed on Specific Plan Areas Outside the City's 1999 Boundaries**

**WHEREAS**, a Judgment was entered on September 5, 2002 by the Sonoma County Superior Court in *South County Resource Preservation Committee and John King v. City of Rohnert Park* (Case No. 224976) (hereinafter "Judgment"), which directed that certain General Plan policies be interpreted and applied consistent with language included in the Judgment, and that the language in the Judgment be treated as part of the General Plan; and

**WHEREAS**, the General Plan of the City of Rohnert Park requires that all development outside the City's 1999 boundaries be included within one of the specific plan areas identified in the General Plan; and

**WHEREAS**, the purpose of this resolution is to implement language included in the Judgment by describing the way in which certain interpretations of the General Plan will be applied to new developments in specific plan areas outside the City's 1999 boundaries; and

**WHEREAS**, nothing in this Resolution shall be construed to impair the City's ability to deliver water to its customers or respond to the needs of its water customers.

NOW, THEREFORE, the City Council of the City of Rohnert Park does hereby resolve as follows:

1. This Resolution applies to the Specific Plan Areas outside the City's 1999 boundaries that are identified in the General Plan and development projects within those Areas for which the City determines a negative declaration, mitigated negative declaration or environmental impact report is required ("Projects"). The City's 1999 boundaries are depicted on Exhibit A to this Resolution.

2. A negative declaration, mitigated negative declaration, or environmental impact report for a Project shall include the following information:

    a. Projected water demand for the Project before and after water supply reduction measures are implemented and an explanation of how these measures are planned to reduce consumption.

    b. 20-year projection of water supplies available to the City during normal, single-dry, and multiple-dry years. These terms shall have the same meaning as set forth in the most recent Urban Water Management Plan for the City of Rohnert Park.

    c. Analysis of whether the total projected water supplies will meet the projected water demand associated with the Project.

3. The approval of any tentative map for a Project shall be conditioned upon identification, before final map approval, of the water supply that is projected to serve the Project. Groundwater pumped from new or existing private wells within the Penngrove community (with zip code 94951 as of September 2002) will not be permitted as a water supply source.

4. Net Consumptive Water Use Impact Determinations. The information required by this section shall be submitted as part of the application for the first discretionary approval for a Project.

a. Definitions for Net Consumptive Water Use Impact Determinations: The following definitions shall be used to make the Net Consumptive Water Use Impact Determinations required by this section:

- *Net Consumptive Water Use Impact* is the amount of potable water demand of a Project less reductions for (1) Potable Water Conservation Practices and (2) Potable Water Use Offsets. Only those Potable Water Use Conservation Practices and Potable Water Use Offsets that the City Engineer determines will be acceptable, feasible and consistent with the City's water conservation program may be used in determining a project's Net Consumptive Water Use Impact.

- *Potable Water Conservation Practices* are on-site water conservation equipment and practices, including use of recycled water that reduces the projected potable water consumption of a Project and that can be implemented and completed with the Project.

- *Potable Water Use Offsets* are water conservation equipment, practices or programs that are funded, constructed, installed or implemented by a Project and that offset the amount of potable water consumed by that Project, including use of recycled water, that are applied outside of the project area ("off-site"), but which reduce demand on the City's water system for potable water, or, the funding, construction or implementation of facilities or practices in any location that increase recharge to the groundwater supplies available to the City's municipal wells; all of which can be implemented and completed with the Project.

- *Average Annual Groundwater Pumping Rate of 2.3 mgd* is the projected pumping rate from the City's municipal wells for the year estimated to be the Project's buildout year

b. The following calculations shall be included in the application for the first discretionary approval for a Project and shall be reviewed by the City Engineer.

1. Determine a Project's potable water demand (before any proposed Potable Water Conservation Practices or Water Use Offsets) using information and a methodology approved by the City Engineer.

2. Identify Potable Water Conservation Practices and estimated water savings. Potable water conservation practices selected for use in a Project requires concurrence from the City Engineer that the practices are acceptable and consistent with the City's Water Conservation Program. Water savings shall be determined using information and a methodology approved by the City Engineer.

3. Identify onsite and/or offsite recycled water use that is included in the Potable Water conservation Practices or Water Use Offsets proposed for the Project. Offsite use is limited to areas of use in the City's water service area.

4. Identify Water Use Offsets. Said offsets must identify a projected reduction in potable water use in the City's water service area and/or increase in recharge of groundwater supplies available to the City's municipal wells. In calculating the projected reduction in potable water use savings from Potable Water Conservation Practices and Water Use Offsets, estimates shall comply with guidelines established by the California Urban Water Conservation Council or other recognized professional water industry organizations such as the American Water Works Association.

5. Estimate the Project's Net Consumptive Water Use Impact taking into consideration the Potable Water Conservation Practices, and Water Use Offsets.

6. Provide an estimated year of when buildout of all commercial and residential development for the Project will occur. For purposes of this document, the "buildout year" is estimated as the year when 80 percent of the commercial and residential development have been constructed and occupied. For the percentage calculation, commercial development will be based on square footage and residential development will be based on number of dwelling units.

c. The City Engineer shall determine whether the Project's Net Consumptive Water Use Impact is projected to contribute to the City exceeding an Average Annual Groundwater Pumping Rate of 2.3 mgd. Said determination will consider the City's water supply sources, based on best reasonable information available at the time the determination is made. Such determination is without prejudice to the applicant submitting new or additional information and seeking a different determination.

d. The Project cannot be approved if its Net Consumptive Water Use Impact is determined to contribute to the City exceeding an Average Groundwater Pumping Rate of 2.3 mgd.

e. If a Project's Potable Water Conservation Practices and/or Recycled Water Use and/or Water Use Offsets include ongoing activities, the Developer will identify how these ongoing activities will remain in place and identify long-term operation and maintenance of the practices and water systems.

5. This Resolution implements General Plan policy by determining the reasonableness, legality and validity of decisions relating to Specific Plans. As such this Resolution is subject to the 90-day statute of limitations of Government Code section 65009(c).

**DULY AND REGULARLY ADOPTED** by the Rohnert Park City Council this 27th day of April, 2004.

**ATTEST:** **CITY OF ROHNERT PARK**

City Clerk Judy Hauff Mayor Gregory A. Nordin

**FLORES: AYE MACKENZIE: AYE SPRADLIN: AYE**
**VIDAK-MARTINEZ: AYE NORDIN: AYE**
**AYES: (5) NOES: (0) ABSENT: (0) ABSTAIN: (0)**

# APPENDIX 7

# WATER SHORTAGE CONTINGENCY PLAN

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City of Rohnert Park

# Water Shortage Contingency Plan

Update 2016

draft
6/1/2016

# CONTENTS



# List of Tables



APPENDICES

# SECTION 1: INTRODUCTION

The City of Rohnert Park's (City's) Water Shortage Contingency Plan (Shortage Plan) was first adopted by Ordinance in 2004 and is contained in Section 13.66 of the Municipal Code. While the Shortage Plan is revisited every five years as part of the City's Urban Water Management Plan, the City has not made changes to the plan since its original adoption. However, in both 2014 and 2015 the City found it necessary to adopt interim urgency ordinances to respond to the State Water Resources Control Board's (State's) emergency drought regulations, because its codified plan was not sufficiently flexible to demonstrate comprehensive response to the State's requirements. As a result the City is undertaking a comprehensive revision of the Shortage Plan with the 2015 Urban Water Management Plan.

# SECTION 2 STAGES OF ACTION

The Water Code requires that the City's Shortage Plan outline the actions it would take to address reduction in supply of up to 50%. In order to do this, it is important to understand how the City's demand, particularly its potable water demand, relates to its water supply.

## 2.1 POTABLE WATER DEMAND

The City is a community of just over 40,000 and it is anticipated to grow to just over 55,000 persons during the planning period considered by the 2015 UWMP. Approximately 80% of the City's current and projected demand is composed of residential uses. Table 1 presents the City's projected potable water demands as reported in its 2015 UWMP.

**TABLE 1 – POTABLE WATER DEMANDS**

| Customer Class | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|
| Single Family | 1,903 | 1,958 | 1,990 | 2,039 | 2,097 |
| Multi-Family | 1,711 | 1,731 | 1,745 | 1,779 | 1,822 |
| Commercial | 458 | 467 | 477 | 492 | 507 |
| Industrial | 3 | 3 | 4 | 4 | 4 |
| Landscape | 432 | 445 | 459 | 477 | 497 |
| Losses | 1,098 | 1,125 | 1,143 | 1,170 | 1,202 |
| **TOTAL** | 5,605 | 5,729 | 5,818 | 5,961 | 6,129 |

Note: Losses include unmetered irrigation water billed based on estimates

## 2.2 WATER SUPPLIES

The City currently has three water supply sources: a 7,500 acre-feet per year (AFY) entitlement from the Sonoma County Water Agency (Agency); 2,577 AFY of groundwater from the City's wells; and 1,350 AFY of recycled water from the Santa Rosa Subregional System. The City uses these supplies conjunctively, relying first on Agency supply and recycled water and increasing groundwater production as necessary to respond to local, regional or statewide water shortage conditions. Because recycled water is used only for irrigation and its use can be limited or discontinued to manage any type of a supply emergency, this Water Shortage Contingency Plan only deals with the City's potable water supply.

The City's supply from the Agency is constrained by the Agency's water rights and the City considers its "reliable" supply from the Agency to be approximately 6,630 AFY. The Agency's modeling indicates that this "reliable" supply is available under a range of hydrologic conditions, even though the City's contractual supply is not available under all hydrologic conditions.

The City's groundwater supply is governed by the City's 2004 Water Policy Resolution which established the City's pumping rate of 2,577 AFY. Technical studies, including most recently *The Hydrologic and Geochemical Characterization of the Santa Rosa Plain Watershed, Sonoma County California* (U. S. Geological Survey Scientific Investigations Report 2013-5118) document that this pumpage rate is sustainable under a range of hydrologic conditions.

Table 2 provides the City's estimated water supply available for the next three years based on the driest three-year historic sequence for the Agency's water supply and compares this to anticipated demand. No water shortages are anticipated.

**TABLE 2 – ESTIMATED WATER SUPPLY AVAILABILITY FOR THE NEXT THREE YEARS**

| | 2016 | 2017 | 2018 |
|---|---|---|---|
| **Agency Supply** | 6,632 | 6,632 | 6,632 |
| **Groundwater** | 2,577 | 2,577 | 2,577 |
| **Recycled Water** | 1,350 | 1,350 | 1,350 |
| **Total** | **10,559** | **10,559** | **10,559** |

While the City's supply is reliable, the City has experienced water shortage conditions and needed to implement its contingency plan as a result of regulatory requirements imposed upon the Agency, the City or both.

## 2.3 Demand Reductions Required to Meet Supply Reductions

Because the City's water supply exceeds its projected water demands, the City has calculated the demand reduction required to meet water supply reductions of 10% up to 50%. This information is presented in Table 3. The table illustrates that because the City's supply is so robust it can manage shortages of over 20% without necessarily needing to curtail demands. The City can manage shortages of up to 50% with a 25% demand reduction.

**TABLE 3 –DEMAND REDUCTIONS REQUIRED TO MANAGE SUPPLY REDUCTIONS**

| **Reduction in Potable Supply** | | Projected 2040 | **Demand Reduction Required** | |
|---|---|---|---|---|
| % | Available Volume | Demand | Volume | % |
| 10% | 8,288 | 6,129 | 0 | 0% |
| 15% | 7,828 | 6,129 | 0 | 0% |
| 20% | 7,367 | 6,129 | 0 | 0% |
| 25% | 6,907 | 6,129 | 0 | 0% |
| 30% | 6,446 | 6,129 | 0 | 0% |
| 35% | 5,986 | 6,129 | 143 | 2% |
| 40% | 5,525 | 6,129 | 604 | 10% |
| 45% | 5,065 | 6,129 | 1,064 | 17% |
| 50% | 4,605 | 6,129 | 1,525 | 25% |

## 2.4 RATIONING STAGES

While the City's supply is highly reliable, there have been instances, such as the most recent Statewide Emergency Regulations, where the City was required to achieve certain demand reduction targets, even with water supply available. As such the City has developed rationing stages that allow it to respond to both true supply emergencies and regulatory mandates. These are presented in Table 4.

**TABLE 4 - WATER CONSERVATION STAGES**

| Stage No. | Water Supply Conditions | % Water Supply Shortage | % Demand Reduction |
|---|---|---|---|
| Stage 1 - Voluntary | Up to 15% reduction in supply | 0% | 10% |
| Stage 1 -Mandatory | 15% to 30% reduction in supply | 0% | 20% |
| Stage 2 - Mandatory | 30% to 40% reduction in supply | 10% | 25% |
| Stage 3 - Mandatory | up to 50% reduction in supply | 25% | 25% |

Overall demand reduction will be achieved with different reduction goals in each user class. The following priorities have been established for use in developing demand reduction programs and allocations during a water shortage emergency. Priorities for use of available water, from highest to lowest priority, are:

- Health and Safety
- Existing Commercial, Industrial and Governmental
- Existing Residential Demands
- Existing Landscaping - especially trees and shrubs
- New Demand - projects without permits when shortage is declared

With these guidelines in mind, Table 5 details overall reduction goals by customer class for Stages 2 and 3 of the water shortage emergency. Reduction goals are based on projected use by each customer class. Reduction goals for the single family residential class is generally higher, taking into account that landscape use is not metered separately.

**TABLE 5 – AVERAGE DEMAND REDUCTION GOALS BY CUSTOMER CLASS**

| Customer Class | Projected 2040 Demands | Stage 2 | Stage 3 |
|---|---|---|---|
| | | % Reduction | % Reduction |
| | Annual Demand | Annual Allocation | Annual Allocation |
| | | 25% | 25% |
| Single Family | 2,097.0 | 1,572.8 | 1,572.8 |
| | | 25% | 25% |
| Multi-Family | 1,822.0 | 1,366.5 | 1,366.5 |
| | | 15% | 15% |
| Commercial | 507.0 | 431.0 | 431.0 |
| | | 10% | 10% |
| Industrial | 4.0 | 3.6 | 3.6 |
| | | 25% | 30% |
| Landscape | 497.0 | 372.8 | 347.9 |
| | | 50% offset required | 100% offset required |
| New Development | 0.0 | 0.0 | 0.0 |
| | | 25% | 30% |
| Losses | 1,202.0 | 901.5 | 841.4 |
| **TOTAL** | 6,129.0 | 4,648.1 | 4,563.1 |

To achieve the overall reduction goals, a community-wide goal is assigned in Stage 1 – Voluntary and Stage 1 – Mandatory and allocations are determined within a customer classes for Stages 2 and 3. Details of reduction strategies for each customer class at each reduction stage are as follows.

Stage 1 Voluntary is designed to encourage water conservation behavior when supplies are reduced by up to 15%. Under these conditions, as illustrated in Table 4, the City does not anticipate needing to achieve a fixed reduction in demand in order to avoid shortages. However behavior modifications encourage by this stage can help prepare for multi-year shortage situations. Community-wide reduction is the goal; elimination of all waste; minimization of non-essential use; "water-on-request" restaurant program

Stage 1 Mandatory is the City's first mandatory stage and is designed to manage shortages of up to 30%. Again, as illustrated in Table 4, the City does not necessarily need to reduce demand to manage a one-time supply shortage of 30%. Stage 1 Mandatory can also be used to manage regulatory requirements for demand reduction, absent a documented supply shortage. Community-wide reduction is the goal; all Stage 1-Voluntary requirements as well as a limitation on hours of irrigation for all customers

Stage 2 and Stage 3 Mandatory are the conservation stages invoked to manage a water shortage severe enough to require reductions in the City's demands.

## 2.5 Prohibitions on Water Use

The City's Water Waste Ordinance, which is being reconsidered with the 2015 UWMP in response to State requirements includes the following prohibitions:

- The application of potable water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures;
- The use of a hose that dispenses potable water to wash a motor vehicle, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use;
- The application of potable water to driveways and sidewalks;
- The use of potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system;
- The application of potable water to outdoor landscapes during and within 48 hours after measurable rainfall;
- The serving of drinking water other than upon request in eating or drinking establishments;

The City's Water Waste Ordinance also requires:

- Compliance with the California Building Standards Commission and the Department of Housing and Community Development requirements for irrigation systems serving new homes;
- The operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily.

The Water Waste Ordinance states that water service will be discontinued for continued violation once notification has been made.

In addition to the prohibitions outlined in the Water Waste Ordinance, the following program of actions are established for the Water Shortage Emergency condition:

**Stage 1 Voluntary**

- Compliance with the actions in the City's Water Waste Ordinance

**Stage 1 Mandatory –** All actions established in previous stage plus:

- Irrigation limited to the hours of 8:00 pm to 6:00 am
- Nonpotable water used for construction purposes wherever feasible.

**Stage 2 -** All actions established in previous stage plus:

- Filling new swimming pools is prohibited
- Filling or topping-off of existing swimming pools is prohibited
- No water-using landscape installation in new construction

**Stage 3 -** All actions established in previous stage plus:

- New construction must offset new demand by conserving the equivalent of half the demand within the community

The City's required program of actions takes into account that there are no artificial lakes ponds or waterfalls that are supplied by potable water.

A customer will be found in violation of a prohibited use if the use continues after two official City written notifications. Remedies for violation of these prohibited actions are included in Section 6.6.

## SECTION 3: EMERGENCY PLANNING ACTIONS

In addition to responding to drought conditions, the City's Shortage Plan can be used to respond to emergency conditions that interrupt water supplies. Water supplies may be interrupted in the future due to water supply contamination, major transmission pipeline break, regional power outage, or a natural disaster such as an earthquake. 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 Agency and neighboring water purveyors. Table 6

**TABLE 6- EMERGENCY PLANNING ACTIONS**

| 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 |

# SECTION 4: ANALYSIS OF REVENUE AND EXPENDITURE IMPACTS

The Water Code requires the City to analyze the impacts on revenue from a 50% reduction in supplies. As outlined above, a 50% reduction in water supply will require a 25% reduction in water use. Therefore, the City' analysis is based on a 25% reduction in demand and the revenue associated with that demand. This reduced revenue would be balanced by some reduction in costs, since the City would be purchasing less water from the Sonoma County Water Agency. 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 are currently approximately 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 10%, 20% and 25% reductions on water delivered, which would be its response to 15%, 30% and 50% reductions in supply. For the purpose of this analysis, FY 2015-2016 **budget** data was used. The City's actual costs in FY 2015-16 were significantly impacted by its response to the State Water Board's Emergency Regulations and represent its response to a 17% reduction in demand.

The City's current water rate includes a monthly service charge and a commodity charge. These are presented in Table 7. These rates reflect an increase adopted by the City in April 2015.

**TABLE 7 – RATE SCHEDULE**

| Monthly Service Charge | | Commodity Rate Charge |
|---|---|---|
| **Residential** | | |
| $18.32 | | $0.003/gallon |
| **Commercial and Multifamily** | | |
| ¾" or 1" meter | $19.03 | $0.00323gallon |
| 1 ½" meter | $34.85 | $0.00323gallon |
| 2" meter | $58.53 | $0.00323gallon |
| 3" meter | $98.12 | $0.00323gallon |
| 4" meter | $161.39 | $0.00323gallon |
| 6" meter | $319.58 | $0.00323gallon |
| 8" meter | $509.40 | $0.00323gallon |

Note: $0.003/gallon is the estimated average of the City's Tier 1 rate of $0.00277 and Tier 2 rate of $0.00376 per 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 8 illustrates this calculation.

**TABLE 8 – EFFECT OF REDUCED WATER SALES ON REVENUE**

| | No. of Accounts | Monthly Service Charge[a] | Revenue from Monthly Service Charge | Total Budgeted Revenue | Budgeted Revenue Subject to Reduction |
|---|---|---|---|---|---|
| | (a) | (b) | (c) = (a)*(b)*12 mos/yr | (d) | (e) = (d)-(c) |
| **Residential** | 7647 | $19.03 | $1,746,269 | $4,030,934 | $2,284,665 |
| **Commercial/MFR** | 1347 | $58.83 | $950,928 | $2,918,796 | $1,967,868 |

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

In order to estimate the revenue loss as a result of a water shortage emergency, the total revenue from commodity charges (as calculated in Table 8) is reduced by 15% for Stage 1 Mandatory, 20% for Stage 2 Mandatory and 25% for Stage 3. This calculation is illustrated in Table 9.

**TABLE 9 – EFFECT OF REDUCED SUPPLY ON REVENUES AND EXPENDITURES**

| | Normal | 10% Reduction in Demand (up to 15% Reduction in Supply | 20% Reduction in Demand (up to 30% Reduction in Supply) | 25% Reduction in Demand (up to 50% Reduction in Supply) |
|---|---|---|---|---|
| **Revenues** | | | | |
| Residential | $4,030,934 | $3,802,467 | $3,574,001 | $3,459,768 |
| Commercial/MFR | $2,918,796 | $2,623,616 | $2,525,222 | $2,426,829 |
| Other | $110,000 | $93,500 | $88,000 | $82,500 |
| **Totals** | **$7,059,730** | **$6,519,583** | **$6,187,223** | **$5,969,097** |
| | | | | |
| **Expenditures** | | | | |
| Purchase of Water | $2,308,800 | $1,385,280 | $1,385,280 | $1,385,280 |
| Operations & Maintenance | $3,887,577 | $3,887,577 | $3,887,577 | $3,887,577 |
| Demand Management | $11,000 | $11,000 | $11,000 | $11,000 |
| Capital Outlay | $155,000 | $155,000 | $155,000 | $155,000 |
| Non-Capital Transfers | $1,457,670 | $1,457,670 | $1,457,670 | $1,457,670 |
| **Totals** | **$7,820,047** | **$6,896,527** | **$6,896,527** | **$6,896,527** |
| | | | | |
| **Transfer to the CIP** | **$735,000** | **$0** | **$0** | **$0** |
| | | | | |
| **Surplus (Deficit)** | **($760,317)** | **($376,944)** | **($709,304)** | **($927,430)** |
| | | | | |
| **Reserves**[a] | $3,916,430 | $4,171,722 | $4,171,722 | $4,171,722 |
| Available Balance | $3,156,113 | $4,171,722 | $4,171,722 | $4,171,722 |
| Used to Cover Operations | $0 | ($376,944) | ($709,304) | ($927,430) |
| **Ending Balance** | **$3,156,113** | **$3,794,778** | **$3,462,418** | **$3,244,292** |

[a] Reserves for "Normal" scenario from February 29, 2016 Cash Report from the City

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 Agency and relying more heavily on groundwater); it would defer capital projects as necessary and use available reserves to cover operational expenses. In Fiscal Year 2015-16, where the City experienced revenue reductions as a result of the State's emergency regulations, it deferred capital projects and discretionary contract services in order to manage the revenue reduction.

Currently, the City is able to manage even a 50% reduction in supplies with funding available from its current reserves. Late in Fiscal Year 2015-16, the City did raise water rates by 9% in order to manage increasing costs and provide for more stable reserve levels. At the same time, the City adopted annual escalators that will allow its water rates to better keep up with increasing costs. The impact of these increases on water enterprise revenue was dampened by the demand reductions requires as a result of the State's emergency regulations. The City will continue to monitor its reserves in order to assure that reserve funding remains available to manage unanticipated reductions in demand.

## SECTION 5 IMPLEMENTATION AND MONITORING PROCEDURES

At the time of a water shortage emergency, the Santa Rosa City Council will adopt a Water Shortage Resolution. A draft Water Shortage Emergency Resolution is found in Appendix 1. With Stages 2 through 4, a Water Shortage Emergency Ordinance will also be adopted.

In the event that a Water Shortage Emergency occurs and the City Council cannot assemble to adopt the Water Shortage Emergency Resolution, the Director of Utilities is authorized to implement the appropriate stage, based on the reduction in water supply, of the Shortage Plan. The Director of Utilities' determination to implement the Shortage Plan shall remain effective until the City Council meeting immediately following such determination, at which time the Santa Rosa City Council will adopt the Water Shortage Resolution.

Stage 1 – Voluntary and Stage 1 – Mandatory – Monthly delivery records from the Agency meters and from local groundwater sources, if in use, will be reported to the City Manager or his/her designee. If overall reduction goals are not met, the City Manager may notify the City Council and more aggressive measures can be implemented.

Stages 2 and 3 - Weekly delivery figures from the Agency meters and local groundwater sources, if in use, and monthly consumption data from the City's Utility Billing Division will be reported to the City Manager or his/her designee. If overall reduction goals are not met, the City Manager may notify the City Council and more aggressive measures can be implemented.

# Appendices

# Appendix 1 – Draft Water Shortage Emergency Resolution

**DRAFT WATER SHORTAGE EMERGENCY RESOLUTION**

**RESOLUTION NO. 20__-__**

**RESOLUTION OF THE COUNCIL OF THE CITY OF ROHNERT PARK DECLARING A WATER SHORTAGE EMERGENCY, IMPLEMENTING STAGE ___ OF THE CITY'S URBAN WATER SHORTAGE CONTINGENCY PLAN AND REQUESTING CUSTOMERS TO REDUCE WATER USE BY ___PERCENT**

**WHEREAS**, the City of Rohnert Park is empowered to provide water service within certain boundaries; and

**WHEREAS,** the City of Rohnert Park has the authority and responsibility to adopt water demand reduction measures within its area of service; and

**WHEREAS,** due to (current condition – drought, contamination, etc.), water supply conditions indicate that a _____% reduction in demand is required to ensure adequate supply and/or comply with regulatory directives; and

**WHEREAS,** City staff is recommending implementation of Stage _____ of the City's Urban Water Shortage Contingency Plan to respond to the water supply condition; and

**NOW, THEREFORE, BE IT RESOLVED** that the Council of the City of Rohnert Park declares a water shortage emergency and directs staff to implement a program of demand management as defined by Stage _____ of the City's Urban Water Shortage Contingency Plan to realize community-wide water reduction of _____%.

**BE IT FURTHER RESOLVED** that the City Manager is hereby authorized and directed to take all actions to effectuate the implementation of the City's Urban Water Shortage Contingency Plan attached hereto as Exhibit "A.

**DULY AND REGULARLY ADOPTED** this ____ day of _____, 20__.

**CITY OF ROHNERT PARK**

_____

_____, Mayor

**ATTEST:**

_____

_____, City Clerk

**APPROVED AS TO FORM**

_____
City Attorney

# Appendix 2 – Water Code Section 10632

# Water Code Section 10632

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

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

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

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

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

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

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

(7) An analysis of the impacts of each of the actions and conditions described in paragraphs (1) to (6), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

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

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

(b) Commencing with the urban water management plan update due July 1, 2016, for purposes of developing the water shortage contingency analysis pursuant to subdivision (a), the urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code

# APPENDIX 8

# CALIFORNIA URBAN WATER CONSERVATION COUNCIL REPORTS

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# APPENDIX 9

# PUBLIC NOTICES AND ADOPTION RESOLUTION

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March 4, 2016

Mr. Tennis Wick
Director
Sonoma County Permit and Resource Management Department
550 Ventura Avenue
Santa Rosa, CA 95403

Re: Notice of Review and Preparation of 2015 Urban Water Management Plan

Dear Mr. Wick,

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 2015 UWMP is July 1, 2016.

The City of Rohnert Park is providing notice that it is in the process of preparing its 2015 UWMP. The 2015 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 2015 UWMP, please feel free to contact me at (707) 588-2234 or via email at marygracepawson@rpcity.org.

Sincerely,

Mary Grace Pawson
Director of Development Services/City Engineer

Distribution List:

Sonoma County Water Agency, Attn: Grant Davis
City of Cotati, Attn: Craig Scott
City of Petaluma, Attn: Leah Walker
City of Santa Rosa, Attn: Jennifer Bruce
City of Sonoma, Attn: Dan Takasugi
North Marin Water District, Attn: Chris DeGabriele
Town of Windsor, Attn: Toni Bertolero
Valley of the Moon Water District, Attn: Dan Muelrath
City of Sebastopol, Attn: Henry Mikus
Penngrove Water Company, Attn: Jim Downey
Sonoma State University, Attn: Christopher Dinno
City of Rohnert Park, Attn: John McArthur, Mark Bautista

**[NOTE: Forward completed Notice to City Clerk's Office at least four days prior to first publication.]**

# 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 28, 2016, 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 the City's 2015 Urban Water Management Plan

The City Council of the City of Rohnert Park will hold a public hearing on June 28, 2016 at 6:00 pm to receive comments on the City's 2015 Urban Water Management Plan, including an update to the City's Water Shortage Contingency Plan. The purpose of these plans is to consolidate information regarding the City's water demands and water supplies, to provide public information and to improve statewide water planning. Documents related to this item are available for public review during normal business hours at:

City of Rohnert Park Development Services Department

130 Avram Avenue, 2nd Floor, Rohnert Park, CA

Rohnert Park –Cotati Regional Library

6250 Lynne Conde Way, Rohnert Park, CA

City of Rohnert Park City Web Page

http:/www.rpcity.org

All persons interested in this matter should appear at the June 28, 2016 City Council meeting. Written statements may be submitted to the City Clerk in advance for presentation to the Council as part of the public hearing.

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 Mary Grace Pawson, Director of Development Services/City Engineer (707) 588-2234

Dated: June 13, 2016 Caitlin Saldanha, Deputy City Clerk

Published: June 15, June 17, June 24

# APPENDIX 10

# DWR CHECKLIST

# (NOT PRINTED WITH REVIEW DRAFT)

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