Walnut Valley Water District

Water Use Efficiency Strategic Plan

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LIST OF ABBREVIATIONS AND ACRONYMS

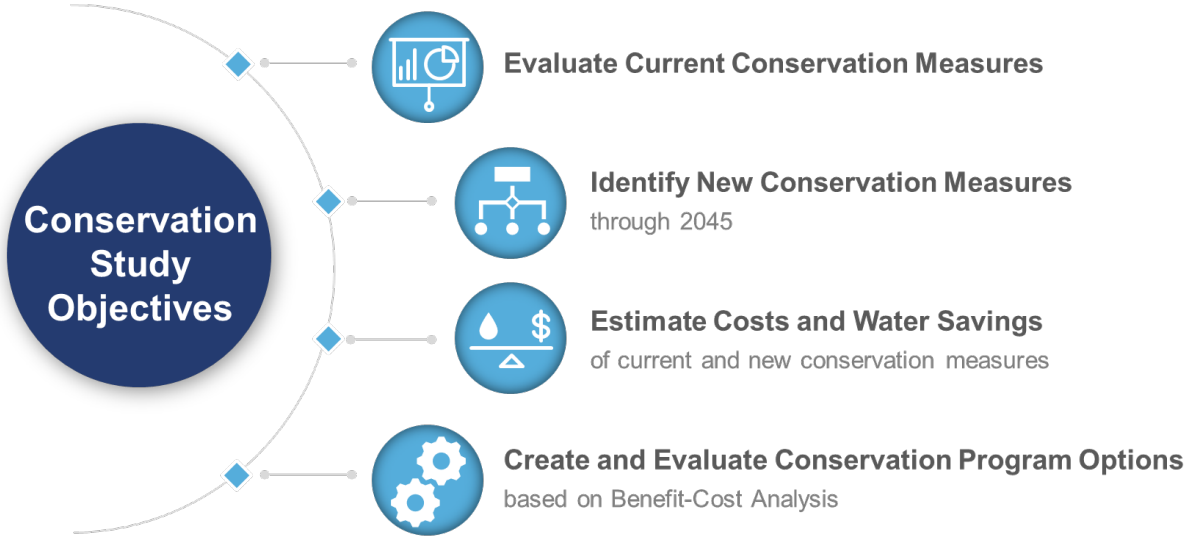
AB	Assembly Bill
acct	account
AF	acre-feet
AFY	acre-feet per year
AWE	Alliance for Water Efficiency
AWWA	American Water Works Association
AWWARF	American Water Works Association Research Foundation
CalWEP	California Water Efficiency Partnership
CEC	California Energy Commission
CII	Commercial, Industrial, and Institutional
CIMIS	California Irrigation Management Information System
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
Delta	Sacramento-San Joaquin River Delta
District	Walnut Valley Water District
DSS Model	Least Cost Planning Decision Support System Model
DWR	California Department of Water Resources
EPA	Environmental Protection Agency
E-RIP	Exterior Retrofit Irrigation Program
GPCD	gallons per capita per day
gpd	gallons per day
gpf	gallons per flush
gpm	gallons per minute
HE	high efficiency
MF	multifamily
MWD	Metropolitan Water District of Southern California
MWELO	Model Water Efficient Landscape Ordinance
MWM	Maddaus Water Management
Plan	Water Use Efficiency Strategic Plan
psi	pounds per square inch
REUWS	Residential End Uses of Water Study
SB	Senate Bill
SB X7-7	Water Conservation Act of 2009
SF	Single Family
SFR	Single Family Residential
SWP	State Water Project
SWRCB	State Water Resources Control Board
TVMWD	Three Valleys Municipal Water District
UWMP	Urban Water Management Plan
WSAP	Water Supply Allocation Plan
WUE	Water Use Efficiency

EXECUTIVE SUMMARY

The purpose of the Executive Summary is to briefly describe the Walnut Valley Water District (District) Water Use Efficiency Strategic Plan (Plan). The evaluation process and assumptions used to develop this Plan as well as recommendations for future implementation are included in this section.

Introduction

This conservation technical analysis was conducted by Maddaus Water Management Inc. (MWM) for the Walnut Valley Water District. The purpose of the analysis is to accomplish the following Conservation Study Objectives:



Program Overview

Through the identification and prioritization of conservation measures, this Water Use Efficiency Strategic Plan will enable the District to project long-range demands, identify attainable conservation goals, develop strategies, and raise awareness. The Plan includes a cost-effective suite of water conservation measures[1] that will help meet future water needs locally and regionally. In addition, by adhering to the Plan, the District can meet the state of California's current and future requirements and objectives. By combining new initiatives with existing programs as part of a comprehensive strategy for sustainable management of water supplies, the District's conservation activities proposed for Program B of this Plan are expected to save an estimated 2,400 acre-feet of water per year in 2045, depending on program selection and implementation schedule.

The planning process included the analysis of conservation measures and programs using the Least Cost Planning Decision Support System Model (DSS Model), developed by MWM. A screening of more than 100 measures, directed at existing customers and new development, was conducted following the methodology presented in the American Water Works Association Manual of Practice, *M52 Water Conservation Programs – A Planning Manual* (AWWA, 2017).

The foundation of Plan development was four-fold: (1) incorporate current, historical, and projected population growth and new commercial growth rates; (2) evaluate current and future conservation measures using a set of applicable criteria; (3) quantify the costs and water savings of these measures; and (4) combine the measures into increasingly aggressive programs that could be evaluated as a group.

[1] Though "demand management measure" is not a term used in this report, it may be relevant to readers who are more familiar with the term to understand that it is essentially the same as the term "water conservation measure." So, in this report, "demand management" and "water conservation" are used interchangeably.

The Current Program (Program A) scenario includes measures required by law as well as regional programs that focus on indoor and outdoor efficiency for both Residential and Commercial, Industrial, and Institutional (CII) customers. Program B expands on this foundation by including advanced measures for CII efficiency and leak detection. Program C, which includes all measures modeled, adds several more programs that incentivize pool covers, provide fixture updates for government and school buildings, and build partnerships with energy utilities. All measures are listed in Figure ES-1 and described in more detail in Appendix E.

Figure ES-1. Walnut Valley Water District Selected Measures for Evaluation

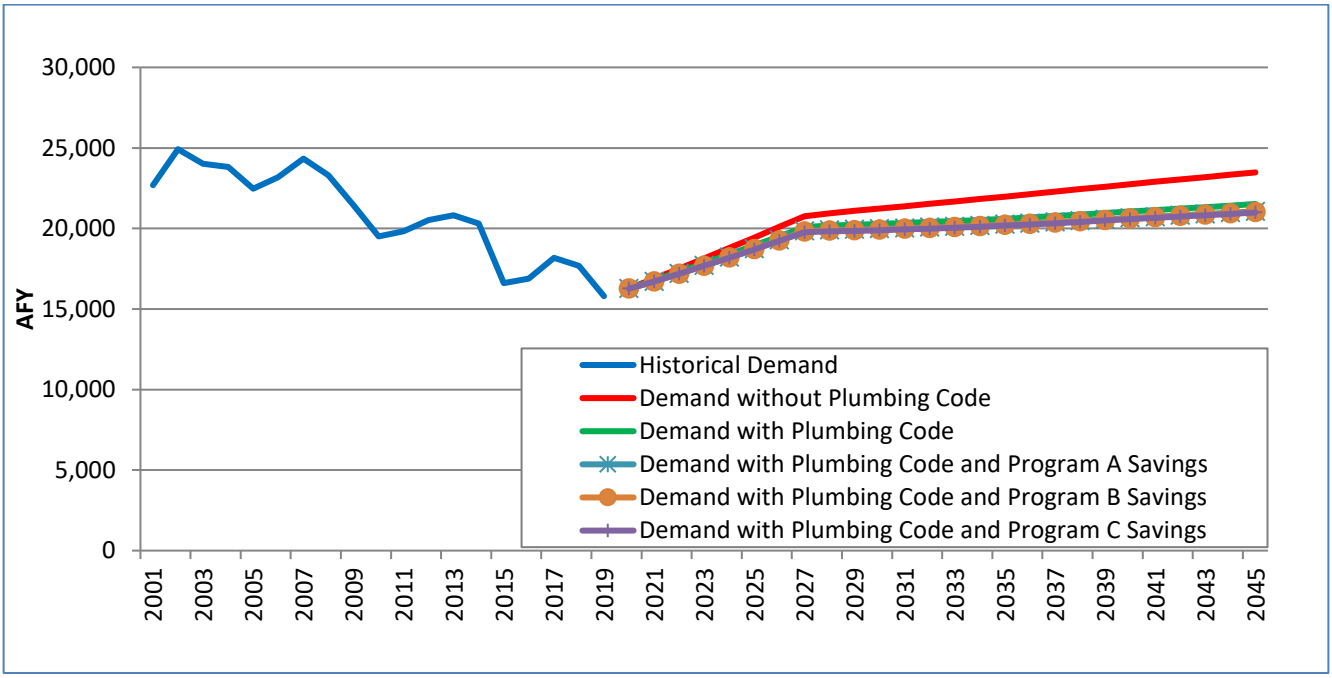
This Plan was also developed to support the future intentions of the state of California. In light of yet another drought from 2014–2017, the California Legislature established a framework centered on "Making Water Conservation a California Way of Life." This framework was designed to help the state better prepare for droughts and climate change by establishing statewide water efficiency standards and incentivizing recycled water. The supporting state legislation, Senate Bill (SB) 606 (Hertzberg) and Assembly Bill (AB) 1668 (Friedman), established guidelines for efficient water use and a framework for the implementation and oversight of the new standards by 2022. These efforts and requirements, along with any future regulations currently under development, will have profound effects on water providers over the coming years by requiring per-person indoor water use goals, annual water budgets, and documented preparation for long-term droughts.

The benefits of each of the Conservation Program options include the following:

- Alignment with the District's Goals and Objectives to:
  - Operate existing water systems to provide economical service at a specified quality level to existing users
  - Provide for the orderly expansion of capacity to satisfy future demand for utility services
  - Charge each rate payer, consumer class, and new applicant for service including those reasonable costs incurred by the District in providing that service
  - Promote wherever possible and practicable the use of recycled water and water conservation practices
- An expansion of existing efforts to meet state-mandated targets and aggregate water use objectives
- A long-term plan that models a cost-effective means to manage water supplies
- Environmental sustainability for the District
- Provides the District's customers with educational opportunities to learn about the benefits of water efficiency and conservation

The following figure presents historical and projected acre-feet per year (AFY) use for all conservation programs. Plumbing code elements include current local, state, and federal standards for retrofits of items such as toilets, showerheads, and faucets.

Figure ES-2. Walnut Valley Water District Historical and Projected Demand



Note: All line types shown in the legend are presented in the graph, but Program A, Program B, and Program C are close in value and therefore may be indistinguishable in the figure.

The average annual implementation cost for Programs A, B, and C (including administrative costs) are approximately $92,239, $119,774, and $126,960, respectively, for the 26-year analysis period. This total includes all direct District costs but does not include any costs related to county programs or grants. However, the program is intended to be flexible and structured in a "menu/toolbox" format to allow individual measures to change within the schedule as necessary. This flexible format will allow adaptation to new or best-available technology, changes in cost-sharing partnerships, or other unforeseen needs. It will also enable the District to select or change measures for implementation, as needed, to reach its conservation goals.

1 INTRODUCTION

This section provides an overview of the main components of the Walnut Valley Water District's water system, describes the objectives of the District's Water Use Efficiency Strategic Plan, and provides a project history of the steps used to complete the Plan.

1.1 Overview of Walnut Valley Water District Water System

Purpose of District and Board of Directors

Dedicated to meeting the water supply needs of the communities we serve

Formed on July 10, 1952, Walnut Valley Water District, a California Water District, is located about 20 miles east of Los Angeles in the San Gabriel Valley. The District encompasses an area of around 29 square miles. The District's present service area includes all of the city of Diamond Bar, portions of the cities of Industry, Pomona, Walnut, and West Covina, and the easterly section of the unincorporated area of Rowland Heights (Figure 1-1).

With more than six decades of service to the community, the District operates and maintains two large imported water pipelines, 497 miles of distribution mains, 17 pump plants, and 31 reservoirs with a storage capacity of 88.9 million gallons of water. The District delivers an average of 6 billion gallons of water to its customers every year. The District also provides water services to over 27,000 connections in an area encompassing 17,900 acres, serving an approximate population of over 100,000 residents and businesses in six local communities. Of the 27,000 connections, 25,500 are single and multifamily residential customers. The remaining connections are used for commercial, industrial, and irrigation purposes.

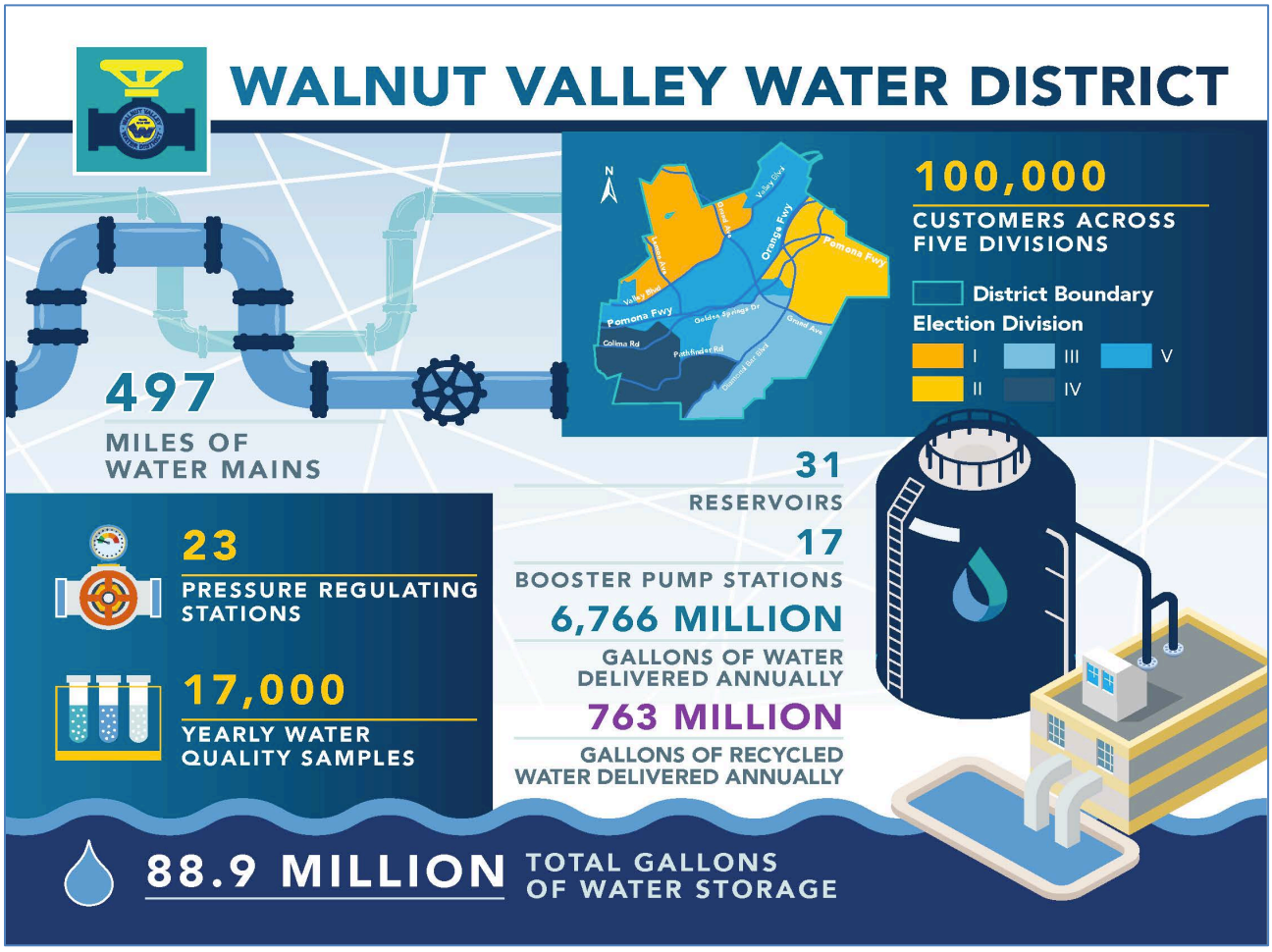
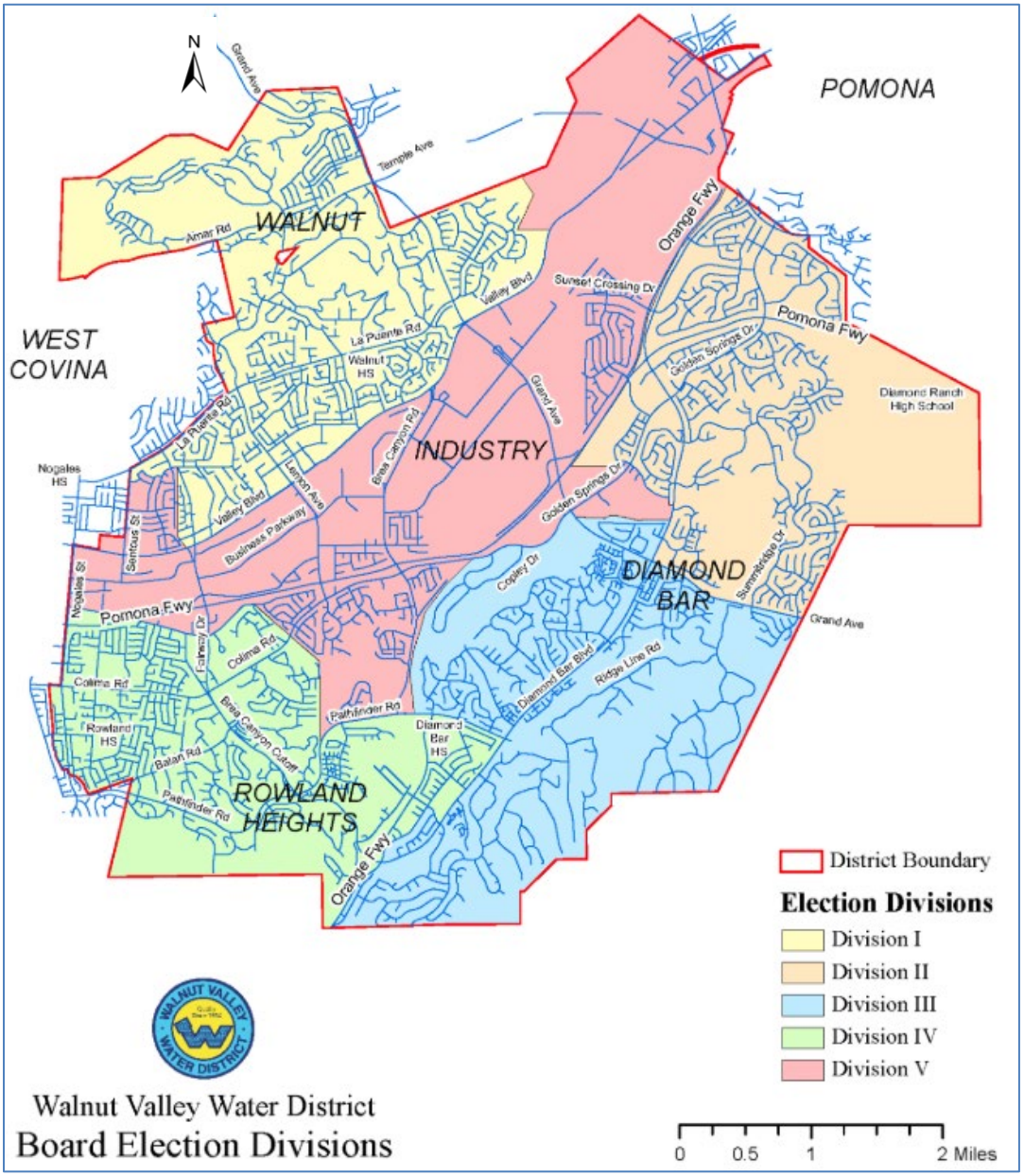


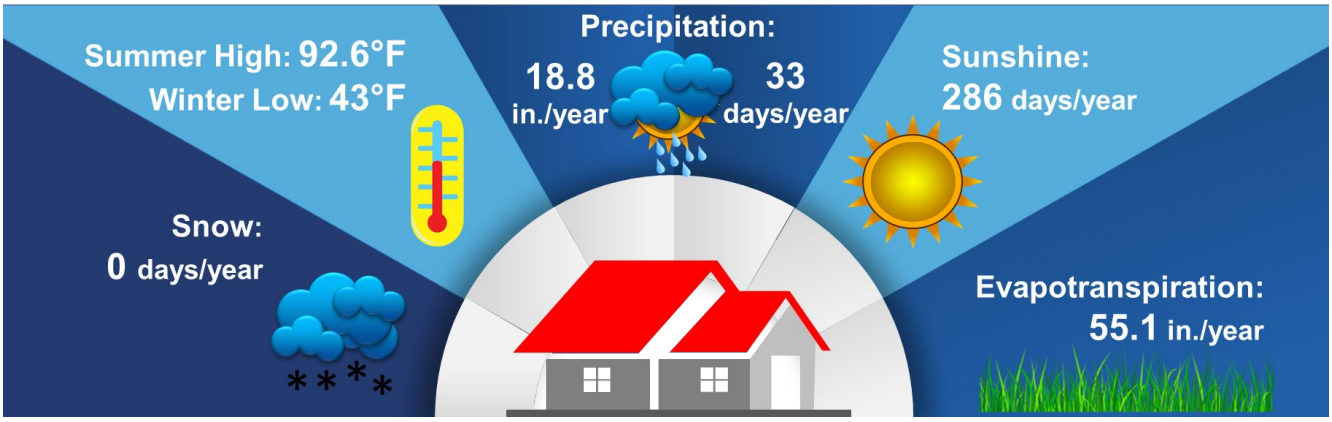
Figure 1-1. Walnut Valley Water District Service Area Map



1.1.1 Climate

Walnut Valley Water District is located in the inland area between marine and desert climates and includes some higher elevation coastal areas. The District straddles two California Irrigation Management Information System (CIMIS) Evapotranspiration Reference Zones: 1) Zone 6 – Upland Central Coast and Los Angeles Basin; and 2) Zone 9 – South Coast Marine to Desert Transition. August is the hottest month for the District's service area with an average high temperature of 92.6° Fahrenheit. There are six comfortable months with high temperatures in the range of 70-85°F. The most pleasant months of the year are May, October, and April.

The area gets some kind of precipitation 33 days per year, on average. February is the wettest month with 4.7 inches of rain; the driest month is July with 0.0 inches. The annual rainfall averages 18.8 inches. The wettest season is in spring with 60% of yearly precipitation; 1% occurs in the fall, which is the driest season.

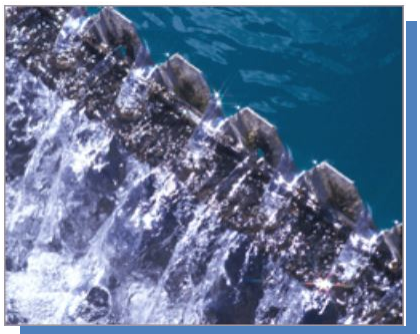


Walnut Valley Water District Weather Averages

1.1.2 System Supplies

Due to the limited availability of local groundwater sources, the District is entirely dependent on surface water imported from the Colorado River and Northern California by the Metropolitan Water District of Southern California (MWD), the sole importer of water to this area, through a wholesale member agency, Three Valleys Municipal Water District (TVMWD). Two groundwater basins, the Puente Basin and the Spadra Basin, underlie the District. The primary basin, Puente Basin, is an adjudicated basin and is governed by the Puente Basin Watermaster representing all overlying interests, including those of the Rowland Water District and the City of Industry. The Spadra Basin is an unadjudicated basin. Currently, potable water is not available from either basin.

In 1955, the District, in concert with the City of Pomona and the Rowland Water District, constructed a joint pipeline (Joint Water Line) for the purpose of delivering imported water to meet the water supply needs of these communities. This pipeline varies in diameter from 42 to 60 inches and transports potable water from MWD's Weymouth Treatment Plant in La Verne and, when surplus water is available, from TVMWD's Miramar Treatment Plant in Claremont to the District's Edmund M. Biederman Terminal Storage Reservoir and Hydroelectric Facilities in Walnut.



Weymouth Treatment Plant

The Joint Water Line is 7.6 miles in length and, for many years, was the District's primary source of water until completion of the Badillo/Grand Transmission Main in 1993, which effectively doubled this area's import water supply and provided an alternate supply route. The construction of this 5.5-mile transmission main was critical to the District since it provides access to a secondary water source, ensuring system reliability in times of catastrophic need, such as fire or earthquake. The District also presently owns and operates a 150-kilowatt hydroelectric plant at its connection to the Joint Water Line.

In an effort to reduce its dependence on imported potable water, the District also operates a recycled water distribution system for use in irrigating large landscaped areas, such as parks and school grounds; these areas have traditionally placed a significant demand on the District's potable drinking water system. This recycled water system is completely separate from the potable water system and annually delivers an average of 763 million gallons of "drought-proof" water. The District obtains its recycled water from the Los Angeles County Sanitation Districts' Pomona Water Reclamation Plant, including augmentation by groundwater from the District's recycled wells. This water is combined with water pumped from the District's recycled water well and furnished to various local schools and government agencies for landscape irrigation and other related uses. The District's recycled water distribution system consists of approximately 40 miles of pipeline, 3 reservoirs, 1 pump plant, 2 booster stations, and 5 non-potable wells.

In 2012, the District began to explore the development of projects to diversity its water supply and further decrease its dependency on treated, imported water. The District established a goal of developing at least 5,000

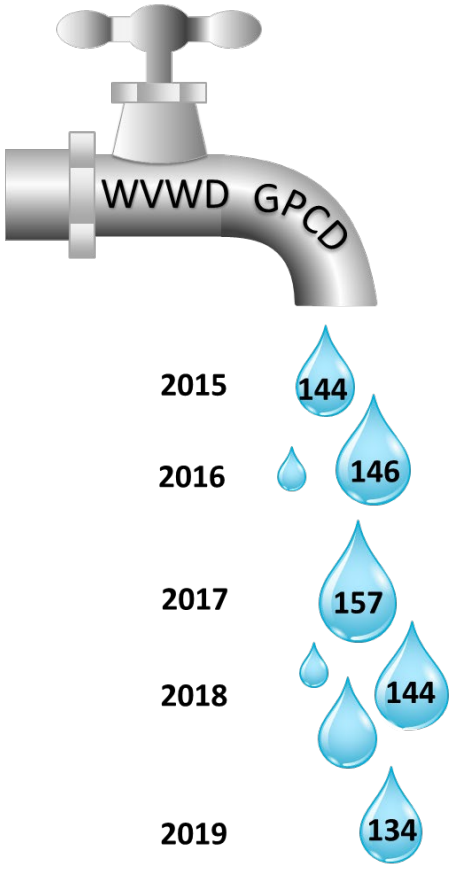
AFY of locally available water supply. In order to accomplish this goal, the District, working with the Rowland Water District through the Puente Basin Water Agency, has explored several projects in the Main San Gabriel, Central, and Six Basins groundwater basins that would allow both agencies to meet their individual water supply diversification project goals. So far, the agencies have completed two projects that have a combined capacity of 7,000 AFY (3,500 AFY per agency). The agencies also are pursuing two additional projects, one currently under construction, that will yield an additional 1,500 to 3,500 AFY.

1.2 Project Background

Recently, a substantial shift in the challenges and drivers for water management has occurred – in part because of the recent drought, water supply conditions, and the need to comply with looming water conservation regulations. This Plan will allow the District to implement additional water use conservation measures in line with current conditions regarding water sustainability and reliability. The Plan considers best management practices consistent with current regulations and best practices in the industry.

Miramar Treatment Plant

The Plan is in support of the Water Conservation Act of 2009 (Senate Bill X7-7 or SB X7-7) that was originally enacted to help ensure California continues to have reliable water supplies and requires urban water agencies to collectively reduce statewide per capita water use by 20% before December 31, 2020. For the year 2020, SB X7-7 gallons per capita per day (GPCD) target for the District was determined to be 169, as documented in the 2015 Urban Water Management Plan (UWMP). With the 2015–2019 system-wide GPCD under 169, the District has already met its SB X7-7 20x2020 target and so plans to focus on meeting the new legislation requirements.



To forecast and plan for long-term demand management reductions and meet the SB X7-7 per capita water use reduction requirements, the District hired Maddaus Water Management in 2019. MWM analyzed the existing conservation program and utilized its proprietary DSS Model (a software tool that assists water planners with water conservation program analysis) to evaluate current and potential water conservation measures. The DSS Model quantified the demand reduction effects of these measures along with the effects of plumbing codes and appliance standards. Projections of future water demand, with and without water conservation programs, were made using the DSS Model for the District's water service area for every year in the 26-year analysis period. An overview of the DSS Model is in Appendix B.

In May 2018, California Governor Edmund G. Brown Jr. signed SB 606 and AB 1668, the two bills intended to implement "Making Water Conservation a California Way of Life" legislation to better prepare the state for droughts and climate change through the establishment of statewide guidelines for efficient water use. According to the framework of the legislation, the new standards must be in place by 2022. This Plan will be used for compliance in meeting the requirements of SB 606 and AB 1668 as well as SB 555 and additional upcoming state mandates.

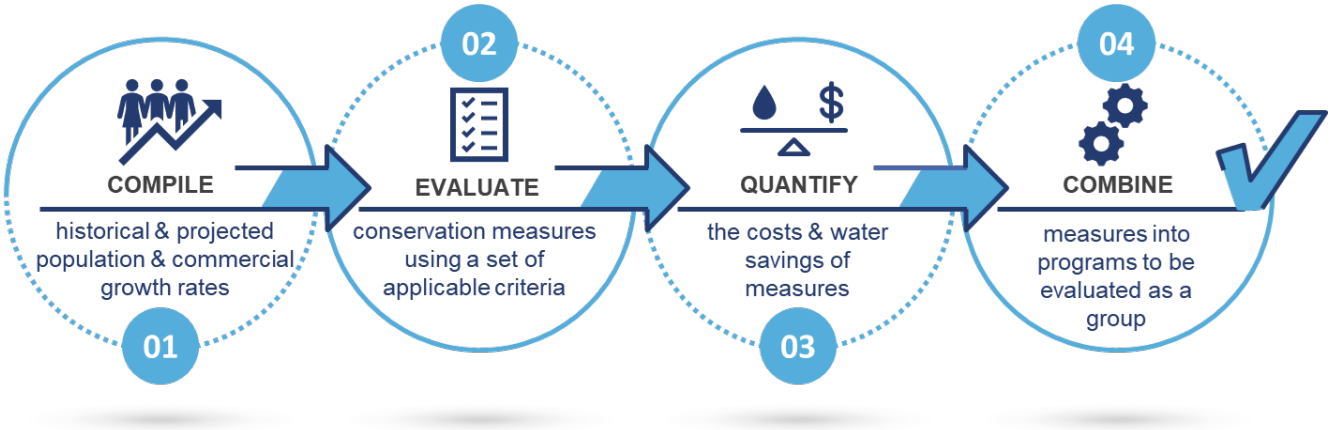
SB 606 and AB 1668 strengthen the state's water resiliency in the face of future droughts[2]; provisions include:

- Establishing an indoor, per person water use goal of 55 gallons per day until 2025, 52.5 gallons from 2025 to 2030, and 50 gallons beginning in 2030;
- Creating incentives for water suppliers to recycle water; and
- Requiring both urban and agricultural water suppliers to set annual water budgets and make preparations for drought.

Based on the analysis of current water use patterns, and taking into account characteristics of the service area, a list of more than 100 potential conservation measures was compiled and reviewed with the District staff during two measure screening workshops.

District staff reviewed the measure list and selected 22 measures for further detailed economic analysis. The evaluation included measures directed at existing accounts as well as new development measures for new residential and business customers to encourage more water efficiency. Water savings and benefit-cost evaluations were performed on the selected measures. Based on a preliminary analysis of the individual measures, three programs (Program A, B, and C) were developed by MWM. Each of the three programs were evaluated to determine the net effect of running multiple measures together over the 26-year period of analysis from 2020 to 2045. Assumptions and results for each of the 22 individual measures and three programs are described in detail later in this Plan.

1.3 Plan Development



The District worked closely with MWM to compile extensive historical data on the region, the water service area, conservation measures, production, consumption, weather, and various census data points. Together, these formed the foundation for MWM's DSS Model, which was used specifically on this project. The DSS Model prepares long-range, water demand and conservation water savings projections.[3] The District project team utilized the template data collection workbook provided by MWM to compile and verify data. The project team at MWM verified and tested data against historical records to ensure accuracy and logic as the DSS Model was developed. More detailed information about the DSS Model can be found in the appendices of this Plan, including a description of the assumptions, analysis, and methodology used.

[2] https://www.ca.gov/archive/gov39/2018/05/31/governor-brown-signs-legislation-establishing-statewide-water-efficiency-goals/index.html

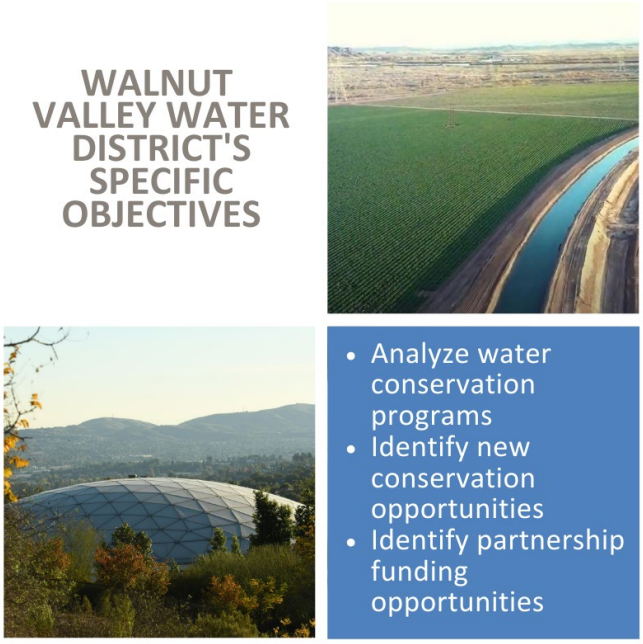
[3] The DSS Model is an "end-use" model that breaks down total water production (water demand in the service area) to specific water end uses, such as plumbing fixtures and appliance uses. It uses a bottom-up approach that allows for multiple criteria to be considered when estimating future demands, such as the effects of natural fixture replacement, plumbing codes, and conservation efforts. It also may use a top-down approach with a utility prepared water demand forecast.

MWM reviewed existing District practices and procedures to create a comprehensive list of water use conservation measures currently in place. The team also reviewed relevant literature and practices of other agencies to determine potential measures that could be implemented by the District. MWM used its master potential measures database and followed the process outlined in the AWWA Manual *M52*.

Throughout the planning process, the District and MWM conducted five meetings, primarily in an effort to complete the DSS Model. In the model, which is robust for each of the 22 measures modeled, the District identified fixture costs, applicable customer classes, time period of implementation, measure life, administrative costs, end uses, end-use savings per replacement, and a target number or percentage of accounts per program year. The analysis is planned to be used in further District planning documents such as the 2020 Walnut Valley Water District UWMP.

Following the DSS Model completion and evaluation of program options, the Draft and Final Water Use Efficiency Strategic Plans were prepared. The Final Plan is aligned to the new state legislation SB 606 and AB 1668 framework. However, details of the state plan have yet to be released. When the detailed guidance is available, this Final Plan may need to be modified to include any new or revised actions needed by the District.

1.4 Purpose and Scope of Strategic Plan



The purpose of the District's Water Use Efficiency Strategic Plan is to systematically evaluate and quantify a long-term water conservation strategy for the service area. The Plan details the assessment, analysis, and measurement of completed and existing programs and identifies new water use efficiency (WUE) opportunities. The Plan optimizes program costs and water savings, thereby evaluating whether expanding existing efforts is a feasible and cost-effective way to meet future water needs in comparison to using and/or developing other sources of water supply. The Plan is intended to serve as a guide for conservation programming and to set measurable targets for the District regarding future water use efficiency investments and activities. This includes an implementation plan for the District to use to establish and administer cost-effective WUE programs to meet its WUE goals.

Through identification and prioritization of conservation measures, the District can project long-range demands, identify attainable conservation goals, develop strategies, and raise awareness. By combining new initiatives with existing programs, this comprehensive strategy and slate of conservation activities will contribute to a more sustainable management of water supplies in the District service area and community.

The evaluation in the Plan includes measures directed at existing accounts as well as additional development measures mandating that new residential and business customers be water efficient. Based on a preliminary analysis of the individual measures, three programs (Programs A, B, and C) were designed by the District. Each of the three programs was evaluated to determine the net effect of running multiple measures together over the 26-year period of analysis (2020–2045). Assumptions and results for each of the 22 individual measures and three programs are described in detail in this Plan.

2 HISTORICAL AND CURRENT WATER USE

This section presents information about the data collection process, historical production, and customer category consumption data as well as a summary of the District's conservation efforts. The District's water use patterns were analyzed based on water production, consumption, and water loss data.

2.1 Information Review and Data Collection Methods

A thorough collection and review of information relevant to this effort was conducted and entered into the District's Excel-based Data Collection Workbook. To help streamline the process, MWM initially entered data from readily available sources, like the 2015 UWMP, into the Data Collection Workbook prior to sending the file to the District staff for updating and review. Using the provided consumption and accounts database values from the District, MWM and the District staff confirmed the number and types of customers within the District service area. Several follow-up actions of data review were conducted between the District staff and MWM to compile all relevant and valuable information and to identify the unique customer categories to be tracked.

Data from each customer category was analyzed separately. Monthly production data from 2000–2019 was reviewed. MWM and District staff decided to use the data from 2010–2013 to derive typical non-drought average water use per account per day. Based on the District's water billing system, residential water use was broken down into single family and multifamily categories. Historical data was segregated into indoor and outdoor water use by customer type using the monthly billing data. Non-residential categories of use were analyzed separately. Average daily commercial, industrial, and institutional water use was expressed on a gallons-per-account basis.

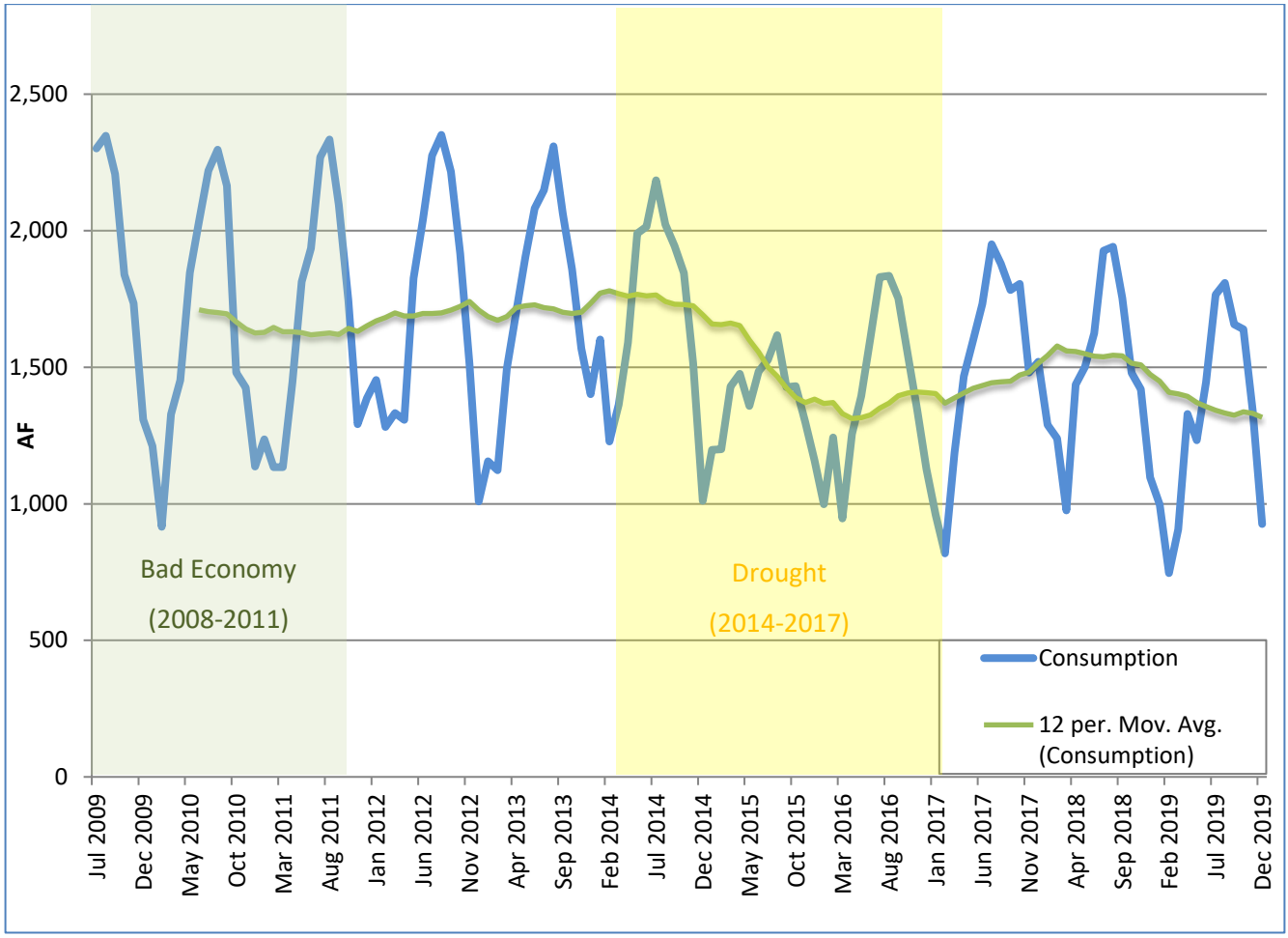
Figure 2-1 presents data topics and items requested, gathered, and stored in the District's Data Collection Workbook. Items were tracked in a robust checklist worksheet kept by MWM and the District.

Figure 2-1. Data Collection Workbook Topics and Items Requested

2.2 Consumption

Figure 2-2 illustrates historical monthly consumption from 2010–2019. Consumption data was measured at the customer meters. The District's water use decreased with the 2008–2011 recession and due to the historic multi-year drought that followed officially from 2014–2017 but had its greatest effect on the District from 2012–2016.

Figure 2-2. Walnut Valley Water District Historical Consumption



The District has several types of water users with approximately 27,000 active connections (excluding fire lines), all of which are metered. For the purpose of this analysis, current and projected user categories are classified as follows:

- Single Family
- Multifamily
- Commercial
- Industrial
- Institutional/Governmental

Figure 2-3 presents the water use profile of the average annually billed metered consumption of the various user categories based on monthly water use and account data from post-drought year 2019. This is used to derive average per account per day water use.

Figure 2-3. Potable Average Consumption by User Category

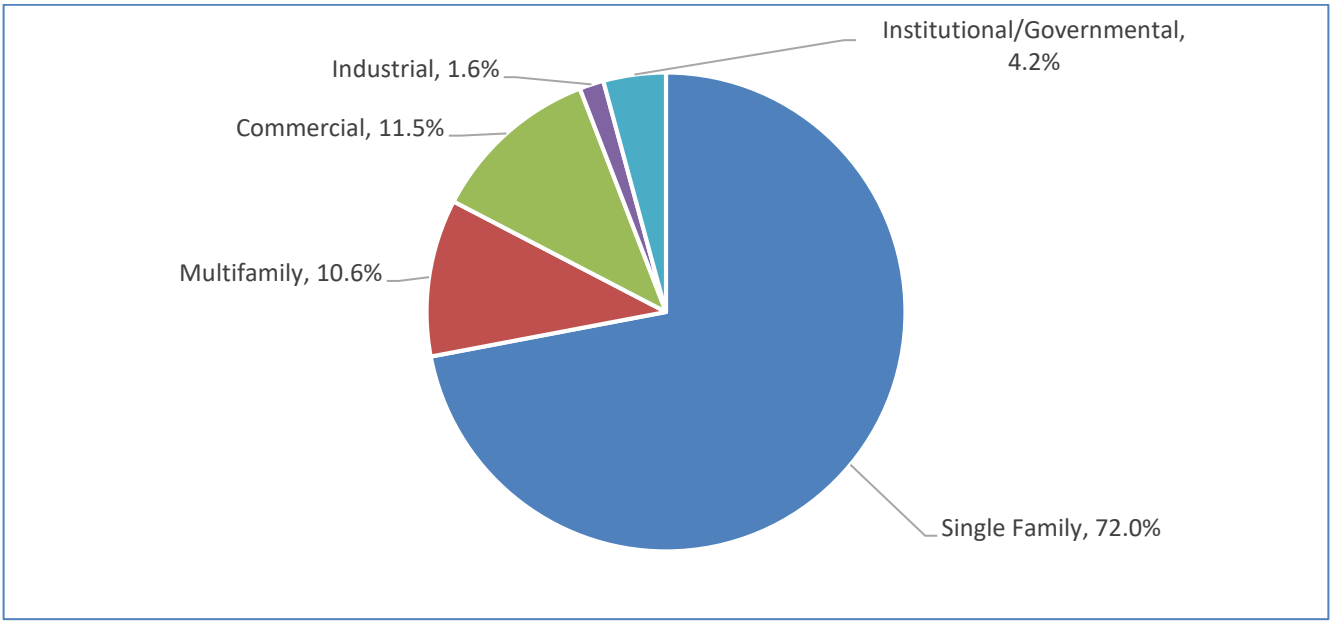
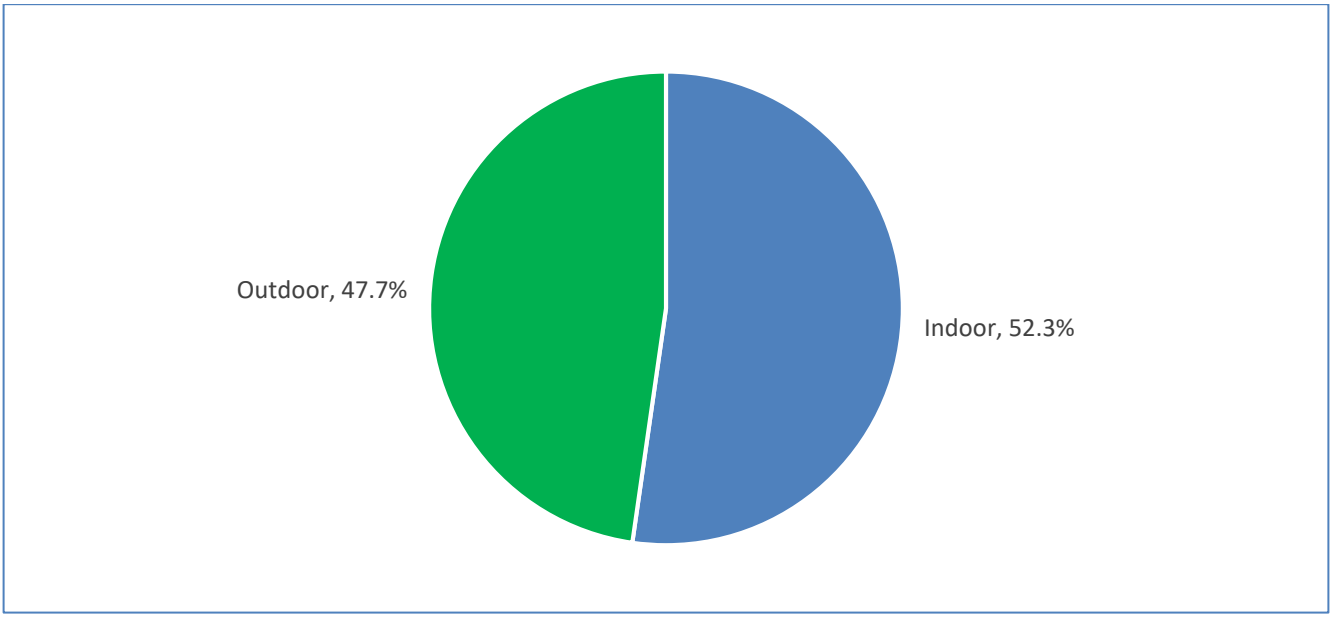


Figure 2-4 shows the breakdown of water use into indoor and outdoor components based on the assumption that the District experiences year-round irrigation. Year 2019 water use was selected for this profile, representing post-drought conditions. This analysis helped determine historical use patterns and allow water conservation planning to focus on the area with the highest overall category of use.

Figure 2-4. Potable Water System Indoor vs. Outdoor Overall Water Use



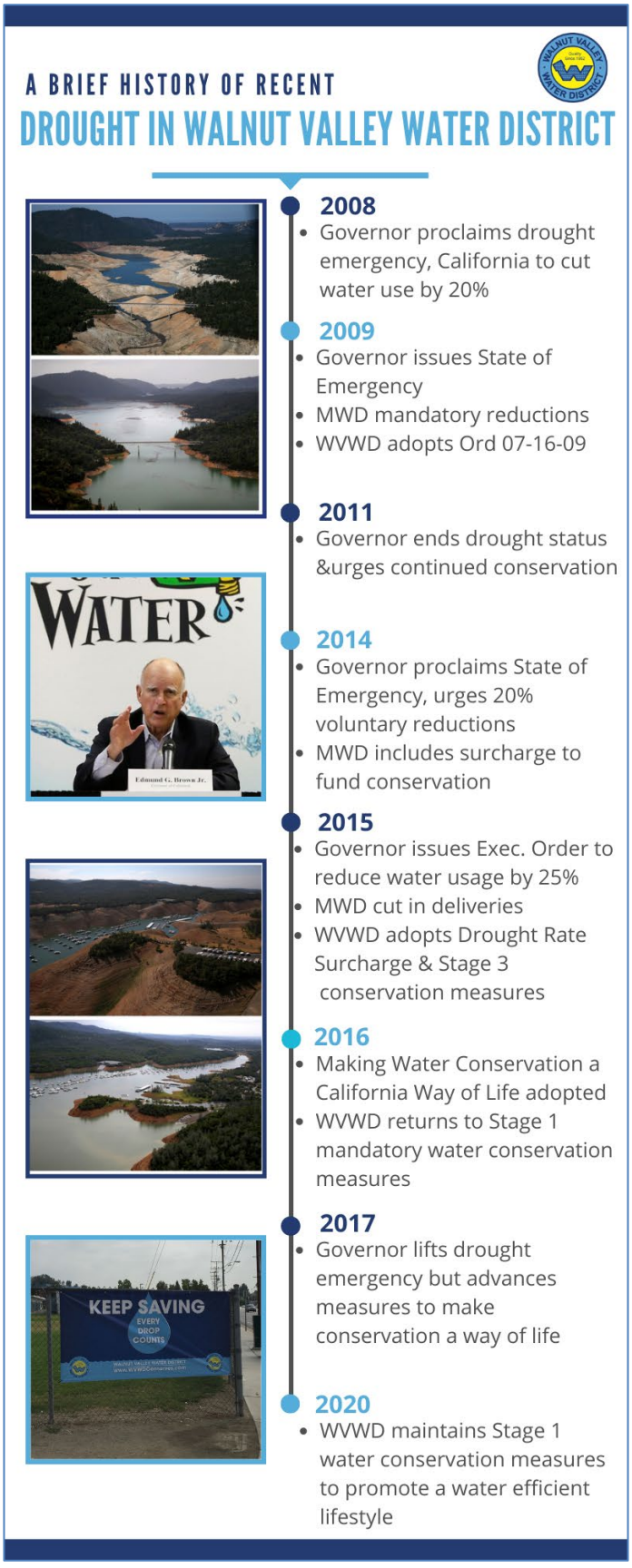
2.3 Historical and Current Conservation Program

The District's water use efficiency program has evolved under a legacy of drought in California and therefore practices ongoing commitment to water use efficiency at all times. In addition to responding to state and regional legislation and requirements, the District has adopted ordinances, created public outreach programs, and provided rebates and incentives to improve water efficiency throughout the service area. The District requires water efficiency in building codes and standards as a result of state-guided mandates as well as increasingly strict local ordinances. The District likewise promotes the use and maintenance of water efficient products, practices and services.

In February 2008, Governor Schwarzenegger proclaimed a statewide drought emergency urging California to cut water use by 20% asking urban water agencies to step up conservation efforts. In preparation for drought, Metropolitan Water District, a regional wholesaler that delivers water to the District, adopts the Water Supply Allocation Plan (WSAP) used for allocating water supplies to member agencies in times of declared water shortages. In June 2008, MWD declared a water supply alert to sustain water reserves and in February 2009, Governor Schwarzenegger issued a State of Emergency for all of California. During this time, MWD imposed mandatory reductions on its member agencies for the first time in 18 years, together with a rate increase of 8.8% in the base wholesale rate and a $69/AF Sacramento-San Joaquin River Delta (Delta) surcharge.

In response to the drought, in June 2009 the District adopted Ordinance No. 07-16-09 (see Section 2.3.2 Water Waste Ordinance) to establish Water Use Efficiency Requirements and Water Supply Shortage Stages. In order to communicate the situation to customers and provide guidance on water conservation actions, the District started a public outreach messaging campaign that included "The 20 Gallon Challenge, Save Our Water Now" and "A Call to Save Water."

This timeframe, 2007–2009, was known as the 12th worst drought period in the state's history. The 2008 drought declaration was the first since 1991 and stopped just short of mandatory water rationing. Water years 2007–2009 also marked a



period of unprecedented restrictions in State Water Project (SWP) and federal Central Valley Project (CVP) diversions from the Delta to protect listed fish species.

From July 2009 through June 2011, MWD implemented the WSAP when storage levels fell to low levels. The WSAP is a "needs-based" method that uses financial incentives for water conservation. Water use above supply allocations of 100–115% faced a penalty rate charge two times the tier, and water use above 115% of supply allocation was charged four times the tier for excess water use. Finally, in March 2011, Governor Brown ended California's drought status and urged continued conservation. However, this reprieve from drought did not last long as it was less than five years before the worst drought in California history occurred (2014–2017).

With dry conditions persisting and another drought looming, in April 2014 Governor Brown called for actions to strengthen the state's ability to manage water and habitat effectively in drought conditions. He called on all Californians to redouble their efforts to conserve water and refrain from wasting water. He also directed the State Water Resources Control Board (SWRCB) to adopt emergency regulations pursuant to Water Code section 1058.5[4] to implement water conservation requirements.

While a water shortage in 2014 was avoided, MWD approved adjustments to its WSAP In December 2014 as drought conditions continued into 2015 and were predicted to result in mandatory supply allocations. The adjusted WSAP included an allocation surcharge based on the marginal cost of water conservation (a cost-of-service charge). Revenues generated by the allocation surcharge were dedicated to increased funding of water conservation. As expected, in April 2015 Governor Brown issued an Executive Order that, for the first time in state history, directed the SWRCB to implement mandatory water reductions in cities and towns across California to reduce water usage by 25% through February 2016. This included a call to increase actions to save water, increase enforcement to prevent wasteful water use, streamline the state's drought response, and invest in technologies that would make California more drought resilient.

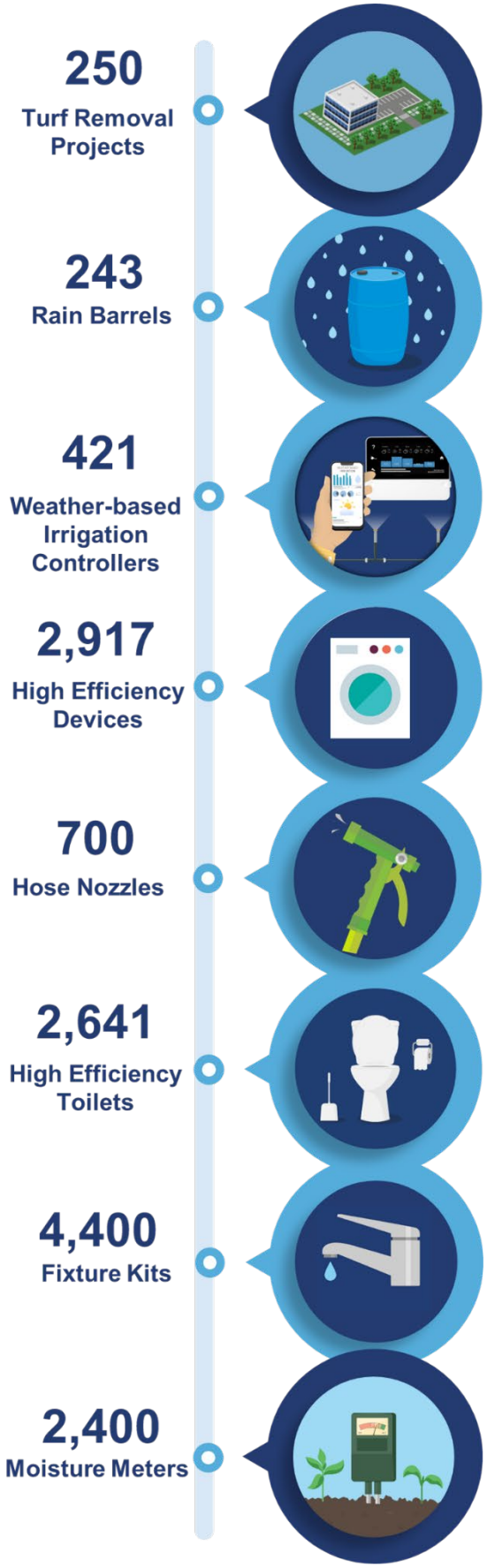
Water Efficiency Makeover Sign

Local to the District, during this time, the MWD board approved a cut in deliveries to member water districts for only the fourth time in the agency's history. The water rationing was intended to reduce MWD deliveries by 15% overall. Allocations were calculated according to a complex formula and member agencies requiring more water than their allocation were charged financial penalties that made the additional water more expensive.

In May 2015, the District adopted a Drought Rate Surcharge which imposed an additional fee for high water usage to its Rates and Charges for Water Service. (The District bills customers monthly based on metered use with the units of consumption clearly indicated. A sample bill can be found in Appendix G.) In addition, Stage 3 mandatory water conservation measures took effect which included obligations to fix leaks and breaks as well as limits on watering hours, days, duration; irrigation; cooling systems; pools; and more. The District also created a public outreach campaign to communicate with customers which included "25%, Together We Can Get There," "Together We Can Make a Difference," "Brown is the New Green," "Keep Saving, Every Drop Counts," and "Use Water Wisely."

As the drought persisted into January 2016, water suppliers were required to comply with the water conservation requirements from the Water Conservation Act of 2009 (SB X7-7), a legislative package that required a 20% reduction in urban water use per capita by 2020. In May 2016, Govern Brown issued the Executive Order to "Make Water Conservation a California Way of Life" which set forth actions to use water more wisely, eliminate water waste, strengthen local drought resilience, and improve agricultural water use efficiency and drought planning.

[4] California State Legislature. California Water Code 1058.5. https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=WAT&sectionNum=1058.5.



Finally, in mid-2016, the situation began to ease and the SWRCB recommended changes to the emergency drought rules to allow communities around the state to relax or even drop their mandatory conservation targets. The SWRCB also announced that 343 of the state's 411 water districts reported having enough water to meet their customers' demands. In addition, the MWD board adopted less stringent conditions for water districts that make additional water purchases and agencies by no longer subjecting them to allocations or punitive surcharges when exceeding those allocations.

In July 2016, the District implemented Stage 1 mandatory water conservation measures which included an easing of limits on watering hours, days, duration, washing of vehicles and paved surfaces, irrigation, and more. However, despite the relief from drought, "Making Water Conservation a California Way of Life" was maintained through education and public outreach programs. Furthermore, in partnership with MWD, water savings incentives were offered through rebates for water efficient devices, turf removal, and more.

In April 2017, Governor Brown lifted the drought emergency but, reflecting on the 340-week drought, retained prohibitions on wasteful practices and advanced measures to make conservation a way of life.

As of 2020, Walnut Valley Water District maintains Stage 1 water conservation measures as a permanent tool to further advance education and outreach efforts to promote a water efficient lifestyle. Through education and community programs, the District fosters relationships to provide customers with the resources and incentives needed to become water conservation stewards and ambassadors. The figure to the left showcases the water conservation upgrades, incentives, and rebated equipment facilitated by the District over time.

2.3.1 Public Education and Outreach

The District has developed a diverse portfolio of public outreach and education programs to promote a water-efficient lifestyle. Efforts to connect with the local community are ever-growing as the demand and needs evolve.

Education programs are available to students in grades 3-12 within the District's service area. Through an annual poster contest utilizing the theme "Use Water Wisely, It's a Way of Life," students are given the opportunity to demonstrate their artistic abilities while learning the importance of water conservation. Each year the District establishes a unique theme, based on the current climate and state of water, and hosts a high school digital and broadcast media contest. Classroom presentations are available to teachers in the

service area that include audience participation and information on water distribution and treatment, the water cycle, and conservation techniques. Classroom and community presentations are accompanied by water awareness "goodie bags" to help bring the conservation conversation into the home. In addition, a high school internship program is offered to students interested in learning about careers in the water industry. It provides hands-on opportunities to learn how they can become environmental stewards in their community.

Constant communication with customers through various mediums creates a unique opportunity to foster relationships, meeting customers where they are most comfortable. The District maintains a robust social media presence on Facebook, Instagram, Twitter, and YouTube to promote conservation and all the ways in which customers can save water as a part of their daily routine. Monthly billing inserts, monthly e-newsletters, community newspaper ads, participation in numerous community events, water awareness giveaways, online and in-person workshops/events, virtual tours, and an interactive website further serve to promote water use efficiency within the District.

2.3.2 Water Waste Ordinance

The District understands that careful water management includes active water conservation measures at all times to ensure a reliable supply of water for current and future needs within the service area. To that end, in June 2009 the District adopted Ordinance No. 07-16-09 to establish Water Use Efficiency Requirements and Water Supply Shortage Stages as described below.

Water Use Efficiency Requirements – Prohibition Against Water Waste/Permanent Water Use Restrictions

- Limits on watering duration
- Limits on watering hours
- Limits on watering following precipitation/rainfall
- No excessive water flow or runoff
- No washing down hard or paved surfaces
- Obligation to fix leaks, breaks, or malfunctions
- Limits on washing vehicles
- Re-circulating water required for water fountains and decorative water features
- No installation of single pass cooling systems
- No installation of non-re-circulating systems in commercial car washes and laundry facilities
- No irrigating ornamental turf on public street medians
- No negligent waste of water

Water Supply Shortage Stages of Action

The Stages of Action include MWD's reduction objective and drought contingency planning based on four stages as follows, each with additional conservation measures.

1. Stage 1: 10–15% Reduction of Water Use
2. Stage 2: 15–25% Reduction of Water Use
3. Stage 3: 25–35% Reduction of Water Use
4. Stage 4: 35–50% Reduction of Water Use

Ordinance No. 07-16-09 enables water conservation action at all times for the District and is an efficient mechanism to deal with drought conditions of increasing severity.

3 PROJECTED WATER DEMANDS WITH AND WITHOUT PLUMBING CODE SAVINGS

This section presents baseline water demands with and without the plumbing code, including details regarding the national and state plumbing codes and the DSS Model, which is used to prepare long-range, detailed demand projections (see DSS Model overview in Appendix B). This rigorous modeling approach is especially important if the project will be subject to regulatory or environmental review.

3.1 Projected Baseline Demand

The assumptions having the most dramatic effect on future demands are: 1) the natural replacement rate of fixtures; 2) the method for projecting residential and commercial future use; and 3) the percent of estimated real water losses. As described in the previous section, baseline customer category water use was determined using 2019 post-drought historical monthly water use. After several demand scenarios were explored, it was determined by District staff that the projected baseline water demand would assume a multi-year drought recovery to bring the 2026 water use to 10% less than the average of 2010–2013 levels. Appendix C contains a detailed summary of the key assumptions used for developing projected baseline demands, including the population and employment projection basis used in the District's DSS Model.

3.2 Estimated Plumbing Code Savings

The DSS Model forecasts service area water fixture use. In the codes and standards part of the DSS Model, specific fixture end-use type (point of use fixture or appliance), average water use, and lifetime are compiled. Additionally, state and national plumbing codes and appliance standards for toilets, urinals, showers, and clothes washers are modeled by customer category. This approach yields two distinct demand forecasts related to plumbing code savings: 1) with plumbing codes and 2) without plumbing codes. Plumbing code measures are independent of any conservation program and are based on customers following applicable local, state and federal laws, building codes, and ordinances.

Plumbing code-related water savings are considered "passive" and reliable long-term savings and can be depended upon over time to help reduce overall system water demand. In contrast, water savings are considered "active" if a specific action unrelated to the implementation of codes and standards is taken by the water agency to accomplish conservation measure savings (e.g., offering turf replacement rebates). The DSS Model incorporates the following items as a "code," meaning that the savings are assumed to occur and therefore are "passive" savings:

- The Federal Energy Policy Act of 1992 (amended in 2005)
- California Code of Regulations Title 20 California State Law (Assembly Bill 715)
- California State Law Senate Bill 407
- 2015 California Code of Regulations Title 20 Appliance Efficiency Regulations
- 2019 CALGreen Code (effective January 1, 2020)

The DSS Model uses "fixtures models" to track individual plumbing devices and their water savings as they change and become more efficient over time. Figure 3-1 conceptually describes how plumbing codes using fixture models are incorporated into the flow of information in the DSS Model. The demand projections, including plumbing code savings, further assumes no active involvement by the water utility, and that the costs of purchasing and installing replacement equipment (and new equipment in new construction) are borne solely by the customers, occurring at no direct utility expense. The inverse of the fixture life is the natural replacement rate expressed as a percent (i.e., 10 years is a rate of 10% per year). Further information about plumbing codes and standards; passive water savings; fixture replacement and estimates; and additional assumptions and corresponding resources used in the DSS Model to determine projected demands with plumbing codes can be found in Appendix C.

Figure 3-1. DSS Model Overview Used to Make Potable Water Demand Projections

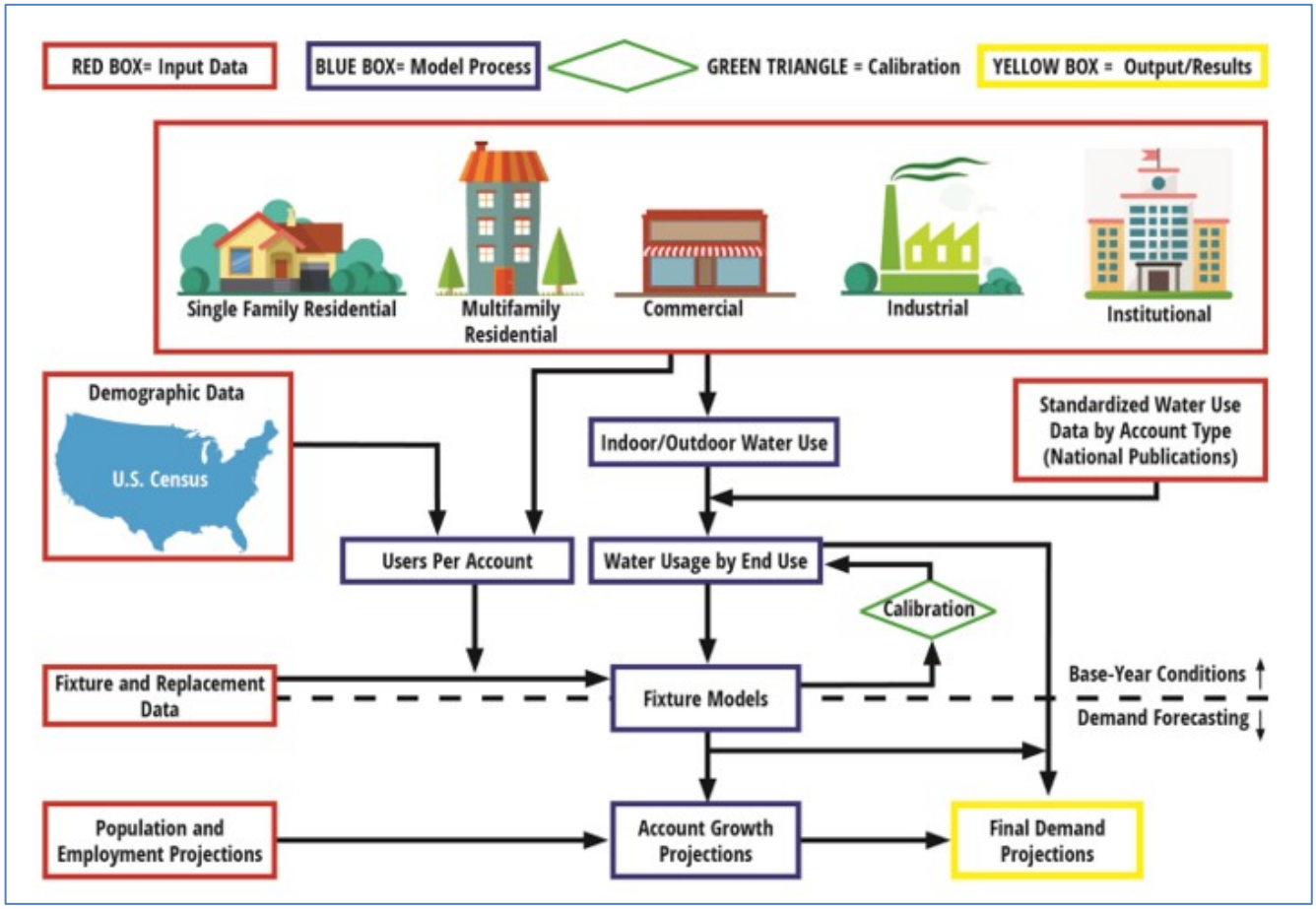


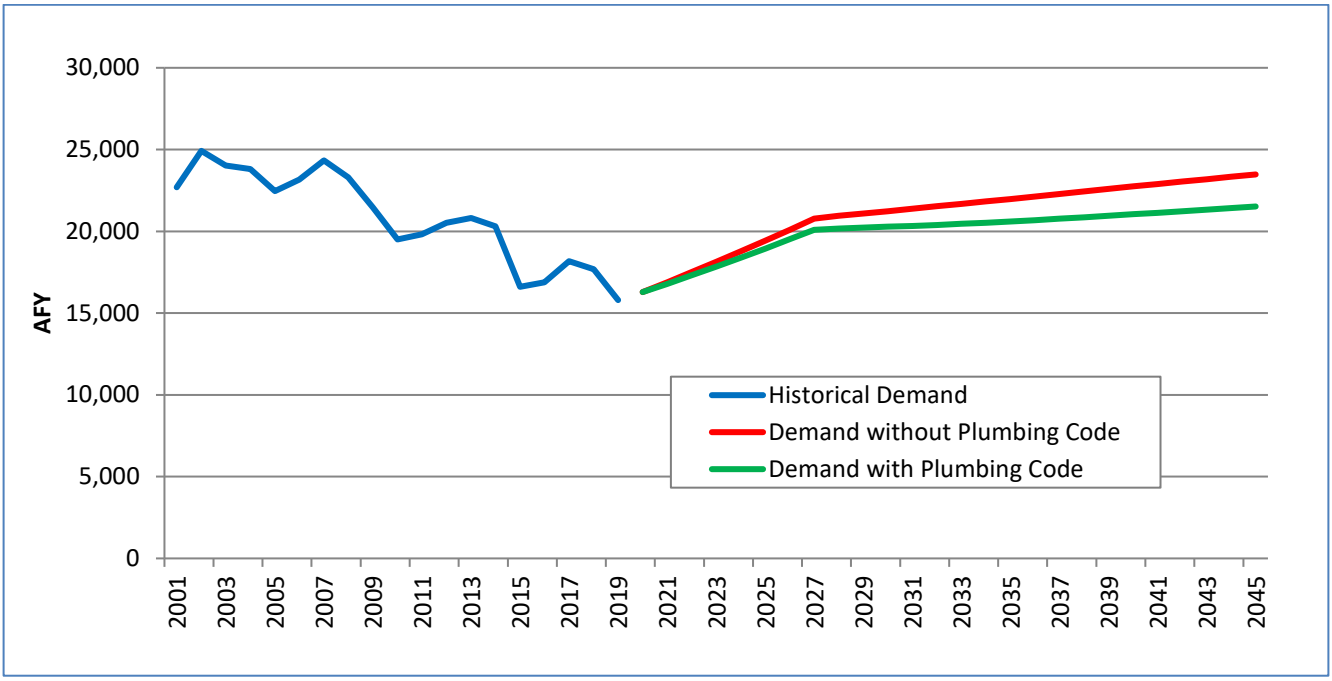
Table 3-1 shows the water system demands for the District in acre-feet in 5-year increments over the 26-year modeling period (2020–2045). Figure 3-2 illustrates demands in graphical format. Both the table and the figure include historical (baseline) demand as well as demand with and without plumbing code.

Table 3-1. Walnut Valley Water District Potable Water System Demands for Years 2020–2045

AFY	2020	2025	2030	2035	2040	2045
Baseline Demands	16,286	19,436	21,234	21,979	22,750	23,478
Plumbing Code Savings	-	491	957	1,378	1,705	1,964
Demands with Plumbing Code Savings	16,286	18,945	20,277	20,601	21,044	21,515

Note: All numbers in the table are listed in acre-feet/year.

Figure 3-2. Walnut Valley Water District Potable Water System Demands



4 FUTURE WATER USE OBJECTIVES

The District utilizes a suite of various benchmarks to assess progress in the implementation of the ongoing conservation program. The District also tracks SB X7-7 per capita water use goals as well as measures performance metrics such as number of rebates awarded, student engagement, customer workshops and classes (virtual and in-person), and customer satisfaction surveys. At this time, District system wide total water use remains 21% below year 2013 water use. Looking ahead, the District plans to track state legislation metrics related to the future water use objectives as the standards are developed through the state's stakeholder process by the California Department of Water Resources (DWR) and the State Water Resources Control Board.

A supply assessment is conducted regularly by the District with its water supply portfolio demonstrating how conservation is evaluated and regarded as equal to other water supply options. When the District conducts supply and demand forecasting analyses, the estimated water made available through conservation is a part of the supply portfolio. This is evident in the District's previous and pending Urban Water Management Plan.

4.1 California Legislation and the Water Use Objectives

On April 7, 2017, the state of California released the "Making Water Conservation a California Way of Life, Implementing Executive Order B-37-16" Final Framework Report[5] (State Framework Report). The State Framework Report, which builds upon Governor Brown's call for new long-term water use efficiency requirements in Executive Order B-37-16, provided the state's proposed approach for implementing new long-term water conservation requirements. A key element of the report is the proposed new water use targets for urban water suppliers that go beyond existing SB X7-7 requirements[6] and are based on strengthened standards for indoor residential per capita use, outdoor irrigation, CII water use, and water loss.

On May 17, 2018, the California Legislature adopted SB 606 and AB 1668 to implement new long-term water use efficiency requirements, including new urban water use objectives for urban water suppliers. This legislation incorporated some key components of the State Framework Report, although some specific elements of the approach for implementing the new water use objectives were changed during the legislative process.

4.1.1 Adopted Legislation and Regulatory Schedule

The legislation requires the SWRCB, in coordination with DWR, to adopt long-term standards for the efficient use of water. The legislation establishes specified standards for per capita daily indoor residential use. In addition to performance measures for CII water use, and with stakeholder input, the SWRCB will adopt long-term efficiency standards for outdoor water use and water loss through leaks.

The legislation requires each urban retail water supplier to calculate and report an urban water use objective, which is an estimate of aggregate efficient water use for the previous year based on the adopted water use efficiency standards. Urban retail water suppliers will be required to calculate and report urban water use objectives by November 1, 2023 and by November every year thereafter, and to compare actual water use to the objective for the prior year by the same date.

The bills grant SWRCB the authority to enforce compliance with the urban water use objectives, with enforcement actions ramping up over the first three years of implementation. The bills also establish a schedule for state agencies to develop the methodology for implementing the requirements, as presented in Table 4-1.

[5] California Department of Water Resources, et al. (2017). *Making Water Conservation a California Way of Life, Implementing Executive Order B-37-16*.

[6] SB X7-7, also known as the Water Conservation Act of 2009, was a significant amendment introduced after the drought of 2007-2009 and because of the California governor's call for a statewide 20% reduction in urban water use by the year 2020.

Table 4-1. Implementation Schedule for SB 606 and AB 1668 Key Requirements

Date	SB 606/AB 1668 Key Requirements
January 1, 2021	1. DWR to recommend to legislature standards for indoor residential water use. Defaults are: • 55 gallons per capita per day (GPCD) until 2025 • 52.5 GPCD from 2025 until January 2030 • 50 GPCD beginning in 2030 2. DWR to provide each urban retail water supplier with data regarding irrigable lands at level of detail sufficient to verify accuracy at the parcel level
October 1, 2021	1. DWR to recommend standards for outdoor residential use for adoption by SWRCB • Incorporate Model Water Efficient Landscape Ordinance principles • Applies to irrigable lands • Include provisions for swimming pools, spas, etc. 2. DWR to recommend performance measures for CII water use, including: • CII classification system • Minimum size thresholds for converting mixed CII meters to dedicated irrigation meters • Recommendations for CII best management practices 3. DWR to recommend variance provisions for: evaporative coolers, horses and livestock, seasonal populations, soil compaction/dust control, water to sustain wildlife, and water for fire protection 4. DWR to recommend standards for outdoor irrigation of landscape areas with dedicated irrigation meters and incorporate Model Water Efficient Landscape Ordinance principles
June 30, 2022	1. SWRCB to adopt long-term standards for efficient water use: • Outdoor residential • Outdoor irrigation of landscape with dedicated irrigation meters at CII customer sites • Water loss (consistent with SB 555) 2. SWRCB to adopt performance measures for CII water use
November 1, 2023 and annually thereafter	1. Urban water supplier shall calculate its urban water use objective: • Efficient indoor residential water use, plus • Efficient outdoor residential water use, plus • Efficient outdoor water use through dedicated irrigation meters at CII customer sites, plus • Efficient water loss, plus • Variances as appropriate 2. Urban water supplier shall submit report to DWR on urban water use objectives, actual urban water use, implementation of CII water use performance measures, and progress towards urban water use objective.

5 CONSERVATION MEASURE EVALUATION

This section details the screening process, the conservation measures that were analyzed and the measure assumptions and inputs used in the DSS Model. Also included is a comparison of the individual conservation measures.

5.1 Screening of Conservation Measures

This section presents the District's goal to develop a Plan that would result in the greatest ease and efficiency of program administration, the lowest cost of implementation, and the greatest water savings. The measures also would need to be designed to address water conservation across all relevant customer categories. The screening process undertaken with the District's staff yielded 22 measures for further evaluation.

The experience of many utilities has shown that there is a reasonable limit to how many measures can be feasibly implemented at one time. Programs that consist of a large number of measures are historically difficult to implement successfully. Therefore, prioritization of measures is important both as an outcome of this planning effort and as the program is implemented. The approach to program implementation is viewed as a "living" process where opportunities may arise and be adopted as new technologies become available over time. Program timelines can also be adjusted, with the recognition that doing so may impact the savings objectives.

An important step in updating the District's water conservation program included identification of new measures that may be appropriate and the screening of these measures to a short-list for detailed evaluation (benefit-cost analysis). A thorough screening process was necessary to scale a reasonable short-list of measures for evaluation in the DSS Model. This evaluation was specific to the factors that were unique to the District's service area, such as water use characteristics, economies of scale, and demographics.

Potential new measures for the District's 2020 Water Use Efficiency Strategic Plan were screened using qualitative evaluation. The overall initial list of more than 100 potential water conservation measures was drawn from MWM and the District's experience and a review of what other water agencies with innovative and effective conservation programs are currently implementing.

When selecting which water use efficiency initiatives to pursue, the District always coordinates with partnering agencies to foster a holistic approach to serving the community.

5.2 Conservation Measures Analyzed

Table 5-1 describes the 22 measures that were selected for analysis through the measure screening. The list of measures includes devices or programs (e.g., such as a new, high-efficiency toilet that would save water if installed by a water retailer, contractor, or customer) that can be used to achieve water conservation; 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.

Information about the DSS Model analysis approach to measure unit costs, water savings, and market penetrations is in Appendix D. Actual measure inputs used in the DSS Model to evaluate the water conservation measures selected by the District, and their results, can be found in individual measure screenshots provided in Appendix E.

Table 5-1. Measure Descriptions

Measure Name	Description
Commercial	
Commercial Incentive Program	Through MWD's SoCal Water$mart, Southern California businesses are eligible for generous rebates to help encourage water efficiency and conservation. The SoCal Water$mart program offers cash rebates on a wide variety of water-saving technologies.
Indoor CII Survey	Provide free commercial surveys to CII customers. Survey includes free 1.15 gallons per minute (gpm), or lower, spray nozzles where appropriate.
High Efficiency Toilet & Urinal Bulk Purchase	Purchase high efficiency (HE) toilets and urinals in bulk and subsidize direct installation costs.
High Efficiency Urinal Incentive	Provide a rebate or voucher for the installation of an HE urinal.
Install High Efficiency Fixtures in Government Buildings, Schools & Commercial Buildings	Provide direct installation of HE faucets, toilets, urinals, and showerheads in municipal or District facilities.
Pool & Spa Cover Incentive	Provide a rebate for the purchase of a swimming pool cover through pool equipment supply stores. Single family, multifamily, and commercial customers are eligible for this rebate.
Irrigation	
Outdoor Water Audit – Large Landscape	Outdoor water audits offered for existing large landscape customers.
Financial Incentives for Irrigation & Landscape Upgrades	Through MWD's SoCal Water$mart, financial incentives are provided to commercial, industrial, and institutional property owners to install HE irrigation equipment or convert irrigation or industrial water systems to recycled water use.
Landscape Conversion or Turf Removal – SF	Provide rebate to single family customers to replace turf with low water use plants or permeable hardscape.
Landscape Conversion or Turf Removal – MF, CII	Through MWD's SoCal Water$mart, a rebate is provided to multifamily and commercial customers to replace turf with low water use plants or permeable hardscape.
Exterior Retrofit Irrigation Program (E-RIP)	Offers customers free landscape surveys and irrigation system retrofits. Program services are provided by EcoTech Services, Inc.
Residential	
Residential Water Surveys	Provide free indoor/outdoor water surveys for existing single and multifamily residential customers.
Residential Leak Repair & Plumbing Emergency Assistance	Assist qualified customers with leak repair either by subsidizing a portion of the repair or by paying the cost with revolving funds that must be paid back through the customer's water bills over time.

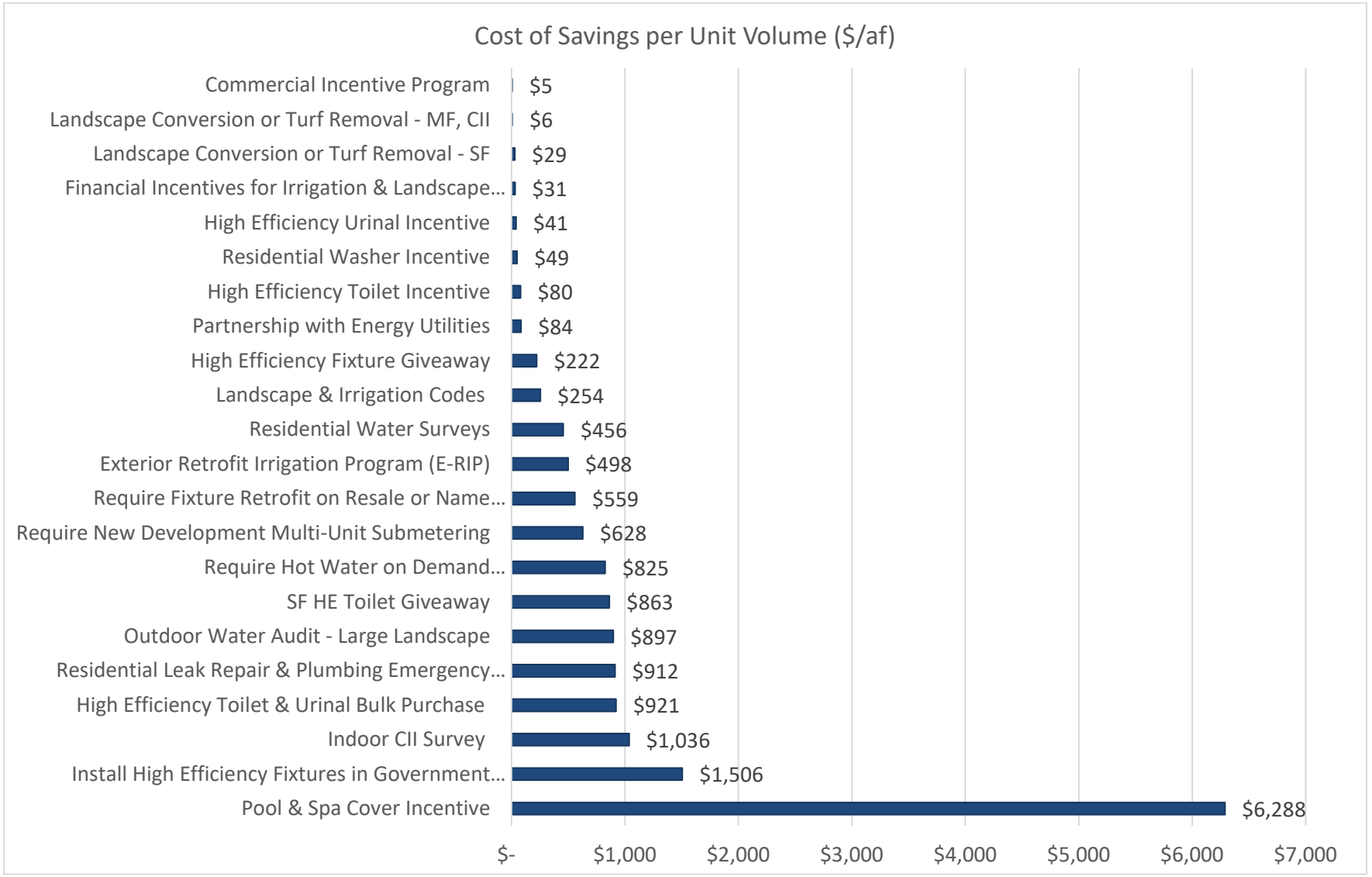
High Efficiency Fixture Giveaway	Provide HE showerheads, faucets, and aerators to customers free of charge. Fixtures available at the District office, given away at community events, or provided during residential water audits.
High Efficiency Toilet Incentive	Through MWD's SoCal Water$mart, rebates of $40 per toilet are available for Premium High Efficiency Toilets using 1.1 gallons per flush (gpf) or less.
Residential Washer Incentive	Through MWD's SoCal Water$mart, rebates starting at $85 are available for efficient washing machines to single family homes and apartment complexes with common laundry rooms.
SF HE Toilet Giveaway	Provide free 1.1 gpf toilet to single family customers.
Codes and Partnerships	
Water Conserving Landscape & Irrigation Codes	Enforce Landscape Design Standards for Water Conservation. Compliance with the District's Landscape Design Standards is mandatory for all new or altered landscaping proposed as part of a project subject to review by any District design review body. The standards are intended to promote water conservation while allowing flexibility in designing attractive and cost-effective water-wise landscapes.
Require New Development Multi-Unit Submetering	Require the metering of individual units in new multifamily, condos, townhouses, mobile-home parks, and business centers (less than four stories and with water heater in units). The District has been installing utility submeters on individual multifamily units for the past 10 years and plans to continue this practice moving forward. The utility reads the bills and charges each unit on an individual basis.
Require Fixture Retrofit on Resale or Name Change on Water Account or Renovation	Support the active monitoring and enforcement of the Retrofit on Change of Service requirement per SB 407.
Require Hot Water on Demand Structured Plumbing in New Developments	New development in the District would include equipping new homes or buildings with efficient hot water on demand systems such as structured plumbing systems.
Partnership with Energy Utilities	Identify opportunities to partner with local energy utilities to offer incentives to customers to save both water and energy.

5.3 Comparison of Individual Conservation Measures

MWM conducted an economic evaluation of each selected water conservation measure using the DSS Model. Appendix F presents detailed results including how much water each measure will save through 2045, how much each will cost, and the cost of saved water per unit volume if the measure were to be implemented on a stand-alone basis (i.e., without interaction or overlap from other measures that might address the same end use/uses). Dollar savings from reduced water demand was quantified annually and based on avoided costs provided by the District.[7] Actual measure design parameter inputs can be found in Appendix E. While each measure was analyzed independently, it is important to note that very few measures operate independently. For example, higher efficiency indoor fixtures go hand-in-hand with indoor water checkups and public education.

[7] The City's estimated average water production cost is $1,402/AF including treatment, energy, and transport costs.

Figure 5-1. Comparison of Conservation Between Cost of Programs and Water Savings



Note: Due to the length of some of the measure names, a few names were shortened in the above graph. Full measure names can be found in Table 5-1.

6 CONSERVATION PROGRAM EVALUATION

This section provides a summary of which measures were included in each of the three conservation programs as well as the program implementation strategy selected by the District. The three programs were designed to illustrate a range of various measure combinations and resulting water savings.

The following key items were taken into consideration during measure selection for Programs A, B, and C:

- Existing conservation measures
- Conservation measures recommended by AWWA, California Water Efficiency Partnership (CalWEP, formerly CUWCC), DWR and others
- New and innovative measures
- Measure equitability among customer categories
- Customer demographics

In addition, this section identifies and prioritizes the conservation programs and projects by cost effectiveness, quantifiable water savings, and compliance with American Water Works Association G480 Water Conservation Program Operation and Management Standard (G480 Standard). The G480 Standard is defined on the AWWA web page as follows:

> *The G480-13 Water Conservation Program Operation and Management Standard (G480 Standard) is a voluntary standard that can be adopted by water providers at their own discretion. The G480 Standard describes the critical elements of an effective water conservation program and encompasses activities undertaken by a utility within its own operations to improve water use on the supply side through distribution system management and on the demand side through customer billing and education practices. A conservation program meeting this standard has the potential to impact all water users.*[8]

6.1 Measure Selection for Conservation Program Alternatives

Using the data gathered, MWM created a list of all potential program concepts that were appropriate for the District's service area to meet future regulatory and conservation compliance mandates. The list included existing program elements and traditional conservation measures as well as concepts that had yet to be implemented or considered by the District. Factors for determining which measure should be in each program included budgeting, feasibility to implement the program, and the time at which each measure would need to be introduced to promote conservation efforts. Programs also needed to address water conservation across all relevant customer categories.

The results of the program analysis were reviewed, at which point the District adjusted the program contents to determine which measures would be in each of the three program scenarios. MWM then compiled descriptions and parameters of the programs. These program scenarios were not intended to be rigid but rather to demonstrate the range in savings that could be generated if selected measures were run at the same time. When programs were analyzed, any overlap in water savings (and benefits) from individual measures was considered to provide a total combined water savings (and benefits).

[8] American Water Works Association. G480 Standard and AWE Leaderboard web page: https://www.allianceforwaterefficiency.org/resources/topic/g480-standard-and-awe-leaderboard

Following, and in Figure 6-1, are brief descriptions of the resulting programs:

- **Program A: Current Measures.** Current conservation program with no changes (except to comply with state law adding new development submetering and landscape codes); includes 15 measures.
- **Program B: Recommended Measures.** In addition to existing efforts (other than E-RIP, which is not in Program B), includes CII surveys and leak assistance; includes 18 measures.
- **Program C: All Modeled Measures.** In addition to all those above, includes pool and spa covers and fixture installation in government and school buildings; includes all measures modeled in this effort for a total of 22 measures.

Figure 6-1. Conservation Program Options

***Program B does not include the E-RIP measure from Program A.**

Table 6-1 shows the benefit-cost ratios for conservation Programs A, B, and C. Each program's present value of water savings and utility costs as well as cost of water saved can be found in Appendix F.

Table 6-1. Comparison of Program Benefit-Cost Ratios

Conservation Program	Water Utility Benefit-Cost Ratio
Program A with Plumbing Code	3.49
Program B with Plumbing Code	3.06
Program C with Plumbing Code	3.17

Table 6-2 shows the water system demands for the District in acre-feet in five-year increments over the 25-year modeling period (2020–2045).

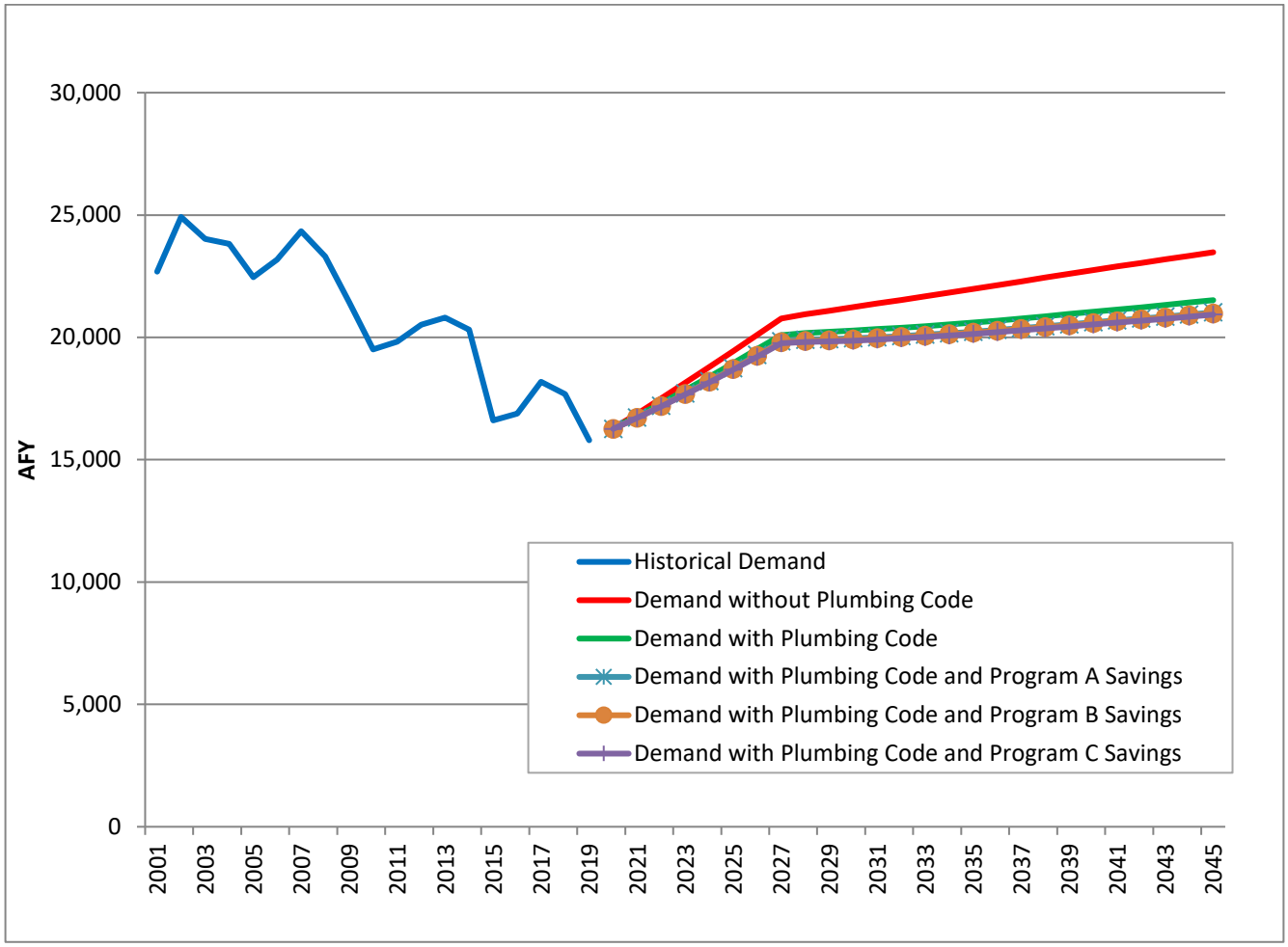
Table 6-2. Walnut Valley Water District Potable Water System Demands for Years 2020–2045

AFY	2020	2025	2030	2035	2040	2045
Baseline Demands	16,286	19,436	21,234	21,979	22,750	23,478
Plumbing Code Savings	-	491	957	1,378	1,705	1,964
Demands with Plumbing Code Savings	16,286	18,945	20,277	20,601	21,044	21,515
Conservation Program A Savings	27	174	251	296	357	415
Demands with Plumbing Code and Conservation Program A Savings	16,259	18,771	20,026	20,305	20,687	21,099
Conservation Program B Savings	26	208	291	335	394	453
Demands with Plumbing Code and Conservation Program B Savings	16,260	18,737	19,986	20,266	20,650	21,062
Conservation Program C Savings	27	232	334	373	430	487
Demands with Plumbing Code and Conservation Program C Savings	16,259	18,713	19,943	20,228	20,614	21,027

Note: All numbers in the table are listed in acre-feet/year.

Figure 6-2 presents historical and projected water demand in AFY given multiple scenarios. Plumbing code elements include current local, state, and federal plumbing code standards for retrofits of items such as toilets, urinals, showerheads, faucets, and clothes washers.

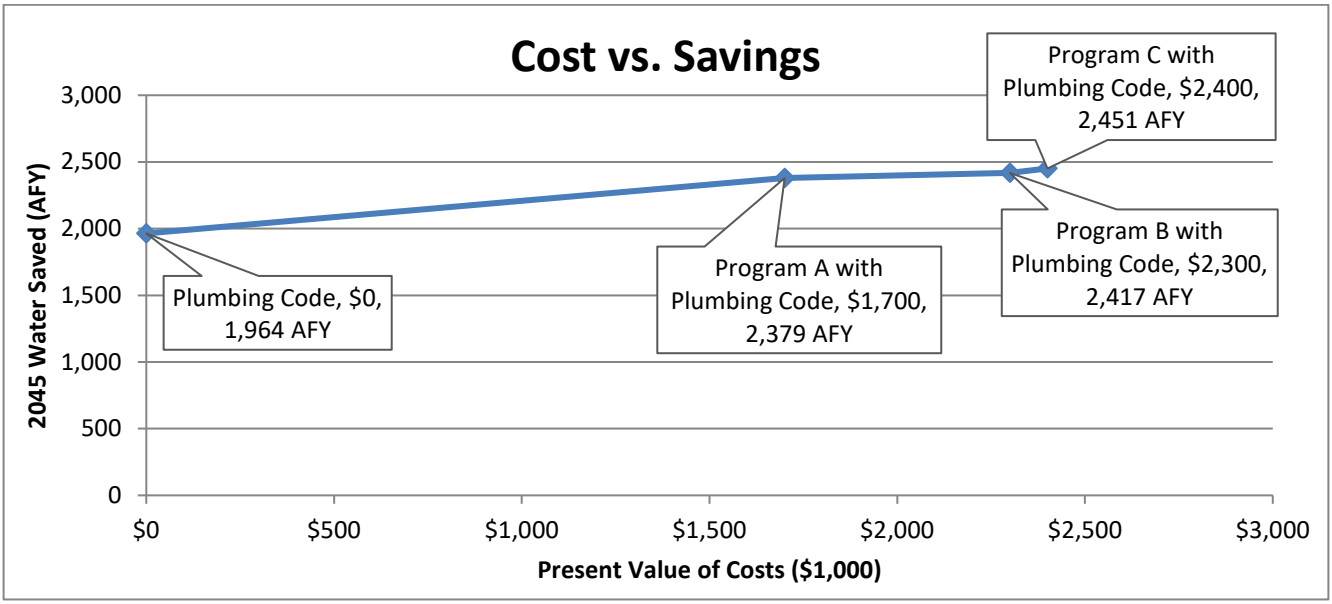
Figure 6-2. Walnut Valley Water District Historical and Projected Demand



Note: All line types shown in the legend are presented in the graph, but Program A, Program B, and Program C are close in value and therefore may be indistinguishable in the figure.

Figure 6-3 illustrates how marginal returns change as more money is spent to achieve water savings in AFY in 2045. A cost-effectiveness curve displays the results of the present value of each program's costs versus the cumulative water savings at the end of the planning period. This curve is helpful in determining how far to push the "conservation envelope" as the point of diminishing economic returns is evident. Note that only a slight increase in savings is achieved when graduating from Program A to Programs B and C.

Figure 6-3. Present Value of Utility Costs vs. Water Saved in 2045



6.2 Estimated Three-Year Budget

The estimated three-year (2020–2022) average annual cost to the District to implement Program A, B, or C, as described in the Plan, is approximately $ $118,315, $134,373, and $147,821, respectively. The budget includes staff time and expenses (materials, rebates, giveaways, etc.) and was developed by evaluating the level of activity by year. Opportunities for funding measures beyond Program A may exist through grant funding and/or cost sharing with other utilities (energy, sewer, or neighboring water utilities).

On an annual basis, the District should continue to develop detailed annual work plans and use the DSS Model to monitor progress on demand reductions along with updates to the implementation cost estimates and associated budgets. Utility costs include unit costs (incentives and rebates) and administrative costs. Individual measure costs (including utility, administrative, customer) can be found in measure input sheets in Appendix E.

6.3 Program Analysis

Walnut Valley serves an educated and conscientious community that has been refining its water use efficiency for years. For that reason, the District has evaluated and prepared three program options with increasing measures that can be implemented to meet any future water use reduction needs. All programs have a high utility benefit-cost ratio, offering significant savings for an appropriate cost. Program A is the current program, representing all the current District measures. Program B includes the current measures plus the additional measures that could be accomplished reasonably with either existing staff or consulting assistance. Program C includes all measures evaluated. Programs B and C systematically offer increased savings for increased costs.

7 IMPLEMENTATION STRATEGY

This section details the Plan implementation strategy including budget, monitoring and tracking, recommendations, water shortage response implications, and DSS Model update suggestions.

7.1 Five-Year Budget

The estimated five-year (2020–2024) total costs for the District to implement Programs A, B, and C, as described in this Plan, are approximately $616,175, $735,089, and $815,107, respectively (or an average of $123,235, $147,018, and $163,021 per year, respectively). The budget includes staff time and expenses. As noted earlier in this report, measure costs and staffing covered by SoCal Water$mart and other partners are not included. Shown in Table 7-1 are utility costs, which include unit (fixture/incentives costs) and administrative costs, for all three programs over the next five years.

Table 7-1. Conservation Program Utility Costs

	Program A	Program B	Program C
2020	$94,945	$92,132	$94,945
2021	$114,637	$153,214	$170,415
2022	$80,608	$114,520	$132,326
2023	$83,453	$108,621	$108,621
2024	$86,373	$112,421	$112,421

Note: The Conservation Program Utility Costs for Programs A, B, and C through 2045 can be found in Appendix F.

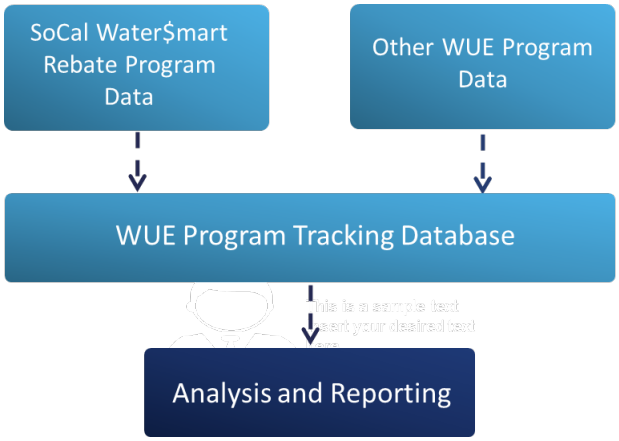
7.2 Monitoring Progress

It is recommended that the District track the level of participation and program effectiveness of the implemented conservation programs. A tracking database in an Excel spreadsheet could store monthly data collected by the District from each conservation measure as well as monthly rebate program data provided by SoCal Water$mart. The tracking database could be designed to easily filter data for reporting purposes and could be updated monthly to reflect up-to-date program participation.

The tracking database could incorporate the following data:

- Customer information – Name, address, account number, type of business (e.g., CII customers)
- Water Use Efficiency measure or device – Type (including make and model), quantity, unit water savings, life expectancy
- Cost information – Rebate amount
- Other documentation or data as appropriate (e.g., survey reports)

Figure 7-1. Components of Tracking Tool Development



Each year the progress made toward meeting the Plan's targeted water savings will be analyzed. It is imperative to track activities and water demand for this analysis.

Program participation by individual accounts may be evaluated by tracking the following:

- Number and type of rebates or other incentives issued (including water saving details for rebates such as efficiency level of washing machines installed through incentive program)
- Number and square footage of turf removal rebates
- Collaboration with Planning Dept to quantify and verify compliance with water efficiency codes
- Water use before and after documented changes in replacement of fixtures or other implementation

7.3 Track and Update for New Codes and Emerging Technologies

More challenging is tracking the changes in the consumer marketplace for the vast array of water-using appliances and plumbing fixtures in both the residential and commercial sectors. The following are some options for tracking the latest in national standards and building codes as well as technologies and emerging trends in customer preferences:

- Having staff member(s) assigned to voluntarily participate on the AWWA Water Conservation Division's committees with attendance at the Annual Conference Committee meetings and conference calls, in particular the Water Efficiency Programs and Technology Committee
- Monitor the Alliance for Water Efficiency (AWE) for updates on changes in National Standards and Codes as well as opportunities to comment on future national changes to codes and regulations
- As a WaterSense Partner, the District should continue to track the U.S. Environmental Protection Agency (EPA) WaterSense new technologies and post updated equipment lists of newly labeled products and services. Frequently, AWE or CalWEP have performance testing results posted on their websites that provide very useful information to consumers. Performance information may also be available through Consumer Reports or Consortium for Energy Efficiency (http://www.cee1.org).
- Attend the WaterSmart Innovations Conference for exposure to the vendors participating in the exhibition and information on emerging trends in water conservation programs
- Leverage the state and county process for adopting new building codes and regulations, especially building codes, to help implement proactive changes in future development in the District service area
- Maintain and use a network of 10–20 key contacts at progressive utilities to inquire about new technologies (e.g., through known contacts or new contacts made at conferences)
- Host events with other partner utilities and applicable stakeholders on related water loss control programs or conservation measures
- Conduct surveys every three years with other national utilities to gain insight on programs and testing of products

Staying on or ahead of the curve with tracking new technologies could lead to water savings without District investment for later upgrades through incentive programs. Emerging products may be worthy of pilot programs and potentially attractive for grant funding projects through agencies like the U.S. EPA or U.S. Bureau of Reclamation. However, use caution when adopting new technologies that have yet to be adequately researched or tested.

7.4 Proposed Implementation Schedule

Figure 7-2 presents an implementation schedule for each individual measure through 2030. A description of each measure can be found in Table 5-1.

Figure 7-2. Conservation Measures Implementation Schedule

Measure	Time Period	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Landscape & Irrigation Codes	2020-2045											
Require New Development Multi-Unit Submetering	2020-2045											
Require Fixture Retrofit on Resale, Account Change, or Renovation	2020-2045											
Require Hot Water on Demand in New Developments	2020-2045											
Residential Water Surveys	2021-2045											
High Efficiency Fixture Giveaway	2020-2024											
Residential Leak Repair & Plumbing Emergency Assistance	2023-2045											
High Efficiency Toilet Incentive	2021-2025											
High Efficiency Urinal Incentive	2020-2025											
High Efficiency Toilet & Urinal Bulk Purchase	2022-2026											
Install HE Fixtures in Gov Bldgs, School & CII Bldgs	2021-2030											
Residential Washer Incentive	2020-2024											
Commercial Incentive Program	2020-2029											
Outdoor Water Audit - Large Landscape	2021-2045											
Financial Incentives for Irrigation & Landscape Upgrades	2020-2029											
Landscape Conversion or Turf Removal - SF	2020-2029											
Landscape Conversion or Turf Removal - MF, CII	2020-2029											
Pool & Spa Cover Incentive	2022-2031											
Indoor CII Survey	2021-2030											
Partnership with Energy Utilities	2021-2030											
SF HE Toilet Giveaway	2021-2025											
Exterior Retrofit Irrigation Program (E-RIP)	2020-2024											

7.5 Five-Year Implementation Recommendations

Recommendations to assist with implementation over the next five years are as follows:

- Track upcoming state regulations regarding residential, CII, landscape, and water loss management
- Consider launching pilot studies for new measures (i.e., as conducted with E-RIP)
- Consider soliciting and tracking community input and feedback via an online or phone survey or at outreach and education events

- Prioritize measures that contribute the most to meeting the per capita use targets and are relatively easy to operate with limited staff
- Consider working with the largest 100 water using customers to reduce water use
- Develop an annual work plan for each plan year as soon as the budget is adopted (or in concert with the budget planning process)
- Form partnerships and apply for grants where appropriate
- Outsource to gain enough staff support to administer the expanded programs, if/as needed
- Develop analytical tools to track water use by customer class and overall per capita water use, adjusted for the weather and external factors
- Use the analytical tools annually to help decide on priorities for the following plan year
- Set up a database to store and manage measure participation, cost, and other data to gauge successes and areas that need improvement/added attention
- Annually update the plan, including actual measure participation, projected water savings, and expected per capita water use reductions, to ensure the District is on track to meet conservation goals

7.6 Implications for Responding to Water Shortages

Given the investment and response by the District both with the most recent 2014-2017 drought and through implementation of this conservation program in the coming years, the District will need to revise its Water Shortage Contingency Plan. This is needed in order to modify its expectations in meeting future reductions during low water supply conditions as it's assumed that the District has been and will continue to be subject to "demand hardening." This term refers to the concept that certain upgrades or changes can only have realized savings one time (e.g., replacing an older toilet with a new high efficiency 1.28 gpf toilet).

In an attempt to achieve equity, it is recommended that the District's policies and Water Shortage Contingency Plan be expanded to include additional definition for other customer user classes. It is also recommended that priority for fire, health, and sanitation protection be placed above other discretionary uses. For example, in California the Water Code Section 350[9] sets priority for order of demand to be served in times of drought, with fire protection, health, and sanitation at the top of the order.

The California Water Code in Section 10632(a)[10] specifies requirements for any water supplier serving more than 3,000 acre feet or 3,000 connections to plan for up to a 50% reduction in demand in times of drought. Section 10632(b) sets the criteria for planning for minimum water supply conditions based on the driest three-year sequence on record. These sections of the California Water Code are required to be addressed every five years in a Water Shortage Contingency Plan, which is to be filed with the California Department of Water Resources.

With the goal to reduce peak water savings and preserve surface water storage supplies, more concentrated efforts aimed at lowering irrigation and non-potable demands in times of drought should be explored for potential inclusion in the District's Water Shortage Contingency Plan as well.

7.7 Suggestions for Future DSS Model Updates

With the level of investment in both capital projects that may be deferred due to this program and also investments in the program itself, District staff should be ready with an answer to the question: "How much water has been saved and at what cost?" In addition, due to the need for ongoing water conservation efforts to

[9] California State Legislature. California Water Code 350.
http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=WAT&sectionNum=350

[10] Ibid. California Water Codes 10632(a) and 10632(b).
http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=WAT&sectionNum=10632

attain and maintain more water savings, the District will need to track program water savings, costs, and benefits (i.e., cost savings).

There are two types of updates envisioned for the DSS Model: 1) regular monitoring of costs and water savings; and 2) model recalibration with updated base year data and model inputs and assumptions. The following describes each type of update in more detail:

- **Annual or more frequent model monitoring updates.** The conservation measure worksheets can be used to track actual activities and compare them to the planned activities defined as part of the model development for this program. It is recommended that this update be done in conjunction with the development of an annual work plan and budget. At minimum, it should happen every 3–5 years.
- **Recalibration of the model.** The DSS Model has a base year of 2019. Depending on water demand and account growth rates, it is advisable to update the base year on a 5-year basis, which can be a small percentage change in the number of total accounts served by the District. This update requires reviewing historical demand trends; future population and demand forecasts; fixture models calibration; new or updated conservation measures; and cost and water savings assumptions.

Specific triggers for updates may include:

- Significant cost in the water pumped (more than 10-20% energy or chemical cost increase or decrease would modify the “savings worksheet” and change the benefit-cost ratios)
- Significant change in population or accounts for one of the billing categories (more than a 5% shift)
- Significant changes to water system balance (e.g., more than 10% change in water losses or other parameter on the Demands Section of the DSS Model)
- New codes or regulations that affect natural replacement rates of fixtures
- Alternatives for staffing versus outsource contracting or other changes to cost of implementation of a conservation measure (change to conservation measure worksheet only)
- New technologies for conservation measure being considered (change or addition of new conservation measure worksheet)
- Any other change in conservation measures (i.e., updates to the measure worksheets can be changed or modified at any time without altering the water system balance worksheets or affecting fixture model calibration)

8 NEXT STEPS AND CONCLUSIONS

Current conditions have encouraged the District to implement Program B and pursue the additional measures in Program C only as needed to achieve their water use objective or if drought conditions return and call for more drastic conservation measures. However, water use in a service area is very dynamic and responds to changes in population, economy, weather, efficiency of devices, and types of industry. In the future, as the District's community evolves and water use patterns and weather change, there remains the possibility that the District will elect to adjust measure implementation targets and schedules. This may include expounding upon, or scaling back, various program components and measures to increase efficiency; meet benefit-cost ratios; adopt better technology or methods; or meet budget and staffing restrictions.

Whether additional measures become necessary would be dependent on several factors, including potential future drought conditions; compliance with the annual aggregate water use objectives as provided by the state; and the District's ability to support new and more innovative programs. With individual measures clearly defined and water saving objectives and customer target goals measurable, the District has quantifiable performance goals to track on both a measure and overall program level basis.

8.1 Selected Program Estimated Water Savings and Budget

WVWD Conservation Program Comparison

	A	B	C
# of Measures	15	18	22
Utility Benefit-Cost Ratio	3.49	3.06	3.17
Cost of Water Saved	$260/AF	$300/AF	$290/AF
Avoided Cost of Water	$1,402/AF	$1,402/AF	$1,402/AF

Selected Program: B

The estimated five-year (2020–2024) average annual cost to the District to implement Program B is approximately $147,018 per year. The budget includes staff time (burdened salaries) and expenses. This budget was developed while working closely with the District staff on parts of the DSS Model evaluations for the level of activity by year. Opportunities exist for outside funding mechanisms to offset the cost of conservation measures. The District should continue to develop detailed annual work plans and use the DSS Model to monitor progress on demand reductions. The model also can be used to update the implementation cost estimates and associated budgets on an annual basis. To further support budgeting, the District will prepare comprehensive water conservation pricing and rate studies periodically.

More than 70% of the District's service area water use is associated with residential water use. Consequently, residential conservation programs will produce the most savings. At less than 18% of overall water use, the District's service area does not include extensive commercial activity. Therefore, the conservation potential for the commercial sector is not as high.

In conjunction with plumbing codes, Program B will save 10% of projected demand in 2045. From the utility standpoint, the average cost of water saved for Program B will be $300 per AF, less than the avoided cost of water at $1,402 per AF. Therefore, this program has the potential to reduce per capita water use in a cost-effective manner based on the implementation level of the plan.

8.2 Recommended Funding Sources and Partnerships

District staff worked with MWM, the community, and District leadership to fine tune goals and priorities for water conservation, cost effectiveness, and qualitative benefits. It is recommended the District seek out additional funding sources and partnership opportunities both nationally and regionally to expand the conservation programs and pilot programs that have high potential for water savings within the District demographics.

Partnership and funding sources may include the following:

- District conservation budget
- County partnerships
- State and federal grants
- Local schools/university students or student organizations
- Local community organizations with an interest in water efficiency (e.g., gardening groups)
- Partnerships with energy utilities

8.3 Recommended Next Steps

The following next steps are recommendations to assist with implementation:

- Engage in state processes to establish the requirement associated with implementation of the legislation. The District will review state documents; present key information to principal District stakeholders and receive feedback; submit written comments as needed; and participate in public workshops and stakeholder groups.
- Program B has an average 2020-2024 cost of approximately $147,018 per year to cover the cost of maintaining the current measures. Note that average annual costs include administrative costs and staff labor.
- Review program staff needs and hire staff to adequately support program needs.
- Prioritize measures for implementation, with the highest priority for implementation given to those that contribute the most to meeting water saving targets and/or can be implemented with relative ease. To launch implementation of a conservation program, the District may consider answering a series of key questions to determine measures, budget and schedules for the Plan. These questions include:
    - What level of support will be required from conservation staff to run the selected measures?
    - What other support is needed (e.g., outsourced support or other sources of funding) or wanted to run these programs?
- Develop Implementation Plans that describe in detail how to implement each conservation measure.
- Prepare an annual work plan for each Plan year in concert with the budget planning process.
- Form partnerships and apply for grants where appropriate.
- Set up a method to store and manage measure participation, cost, and other data to gauge successes and identify areas that need improvement.
- Review Plan goals in the DSS Model annually and update measure participation or other elements that are refined.
- Use the input from the District and annual work planning process as the forum to amend the Plan, budgets, staffing, contracting, schedule, etc. to stay on track.

District Open House

8.4 Conclusions

The following is a summary of the water conservation analysis findings:

- Conservation is the least expensive means of meeting future water supply needs for the area. The implementation of these conservation measures should reduce per capita water use and have the potential to defer the need for further infrastructure expansion. While the conservation actions identified can have a significant cost, the cost of not doing conservation and having to address increased demands through engineering solutions are even higher. Furthermore, with climate change, long-term drought, and environmental restrictions on the delivery of imported water, additional water supplies may not be available to meet future increases in demands without conservation.
- The governor signed SB 606 and AB 1668 into state law to create a more permanent conservation standard as part of implementing the "Making Water Conservation a California Way of Life" legislation. The District should track development of the DWR framework into new state mandates for 2021 and beyond and update this Plan as necessary to comply with those new mandates.
- Through the DSS Model analysis, the District identified fixture costs, applicable customer classes, time period of implementation, measure life, administrative costs, end uses, end-use savings per replacement, and a target number or percentage of accounts per program year. This thorough analysis is planned to be used in the 2020 Walnut Valley Water District Urban Water Management Plan and additional planning documents.
- Invest in water conservation efforts that appear to be a feasible and cost-effective means of:
    - Being more sustainable within existing water supplies;
    - Meeting the water use objectives outlined in SB 606 and AB 1668;
    - Maintaining a program in line with the former CUWCC's Best Management Practices;
    - Measuring, tracking, and reducing Non-Revenue Water Losses as outlined in SB 555;
    - Addressing reduction in water use as previously required by the statewide drought emergency declaration recently lifted; and
    - Implementing the mandated statewide prohibitions in the governor's Executive Orders going forward (e.g., only serving water upon request, no watering for 48 hours after a rain event).
- Based on the analysis, the District has chosen to implement Program B and pursue additional measures evaluated in Program C if drought conditions return and call for more drastic conservation measures. Program B has 18 measures, a utility benefit-cost ratio of 3.06 and a cost of water saved of $300 per AF versus the estimated avoided cost of water of $1,402 per AF.

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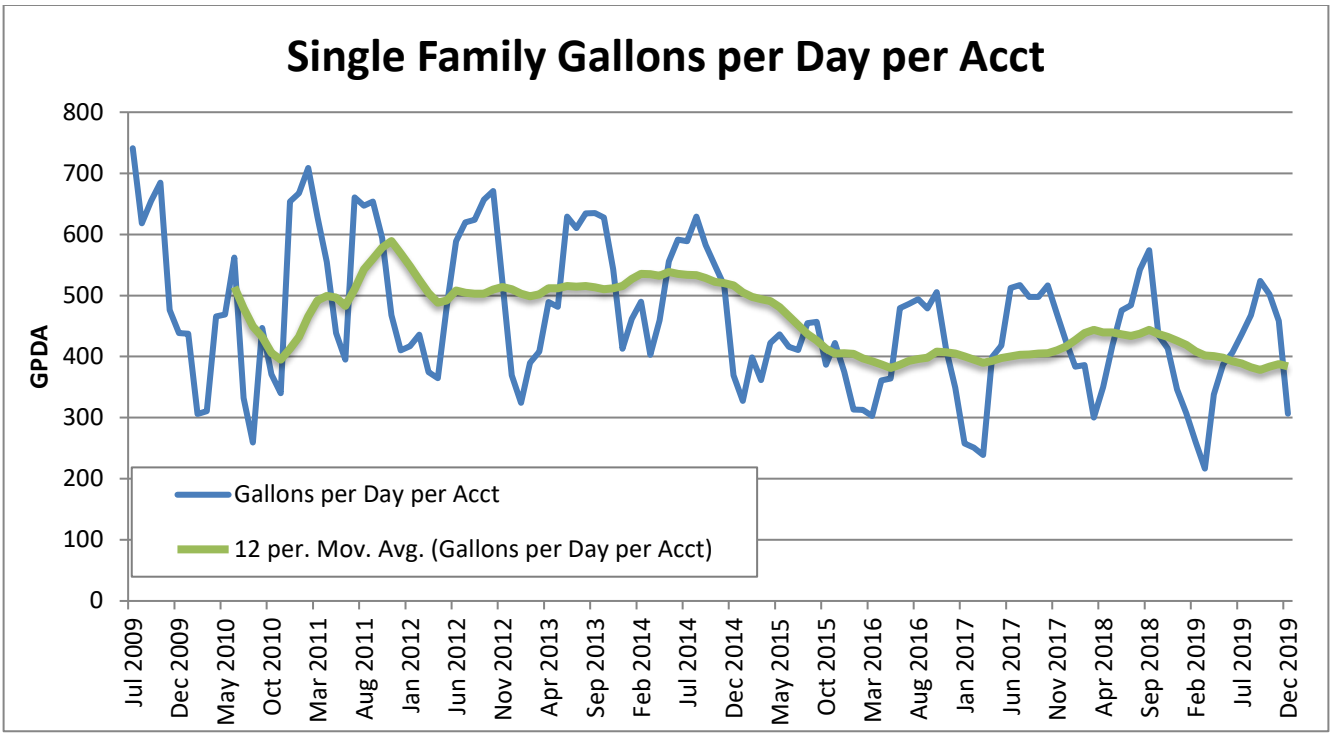
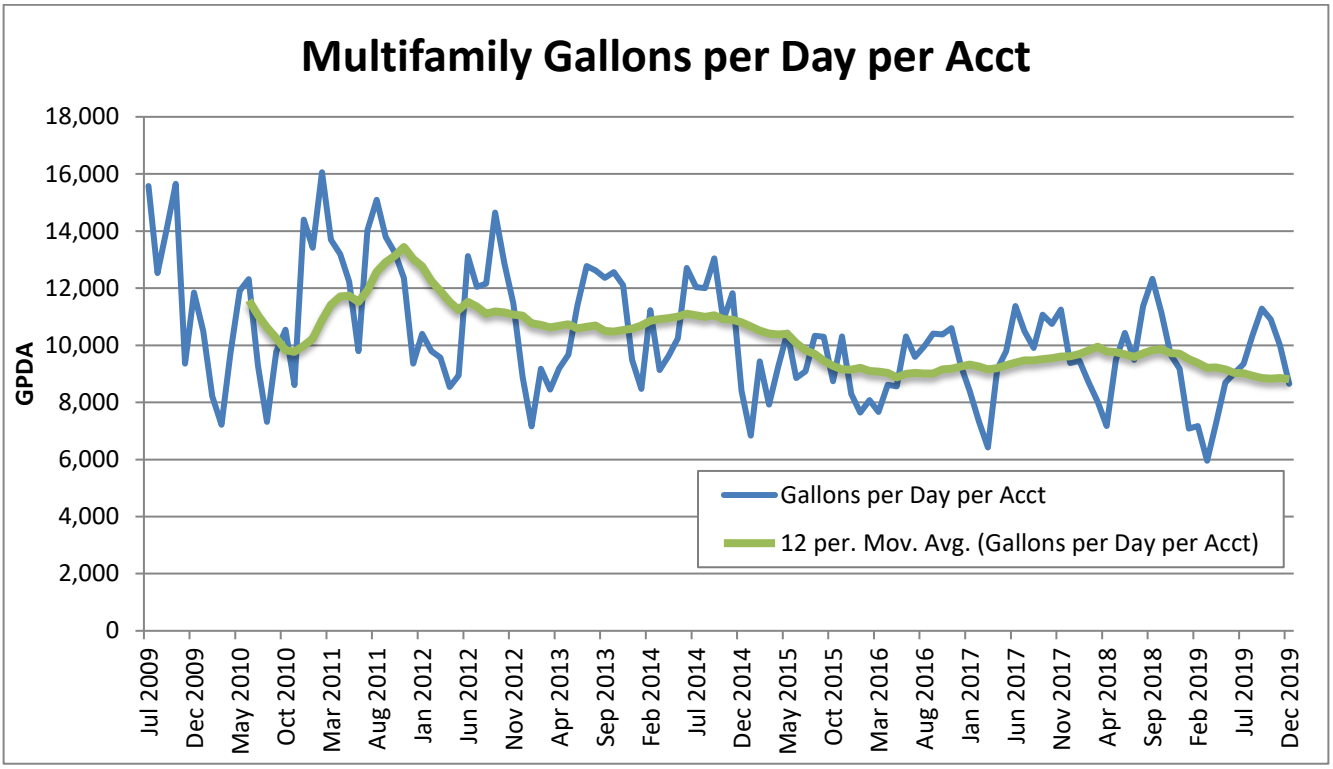
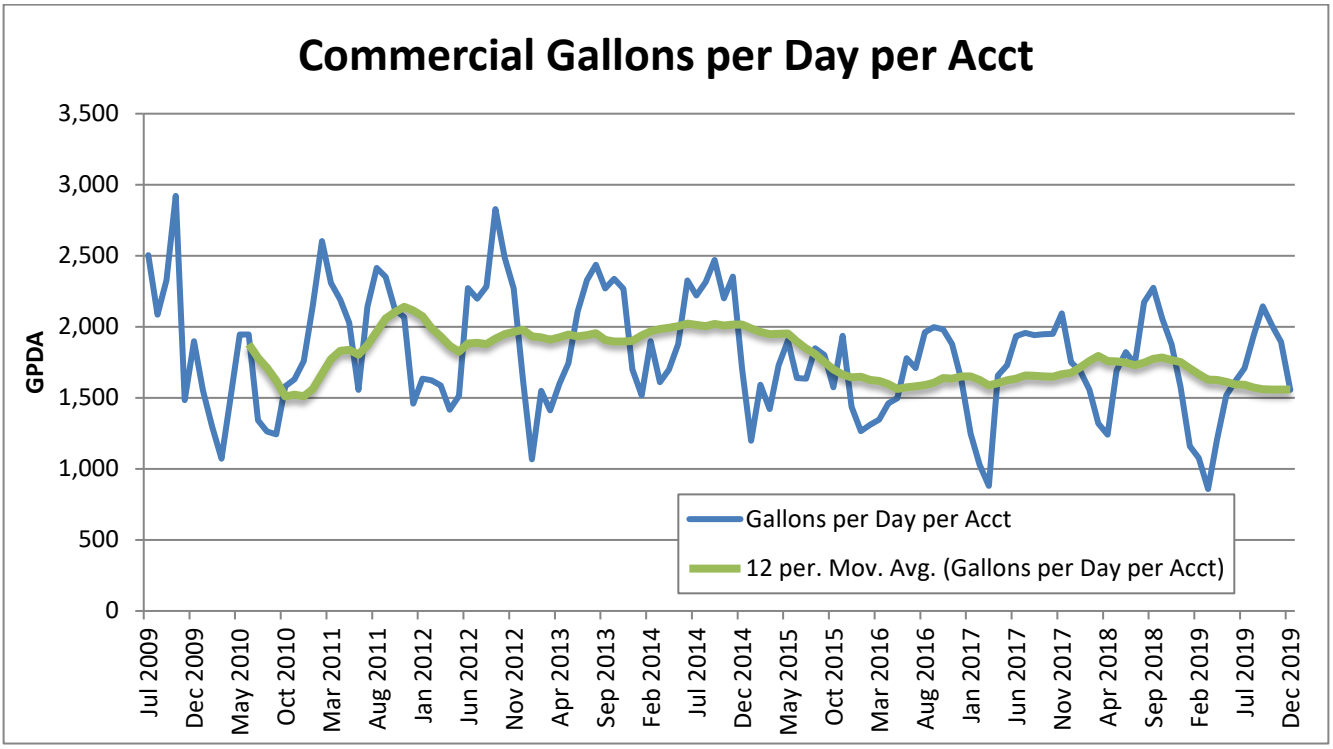
APPENDIX A – HISTORICAL MONTHLY WATER USE PER ACCOUNT TYPE



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2,500
2,000
1,500
1,000
500
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Dec 2009
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Oct 2010
Mar 2011
Aug 2011
Jan 2012
Jun 2012
Nov 2012
Apr 2013
Sep 2013
Feb 2014
Jul 2014
Dec 2014
May 2015
Oct 2015
Mar 2016
Aug 2016
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Dec 2019
Gallons per Day per Acct
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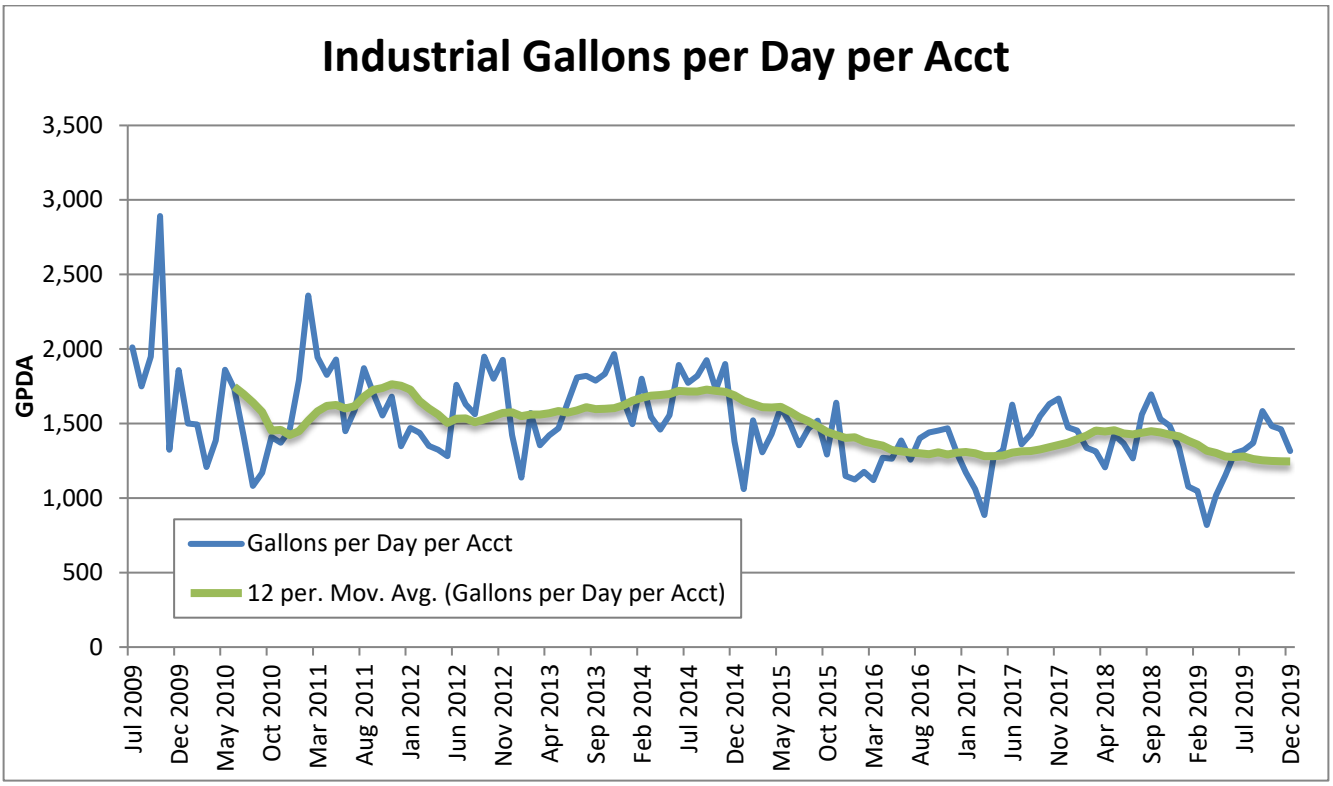
Industrial Gallons per Day per Acct
GPDA
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2,000
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1,000
500
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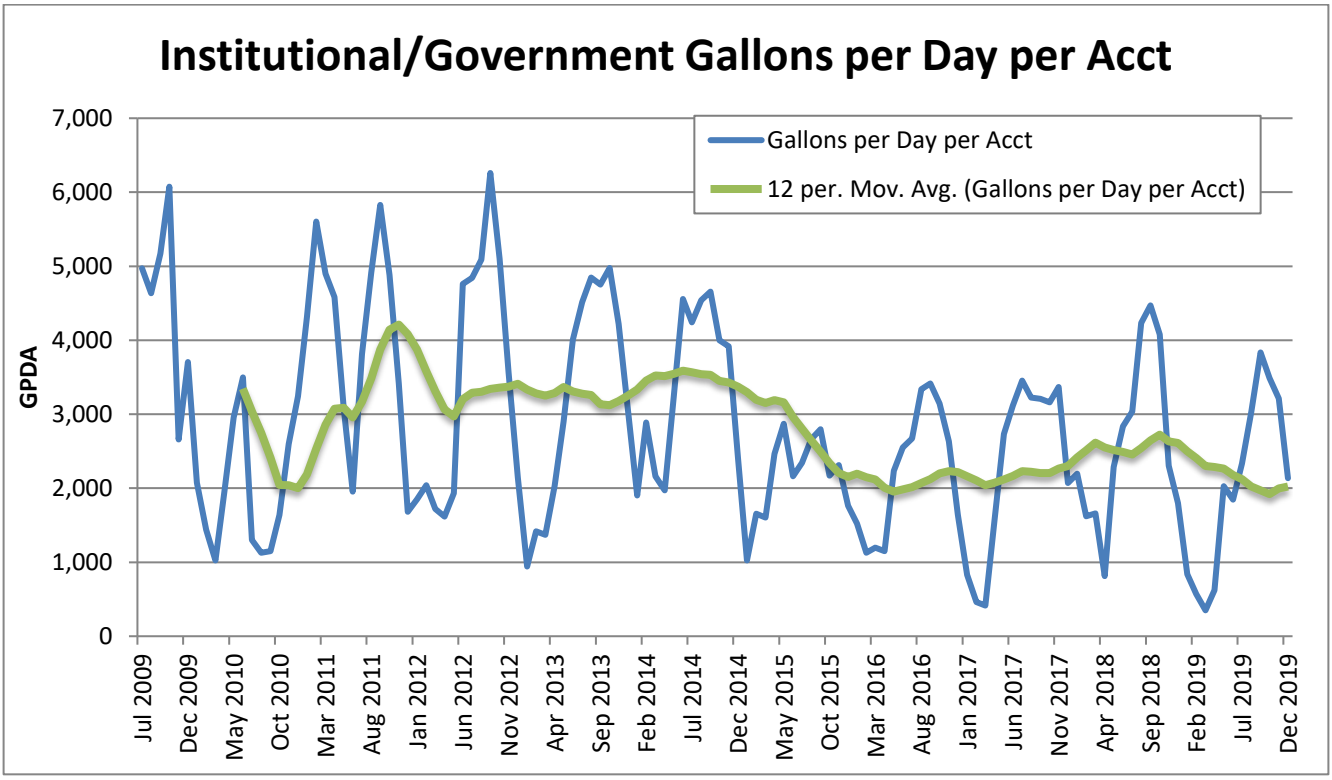
Jun 2012
Nov 2012
Apr 2013
Sep 2013
Feb 2014
Jul 2014
Dec 2014
May 2015
Oct 2015
Mar 2016
Aug 2016
Jan 2017
Jun 2017
Nov 2017
Apr 2018
Sep 2018
Feb 2019
Jul 2019
Dec 2019
Gallons per Day per Acct
12 per. Mov. Avg. (Gallons per Day per Acct)


Institutional/Government Gallons per Day per Acct
GPDA
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
Gallons per Day per Acct
12 per. Mov. Avg. (Gallons per Day per Acct)
Jul 2009
Dec 2009
May 2010
Oct 2010
Mar 2011
Aug 2011
Jan 2012
Jun 2012
Nov 2012
Apr 2013
Sep 2013
Feb 2014
Jul 2014
Dec 2014
May 2015
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Apr 2018
Sep 2018
Feb 2019
Jul 2019
Dec 2019

APPENDIX B – DSS MODEL OVERVIEW

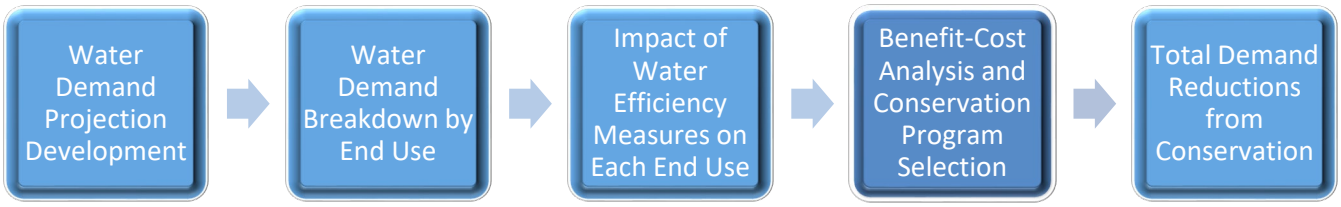


Figure B-1. DSS Model Main Page

DSS Model Overview: The Least Cost Planning Decision Support System Model (DSS Model) is used to prepare long-range, detailed demand projections. The purpose of the extra detail 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.

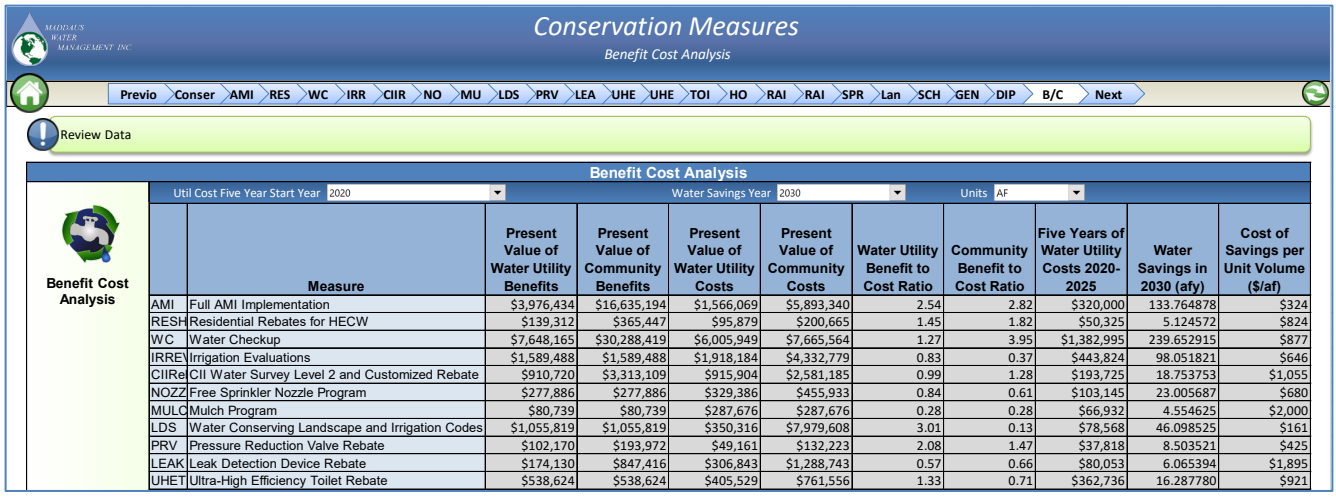
Originally developed in 1999 and continuously updated, the DSS Model is an "end-use" model that breaks down total water production (water demand in the service area) to specific water end uses, such as plumbing fixtures and appliances. The model uses a bottom-up approach that allows for multiple criteria to be considered when estimating future demands, such as the effects of natural fixture replacement, plumbing codes, and conservation efforts. The DSS Model may also use a top-down approach with a utility-prepared water demand forecast.

Demand Forecast Development and Model Calibration: To forecast urban water demands using the DSS Model, customer demand data is obtained from the water agency being modeled. Demand data is reconciled with available demographic data to characterize water usage for each customer category in terms of number of users per account and per capita water use. Data is further analyzed to approximate the split of indoor and outdoor water usage in each customer category. The indoor/outdoor water usage is 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 is combined with the number of water users to calibrate the volume of water allocated to specific end uses in each customer category. In other words, the DSS Model checks that social norms from end studies on water use behavior (e.g., flushes per person per day) are not exceeded or drop below reasonable use limits.

Passive Water Savings Calculations: The DSS Model is used to forecast service area water fixture use. Specific end-use type, average water use, and lifetime are compiled for each fixture. Additionally, state and national plumbing codes and appliance standards are modeled by customer category. These fixtures and plumbing codes can be added to, edited, or deleted by the user. This process yields two demand forecasts, one with plumbing codes and one without plumbing codes.

Active Conservation Measure Analysis Using Benefit-Cost Analysis: The DSS Model evaluates active conservation measures using benefit-cost analysis with the present value of the cost of water saved ($/Million Gallons or $/Acre-Feet). Benefits are based on savings in water and wastewater facility operations and maintenance (O&M) and any deferred capital expenditures. The figures on the previous page illustrate the processes for forecasting conservation water savings, including the impacts of fixture replacement due to existing plumbing codes and standards.

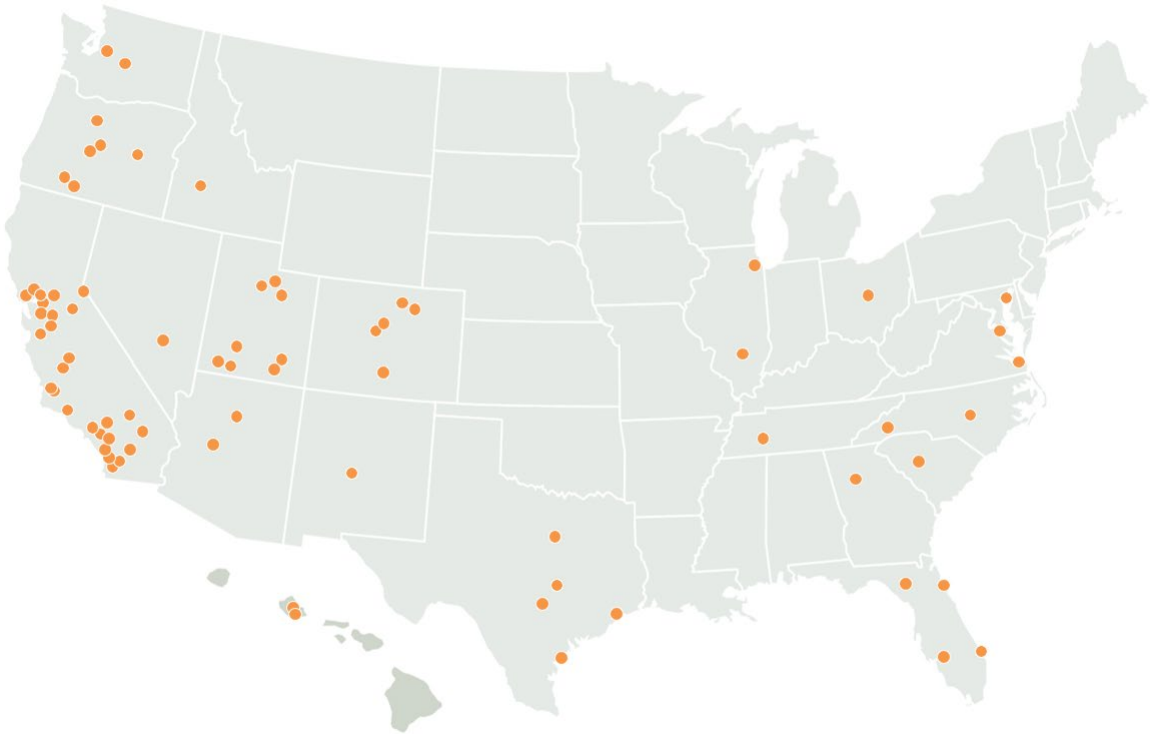
Figure B-2. Sample Benefit-Cost Analysis Summary



	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 2020-2025	Water Savings in 2030 (afy)	Cost of Savings per Unit Volume ($/af)
AMI	Full AMI Implementation	$3,976,434	$16,635,194	$1,566,069	$5,893,340	2.54	2.82	$320,000	133.764878	$324
RESH	Residential Rebates for HECW	$139,312	$365,447	$95,879	$200,665	1.45	1.82	$50,325	5.124572	$824
WC	Water Checkup	$7,648,165	$30,288,419	$6,005,949	$7,665,564	1.27	3.95	$1,382,995	239.652915	$877
IRREV	Irrigation Evaluations	$1,589,488	$1,589,488	$1,918,184	$4,332,779	0.83	0.37	$443,824	98.051821	$646
CIIRe	CII Water Survey Level 2 and Customized Rebate	$910,720	$3,313,109	$915,904	$2,581,185	0.99	1.28	$193,725	18.753753	$1,055
NOZZ	Free Sprinkler Nozzle Program	$277,886	$277,886	$329,386	$455,933	0.84	0.61	$103,145	23.005687	$680
MULC	Mulch Program	$80,739	$80,739	$287,676	$287,676	0.28	0.28	$66,932	4.554625	$2,000
LDS	Water Conserving Landscape and Irrigation Codes	$1,055,819	$1,055,819	$350,316	$7,979,608	3.01	0.13	$78,568	46.098525	$161
PRV	Pressure Reduction Valve Rebate	$102,170	$193,972	$49,161	$132,223	2.08	1.47	$37,818	8.503521	$425
LEAK	Leak Detection Device Rebate	$174,130	$847,416	$306,843	$1,288,743	0.57	0.66	$80,053	6.065394	$1,895
UHET	Ultra-High Efficiency Toilet Rebate	$538,624	$538,624	$405,529	$761,556	1.33	0.71	$362,736	16.287780	$921

Model Use and Validation: The DSS Model has been used for over 20 years for practical applications of conservation planning in over 300 service areas representing 60 million people, including extensive efforts nationally and internationally in Australia, New Zealand, and Canada.

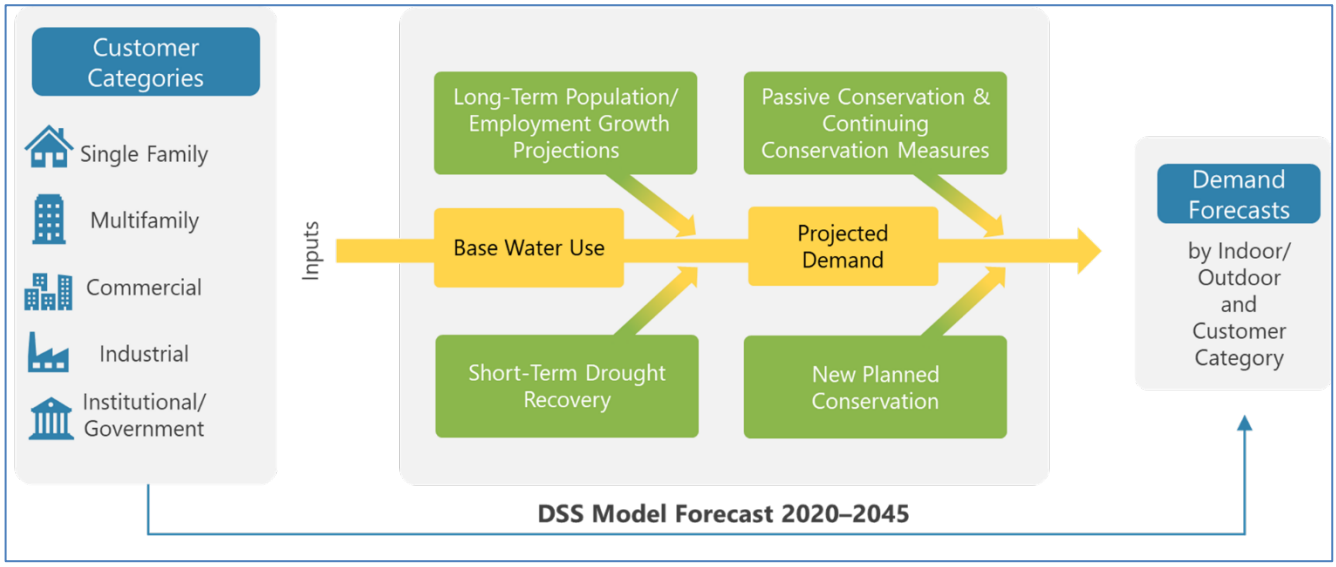
Figure B-3. DSS Model Analysis Locations in the U.S.



The California Water Efficiency Partnership, or CalWEP (formerly the CUWCC), has peer reviewed and endorsed the model since 2006. It is offered to all CalWEP members for use to estimate water demand, plumbing code, and conservation program savings.

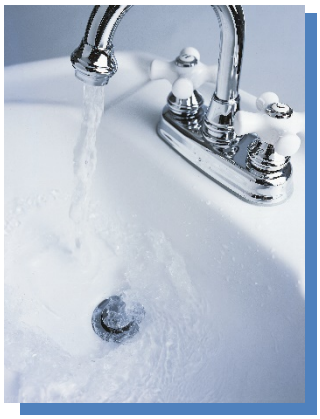
The DSS Model can use one of the following: 1) a statistical approach to forecast demands (e.g., an econometric model); 2) a forecasted increase in population and employment; 3) predicted future demands; or 4) a demand projection entered into the model from an outside source. For the District, baseline demand was developed based on an increase in residential population. The following figure presents the flow of information in the DSS Model Analysis.

Figure B-4. DSS Model Analysis Flow



APPENDIX C – DSS MODEL DEMAND ASSUMPTIONS

This section presents the methodology used to determine Walnut Valley Water District's passive water savings, information regarding national and state plumbing codes, and key inputs and assumptions used in the DSS Model including fixture replacement and estimates.



C.1 National Plumbing Codes

The Federal Energy Policy Act of 1992, as amended in 2005, mandates that 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 pounds per square inch (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, which mandates that only devices with the specified level of efficiency (as shown above) can be sold as of 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 U.S. Department of Energy regulates appliances, such as residential clothes washers, further reducing indoor water demands. Regulations to make these appliances more energy efficient have driven manufactures to dramatically reduce the amount of water these machines use. Generally, front-loading washing machines use 30-50% less water than conventional models (which are still available).

In this analysis, the DSS Model forecasts a gradual transition to high efficiency clothes washers (using 12 gallons or less) so that by the year 2025 that will be the only type of machine available for purchase. 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 on the market will be the more water efficient models. Energy Star washing machines have a water factor of 6.0 or less – the equivalent of using 3.1 cubic feet (or 23.2 gallons) of water per load. The maximum water factor for residential clothes washers under current federal standards is 9.5. The water factor equals the number of gallons used per cycle per cubic foot of capacity. Prior to the year 2000, the water factor for a typical new residential clothes washer was about 12. In March 2015, the federal standard reduced the maximum water factor for top- and front-loading machines to 8.4 and 4.7, respectively. In 2018, the maximum water factor for top-loading machines was further reduced to 6.5. For commercial washers, the maximum water factors were reduced in 2010 to 8.5 and 5.5 for top- and front-loading machines, respectively. Beginning in 2015, the maximum water factor for Energy Star certified washers was 3.7 for front-loading and 4.3 for top-loading machines. In 2011, the U.S. Environmental Protection Agency estimated that Energy Star washers comprised more that 60% of the residential market and 30% of the commercial market (Energy Star, 2011). A new Energy Star compliant washer uses about two-thirds less water per cycle than washers manufactured in the 1990s.

C.2 State Plumbing Codes

This section describes California state codes applicable to the District's water use.

C.2.1 California State Law – AB 715

Plumbing codes for toilets, urinals, showerheads, and faucets were initially adopted by California in 1991, mandating the sale and use of ultra-low flush toilets using 1.6 gpf, urinals using 1 gpf, and low-flow showerheads and faucets. AB 715 led to an update to California Code of Regulations Title 20 (see Section C.2.3) mandating that all toilets and urinals sold and installed in California as of January 1, 2014 must be high efficiency versions having flush ratings that do not exceed 1.28 gpf (toilets) and 0.5 gpf (urinals).

C.2.2 California State Laws – SB 407 and SB 837

SB 407 addresses plumbing fixture retrofits on resale or remodel. The DSS Model carefully considers the overlap with SB 407, the plumbing code (natural replacement), CALGreen, AB 715 and rebate programs (such as toilet rebates). SB 407 (enacted in 2009) requires that properties built prior to 1994 be fully retrofitted with water conserving fixtures by the year 2017 for single family residential houses and 2019 for multifamily and commercial properties. SB 407 program length is variable and continues until all the older high flush toilets have been replaced in 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. Additionally, SB 407 conditions issuance of building permits for major improvements and renovations upon retrofit of non-compliant plumbing fixtures. SB 837 (enacted in 2011) requires that sellers of real estate property disclose on their Real Estate Transfer Disclosure Statement whether their property complies with these requirements. Both laws are intended to accelerate the replacement of older, low efficiency plumbing fixtures, and ensure that only high efficiency fixtures are installed in new residential and commercial buildings.

C.2.3 2019 CALGreen and 2015 CA Code of Regulations Title 20 Appliance Efficiency Regulations

Fixture characteristics in the DSS Model are tracked in new accounts, which are subject to the requirements of the 2019 California Green Building Code and 2015 California Code of Regulations Title 20 Appliance Efficiency Regulations adopted by the California Energy Commission (CEC) on September 1, 2015. The CEC 2015 appliance efficiency standards apply to the following new appliances, if they are sold in California: showerheads, lavatory faucets, kitchen faucets, metering faucets, replacement aerators, wash fountains, tub spout diverters, public lavatory faucets, commercial pre-rinse spray valves, urinals, and toilets. The DSS Model accounts for plumbing code savings due to the effects these standards have on showerheads, faucet aerators, urinals, toilets, and clothes washers.

- Showerheads – July 2016: 2.0 gpm; July 2018: 1.8 gpm
- Wall Mounted Urinals – January 2016: 0.125 gpf (pint)
- Lavatory Faucets and Aerator – July 2016: 1.2 gpm at 60 psi
- Kitchen Faucets and Aerator – July 2016: 1.8 gpm with optional temporary flow of 2.2 gpm at 60 psi
- Public Lavatory Faucets – July 2016: 0.5 gpm at 60 psi

In summary, the controlling law for **toilets** is Assembly Bill 715, requiring high efficiency toilets of 1.28 gpf sold in California beginning in 2014. The controlling law for wall-mounted urinals is the 2015 CEC efficiency regulations requiring that ultra-high efficiency pint **urinals** (0.125 gpf) be exclusively sold in California beginning January 1, 2016. This is an efficiency progression for urinals from AB 715's requirement of high efficiency (0.5 gpf) urinals starting in 2014.

Standards for **residential clothes washers** fall under the regulations of the U.S. Department of Energy. In 2018, the maximum water factor for standard top-loading machines was reduced to 6.5.

Showerhead flow rates are regulated under the 2015 California Code of Regulations Title 20 Appliance Efficiency Regulations adopted by the CEC, which requires the exclusive sale in California of 2.0 gpm showerheads at 80 psi as of July 1, 2016 and 1.8 gpm showerheads at 80 psi as of July 1, 2018. The WaterSense specification applies to showerheads that have a maximum flow rate of 2.0 gpm or less. This represents a 20% reduction in showerhead flow rate over the current federal standard of 2.5 gpm, as specified by the Energy Policy Act of 1992.

Faucet flow rates likewise have been regulated by the 2015 CEC Title 20 regulations. This standard requires that the residential faucets and aerators manufactured on or after July 1, 2016 be exclusively sold in California at 1.2 gpm at 60 psi; and public lavatory and kitchen faucets/aerators sold or offered for sale on or after July 1, 2016 be 0.5 gpm at 60 psi and 1.8 gpm at 60 psi (with optional temporary flow of 2.2 gpm), respectively. Previously, all faucets had been regulated by the 2010 California Green Building Code at 2.2 gpm at 60 psi.

C.3 Key Baseline Potable Demand Inputs, Passive Savings Assumptions, and Resources

The following table presents the key assumptions and references that are used in the DSS Model in determining projected demands with plumbing code savings. 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 the percent of estimated real water losses.

Table C-1. List of Key Assumptions

Parameter	Model Input Value, Assumptions, and Key References
Model Start Year for Analysis	2020
Water Demand Factor Year (Base Year)	2019
Population Projection Source	2015 UWMP
Employment Projection Source	Aligned with Population Growth Rate in 2015 UWMP
Avoided Cost of Water	$1,402 per AF Avoided cost of water is projected year 2030 cost of purchased water and additional energy/treatment cost

Potable Water System Base Year Water Use Profile					
Customer Categories	**Start Year Accounts**	**Total Water Use Distribution**	**Demand Factors (gpd/acct)**	**Indoor Use %**	**2020 Residential Indoor Water Use (GPCD)**
Single Family	25,500	72%	385	50%	55
Multifamily	163	11%	8,882	53%	52
Commercial	981	11%	1,511	68%	34
Industrial	175	2%	1,272	78%	N/A
Institutional/Governmental	276	5%	2,404	41%	N/A
Total/Avg	**27,095**	**100%**	**N/A**	**52%**	**N/A**

Table C-2. Key Assumptions Resources

Parameter	Resource
Residential End Uses	Key Reference: CA DWR Report "California Single Family Water Use Efficiency Study," (DeOreo, 2011 – Page 28, Figure 3: Comparison of household end-uses) and AWWA Research Foundation (AWWARF) Report "Residential End Uses of Water, Version 2 - 4309" (DeOreo, 2016). Table 2-A. Water Consumption by Water-Using Plumbing Products and Appliances - 1980-2012. PERC Phase 1 Report. Plumbing Efficiency Research Coalition. 2013. http://www.map-testing.com/content/info/menu/perc.html Model Input Values are found in the "End Uses" section of the DSS Model on the "Breakdown" worksheet.
Non-Residential End Uses, percent	Key Reference: AWWARF Report "Commercial and Institutional End Uses of Water" (Dziegielewski, 2000 – Appendix D: Details of Commercial and Industrial Assumptions, by End Use). Santa Clara Valley Water District Water Use Efficiency Unit. "SCVWD CII Water Use and Baseline Study." February 2008. Model Input Values are found in the "End Uses" section of the DSS Model on the "Breakdown" worksheet.
Efficiency Residential Fixture Current Installation Rates	U.S. Census, Housing age by type of dwelling plus natural replacement plus rebate program (if any). Key Reference: GMP Research, Inc. (2019). 2019 U.S. WaterSense Market Penetration Industry Report. Key Reference: Consortium for Efficient Energy (www.cee1.org). Model Input Values are found in the "Codes and Standards" green section of the DSS Model by customer category fixtures.
Water Savings for Fixtures, gal/capita/day	Key Reference: AWWARF Report "Residential End Uses of Water, Version 2 - 4309" (DeOreo, 2016). Key Reference: CA DWR Report "California Single Family Water Use Efficiency Study" (DeOreo, 2011 – Page 28, Figure 3: Comparison of household end-uses). WCWCD supplied data on costs and savings; professional judgment was made where no published data was available. Key Reference: California Energy Commission, Staff Analysis of Toilets, Urinals and Faucets, Report # CEC-400-2014-007-SD, 2014. Model Input Values are found in the "Codes and Standards" green section on the "Fixtures" worksheet of the DSS Model.
Non-Residential Fixture Efficiency Current Installation Rates	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. California Energy Commission, Staff Analysis of Toilets, Urinals and Faucets, Report # CEC-400-2014-007-SD, 2014. Santa Clara Valley Water District Water Use Efficiency Unit. "SCVWD CII Water Use and Baseline Study." February 2008. Model Input Values are found in the "Codes and Standards" green section of the DSS Model by customer category fixtures.

Parameter	Resource
Residential Frequency of Use Data, Toilets, Showers, Faucets, Washers, Uses/user/day	Key Reference: AWWARF Report "Residential End Uses of Water, Version 2 - 4309" (DeOreo, 2016). Summary values can be found in the full report: http://www.waterrf.org/Pages/Projects.aspx?PID=4309 Key Reference: California Energy Commission, Staff Analysis of Toilets, Urinals and Faucets, Report # CEC-400-2014-007-SD, 2014. Key Reference: Alliance for Water Efficiency, The Status of Legislation, Regulation, Codes & Standards on Indoor Plumbing Water Efficiency, January 2016. Model Input Values are found in the "Codes and Standards" green section on the "Fixtures" worksheet of the DSS Model and confirmed in each "Service Area Calibration End Use" worksheet by customer category.
Non-Residential Frequency of Use Data, Toilets, Urinals, and Faucets, Uses/user/day	Key References: Estimated based on AWWARF Report "Commercial and Institutional End Uses of Water" (Dziegielewski, 2000 – Appendix D: Details of Commercial and Industrial Assumptions, by End Use). Key Reference: California Energy Commission, Staff Analysis of Toilets, Urinals and Faucets, Report # CEC-400-2014-007-SD, 2014. Fixture uses over a 5-day work week are prorated to 7 days. Non-residential 0.5gpm faucet standards per Table 2-A. Water Consumption by Water-Using Plumbing Products and Appliances - 1980-2012. PERC Phase 1 Report. Plumbing Efficiency Research Coalition, 2012. http://www.map-testing.com/content/info/menu/perc.html Model Input Values are found in the "Codes and Standards" green section on the "Fixtures" worksheet of the DSS Model and confirmed in each "Service Area Calibration End Use" worksheet by customer category.
Natural Replacement Rate of Fixtures (percent per year)	Residential Toilets 2%-4%
	Non-Residential Toilets 2%-3%
	Residential Showers 4% (corresponds to 25-year life of a new fixture)
	Residential Clothes Washers 10% (based on 10-year washer life). Key References: "Residential End Uses of Water" (DeOreo, 2016) and "Bern Clothes Washer Study, Final Report" (Oak Ridge National Laboratory, 1998).
	Residential Faucets 10% and Non-Residential Faucets 6.7% (every 15 years). CEC uses an average life of 10 years for faucet accessories (aerators). A similar assumption can be made for public lavatories, though no hard data exists and since CII fixtures are typically replaced less frequently than residential, 15 years is assumed. CEC, Analysis of Standards Proposal for Residential Faucets and Faucet Accessories, a report prepared under CEC's Codes and Standards Enhancement Initiative, Docket #12-AAER-2C, August 2013.
	Model Input Value is found in the "Codes and Standards" green section on the "Fixtures" worksheet of the DSS Model.
Residential Future Water Use	Increases Based on Population Growth and Demographic Forecast
Non-Residential Future Water Use	Increases Based on Employment Growth and Demographic Forecast

C.3.1 Fixture Estimates

Determining the current level of efficient fixtures in a service area while evaluating the passive savings in the DSS Model is part of the standard process and is called "initial fixture proportions." As described earlier in Section

3, MWM reconciled water efficient fixtures and devices installed within the Walnut Valley Water District service area and estimated the number of outstanding inefficient fixtures.

MWM used the DSS Model to perform a saturation analysis for toilets, urinals, showerheads, faucets, and clothes washers. The process included a review of age of buildings from census data, number of rebates per device, and assumed natural replacement rates. MWM presumed the fixtures that were nearing saturation and worth analysis would include residential toilets and residential clothes washers, as both have been included in recommended conservation practices for over two decades.

In 2014, the Water Research Foundation updated its 1999 Residential End Uses of Water Study (REUWS). Water utilities, industry regulators, and government planning agencies consider it the industry benchmark for single family home indoor water use. This Plan incorporates recent study results that reflect the change to the water use profile in residential homes including adoption of more water efficient fixtures over the 15 years that transpired from 1999 to 2014. REUWS results were combined with District historical rebate and billing data to enhance and verify assumptions made for all customer accounts, including saturation levels on the above-mentioned plumbing fixtures.

The DSS Model presents the estimated current and projected proportions of these fixtures by efficiency level within the District's service area. These proportions were calculated by:

- Using standards in place at the time of building construction;
- Taking the initial proportions of homes by age (corresponding to fixture efficiency levels);
- Adding the net change due to natural replacement; and
- Adding the change due to rebate measure minus the "free rider effect".[11]

Further adjustments were made to initial proportions to account for the reduction in fixture use due to lower occupancy and based on field observations. The projected fixture proportions do **not** include any future active conservation measures implemented by the District. More information about the development of initial and projected fixture proportions can be found in the DSS Model "Codes and Standards" section.

The DSS Model is capable of modeling multiple types of fixtures, including fixtures with different designs. For example, currently toilets can be purchased that flush at a rate of 0.8 gpf, 1.0 gpf or 1.28 gpf. The 1.6 gpf and higher toilets still exist but can no longer be purchased in California. Therefore, they cannot be used for replacement or new installation of a toilet. So, the DSS Model utilizes fixture replacement rates to determine what type of fixture should be used for a new construction installation or replacement. The replacement of the fixtures is listed as a percentage within the DSS Model. A value of 100% would indicate that all the toilets installed 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. All the Fixture Model information and assumptions were carefully reviewed and accepted by District staff.

The DSS Model provides inputs and analysis of the number, type, and replacement rates of fixtures for each customer category (e.g., single family toilets, commercial toilets, residential clothes washing machines.). For example, the DSS Model incorporates the effects of the 1992 Federal Energy Policy Act and AB 715 on toilet fixtures. A DSS Model feature determines the "saturation" of 1.6 gpf toilets as the 1992 Federal Energy Policy Act was in effect from 1992-2014 for 1.6 gpf toilet replacements. AB 715 now applies for the replacement of toilets at 1.28 gpf. Further consideration and adjustments were made to replacement rates to account for the reduction in fixture use and wear, due to lower occupancy and based on field observations.

[11] It is important to note that in water conservation program management the "free rider effect" occurs when a customer applies for and receives a rebate on a targeted high efficiency fixture that they would have purchased even without a rebate. In this case, the rebate was not the incentive for their purchase but a "bonus." Rebate measures are designed to target those customers needing financial incentive to install the more efficient fixture.

APPENDIX D – DSS MODEL MEASURE ANALYSIS, METHODOLOGY, PERSPECTIVES, AND ASSUMPTIONS

This appendix presents an overview of the water reduction methodology, benefit-cost perspectives, present value analysis, and costs and savings assumptions for the measure analysis.

D.1 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; multifamily residential; commercial, industrial, and institutional; and so forth. 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 multifamily 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 multifamily 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. Essentially, the market penetration goal identifies how many fixtures, rebates, surveys, and so forth that the wholesale customer would have to offer or conduct over time to reach its water savings goal for that conservation measure. This is often expressed in terms of the number of fixtures, rebates, or surveys offered or conducted per year.

The potential for error in market penetration goal estimates for each measure can be significant because the estimates 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 reevaluation 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 different 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% market penetration for affected properties.

The District is constantly examining when a measure might reach saturation. Baseline surveys are the best approach to having the most accurate information on market saturation. This was considered 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 District regarding what the saturation best estimates were within its service area.

D.2 Present Value Analysis and Perspectives on Benefits and Costs

The determination of the economic feasibility of water conservation programs involves comparing the costs of the programs to the benefits provided using the DSS Model, which calculates the 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.

Present value analysis using present day 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, 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 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 aggregate for reasons described previously. 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 over 30 years is often used because costs and benefits that occur beyond these 25 years (beyond the year 2045 in this Plan) 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) 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.

D.3 Measure Cost and Water Savings Assumptions

Appendix E presents more detail on the assumptions and inputs used in the District'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 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 most 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, general expenses, and overhead.

Costs are determined for each of the measures based on industry knowledge, past experience, and data provided by the District. Costs may include incentive costs, usually determined on a per-participant basis; fixed costs, such as marketing; variable costs, such as the cost 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 through 2045. 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 water use conservation measures evaluated herein generally take effect over a long span of time. This span is sufficient to enable timely rate adjustments, if necessary, to meet fixed cost obligations and savings on variable costs such as energy and chemicals.

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 for a residential multifamily 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

Data necessary to forecast water savings of measures include specifics 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 3 to 10 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 conservation measures stay in place and continue to save water. It is assumed that measures implemented because of codes, standards, or ordinances (e.g., toilets) 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 behavior-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 the new homeowners may have less efficient water using practices). Surveys typically have a measure life on the order of five years.

APPENDIX E – INDIVIDUAL CONSERVATION MEASURE DESIGN INPUTS AND RESULTS

Landscape & Irrigation Codes

Overview	
Name	Landscape & Irrigation Codes
Abbr	C_LDS
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2020
Last Year	2045
Measure Length	26

Measure Life	
Permanent	☑

Fixture Cost per Device

	Utility	Customer	Fix/Acct
SF	$200.00	$2,000.00	1
MF	$300.00	$5,000.00	1
COM	$300.00	$5,000.00	1
IND	$300.00	$5,000.00	1
INST	$300.00	$5,000.00	1

Administration Costs

Method: Percent

Markup Percentage	25%

Description

This is an existing code. Enforce Model Water Efficient Landscape Ordinance (MWELO) for eligible new accounts and on existing accounts undergoing eligible site renovations. 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.
> Measure also requires the design and installation of irrigation systems by trained certified contractors. Certification might be through the California Landscape Contractors Association (CLCA), Irrigation Association (IA) and/or specialized training provided by utility.
> Measure also requires new MF and CII developments with more than 5,000 sq. ft of irrigated landscape to install dedicated irrigation meters per California Water Code Section 535.
> The 2015 MWELO has a prescriptive compliance approach for landscapes between 500 and 2,500 sq. ft. All landscapes that include turf (of any size), may be subject to review.
> MWELO uses a water budget approach and larger areas of high water use plants can be installed if the water use is reduced in the other areas, provided the overall landscape stays within the budget. Extra water allowances are provided in non-residential areas for specific functional landscapes, such as recreation, areas for public assembly and edible gardens or for areas irrigated with recycled water.

Customer Classes

SF	MF	COM	IND	INST
☑	☑	☑	☑	☑

End Uses

	SF	MF	COM	IND	INST
Toilets	☐	☐	☐	☐	☐
Urinals			☐	☐	
Lavatory Faucets	☐	☐	☐	☐	☐
Showers	☐	☐	☐	☐	☐
Dishwashers	☐	☐	☐	☐	☐
Clothes Washers	☐	☐	☐	☐	☐
Process			☐	☐	
Kitchen Spray Rinse			☐	☐	☐
Internal Leakage	☐	☐	☐	☐	☐
Baths	☐	☐			
Other	☐	☐	☐	☐	☐
Irrigation	☑	☑	☑	☑	☑
Pools	☐	☐			☐
Wash Down	☐	☐			
Car Washing	☐	☐			
External Leakage	☐	☐	☐	☐	☐
Outdoor					
Non-Lavatory/Kitchen Faucets	☐	☐	☐	☐	☐
Cooling			☐	☐	

Comments

>Utility Costs: Cost of utility staff inspection. Assume staff avg fully burdened rate with fringe and overhead is $82/hr, assuming 2-3 hours for single family, including preparation, communication, conducting inspection, and all associated logistics, and 3-4 hours for MF/CII on average per site, assuming inspections are random.
>Customer Cost: Assume average additional cost to build landscape by MWELO standards (cost to comply versus install typical all-turf) landscape ($2000-$5000/acct). MWELO requires the installation of a water efficient landscape which requires the installation of high efficiency irrigation equipment such as a Weather-Based Irrigation Controllers, High Efficiency Sprinkler Nozzles, and High Efficiency Drip Irrigation Systems. The cost of this equipment will increase with landscape size and irrigation system complexity. Multifamily and CII landscapes are typically larger and more complex than Single Family landscapes and therefore typically cost more.
>Administration Costs: Program management
>End Use Water Savings Assumptions: The maximum applied water allowance (MAWA) has been lowered from 70% of the reference evapotranspiration (ETo) to 55% for residential landscape projects, and to 45% of ETo for non-residential projects. Savings are simplified to be the difference from the prior standard to the new MWELO standard budget difference of 70-55% for residential or 70-45% for non-residential. This water allowance reduces the landscape area that can be planted with high water use plants such as cool season turf. For typical residential projects, the reduction in the MAWA reduces the percentage of landscape area that can be planted to high water use plants from 33% to 25%. The site-wide irrigation efficiency of the previous ordinance (2010) was 0.71; for the purposes of estimating total water use, the revised MWELO defines the irrigation efficiency (IE) of drip irrigation as 0.81 and overhead irrigation and other technologies must meet a minimum IE of 0.75. Also assumed that the amount of irrigated landscape per new development for each individual parcel is reducing over time (meaning that the lot size for homes/businesses is shrinking when comparing existing homes versus new homes/businesses.) Assume some external leakage reduction (since new development would not have much) in addition to irrigation water use reduction. Assume end use savings as compared to existing account irrigation water end use.
>Targets: Assumes 90% of new accounts will comply with regulatory requirements. High because assumes total accounts targeted includes a number of existing account remodels that are eligible.

Results

Units: AF

Average Water Savings (afy)	
	127.937299
Lifetime Savings - Present Value ($)	
Utility	$2,886,061
Community	$2,886,061
Lifetime Costs - Present Value ($)	
Utility	$844,162
Community	$7,991,020
Benefit to Cost Ratio	
Utility	3.42
Community	0.36
Cost of Savings per Unit Volume ($/af)	
Utility	$254

End Use Savings Per Replacement

Method: Percent

	% Savings/Acct	Avg GPD/Acct
SF Irrigation	25.0%	159.8
MF Irrigation	25.0%	3,465.0
COM Irrigation	25.0%	381.3
IND Irrigation	25.0%	208.0
INST Irrigation	25.0%	1,027.0

Targets

Target Method: Percentage

% of Accts Targeted/Yr	90.000%
Only Affects New Accts	☑

Costs

View: Summary

	Utility	Customer	Total
2020	$43,937	$371,592	$415,528
2021	$43,937	$371,592	$415,528
2022	$43,956	$371,847	$415,802
2023	$43,975	$372,103	$416,078
2024	$43,994	$372,362	$416,356
2025	$44,014	$372,622	$416,636
2026	$45,463	$384,513	$429,977
2027	$45,483	$384,777	$430,261
2028	$45,503	$385,043	$430,546
2029	$45,523	$385,311	$430,834
2030	$45,543	$385,580	$431,124
2031	$47,071	$398,112	$445,183
2032	$47,091	$398,385	$445,477
2033	$47,112	$398,661	$445,773
2034	$47,133	$398,938	$446,071
2035	$47,154	$399,217	$446,371
2036	$48,715	$412,029	$460,744
2037	$48,737	$412,312	$461,048
2038	$48,758	$412,597	$461,355
2039	$48,780	$412,884	$461,663
2040	$48,801	$413,173	$461,974
2041	$45,742	$388,402	$434,144
2042	$45,764	$388,695	$434,459
2043	$45,786	$388,990	$434,776
2044	$45,808	$389,288	$435,096
2045	$45,831	$389,587	$435,418

Targets

View: Accounts

	SF	MF	COM	IND	INST	Total
2020	161	1	6	1	2	171
2021	161	1	6	1	2	171
2022	161	1	6	1	2	171
2023	161	1	6	1	2	171
2024	161	1	6	1	2	171
2025	161	1	6	1	2	171
2026	166	1	6	1	2	177
2027	166	1	6	1	2	177
2028	166	1	6	1	2	177
2029	166	1	7	1	2	177
2030	166	1	7	1	2	177
2031	172	1	7	1	2	183
2032	172	1	7	1	2	183
2033	172	1	7	1	2	183
2034	172	1	7	1	2	183
2035	172	1	7	1	2	183
2036	178	1	7	1	2	189
2037	178	1	7	1	2	189
2038	178	1	7	1	2	189
2039	178	1	7	1	2	189
2040	178	1	7	1	2	190
2041	166	1	7	1	2	177
2042	166	1	7	1	2	177
2043	166	1	7	1	2	177
2044	166	1	7	1	2	178
2045	166	1	7	1	2	178

Water Savings

Units: afy

	Total Savings (afy)
2020	9.135909
2021	18.271818
2022	27.412647
2023	36.558429
2024	45.709200
2025	54.864994
2026	64.318444
2027	73.776988
2028	83.240661
2029	92.709500
2030	102.183540
2031	111.971293
2032	121.764321
2033	131.562661
2034	141.366349
2035	151.175423
2036	161.305201
2037	171.440440
2038	181.581180
2039	191.727458
2040	201.879314
2041	211.406229
2042	220.938799
2043	230.477064
2044	240.021065
2045	249.570841

Require New Development Multi-Unit Submetering

Overview	
Name	Require New Development Multi-U
Abbr	C Submeter
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2020
Last Year	2045
Measure Length	26

Measure Life	
Permanent	☑

Fixture Cost per Device			
	Utility	Customer	Fix/Acct
MF	$100.00	$600.00	20
COM	$100.00	$600.00	4

Administration Costs	
Method:	Percent
Markup Percentage	25%

Description

This is an existing code. This is a CA regulation as of 1/1/2018. Require the metering of individual units in new multifamily, condos, townhouses, mobile-home parks and business centers (less than four stories and with water heater in the units). After Jan 1, 2018, per Water Code Chapter 8 Article 5. Multiunit Structures [537 - 537.5] sub meters are required on all individual units in new multi-unit residential development or mixed use commercial/residential development. Walnut Valley has been installing utility submeters on individual MF units for the past 10 years and plans to continue this practice moving forward, having the utility read the bills and charge the unit on an individual unit basis.

Customer Classes	SF	MF	COM	IND	INST
	☐	☑	☑	☐	☐

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

Comments

>This is a CA regulation as of 1/1/2018.
>Utility Costs: Represents staff inspection time for enforcement. Assume no actual fixture costs to the utility.
>Customer Cost: Cost of submeter which would be purchased by the customer.
>Administration Costs: Cost for staff to administer and track participants.
>End Use Water Savings Assumptions: End Use Water Savings were calculated from the analysis of an existing submetering program run by Valley Water since 2001. The measure saved 22% when analyzed on mobile home parks in 2007. This program on new development starting in 2020 and into the future is modified to new accounts which use less water due to newer building standards, therefore there are less savings by adding individual submeters. To be conservative, assume 5% savings on indoor fixtures only. No outdoor savings are assumed because typically large sites have separate irrigation meters. Assume there is no change in bath water use due to installation of submeter.
>Targets: Per code this applies to mixed-use accounts, assume that 50% of new MF and COM accounts are eligible.

Results	
Units	AF
Average Water Savings (afy)	
3.748916	
Lifetime Savings - Present Value ($)	
Utility	$85,286
Community	$289,607
Lifetime Costs - Present Value ($)	
Utility	$61,239
Community	$355,184
Benefit to Cost Ratio	
Utility	1.39
Community	0.82
Cost of Savings per Unit Volume ($/af)	
Utility	$628

End Use Savings Per Replacement		
Method:	Percent	
	% Savings/Acct	Avg GPD/Acct
MF Toilets	5.0%	988.6
COM Toilets	5.0%	173.8
COM Urinals	5.0%	51.1
MF Lavatory Faucets	5.0%	306.0
COM Lavatory Faucets	5.0%	30.7
MF Showers	5.0%	1,082.8
COM Showers	5.0%	81.8
MF Dishwashers	5.0%	56.5
COM Dishwashers	5.0%	61.3
MF Clothes Washers	5.0%	776.8
COM Clothes Washers	5.0%	132.9
COM Process	5.0%	143.1
COM Kitchen Spray Rinse	5.0%	51.1
MF Internal Leakage	5.0%	583.8
COM Internal Leakage	5.0%	102.2
MF Non-Lavatory/Kitchen Faucets	5.0%	612.0
COM Non-Lavatory/Kitchen Faucets	5.0%	92.0

Targets	
Target Method:	Percentage
% of Accts Targeted/Yr	50.000%
Only Affects New Accts	☑

Costs

View: Summary

	Utility	Customer	Total
2020	$3,143	$15,087	$18,231
2021	$3,143	$15,087	$18,231
2022	$3,155	$15,145	$18,300
2023	$3,167	$15,203	$18,371
2024	$3,180	$15,262	$18,441
2025	$3,192	$15,321	$18,512
2026	$3,254	$15,617	$18,871
2027	$3,266	$15,677	$18,943
2028	$3,279	$15,737	$19,016
2029	$3,291	$15,798	$19,089
2030	$3,304	$15,859	$19,163
2031	$3,369	$16,171	$19,540
2032	$3,382	$16,233	$19,614
2033	$3,395	$16,295	$19,690
2034	$3,408	$16,358	$19,765
2035	$3,421	$16,421	$19,842
2036	$3,488	$16,740	$20,228
2037	$3,501	$16,804	$20,305
2038	$3,514	$16,869	$20,383
2039	$3,528	$16,934	$20,462
2040	$3,542	$16,999	$20,541
2041	$3,449	$16,553	$20,002
2042	$3,462	$16,619	$20,082
2043	$3,476	$16,686	$20,163
2044	$3,490	$16,753	$20,244
2045	$3,504	$16,821	$20,326

Targets

View: Accounts

	MF	COM	Total
2020	1	3	4
2021	1	3	4
2022	1	3	4
2023	1	3	4
2024	1	4	4
2025	1	4	4
2026	1	4	4
2027	1	4	4
2028	1	4	4
2029	1	4	4
2030	1	4	4
2031	1	4	4
2032	1	4	4
2033	1	4	4
2034	1	4	4
2035	1	4	4
2036	1	4	4
2037	1	4	4
2038	1	4	4
2039	1	4	5
2040	1	4	5
2041	1	4	5
2042	1	4	5
2043	1	4	5
2044	1	4	5
2045	1	4	5

Water Savings

Units: afy

	Total Savings (afy)
2020	0.308386
2021	0.609641
2022	0.905396
2023	1.196040
2024	1.481930
2025	1.763392
2026	2.044999
2027	2.322311
2028	2.595507
2029	2.864757
2030	3.130222
2031	3.396211
2032	3.660062
2033	3.922106
2034	4.182634
2035	4.441907
2036	4.704139
2037	4.965525
2038	5.226257
2039	5.486510
2040	5.746435
2041	5.998554
2042	6.250775
2043	6.503198
2044	6.755915
2045	7.009007

Require Fixture Retrofit on Resale or Name Change on Water Account or Renovation

Overview

Name	Require Fixture Retrofit on Resale or Name Change on
Abbr	C_Retrofit
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2020
Last Year	2045
Measure Length	26

Measure Life	
Permanent	☑

Fixture Cost per Device

	Utility	Customer	Fix/Acct
SF	$272.00	$100.00	1
MF	$408.00	$100.00	3
COM	$408.00	$200.00	3
IND	$408.00	$200.00	3
INST	$408.00	$200.00	3

Administration Costs

Method: Percent

Markup Percentage	10%

Description

>This is an existing code. Walnut Valley Water District would support the active monitoring/enforcement of the Retrofit on Change of Service requirement per SB407.

> Model assumes agencies will take active role in ensuring compliance, in participation by sending retrofit letters to new accounts holders who do not have a certificate on file. Random inspections would be conducted by utility staff to ensure process is valid and yields fixture replacements.

>SB 407 (Padilla; Chapter 587, 2009), also requires "non-compliant" plumbing fixtures to be replaced with water-conserving plumbing fixtures when a property is undergoing additions, alterations or improvements. Applicants seeking to obtain permits for any of these types of work will be required to replace non-compliant fixtures prior to final permit approval or issuance of a certificate of occupancy by the local building department. This law applies only to properties built on or before January 1, 1994, and by January 1, 2019, ALL of those pre-1994 buildings must comply with these requirements, regardless of whether or not you are planning to renovate the space.

Customer Classes

SF	MF	COM	IND	INST
☑	☑	☑	☑	☑

End Uses

	SF	MF	COM	IND	INST
Toilets	☑	☑	☑	☑	☑
Urinals			☑	☑	☑
Lavatory Faucets	☑	☑	☑	☑	☑
Showers	☑	☑	☑	☑	☑
Dishwashers					
Clothes Washers					
Process					
Kitchen Spray Rinse					
Internal Leakage					
Baths					
Other					
Irrigation					
Pools					
Wash Down					
Car Washing					
External Leakage					
Outdoor					
Non-Lavatory/Kitchen Faucets	☑	☑	☑	☑	☑
Cooling					

Comments

>Utility Costs: Random inspections would be conducted by utility staff to ensure process is valid and yields fixture replacements. Assume staff avg fully burdened rate with fringe and overhead is $82/hr, assuming 3-4 hours for single family, including preparation, communication, conducting inspection, and all associated logistics, and 4-5 hours for MF/CII on average per site, assuming inspections are random.

>Customer Cost: Customer costs represent cost to replace fixture replace to come into compliance with code requirements. All new fixtures must meet California standards. CII cost accounts for urinals too.

>Administration Costs: 10% costs represent staff time to administer the measure.

>End Use Water Savings Assumptions: Savings from this code measure assume 2.2 gpm faucets, 2.5 showerheads, 1.6 gpf toilets and 1.0 gpf urinals are replaced with 1.2 gpm bathroom aerators ($1/ea), 1.8 gpm kitchen aerators ($2.10/ea), 1.8 gpm showerheads ($4.60/ea), 1.28 gpf ($100/ea), and 0.125 gpf urinals ($150/ea).

>Targets: Target 0.2% percent of accounts is a conservative assumption based on recent resale and water account change rates.

>This measure is modeled through the full analysis period in order to reach ALL pre-1992 housing stock.

Results

Units: AF

Average Water Savings (afy)	
	26.721365
Lifetime Savings - Present Value ($)	
Utility	$610,703
Community	$1,304,276
Lifetime Costs - Present Value ($)	
Utility	$388,064
Community	$525,328
Benefit to Cost Ratio	
Utility	1.57
Community	2.48
Cost of Savings per Unit Volume ($/af)	
Utility	$559

End Use Savings Per Replacement

Method: Percent

	% Savings/Acct	Avg GPD/Acct
SF Toilets	20.0%	38.7
MF Toilets	20.0%	988.6
COM Toilets	20.0%	173.8
IND Toilets	20.0%	148.1
INST Toilets	20.0%	199.5
COM Urinals	87.5%	51.1
IND Urinals	87.5%	59.3
INST Urinals	87.5%	59.8
SF Lavatory Faucets	45.5%	12.7
MF Lavatory Faucets	45.5%	306.0
COM Lavatory Faucets	45.5%	30.7
IND Lavatory Faucets	45.5%	74.7
INST Lavatory Faucets	45.5%	86.2
SF Showers	28.0%	42.4
MF Showers	28.0%	1,082.8
COM Showers	28.0%	81.8
IND Showers	28.0%	29.6
INST Showers	28.0%	99.7
SF Non-Lavatory/Kitchen Faucets	18.2%	27.0
MF Non-Lavatory/Kitchen Faucets	18.2%	612.0
COM Non-Lavatory/Kitchen Faucets	18.2%	92.0
IND Non-Lavatory/Kitchen Faucets	18.2%	63.6
INST Non-Lavatory/Kitchen Faucets	18.2%	73.4

Targets

Target Method: Percentage

% of Accts Targeted/Yr	0.200%
Only Affects New Accts	☐

Costs

View: Summary

	Utility	Customer	Total
2020	$19,554	$6,916	$26,470
2021	$19,691	$6,965	$26,656
2022	$19,828	$7,013	$26,841
2023	$19,965	$7,062	$27,027
2024	$20,103	$7,110	$27,213
2025	$20,240	$7,159	$27,399
2026	$20,382	$7,209	$27,591
2027	$20,524	$7,259	$27,783
2028	$20,666	$7,310	$27,975
2029	$20,808	$7,360	$28,168
2030	$20,950	$7,410	$28,360
2031	$21,097	$7,462	$28,559
2032	$21,244	$7,514	$28,758
2033	$21,391	$7,566	$28,957
2034	$21,538	$7,618	$29,156
2035	$21,685	$7,670	$29,356
2036	$21,837	$7,724	$29,561
2037	$21,989	$7,778	$29,767
2038	$22,141	$7,832	$29,973
2039	$22,293	$7,886	$30,179
2040	$22,446	$7,940	$30,386
2041	$22,590	$7,991	$30,581
2042	$22,734	$8,042	$30,776
2043	$22,879	$8,093	$30,972
2044	$23,023	$8,145	$31,168
2045	$23,168	$8,196	$31,364

Targets

View: Accounts

	SF	MF	COM	IND	INST	Total
2020	51	0	2	0	1	54
2021	51	0	2	0	1	55
2022	52	0	2	0	1	55
2023	52	0	2	0	1	55
2024	52	0	2	0	1	56
2025	53	0	2	0	1	56
2026	53	0	2	0	1	56
2027	54	0	2	0	1	57
2028	54	0	2	0	1	57
2029	54	0	2	0	1	58
2030	55	0	2	0	1	58
2031	55	0	2	0	1	58
2032	55	0	2	0	1	59
2033	56	0	2	0	1	59
2034	56	0	2	0	1	60
2035	57	0	2	0	1	60
2036	57	0	2	0	1	61
2037	57	0	2	0	1	61
2038	58	0	2	0	1	61
2039	58	0	2	0	1	62
2040	59	0	2	0	1	62
2041	59	0	2	0	1	63
2042	59	0	2	0	1	63
2043	60	0	2	0	1	63
2044	60	0	2	0	1	64
2045	60	0	2	0	1	64

Water Savings

Units: afy

	Total Savings (afy)
2020	2.384366
2021	4.683960
2022	6.907792
2023	9.063834
2024	11.159135
2025	13.199936
2026	15.191387
2027	17.140471
2028	19.051939
2029	20.930012
2030	22.778435
2031	24.599855
2032	26.399499
2033	28.180208
2034	29.944516
2035	31.694690
2036	33.431944
2037	35.159614
2038	36.879345
2039	38.592616
2040	40.300754
2041	42.006628
2042	43.711190
2043	45.415520
2044	47.120586
2045	48.827263

Require Hot Water on Demand Structured Plumbing in New Developments

Overview	
Name	Require Hot Water on Demand
Abbr	C_Hot Water
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2020
Last Year	2045
Measure Length	26

Measure Life	
Permanent	☑

Fixture Cost per Device	Utility	Customer	Fix/Acct
SF	$50.00	$500.00	1
MF	$50.00	$500.00	3

Administration Costs	
Method:	Percent
Markup Percentage	25%

Description

This is an existing code. New development would include equipping new homes or buildings with efficient hot water on demand systems such as structured plumbing systems. These systems use a pump placed under the sink to recycle water sitting in the hot water pipes to the water heater or to move the water heater into the center of the house and/or reduce hot water waiting times by having a an on-demand pump on a recirculation line.

Customer Classes	SF	MF	COM	IND	INST
	☑	☑	☐	☐	☐

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

Comments

>Utility Costs: Represents time to monitor implementation.
>Customer Cost: Represents new development installation and device (less than existing retrofit costs).
>Administration Cost: 25% costs represent staff time to administer the measure
>End Use Water Savings Assumptions:
-Assume applies to new residential accounts
-Water savings based on Jim Lutz paper and information from Gary Klein and David Grieshop. See spreadsheet titled "Hot Water On Demand Water Savings Estimate_2013" which purports that a 1750 sq. ft house saves ~ 1600 gallons per year or 4.3 gpd or 5%. Assumes equivalent percentage savings on shower and faucet end uses.
-Conservatively assumes 3 units or homes per MF account.
-More information for example system by ACT on www.gothotwater.com.
>Targets: Assumes 90% of new accounts will comply with regulatory requirements. To be conservation, assume 10% of new accounts may not be aware and/or follow regulatory requirements.

Results	
Units	AF
Average Water Savings (afy)	
9.151122	
Lifetime Savings - Present Value ($)	
Utility	$209,162
Community	$530,575
Lifetime Costs - Present Value ($)	
Utility	$196,286
Community	$1,766,570
Benefit to Cost Ratio	
Utility	1.07
Community	0.30
Cost of Savings per Unit Volume ($/af)	
Utility	$825

End Use Savings Per Replacement		
Method:	Percent	
	% Savings/Acct	Avg GPD/Acct
SF Lavatory Faucets	5.0%	12.7
MF Lavatory Faucets	5.0%	306.0
SF Showers	5.0%	42.4
MF Showers	5.0%	1,082.8
SF Non-Lavatory/Kitchen Faucets	5.0%	27.0
MF Non-Lavatory/Kitchen Faucets	5.0%	612.0

Targets	
Target Method:	Percentage
% of Accts Targeted/Yr	90.000%
Only Affects New Accts	☑

Costs — View: Summary

	Utility	Customer	Total
2020	$10,235	$81,877	$92,112
2021	$10,235	$81,877	$92,112
2022	$10,235	$81,877	$92,112
2023	$10,235	$81,877	$92,112
2024	$10,235	$81,877	$92,112
2025	$10,235	$81,877	$92,112
2026	$10,590	$84,718	$95,308
2027	$10,590	$84,718	$95,308
2028	$10,590	$84,718	$95,308
2029	$10,590	$84,718	$95,308
2030	$10,590	$84,718	$95,308
2031	$10,964	$87,713	$98,677
2032	$10,964	$87,713	$98,677
2033	$10,964	$87,713	$98,677
2034	$10,964	$87,713	$98,677
2035	$10,964	$87,713	$98,677
2036	$11,347	$90,774	$102,121
2037	$11,347	$90,774	$102,121
2038	$11,347	$90,774	$102,121
2039	$11,347	$90,774	$102,121
2040	$11,347	$90,774	$102,121
2041	$10,582	$84,652	$95,234
2042	$10,582	$84,652	$95,234
2043	$10,582	$84,652	$95,234
2044	$10,582	$84,652	$95,234
2045	$10,582	$84,652	$95,234

Targets — View: Accounts

	SF	MF	Total
2020	161	1	162
2021	161	1	162
2022	161	1	162
2023	161	1	162
2024	161	1	162
2025	161	1	162
2026	166	1	167
2027	166	1	167
2028	166	1	167
2029	166	1	167
2030	166	1	167
2031	172	1	173
2032	172	1	173
2033	172	1	173
2034	172	1	173
2035	172	1	173
2036	178	1	179
2037	178	1	179
2038	178	1	179
2039	178	1	179
2040	178	1	179
2041	166	1	167
2042	166	1	167
2043	166	1	167
2044	166	1	167
2045	166	1	167

Water Savings — Units: afy

	Total Savings (afy)
2020	0.828250
2021	1.620397
2022	2.380443
2023	3.111878
2024	3.817755
2025	4.500739
2026	5.188459
2027	5.857434
2028	6.509720
2029	7.147115
2030	7.771195
2031	8.408077
2032	9.034106
2033	9.650477
2034	10.258238
2035	10.858308
2036	11.475411
2037	12.086007
2038	12.690767
2039	13.290284
2040	13.885079
2041	14.429709
2042	14.972308
2043	15.513212
2044	16.052717
2045	16.591079

Residential Water Surveys

Overview	
Name	Residential Water Surveys
Abbr	M_Res Survey
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2021
Last Year	2045
Measure Length	25

Measure Life	
Permanent	☐
Years	5
Repeat	☐

Fixture Cost per Device	Utility	Customer	Fix/Acct
SF	$100.00	$50.00	1
MF	$100.00	$50.00	3

Administration Costs	
Method:	Percent
Markup Percentage	25%

Description

>Indoor/outdoor water surveys for existing single and multi family residential customers.
>Normally target those with high water use and provide a customized report to owner on tips to save water but available to all single family and multifamily residents on request.
>In the surveys, staff checks for leaks, provide direction on appropriate irrigation scheduling, demonstrate how to set irrigation controllers, provide guidance on plant selection and offer additional ways to increase outdoor efficiencies (car washing, pool covers, mulch etc.).
>This measure does not capture any outdoor savings for MF since the landscape is considered a large landscape and would have to be addressed by a different measure such as the Outdoor Water Audit.
>Low-cost, general-use, outdoor efficiency fixtures that do not require workshop attendance for receival and can be used without an irrigation system are accounted for in this measure.
>Walnut Valley is researching options for residential surveys to determine if the District will include give-away of efficient shower heads, aerators, toilet devices, (or possibly any outdoor giveaways).
>Walnut Valley is researching if the audits will be in house or outsourced. Walnut Valley is considering self water audit videos on their website (for example showing how a customer can find a leaking toilet or irrigation system.)

Customer Classes

	SF	MF	COM	IND	INST
	☑	☑	☐	☐	☐

End Uses

	SF	MF	COM	IND	INST
Toilets	☑	☑			
Urinals					
Lavatory Faucets	☑	☑			
Showers	☑	☑			
Dishwashers	☑	☑			
Clothes Washers	☑	☑			
Process					
Kitchen Spray Rinse					
Internal Leakage	☑	☑			
Baths	☑	☑			
Other	☐	☐			
Irrigation	☑	☐			
Pools	☑	☐			
Wash Down	☑	☐			
Car Washing	☑	☐			
External Leakage	☑	☐			
Outdoor					
Non-Lavatory/Kitchen Faucets	☑	☑			
Cooling					

Comments

>Utility Costs: Time estimates includes field time, drive time, scheduling, and data entry. Assume staff avg fully burdened Rate with fringe and overhead is $82/hr. Utility fixture costs assume all surveyed account receive a rain gauge ($0.25/ea.) and auto shut-off hose nozzle ($3.00/ea.); and 10% receive a soil moisture sensor ($3.50/ea.). Utility Cost =(82*1.25)+(3+0.25+10% of accounts*3.5)
>Customer Cost: represent average customer cost to implement any survey suggestions.
>Administration Cost: Portion 25% to admin in measure design. Utility costs for this measure are primarily staff time.
>End Use Water Savings Assumptions:
- Savings based off of California Urban Water Agencies water Savings Study (4/13/15); Outdoor Residential Water Surveys saved on average 21 gpd per audit. Assumed 5% selected on pools to be conservative which total up to an approximate average savings of 21 gpd per residential audit.
-Assume 18% for outdoor irrigation based on study that showed the average residential property reduced outdoor water consumption by 9.6%, 12.4%, 22.2% and 25.6% respectively for the audit year and the following three years.
-Approximate 5.8% savings for indoor. Slightly lower value of 5% water savings were selected to account for efficient devices installed during the recent CA drought, and more efficient homes built to CALGreen on the market in the past 5 years.
>Targets: Target based on staff resources. Planning a lower target for the first year as the program gets established.

Results

Units	AF
Average Water Savings (afy)	
25.835286	
Lifetime Savings - Present Value ($)	
Utility	$631,358
Community	$892,899
Lifetime Costs - Present Value ($)	
Utility	$306,045
Community	$428,464
Benefit to Cost Ratio	
Utility	2.06
Community	2.08
Cost of Savings per Unit Volume ($/af)	
Utility	$456

End Use Savings Per Replacement

Method:	Percent	
	% Savings/Acct	Avg GPD/Acct
SF Toilets	5.0%	38.7
MF Toilets	5.0%	988.6
SF Lavatory Faucets	5.0%	12.7
MF Lavatory Faucets	5.0%	306.0
SF Showers	5.0%	42.4
MF Showers	5.0%	1,082.8
SF Dishwashers	5.0%	3.9
MF Dishwashers	5.0%	56.5
SF Clothes Washers	5.0%	31.8
MF Clothes Washers	5.0%	776.8
SF Internal Leakage	5.0%	23.9
MF Internal Leakage	5.0%	583.8
SF Baths	5.0%	5.0
MF Baths	5.0%	122.4
SF Irrigation	18.0%	159.8
SF Pools	5.0%	3.9
SF Wash Down	1.0%	7.7
SF Car Washing	1.0%	7.7
SF External Leakage	5.0%	13.5
SF Non-Lavatory/Kitchen Faucets	5.0%	27.0
MF Non-Lavatory/Kitchen Faucets	5.0%	612.0

Targets

Target Method:	Percentage
% of Accts Targeted/Yr	0.500%
Only Affects New Accts	☐

Costs

View: Summary

	Utility	Customer	Total
2020	$0	$0	$0
2021	$16,357	$6,543	$22,900
2022	$16,471	$6,588	$23,059
2023	$16,584	$6,634	$23,218
2024	$16,698	$6,679	$23,377
2025	$16,812	$6,725	$23,536
2026	$16,929	$6,772	$23,701
2027	$17,047	$6,819	$23,866
2028	$17,165	$6,866	$24,031
2029	$17,282	$6,913	$24,195
2030	$17,400	$6,960	$24,360
2031	$17,522	$7,009	$24,531
2032	$17,644	$7,057	$24,701
2033	$17,766	$7,106	$24,872
2034	$17,887	$7,155	$25,042
2035	$18,009	$7,204	$25,213
2036	$18,135	$7,254	$25,389
2037	$18,261	$7,305	$25,566
2038	$18,387	$7,355	$25,742
2039	$18,513	$7,405	$25,919
2040	$18,640	$7,456	$26,095
2041	$18,757	$7,503	$26,260
2042	$18,875	$7,550	$26,425
2043	$18,992	$7,597	$26,589
2044	$19,110	$7,644	$26,754
2045	$19,227	$7,691	$26,918

Targets

View: Accounts

	SF	MF	Total
2020	0	0	0
2021	128	1	129
2022	129	1	130
2023	130	1	131
2024	131	1	132
2025	132	1	133
2026	133	1	134
2027	134	1	135
2028	135	1	136
2029	136	1	137
2030	137	1	137
2031	138	1	138
2032	138	1	139
2033	139	1	140
2034	140	1	141
2035	141	1	142
2036	142	1	143
2037	143	1	144
2038	144	1	145
2039	145	1	146
2040	146	1	147
2041	147	1	148
2042	148	1	149
2043	149	1	150
2044	150	1	151
2045	151	1	152

Water Savings

Units: afy

	Total Savings (afy)
2020	0.000000
2021	5.631098
2022	11.257807
2023	16.882183
2024	22.506059
2025	28.131076
2026	28.229373
2027	28.328766
2028	28.429261
2029	28.530860
2030	28.633562
2031	28.737120
2032	28.848129
2033	28.966036
2034	29.090341
2035	29.220594
2036	29.356184
2037	29.497024
2038	29.642774
2039	29.793127
2040	29.947803
2041	30.102752
2042	30.257601
2043	30.412144
2044	30.566192
2045	30.719576

High Efficiency Fixture Giveaway

Overview	
Name	High Efficiency Fixture Giveaway
Abbr	M_HE Fix Giveaway
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2020
Last Year	2024
Measure Length	5

Measure Life	
Permanent	☑

Fixture Cost per Device			
	Utility	Customer	Fix/Acct
SF	$12.00	$15.00	2

Administration Costs	
Method:	Percent
Markup Percentage	25%

Description

Utility provides high efficiency showerheads and faucets, aerators in bulk and give them away at Utility office or community events. Walnut Valley will plan to give these away during residential water audits also.

Customer Classes	SF	MF	COM	IND	INST
	☑	☐	☐	☐	☐

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

Comments

>Utility Costs: Devices are ordered in bulk. Devices are given away individually, and not necessarily as a "kit". Average cost for devices: 1.2 gpm bathroom aerators ($1/ea.), 1.8 gpm kitchen aerators ($2.10/ea.), 1.8 gpm showerheads ($4.60/ea.).
>Administration Costs: Costs for tracking of program participation and savings.
>Customer Cost: Assumes minimal cost for installation.
>End Use Water Savings Assumptions: Assuming overall kit, including faucets and showers, save a combined total of 27.6%. This savings value is reduced to be conservative by assuming only 25% of kits are actually installed in the homes and yield water savings. For example, 27.6% * 25% installed is equivalent to 6.9% end use savings on average for individual devices. We assumed an additional 1% internal leakage savings to account for small leakage volumes that can be saved by replacing the older devices.
>Targets: Assume based on 2019 rebate data. 800 kits given away. Assume covered 400 SFR. This equates to 1.5% SF homes.

Results	
Units	AF
Average Water Savings (afy)	
9.505487	
Lifetime Savings - Present Value ($)	
Utility	$241,218
Community	$641,202
Lifetime Costs - Present Value ($)	
Utility	$54,854
Community	$109,708
Benefit to Cost Ratio	
Utility	4.40
Community	5.84
Cost of Savings per Unit Volume ($/af)	
Utility	$222

End Use Savings Per Replacement		
Method:	Percent	
	% Savings/Acct	Avg GPD/Acct
SF Lavatory Faucets	6.9%	12.7
SF Showers	6.9%	42.4
SF Internal Leakage	1.0%	23.9
SF Non-Lavatory/Kitchen Faucets	6.9%	27.0

Targets	
Target Method:	Percentage
% of Accts Targeted/Yr	1.500%
Only Affects New Accts	☐

Costs			
View:	Summary		
	Utility	Customer	Total
2020	$11,475	$11,475	$22,950
2021	$11,555	$11,555	$23,111
2022	$11,636	$11,636	$23,271
2023	$11,716	$11,716	$23,432
2024	$11,796	$11,796	$23,593
2025	$0	$0	$0
2026	$0	$0	$0
2027	$0	$0	$0
2028	$0	$0	$0
2029	$0	$0	$0
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0
2036	$0	$0	$0
2037	$0	$0	$0
2038	$0	$0	$0
2039	$0	$0	$0
2040	$0	$0	$0
2041	$0	$0	$0
2042	$0	$0	$0
2043	$0	$0	$0
2044	$0	$0	$0
2045	$0	$0	$0

Targets		
View	Accounts	
	SF	Total
2020	383	383
2021	385	385
2022	388	388
2023	391	391
2024	393	393
2025	0	0
2026	0	0
2027	0	0
2028	0	0
2029	0	0
2030	0	0
2031	0	0
2032	0	0
2033	0	0
2034	0	0
2035	0	0
2036	0	0
2037	0	0
2038	0	0
2039	0	0
2040	0	0
2041	0	0
2042	0	0
2043	0	0
2044	0	0
2045	0	0

Water Savings	
Units	afy
	Total Savings (afy)
2020	2.453323
2021	4.820932
2022	7.113218
2023	9.339272
2024	11.507045
2025	11.313852
2026	11.133032
2027	10.965201
2028	10.809182
2029	10.663915
2030	10.528444
2031	10.401458
2032	10.283254
2033	10.173068
2034	10.070212
2035	9.974064
2036	9.883729
2037	9.799071
2038	9.719620
2039	9.644953
2040	9.574687
2041	9.508960
2042	9.447670
2043	9.390462
2044	9.337013
2045	9.287031

Residential Leak Repair & Plumbing Emergency Assistance

Overview	
Name	Residential Leak Repair & Plumbin
Abbr	M_Res Leak Repair
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2023
Last Year	2045
Measure Length	23

Measure Life	
Permanent	☐
Years	10
Repeat	☐

Fixture Cost per Device			
	Utility	Customer	Fix/Acct
SF	$200.00	$200.00	1
MF	$200.00	$200.00	2

Administration Costs	
Method:	Percent
Markup Percentage	25%

Description

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, but either subsidize part of the repair and/or pay the cost with revolving funds that are paid back with water bills over time. May also include an option to replace inefficient plumbing fixtures at low-income residences.

Customer Classes	SF	MF	COM	IND	INST
	☑	☑	☐	☐	☐

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

Comments

>Utility Costs: Partial cost of leak repair up to $200.
>Customer Cost: This is set up as a cost share program where customer pays 50%
>Administration Cost: Staff time for account leak identification, multiple notifications and a possible site survey (incl drive time) and reporting.
>End Use Water Savings Assumptions:
-Savings might be over 200% if based on a targeted account's using 2-4 times the amount of the previous year's water use. Assume 50% savings due to utility cost value of $200, may not be able to address all leaks.
-Could assume 1 leak per SF, 2 leaks per MF (typically duplex owners), as these programs typically are for owner-occupied residences.
>Targets: Assume 0.1% of accounts per year need leak repair and plumbing assistance.

Results	
Units	AF
Average Water Savings (afy)	
	4.604425
Lifetime Savings - Present Value ($)	
Utility	$105,223
Community	$386,067
Lifetime Costs - Present Value ($)	
Utility	$109,169
Community	$196,504
Benefit to Cost Ratio	
Utility	0.96
Community	1.96
Cost of Savings per Unit Volume ($/af)	
Utility	$912

End Use Savings Per Replacement		
Method:	Percent	
	% Savings/Acct	Avg GPD/Acct
SF Internal Leakage	50.0%	23.9
MF Internal Leakage	50.0%	583.8
SF External Leakage	50.0%	13.5
MF External Leakage	50.0%	292.2

Targets	
Target Method:	Percentage
% of Accts Targeted/Yr	0.100%
Only Affects New Accts	☐

Costs — View: Summary

	Utility	Customer	Total
2020	$0	$0	$0
2021	$0	$0	$0
2022	$0	$0	$0
2023	$6,592	$5,274	$11,866
2024	$6,637	$5,310	$11,947
2025	$6,683	$5,346	$12,029
2026	$6,729	$5,383	$12,113
2027	$6,776	$5,421	$12,197
2028	$6,823	$5,458	$12,281
2029	$6,870	$5,496	$12,365
2030	$6,916	$5,533	$12,449
2031	$6,965	$5,572	$12,537
2032	$7,013	$5,611	$12,624
2033	$7,062	$5,649	$12,711
2034	$7,110	$5,688	$12,798
2035	$7,158	$5,727	$12,885
2036	$7,209	$5,767	$12,975
2037	$7,259	$5,807	$13,066
2038	$7,309	$5,847	$13,156
2039	$7,359	$5,887	$13,246
2040	$7,409	$5,927	$13,336
2041	$7,456	$5,965	$13,420
2042	$7,503	$6,002	$13,505
2043	$7,549	$6,039	$13,589
2044	$7,596	$6,077	$13,673
2045	$7,643	$6,114	$13,757

Targets — View: Accounts

	SF	MF	Total
2020	0	0	0
2021	0	0	0
2022	0	0	0
2023	26	0	26
2024	26	0	26
2025	26	0	27
2026	27	0	27
2027	27	0	27
2028	27	0	27
2029	27	0	27
2030	27	0	27
2031	28	0	28
2032	28	0	28
2033	28	0	28
2034	28	0	28
2035	28	0	28
2036	28	0	29
2037	29	0	29
2038	29	0	29
2039	29	0	29
2040	29	0	29
2041	29	0	30
2042	30	0	30
2043	30	0	30
2044	30	0	30
2045	30	0	30

Water Savings — Units: afy

	Total Savings (afy)
2020	0.000000
2021	0.000000
2022	0.000000
2023	0.608009
2024	1.220187
2025	1.836534
2026	2.457195
2027	3.082169
2028	3.711458
2029	4.345060
2030	4.982976
2031	5.625358
2032	6.272207
2033	6.315513
2034	6.359116
2035	6.403016
2036	6.447225
2037	6.491742
2038	6.536567
2039	6.581701
2040	6.627143
2041	6.672429
2042	6.717559
2043	6.762534
2044	6.807352
2045	6.852015

High Efficiency Toilet Incentive

Overview	
Name	High Efficiency Toilet Incentive
Abbr	M_HE Toilet
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2021
Last Year	2025
Measure Length	5

Measure Life	
Permanent	☑

Fixture Cost per Device

	Utility	Customer	Fix/Acct
SF	$20.00	$150.00	2
MF	$20.00	$150.00	3
COM	$20.00	$150.00	4
IND	$20.00	$150.00	4
INST	$20.00	$150.00	4

Administration Costs

Method:	Percent
Markup Percentage	10%

Description

This program is sponsored by MWD's SoCal Water$mart:
Rebates of $40 per toilet are available for Premium High Efficiency Toilets using 1.1 gallons per flush or less.
>Through MWD's SoCal Water$mart, Southern California businesses are eligible for generous rebates to help encourage water efficiency and conservation. The SoCal Water$mart program offers cash rebates on a wide variety of water-saving technologies.
$40 base rebate.
>Measure implementation period is based on the current and anticipated changes in plumbing codes that would negate the need for this fixture rebates. Ending this measure avoids free-ridership

Customer Classes

	SF	MF	COM	IND	INST
	☑	☑	☑	☑	☑

End Uses

	SF	MF	COM	IND	INST
Toilets	☑	☑	☑	☑	☑
Urinals			☐	☐	☐
Lavatory Faucets	☐	☐	☐	☐	☐
Showers	☐	☐	☐	☐	☐
Dishwashers	☐	☐	☐	☐	☐
Clothes Washers	☐	☐	☐	☐	☐
Process			☐	☐	
Kitchen Spray Rinse			☐		☐
Internal Leakage	☐	☐	☐	☐	☐
Baths	☐	☐			
Other	☐	☐	☐	☐	☐
Irrigation	☐	☐	☐	☐	☐
Pools	☐	☐			☐
Wash Down	☐	☐			
Car Washing	☐	☐			
External Leakage	☐	☐	☐	☐	☐
Outdoor					
Non-Lavatory/Kitchen Faucets	☐	☐	☐	☐	☐
Cooling			☐	☐	☐

Comments

>Utility Costs: Represents the increased level of utility marketing to encourage a higher level of participation in the SoCal Water$mart rebate program via staff revision of Walnut Valley website and keeping Social Media posts current and relevant.
>Customer Cost: Reflects the remaining fixture and installation costs.
>Administration Cost: Costs to track program statistics
>End Use Water Savings Assumptions:
-Savings estimates assume the difference between 0.8 gpf and 1.6 gpf.
>Targets: Target assumed to be 0.5% of accounts.

Results

Units	AF
Average Water Savings (afy)	14.203142
Lifetime Savings - Present Value ($)	
Utility	$354,631
Community	$354,631
Lifetime Costs - Present Value ($)	
Utility	$29,410
Community	$229,931
Benefit to Cost Ratio	
Utility	12.06
Community	1.54
Cost of Savings per Unit Volume ($/af)	
Utility	$80

End Use Savings Per Replacement

Method:	Percent	
	% Savings/Acct	Avg GPD/Acct
SF Toilets	50.0%	38.7
MF Toilets	50.0%	988.6
COM Toilets	50.0%	173.8
IND Toilets	50.0%	148.1
INST Toilets	50.0%	199.5

Targets

Target Method:	Percentage
% of Accts Targeted/Yr	0.500%
Only Affects New Accts	☐

Costs

View: Summary

	Utility	Customer	Total
2020	$0	$0	$0
2021	$6,338	$43,213	$49,551
2022	$6,382	$43,514	$49,896
2023	$6,426	$43,815	$50,241
2024	$6,470	$44,115	$50,586
2025	$6,514	$44,417	$50,931
2026	$0	$0	$0
2027	$0	$0	$0
2028	$0	$0	$0
2029	$0	$0	$0
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0
2036	$0	$0	$0
2037	$0	$0	$0
2038	$0	$0	$0
2039	$0	$0	$0
2040	$0	$0	$0
2041	$0	$0	$0
2042	$0	$0	$0
2043	$0	$0	$0
2044	$0	$0	$0
2045	$0	$0	$0

Targets

View: Accounts

	SF	MF	COM	IND	INST	Total
2020	0	0	0	0	0	0
2021	128	1	5	1	1	136
2022	129	1	5	1	1	137
2023	130	1	5	1	1	138
2024	131	1	5	1	1	139
2025	132	1	5	1	1	140
2026	0	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	0	0	0
2029	0	0	0	0	0	0
2030	0	0	0	0	0	0
2031	0	0	0	0	0	0
2032	0	0	0	0	0	0
2033	0	0	0	0	0	0
2034	0	0	0	0	0	0
2035	0	0	0	0	0	0
2036	0	0	0	0	0	0
2037	0	0	0	0	0	0
2038	0	0	0	0	0	0
2039	0	0	0	0	0	0
2040	0	0	0	0	0	0
2041	0	0	0	0	0	0
2042	0	0	0	0	0	0
2043	0	0	0	0	0	0
2044	0	0	0	0	0	0
2045	0	0	0	0	0	0

Water Savings

Units: afy

	Total Savings (afy)
2020	0.000000
2021	3.767512
2022	7.439194
2023	11.021291
2024	14.519693
2025	17.939962
2026	17.677452
2027	17.424601
2028	17.180972
2029	16.946151
2030	16.719741
2031	16.500357
2032	16.289594
2033	16.087063
2034	15.892394
2035	15.705231
2036	15.524412
2037	15.350516
2038	15.183230
2039	15.022254
2040	14.867306
2041	14.719447
2042	14.576969
2043	14.439635
2044	14.307216
2045	14.179495

High Efficiency Urinal Incentive

Overview	
Name	High Efficiency Urinal Incentive
Abbr	M_HE Urinal
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2020
Last Year	2025
Measure Length	6

Measure Life	
Permanent	☑

Fixture Cost per Device	Utility	Customer	Fix/Acct
COM	$20.00	$100.00	2
IND	$20.00	$100.00	2
INST	$20.00	$100.00	2

Administration Costs	
Method:	Percent
Markup Percentage	10%

Description

Provide a rebate or voucher for the installation of a high efficiency urinals. WaterSense standard is 0.5 gpf or less; CA code requires 0.125 (pint) gpf or less.
Through MWD's SoCal Water$mart, Southern California businesses are eligible for $200 rebates on 0.125 gpf urinals to replace existing urinals of 1.5 gpf or greater. The SoCal Water$mart program offers cash rebates on a wide variety of water-saving technologies.

Customer Classes	SF	MF	COM	IND	INST
	☐	☐	☑	☑	☑

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

Comments

>Utility Costs: Represents the increased level of utility marketing to encourage a higher level of participation in the SoCal Water$mart rebate program via staff revision of Walnut Valley website and keeping Social Media posts current and relevant.
>Customer Cost: Customer cost reflects the remaining fixture and installation costs and represents the valve and basin.
>Administration Cost: Cost to track program savings and participation.
>End Use Water Savings Assumptions:
Per SoCal Program requirements, 1.5 gpf urinals are replaced by 0.125 gpf which equates to a savings of 91.7%.
>Shorter measure length of 6 years due to existing code and free-ridership tendency.
>Measure implementation period is based on the current and anticipated changes in plumbing codes that would negate the need for this fixture rebates. These will be the only kinds of fixtures available. Ending this measure avoids free-ridership.
>Targets: Target assumed to be 1% of accounts.

Results	
Units	AF
Average Water Savings (afy)	
	3.313541
Lifetime Savings - Present Value ($)	
Utility	$84,175
Community	$84,175
Lifetime Costs - Present Value ($)	
Utility	$3,575
Community	$19,823
Benefit to Cost Ratio	
Utility	23.55
Community	4.25
Cost of Savings per Unit Volume ($/af)	
Utility	$41

End Use Savings Per Replacement		
Method:	Percent	
	% Savings/Acct	Avg GPD/Acct
COM Urinals	91.7%	51.1
IND Urinals	91.7%	59.3
INST Urinals	91.7%	59.8

Targets	
Target Method:	Percentage
% of Accts Targeted/Yr	1.000%
Only Affects New Accts	☐

Costs — View: Summary

	Utility	Customer	Total
2020	$630	$2,864	$3,494
2021	$634	$2,884	$3,519
2022	$639	$2,904	$3,543
2023	$643	$2,924	$3,568
2024	$648	$2,945	$3,593
2025	$652	$2,965	$3,618
2026	$0	$0	$0
2027	$0	$0	$0
2028	$0	$0	$0
2029	$0	$0	$0
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0
2036	$0	$0	$0
2037	$0	$0	$0
2038	$0	$0	$0
2039	$0	$0	$0
2040	$0	$0	$0
2041	$0	$0	$0
2042	$0	$0	$0
2043	$0	$0	$0
2044	$0	$0	$0
2045	$0	$0	$0

Targets — View: Accounts

	COM	IND	INST	Total
2020	10	2	3	14
2021	10	2	3	14
2022	10	2	3	15
2023	10	2	3	15
2024	10	2	3	15
2025	10	2	3	15
2026	0	0	0	0
2027	0	0	0	0
2028	0	0	0	0
2029	0	0	0	0
2030	0	0	0	0
2031	0	0	0	0
2032	0	0	0	0
2033	0	0	0	0
2034	0	0	0	0
2035	0	0	0	0
2036	0	0	0	0
2037	0	0	0	0
2038	0	0	0	0
2039	0	0	0	0
2040	0	0	0	0
2041	0	0	0	0
2042	0	0	0	0
2043	0	0	0	0
2044	0	0	0	0
2045	0	0	0	0

Water Savings — Units: afy

	Total Savings (afy)
2020	0.767913
2021	1.511453
2022	2.231326
2023	2.928219
2024	3.602806
2025	4.255744
2026	4.174822
2027	4.096139
2028	4.019635
2029	3.945249
2030	3.872923
2031	3.802600
2032	3.734425
2033	3.668331
2034	3.604253
2035	3.542131
2036	3.481904
2037	3.423514
2038	3.366905
2039	3.312021
2040	3.258811
2041	3.207222
2042	3.157205
2043	3.108712
2044	3.061696
2045	3.016111

High Efficiency Toilet & Urinal Bulk Purchase

Overview

Name	High Efficiency Toilet & Urinal Bulk Purchase
Abbr	M_HE Bulk
Category	Default
Measure Type	Standard Measure

Time Period

First Year	2022
Last Year	2026
Measure Length	5

Measure Life

Permanent ☑

Fixture Cost per Device

	Utility	Customer	Fix/Acct
MF	$400.00	$25.00	25
COM	$400.00	$25.00	5
IND	$400.00	$25.00	5
INST	$400.00	$25.00	5

Administration Costs

Method: Percent

Markup Percentage	25%

Description

Utility would subsidize direct installation cost of a new HET/ urinals purchased in bulk by the utility. Licensed plumbers, pre-qualified by the Utility would solicit customers directly. Customers would get a new HET installed at a discounted price. Pattern after Sonoma County, California program that replaced over 5,000 toilets in several communities in about six months.
>Utility would buy HETs or urinals in bulk and give them away or sell them at a discounted price for customers who want to replace a 3.5 gallon/flush toilet.

Customer Classes

SF	MF	COM	IND	INST
☐	☑	☑	☑	☑

End Uses

	SF	MF	COM	IND	INST
Toilets		☑	☑	☑	☑
Urinals			☑	☑	☑
Lavatory Faucets		☐	☐	☐	☐
Showers		☐	☐	☐	☐
Dishwashers		☐	☐	☐	☐
Clothes Washers		☐	☐	☐	☐
Process			☐	☐	
Kitchen Spray Rinse			☐		☐
Internal Leakage		☐	☐	☐	☐
Baths		☐			
Other		☐	☐	☐	☐
Irrigation		☐	☐	☐	☐
Pools		☐			☐
Wash Down		☐			
Car Washing		☐			
External Leakage		☐	☐	☐	☐
Outdoor					
Non-Lavatory/Kitchen Faucets		☐	☐	☐	☐
Cooling			☐	☐	☐

Comments

>Utility Costs: Cost reflects cost of 1.1 gpf or lower toilet and installation fees based upon City of Santa Monica, CA program. https://www.smgov.net/uploadedFiles/Departments/OSE/Categories/Water/DirectInstall_Toilet.pdf
>Administration Costs: reflects utility staff time to track and run program.
>Customer Cost: Minimal customer cost.
>End Use Water Savings Assumptions: Savings estimates assume the difference between 0.8 gpf and 1.6 gpf or 50% savings on average. Assume urinal difference between 1 gpf to .25 or waterless. Per SoCal Program requirements, 1.5 gpf urinals are replaced by 0.125 gpf which equates to a savings of 91.7%.
>Targets: Assumes 0.1% of non-SF accounts targeted per year.

Results

Units: AF

Average Water Savings (afy)	
	1.071831
Lifetime Savings - Present Value ($)	
Utility	$26,303
Community	$26,303
Lifetime Costs - Present Value ($)	
Utility	$25,662
Community	$26,945
Benefit to Cost Ratio	
Utility	1.02
Community	0.98
Cost of Savings per Unit Volume ($/af)	
Utility	$921

End Use Savings Per Replacement

Method: Percent

	% Savings/Acct	Avg GPD/Acct
MF Toilets	50.0%	988.6
COM Toilets	50.0%	173.8
IND Toilets	50.0%	148.1
INST Toilets	50.0%	199.5
COM Urinals	91.7%	51.1
IND Urinals	91.7%	59.3
INST Urinals	91.7%	59.8

Targets

Target Method: Percentage

% of Accts Targeted/Yr	0.100%
Only Affects New Accts	☐

Costs

View: Summary

	Utility	Customer	Total
2020	$0	$0	$0
2021	$0	$0	$0
2022	$5,696	$285	$5,981
2023	$5,736	$287	$6,023
2024	$5,776	$289	$6,064
2025	$5,816	$291	$6,106
2026	$5,856	$293	$6,149
2027	$0	$0	$0
2028	$0	$0	$0
2029	$0	$0	$0
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0
2036	$0	$0	$0
2037	$0	$0	$0
2038	$0	$0	$0
2039	$0	$0	$0
2040	$0	$0	$0
2041	$0	$0	$0
2042	$0	$0	$0
2043	$0	$0	$0
2044	$0	$0	$0
2045	$0	$0	$0

Targets

View: Accounts

	MF	COM	IND	INST	Total
2020	0	0	0	0	0
2021	0	0	0	0	0
2022	0	1	0	0	2
2023	0	1	0	0	2
2024	0	1	0	0	2
2025	0	1	0	0	2
2026	0	1	0	0	2
2027	0	0	0	0	0
2028	0	0	0	0	0
2029	0	0	0	0	0
2030	0	0	0	0	0
2031	0	0	0	0	0
2032	0	0	0	0	0
2033	0	0	0	0	0
2034	0	0	0	0	0
2035	0	0	0	0	0
2036	0	0	0	0	0
2037	0	0	0	0	0
2038	0	0	0	0	0
2039	0	0	0	0	0
2040	0	0	0	0	0
2041	0	0	0	0	0
2042	0	0	0	0	0
2043	0	0	0	0	0
2044	0	0	0	0	0
2045	0	0	0	0	0

Water Savings

Units: afy

	Total Savings (afy)
2020	0.000000
2021	0.000000
2022	0.295607
2023	0.584026
2024	0.865630
2025	1.140774
2026	1.409792
2027	1.389329
2028	1.369533
2029	1.350376
2030	1.331835
2031	1.313855
2032	1.296502
2033	1.279754
2034	1.263586
2035	1.247975
2036	1.232875
2037	1.218294
2038	1.204210
2039	1.190605
2040	1.177461
2041	1.164800
2042	1.152562
2043	1.140729
2044	1.129287
2045	1.118221

Install High Efficiency Fixtures in Government Bldgs, School & Commercial Bldgs.

Overview	
Name	Install High Efficiency Fixtures in G
Abbr	M_HE INST
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2021
Last Year	2030
Measure Length	10

Measure Life	
Permanent	☑

Fixture Cost per Device

	Utility	Customer	Fix/Acct
COM	$5,000.00	$5,000.00	1
INST	$5,000.00	$5,000.00	1

Administration Costs

Method: Percent

Markup Percentage	25%

Description

>Direct installation of high efficiency faucets, toilets, urinals and showerheads in City or Utility facilities.
>May also offer incentives for similar installations in other government buildings (such as utility pays for all or part of fixture cost, and building owner providing installation.)
>Consider direct install program, rebates or grants for installation of high efficiency fixtures in all or selected commercial or institutional buildings. Replacements would include high efficiency toilets, showerhead, and waterless or high efficiency urinals.
>School retrofit program where in school receives a grant to replace fixtures and upgrade irrigation systems. Might target university and college campuses. Pattern after MWD of Southern California program.

Customer Classes

	SF	MF	COM	IND	INST
	☐	☐	☑	☐	☑

End Uses

	SF	MF	COM	IND	INST
Toilets			☑		☑
Urinals			☑		☑
Lavatory Faucets			☑		☑
Showers			☑		☑
Dishwashers			☑		☑
Clothes Washers			☐		☐
Process			☐		
Kitchen Spray Rinse			☑		☑
Internal Leakage			☑		☑
Baths					
Other			☐		☐
Irrigation			☐		☐
Pools					☐
Wash Down					
Car Washing					
External Leakage			☐		☐
Outdoor					
Non-Lavatory/Kitchen Faucets			☑		☑
Cooling			☐		☐

Comments

>Utility Costs: Cost share to purchase and install HE Fixtures
>Customer Cost: Cost share to purchase and install HE fixtures
>Administration Cost: Overhead costs to manage measure
>End Use Water Savings Assumptions:
-Toilet savings estimates assume conservative estimate of 40% to account for the difference between 0.8 gpf and 1.6 gpf, a 1.28 gpf to 0.8 gpf, or a 1.6gpf to a 1.28 gpf.
-Per SoCal Program requirements, 1.5 gpf urinals are replaced by 0.125 gpf which equates to a savings of 91.7%.
-Kitchen Spray Rinse: 573 gallons/nozzle/year for SFR, 2263 gallons/nozzle/year for multi-family/commercial as per 2015 M&V Study by Metropolitan Water District. Assume a conservative 20%.
-Faucet and dishwashers savings assumed to be 20%.
>Targets: Assumes 0.1% of institutional accounts targeted each year.

Results

Units: AF

Average Water Savings (afy)	
	1.775233
Lifetime Savings - Present Value ($)	
Utility	$42,559
Community	$110,248
Lifetime Costs - Present Value ($)	
Utility	$69,491
Community	$125,084
Benefit to Cost Ratio	
Utility	0.61
Community	0.88
Cost of Savings per Unit Volume ($/af)	
Utility	$1,506

End Use Savings Per Replacement

Method: Percent

	% Savings/Acct	Avg GPD/Acct
COM Toilets	40.0%	173.8
INST Toilets	40.0%	199.5
COM Urinals	91.7%	51.1
INST Urinals	91.7%	59.8
COM Lavatory Faucets	20.0%	30.7
INST Lavatory Faucets	20.0%	86.2
COM Showers	20.0%	81.8
INST Showers	20.0%	99.7
COM Dishwashers	20.0%	61.3
INST Dishwashers	20.0%	59.8
COM Kitchen Spray Rinse	20.0%	51.1
INST Kitchen Spray Rinse	20.0%	49.9
COM Internal Leakage	1.0%	102.2
INST Internal Leakage	1.0%	99.7
COM Non-Lavatory/Kitchen Faucets	20.0%	92.0
INST Non-Lavatory/Kitchen Faucets	20.0%	73.4

Targets

Target Method: Percentage

% of Accts Targeted/Yr	0.100%
Only Affects New Accts	☐

Costs

View: Summary

	Utility	Customer	Total
2020	$0	$0	$0
2021	$7,911	$6,329	$14,240
2022	$7,967	$6,373	$14,340
2023	$8,022	$6,418	$14,440
2024	$8,078	$6,462	$14,540
2025	$8,134	$6,507	$14,642
2026	$8,191	$6,553	$14,744
2027	$8,248	$6,599	$14,847
2028	$8,306	$6,645	$14,951
2029	$8,364	$6,691	$15,055
2030	$8,422	$6,738	$15,160
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0
2036	$0	$0	$0
2037	$0	$0	$0
2038	$0	$0	$0
2039	$0	$0	$0
2040	$0	$0	$0
2041	$0	$0	$0
2042	$0	$0	$0
2043	$0	$0	$0
2044	$0	$0	$0
2045	$0	$0	$0

Targets

View: Accounts

	COM	INST	Total
2020	0	0	0
2021	1	0	1
2022	1	0	1
2023	1	0	1
2024	1	0	1
2025	1	0	1
2026	1	0	1
2027	1	0	1
2028	1	0	1
2029	1	0	1
2030	1	0	1
2031	0	0	0
2032	0	0	0
2033	0	0	0
2034	0	0	0
2035	0	0	0
2036	0	0	0
2037	0	0	0
2038	0	0	0
2039	0	0	0
2040	0	0	0
2041	0	0	0
2042	0	0	0
2043	0	0	0
2044	0	0	0
2045	0	0	0

Water Savings

Units: afy

	Total Savings (afy)
2020	0.000000
2021	0.254086
2022	0.503429
2023	0.748310
2024	0.988994
2025	1.225733
2026	1.458778
2027	1.688385
2028	1.914778
2029	2.138168
2030	2.358753
2031	2.334267
2032	2.310664
2033	2.287906
2034	2.265957
2035	2.244785
2036	2.224357
2037	2.204643
2038	2.185613
2039	2.167240
2040	2.149497
2041	2.132360
2042	2.115803
2043	2.099805
2044	2.084343
2045	2.069396

Residential Washer Incentive

Overview	
Name	Residential Washer Incentive
Abbr	M_HECW
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2020
Last Year	2024
Measure Length	5

Measure Life	
Permanent	☑

Fixture Cost per Device	Utility	Customer	Fix/Acct
SF	$20.00	$200.00	1
MF	$20.00	$200.00	4

Administration Costs	
Method:	Percent
Markup Percentage	25%

Description

Provide a rebate for efficient washing machines to single family homes and apartment complexes that have common laundry rooms. 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.
<Rebate for a high efficiency clothes washer. Only applicable on eligible models and for replacing an existing high-water using washer. Through MWD's SoCal Water$mart:
Rebates Start at $85
Please note: In order to receive a rebate, clothes washers must meet or exceed the CEE Tier 1 standard. Please refer to the Qualifying Products List to verify the eligibility of your clothes washer. Upgrading to a high efficiency washer saves water and energy since approximately 15% of water use in the home is due to laundry.

Customer Classes	SF	MF	COM	IND	INST
	☑	☑	☐	☐	☐

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

Comments

>Utility Costs: program operated by SoCal Water$mart. Cost to utility to market and refer program to customers. Will be marketed on the new utility website and Social Media. Support customers to navigate the SoCal Water$mart website to obtain a rebate.
>Customer Cost: remaining cost of washer after rebate
>Administration Cost: Cost of WVWD staff to track program participation and savings.
>End Use Water Savings Assumptions:
-According to their website, ENERGY STAR certified clothes washers use about 45% less water than regular washers (assumes 23 gallon per load is reduced to 13 gallon per load). Since only 1 of 4 MF units is expected to replace their washer, assume 25% of the 45% savings
>Targets: Assume 50 rebates/yr SFR accounts and 5/yr MFR accounts.

Results	
Units	AF
Average Water Savings (afy)	
6.531396	
Lifetime Savings - Present Value ($)	
Utility	$168,441
Community	$509,215
Lifetime Costs - Present Value ($)	
Utility	$8,253
Community	$74,281
Benefit to Cost Ratio	
Utility	20.41
Community	6.86
Cost of Savings per Unit Volume ($/af)	
Utility	$49

End Use Savings Per Replacement		
Method:	Percent	
	% Savings/Acct	Avg GPD/Acct
SF Clothes Washers	45.0%	31.8
MF Clothes Washers	25.0%	776.8

Targets	
Target Method:	Detailed
Enter Annual Targets Below	

Costs — View: Summary

	Utility	Customer	Total
2020	$1,750	$14,000	$15,750
2021	$1,750	$14,000	$15,750
2022	$1,750	$14,000	$15,750
2023	$1,750	$14,000	$15,750
2024	$1,750	$14,000	$15,750
2025	$0	$0	$0
2026	$0	$0	$0
2027	$0	$0	$0
2028	$0	$0	$0
2029	$0	$0	$0
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0
2036	$0	$0	$0
2037	$0	$0	$0
2038	$0	$0	$0
2039	$0	$0	$0
2040	$0	$0	$0
2041	$0	$0	$0
2042	$0	$0	$0
2043	$0	$0	$0
2044	$0	$0	$0
2045	$0	$0	$0

Targets — View: Accounts

	SF	MF	Total
2020	50	5	55
2021	50	5	55
2022	50	5	55
2023	50	5	55
2024	50	5	55
2025	0	0	0
2026	0	0	0
2027	0	0	0
2028	0	0	0
2029	0	0	0
2030	0	0	0
2031	0	0	0
2032	0	0	0
2033	0	0	0
2034	0	0	0
2035	0	0	0
2036	0	0	0
2037	0	0	0
2038	0	0	0
2039	0	0	0
2040	0	0	0
2041	0	0	0
2042	0	0	0
2043	0	0	0
2044	0	0	0
2045	0	0	0

Water Savings — Units: afy

	Total Savings (afy)
2020	1.832930
2021	3.628042
2022	5.376802
2023	7.071894
2024	8.707056
2025	8.564112
2026	8.411819
2027	8.235260
2028	8.037031
2029	7.819447
2030	7.584576
2031	7.333762
2032	7.109690
2033	6.909499
2034	6.730632
2035	6.570811
2036	6.427718
2037	6.299882
2038	6.185669
2039	6.083623
2040	5.992443
2041	5.911278
2042	5.838712
2043	5.773831
2044	5.715818
2045	5.663944

Commercial Incentive Program

Overview	
Name	Commercial Incentive Program
Abbr	M_CII Incentive
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2020
Last Year	2029
Measure Length	10

Measure Life	
Permanent	☑

Fixture Cost per Device

	Utility	Customer	Fix/Acct
COM	$25.00	$500.00	1
IND	$25.00	$500.00	1
INST	$25.00	$500.00	1

Administration Costs

Method:	Percent
Markup Percentage	25%

Description

>Through MWD's SoCal Water$mart:
Connectionless Food Steamers - $485/Compartment
Air-cooled Ice Machines - $1,000"
Cooling Tower Conductivity Controllers - $625
Cooling Tower ph Controllers - $1,750"
Dry Vacuum Pumps - $125/0.5HP
Laminar Flow Restrictors - $10/Restrictor (minimum of 10)"
SoCal provide about $0.60 per 1000 gallons (1 billing unit) saved to sites within the utility's service area. Any project that saves at least 10,000,000 gallons of water could qualify for WSIP funding. Designed for non-residential customers improving their water efficiency through upgraded equipment or services that do not qualify for standard rebates. WSIP is unique because it provides an incentive based on the amount of water customers save. This "pay-for-performance" design lets customers implement custom projects for their sites.
Incentives to follow-up field evaluation recommendations, but a site visit (evaluation) is NOT required.
>Top 25 water customers from each district would be offered a free water survey that would evaluate ways for the business to save water and money. The surveys would be for large accounts (e.g., 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 25 users for each individual water district.
>After the free water use survey has been completed at site, the Utility will analyze the recommendations on the findings report that is provided and determine if 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 the Utility while funding lasts.

Customer Classes

SF	MF	COM	IND	INST
☐	☐	☑	☑	☑

End Uses

	SF	MF	COM	IND	INST
Toilets			☐	☐	☐
Urinals			☐	☐	☐
Lavatory Faucets			☐	☐	☐
Showers			☐	☐	☐
Dishwashers			☐	☐	☐
Clothes Washers			☑	☑	☑
Process			☑	☑	
Kitchen Spray Rinse			☑		☑
Internal Leakage			☐	☐	☐
Baths					
Other			☑	☑	☑
Irrigation			☐	☐	☐
Pools					☐
Wash Down					
Car Washing					
External Leakage			☐	☐	☐
Outdoor					
Non-Lavatory/Kitchen Faucets			☑	☑	☑
Cooling			☑	☑	☑

Comments

>Utility Costs: This measure is paid for and conducted by SoCal Water$mart. Utility cost to market program, possible to top 25 users. Walnut Valley will market the program via Social Media and new utility website to be launched in 2020. Can consider hosting a commercial workshop for customers to tell them about the program.
>Customer Cost: Remaining cost of device
>Administration Cost: reflects 25% to track participation and identify ideal candidates.
>End Use Water Savings Assumptions:
Typical account savings are 20%, however since large water-using accounts (using more than 4x the average COM and IND account water use) will be targeted, targeted savings are conservatively doubled to 40% to represent the larger water use customers.
>Targets: Target assumed to be 0.5% of accounts.

Results

Units	AF
Average Water Savings (afy)	
15.588540	
Lifetime Savings - Present Value ($)	
Utility	$375,878
Community	$909,327
Lifetime Costs - Present Value ($)	
Utility	$2,025
Community	$34,418
Benefit to Cost Ratio	
Utility	185.66
Community	26.42
Cost of Savings per Unit Volume ($/af)	
Utility	$5

End Use Savings Per Replacement

Method:	Percent	
	% Savings/Acct	Avg GPD/Acct
COM Clothes Washers	40.0%	132.9
IND Clothes Washers	40.0%	79.0
INST Clothes Washers	40.0%	139.6
COM Process	40.0%	143.1
IND Process	40.0%	296.3
COM Kitchen Spray Rinse	40.0%	51.1
INST Kitchen Spray Rinse	40.0%	49.9
COM Other	40.0%	102.2
IND Other	40.0%	98.8
INST Other	40.0%	129.7
COM Non-Lavatory/Kitchen Faucets	40.0%	92.0
IND Non-Lavatory/Kitchen Faucets	40.0%	63.6
INST Non-Lavatory/Kitchen Faucets	40.0%	73.4
COM Cooling	40.0%	73.3
IND Cooling	40.0%	57.0
INST Cooling	40.0%	211.0

Targets

Target Method:	Percentage
% of Accts Targeted/Yr	0.500%
Only Affects New Accts	☐

Costs

View: Summary

	Utility	Customer	Total
2020	$224	$3,580	$3,804
2021	$225	$3,605	$3,830
2022	$227	$3,630	$3,857
2023	$228	$3,656	$3,884
2024	$230	$3,681	$3,911
2025	$232	$3,707	$3,938
2026	$233	$3,733	$3,966
2027	$235	$3,759	$3,994
2028	$237	$3,785	$4,022
2029	$238	$3,811	$4,050
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0
2036	$0	$0	$0
2037	$0	$0	$0
2038	$0	$0	$0
2039	$0	$0	$0
2040	$0	$0	$0
2041	$0	$0	$0
2042	$0	$0	$0
2043	$0	$0	$0
2044	$0	$0	$0
2045	$0	$0	$0

Targets

View: Accounts

	COM	IND	INST	Total
2020	5	1	1	7
2021	5	1	1	7
2022	5	1	1	7
2023	5	1	1	7
2024	5	1	1	7
2025	5	1	1	7
2026	5	1	1	7
2027	5	1	1	8
2028	5	1	1	8
2029	5	1	1	8
2030	0	0	0	0
2031	0	0	0	0
2032	0	0	0	0
2033	0	0	0	0
2034	0	0	0	0
2035	0	0	0	0
2036	0	0	0	0
2037	0	0	0	0
2038	0	0	0	0
2039	0	0	0	0
2040	0	0	0	0
2041	0	0	0	0
2042	0	0	0	0
2043	0	0	0	0
2044	0	0	0	0
2045	0	0	0	0

Water Savings

Units: afy

	Total Savings (afy)
2020	1.856931
2021	3.720907
2022	5.592593
2023	7.472601
2024	9.361491
2025	11.259781
2026	13.168030
2027	15.086675
2028	17.016118
2029	18.956728
2030	18.941272
2031	18.926947
2032	18.913669
2033	18.901363
2034	18.889957
2035	18.879386
2036	18.869588
2037	18.860507
2038	18.852090
2039	18.844289
2040	18.837058
2041	18.830356
2042	18.824145
2043	18.818388
2044	18.813052
2045	18.808107

Outdoor Water Audit - Large Landscape

Overview	
Name	Outdoor Water Audit - Large Landscape
Abbr	M_Outdoor Audit
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2021
Last Year	2045
Measure Length	25

Measure Life	
Permanent	☐
Years	10
Repeat	☐

Fixture Cost per Device

	Utility	Customer	Fix/Acct
MF	$1,500.00	$1,000.00	1
COM	$1,500.00	$1,000.00	1
IND	$1,500.00	$1,000.00	1
INST	$1,500.00	$1,000.00	1

Administration Costs

Method:	Percent
Markup Percentage	25%

Description

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 multifamily residential, CII, and public irrigators of large landscapes would be eligible for free landscape water audits upon request.
Plan to start developing the program in house and will determine participation levels. Program will incorporate information provided via the Eagle Aerial imaging, landscape area and data tables. Information provided is assumed to be a watering goal but not a hard water budget.
MWD plans to offer program in July 2020. Will need to update Costs once program is launched.

Customer Classes

SF	MF	COM	IND	INST
☐	☑	☑	☑	☑

End Uses

	SF	MF	COM	IND	INST
Toilets		☐	☐	☐	☐
Urinals			☐	☐	☐
Lavatory Faucets		☐	☐	☐	☐
Showers		☐	☐	☐	☐
Dishwashers		☐	☐	☐	☐
Clothes Washers		☐	☐	☐	☐
Process			☐	☐	
Kitchen Spray Rinse			☐		☐
Internal Leakage		☐	☐	☐	☐
Baths		☐			
Other		☐	☐	☐	☐
Irrigation		☑	☑	☑	☑
Pools		☐			☐
Wash Down		☐			
Car Washing		☐			
External Leakage		☑	☑	☑	☑
Outdoor					
Non-Lavatory/Kitchen Faucets		☐	☐	☐	☐
Cooling			☐	☐	☐

Comments

>Utility Costs: Assumes all large landscape accounts can apply. Assume 3 acres cost $500/Acre, $1,500 per site.
>Customer Cost: Assumes cost to review/update controller programming or fix minor leaks to align water use to an appropriate level for the amount and type of landscaping at the site.
>Administration Cost: Assumes cost to manage program including scheduling and savings.
>End Use Water Savings Assumptions:
There are a wide range of reported savings for irrigation audits depending on the number of recommendations that are implemented. While leakage is often resolved, additional upgrades to equipment may or may not be implemented. Assumed 10% savings from leakage due to leak identification during an audit. Assumed 20% savings from audit based on mid-range estimate from case studies.
-An EPA WaterSense Case Studies report landscape irrigation audits saving between 20% - 44% or more.
Savings based off of California Urban Water Agencies water savings study (4/13/15) of 326 gpda, average of 15% for CII landscape accounts.
>Targets: Customer participation assumed at 1%.

Results

Units	AF
Average Water Savings (afy)	0.166799
Lifetime Savings - Present Value ($)	
Utility	$3,935
Community	$3,935
Lifetime Costs - Present Value ($)	
Utility	$3,890
Community	$5,965
Benefit to Cost Ratio	
Utility	1.01
Community	0.66
Cost of Savings per Unit Volume ($/af)	
Utility	$897

End Use Savings Per Replacement

Method:	Percent	
	% Savings/Acct	Avg GPD/Acct
MF Irrigation	20.0%	3,465.0
COM Irrigation	20.0%	381.3
IND Irrigation	20.0%	208.0
INST Irrigation	20.0%	1,027.0
MF External Leakage	10.0%	292.2
COM External Leakage	10.0%	34.2
IND External Leakage	10.0%	19.9
INST External Leakage	10.0%	98.5

Targets

Target Method:	Percentage
% of Accts Targeted/Yr	1.000%
Only Affects New Accts	☑

Costs

View: Summary

	Utility	Customer	Total
2020	$0	$0	$0
2021	$209	$112	$321
2022	$210	$112	$323
2023	$211	$113	$324
2024	$213	$113	$326
2025	$214	$114	$328
2026	$217	$116	$332
2027	$218	$116	$334
2028	$219	$117	$336
2029	$220	$117	$337
2030	$221	$118	$339
2031	$224	$120	$344
2032	$226	$120	$346
2033	$227	$121	$348
2034	$228	$122	$349
2035	$229	$122	$351
2036	$232	$124	$356
2037	$234	$125	$358
2038	$235	$125	$360
2039	$236	$126	$362
2040	$237	$126	$364
2041	$234	$125	$359
2042	$235	$125	$361
2043	$236	$126	$363
2044	$238	$127	$364
2045	$239	$127	$366

Targets

View: Accounts

	MF	COM	IND	INST	Total
2020	0	0	0	0	0
2021	0	0	0	0	0
2022	0	0	0	0	0
2023	0	0	0	0	0
2024	0	0	0	0	0
2025	0	0	0	0	0
2026	0	0	0	0	0
2027	0	0	0	0	0
2028	0	0	0	0	0
2029	0	0	0	0	0
2030	0	0	0	0	0
2031	0	0	0	0	0
2032	0	0	0	0	0
2033	0	0	0	0	0
2034	0	0	0	0	0
2035	0	0	0	0	0
2036	0	0	0	0	0
2037	0	0	0	0	0
2038	0	0	0	0	0
2039	0	0	0	0	0
2040	0	0	0	0	0
2041	0	0	0	0	0
2042	0	0	0	0	0
2043	0	0	0	0	0
2044	0	0	0	0	0
2045	0	0	0	0	0

Water Savings

Units: afy

	Total Savings (afy)
2020	0.000000
2021	0.020011
2022	0.040068
2023	0.060171
2024	0.080321
2025	0.100517
2026	0.121228
2027	0.141986
2028	0.162791
2029	0.183645
2030	0.204547
2031	0.205980
2032	0.207416
2033	0.208855
2034	0.210298
2035	0.211744
2036	0.213230
2037	0.214719
2038	0.216211
2039	0.217707
2040	0.219207
2041	0.219208
2042	0.219214
2043	0.219222
2044	0.219235
2045	0.219251

Financial Incentives for Irrigation & Landscape Upgrades

Overview	
Name	Financial Incentives for Irrigation & Landscap
Abbr	M_Outdoor Incentive
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2020
Last Year	2029
Measure Length	10

Measure Life	
Permanent	☐
Years	5
Repeat	☐

Fixture Cost per Device

	Utility	Customer	Fix/Acct
MF	$25.00	$300.00	1
COM	$25.00	$300.00	1
IND	$25.00	$300.00	1
INST	$25.00	$300.00	1

Administration Costs

Method: Percent

Markup Percentage	25%

Description

Program sponsored by MWD's SoCal Water$mart:
Provides financial incentives to commercial, industrial and institutional property owners, including Homeowner Associations, who convert potable water irrigation or industrial water systems to recycled water use. This program provides incentives of $195 per acre-foot for five years of estimated water use, up to actual retrofit costs."
"Through MWD's SoCal Water$mart:
> Weather Based Irrigation Controllers - $35/Station – Eligible WBIC can have a maximum of 11 inactive stations per controller
> Rotating Nozzles for Pop-up Spray Heads - $2/Nozzle (minimum of 30)
> Soil Moisture Sensor Systems - $35/Irrigation controller station – Eligible SMSS can have a maximum of 11 inactive stations per controller

Customer Classes

SF	MF	COM	IND	INST
☐	☑	☑	☑	☑

End Uses

	SF	MF	COM	IND	INST
Toilets		☐	☐	☐	☐
Urinals			☐	☐	☐
Lavatory Faucets		☐	☐	☐	☐
Showers		☐	☐	☐	☐
Dishwashers		☐	☐	☐	☐
Clothes Washers		☐	☐	☐	☐
Process			☐	☐	
Kitchen Spray Rinse			☐		☐
Internal Leakage		☐	☐	☐	☐
Baths		☐			
Other		☐	☐	☐	☐
Irrigation		☑	☑	☑	☑
Pools		☐			☐
Wash Down		☐			
Car Washing		☐			
External Leakage		☑	☑	☑	☑
Outdoor					
Non-Lavatory/Kitchen Faucets		☐	☐	☐	☐
Cooling			☐	☐	☐

Comments

>Utility Costs: Cost to market program. Will be marketed on the new utility website and Social Media. Support customers to navigate the SoCal Water$mart website to obtain a rebate.
>Customer Cost: Cost of upgrades after rebate and installation costs.
>Administration Cost: Administrative cost of WVWD staff to track program participation and savings.
>End Use Water Savings Assumptions: The water savings are based on the following from the 2018 Landscape Rebate Water Savings Study from Valley Water:
>The annual water savings for replacing timer-based automatic irrigation controllers with weather-based irrigation controllers with rain shut-off devices were statistically significant each year following conversion, incrementally increased each year following conversion, and were on average 9 gal/ft2/yr or an average of 27%
>The annual water savings for replacing old sprinklers with high-efficiency nozzles were 1,243 gal/unit/yr on average. or an average of 15.3%
>Annual savings for replacing old sprinklers with high-efficiency nozzles including pressure regulation and/or check valves were significant in the first year following conversion, saving 1,661 gal/unit/yr on average, or an average of 18%.
>Soil moisture sensor savings may be 20% of irrigation use is based on more than 10 California site water use reports conducted over multiple months in years 2015-2017 as provided by Brian Holland www.sustainablewatersavings.com. Studies show a range of 20%-60% savings for trained soil moisture sensor device installation and site management. A lower savings estimate is assumed for layperson usage and non-drought normal planning years. The manufacturer claims device batteries last 10-12 years.
>Irrigation savings final estimate of 20% based on average of reported savings from irrigation controller upgrade (27%), upgrading sprinkler nozzles with (18%) and without (15.3) pressure regulation, and soil moisture sensor installation (20%). Assume 5% savings on leakage due to equipment upgrade.
>Targets: Target assumed to be 1% of accounts

Results

Units: AF

Average Water Savings (afy)	
	5.551535
Lifetime Savings - Present Value ($)	
Utility	$167,310
Community	$167,310
Lifetime Costs - Present Value ($)	
Utility	$4,510
Community	$47,806
Benefit to Cost Ratio	
Utility	37.10
Community	3.50
Cost of Savings per Unit Volume ($/af)	
Utility	$31

End Use Savings Per Replacement

Method: Percent

	% Savings/Acct	Avg GPD/Acct
MF Irrigation	20.0%	3,465.0
COM Irrigation	20.0%	381.3
IND Irrigation	20.0%	208.0
INST Irrigation	20.0%	1,027.0
MF External Leakage	5.0%	292.2
COM External Leakage	5.0%	34.2
IND External Leakage	5.0%	19.9
INST External Leakage	5.0%	98.5

Targets

Target Method: Percentage

% of Accts Targeted/Yr	1.000%
Only Affects New Accts	☐

Costs

View: Summary

	Utility	Customer	Total
2020	$498	$4,785	$5,283
2021	$502	$4,818	$5,320
2022	$505	$4,852	$5,358
2023	$509	$4,886	$5,395
2024	$513	$4,920	$5,433
2025	$516	$4,954	$5,470
2026	$520	$4,989	$5,509
2027	$523	$5,024	$5,547
2028	$527	$5,059	$5,586
2029	$531	$5,094	$5,625
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0
2036	$0	$0	$0
2037	$0	$0	$0
2038	$0	$0	$0
2039	$0	$0	$0
2040	$0	$0	$0
2041	$0	$0	$0
2042	$0	$0	$0
2043	$0	$0	$0
2044	$0	$0	$0
2045	$0	$0	$0

Targets

View: Accounts

	MF	COM	IND	INST	Total
2020	2	10	2	3	16
2021	2	10	2	3	16
2022	2	10	2	3	16
2023	2	10	2	3	16
2024	2	10	2	3	16
2025	2	10	2	3	17
2026	2	10	2	3	17
2027	2	10	2	3	17
2028	2	10	2	3	17
2029	2	10	2	3	17
2030	0	0	0	0	0
2031	0	0	0	0	0
2032	0	0	0	0	0
2033	0	0	0	0	0
2034	0	0	0	0	0
2035	0	0	0	0	0
2036	0	0	0	0	0
2037	0	0	0	0	0
2038	0	0	0	0	0
2039	0	0	0	0	0
2040	0	0	0	0	0
2041	0	0	0	0	0
2042	0	0	0	0	0
2043	0	0	0	0	0
2044	0	0	0	0	0
2045	0	0	0	0	0

Water Savings

Units: afy

	Total Savings (afy)
2020	2.797662
2021	5.614910
2022	8.451788
2023	11.308341
2024	14.184615
2025	14.282993
2026	14.382056
2027	14.481805
2028	14.582242
2029	14.683368
2030	11.787328
2031	8.871017
2032	5.934390
2033	2.977400
2034	0.000000
2035	0.000000
2036	0.000000
2037	0.000000
2038	0.000000
2039	0.000000
2040	0.000000
2041	0.000000
2042	0.000000
2043	0.000000
2044	0.000000
2045	0.000000

Landscape Conversion or Turf Removal - SF

Overview	
Name	Landscape Conversion or Turf Rem
Abbr	M_SF Turf
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2020
Last Year	2029
Measure Length	10

Measure Life	
Permanent	☑

Fixture Cost per Device			
	Utility	Customer	Fix/Acct
SF	$25.00	$1,500.00	1

Administration Costs	
Method:	Percent
Markup Percentage	25%

Description

Provide a per square foot incentive for to remove turf and replace with low water use plants or permeable hardscape. Landscape conversion could include conversion of turf to lower-water-using turf varieties. Rebate based on dollars per square foot removed, and capped at an upper limit for single family residence.
>Through MWD's SoCal Water$mart:
Designed to promote water use reduction and sustainability. Following the success of other incentive programs focusing on landscaping and turf grass removal, the Turf Replacement program aims to combine turf removal, irrigation modification and rainwater retention or filtration to support reuse or soil absorption of rainwater. Every turf replacement project will include:
-3 plants per 100 square feet of area transformed
-A stormwater retention feature
-No hardscape within the transformed area, except permeable hardscape
-Replacement or modification of overhead spray sprinklers

Customer Classes	SF	MF	COM	IND	INST
	☑	☐	☐	☐	☐

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

Comments

>Utility Cost: Utility costs to market and refer SoCal Water$mart program. Will be marketed on the new utility website and Social Media. Support customers to navigate the SoCal Water$mart website to obtain a rebate.
>Customer Cost: Cost of removal after rebate
>Administration Cost: Cost to track program participation and savings.
>End Use Water Savings Assumptions:
-Assume 5% reduction in external leakage with turf replacement.
-Research by Southern Nevada Water Authority (source: Public Policy Institute of California, Lawns and Water Demand in California) estimates that conversion from turf to low-water landscaping resulted in up to a 76 percent savings.
-Other savings estimates range from 15%- over 50%. Santa Clarita Water Agency estimates 25%, Liberty Utilities (Park Water Company) estimates 18%.
-Assumed a conservation estimate of 20% savings based on California estimates and SNWA research. Assume 5% savings due to equipment removal/upgrade/repair.
>Targets: Target based on same number of 2019 Turf Removal Projects.

Results	
Units	AF
Average Water Savings (afy)	
2.191888	
Lifetime Savings - Present Value ($)	
Utility	$52,858
Community	$52,858
Lifetime Costs - Present Value ($)	
Utility	$1,647
Community	$80,690
Benefit to Cost Ratio	
Utility	32.10
Community	0.66
Cost of Savings per Unit Volume ($/af)	
Utility	$29

End Use Savings Per Replacement		
Method:	Percent	
	% Savings/Acct	Avg GPD/Acct
SF Irrigation	25.0%	159.8
SF External Leakage	5.0%	13.5

Targets	
Target Method:	Count
# of Accts Targeted/Yr	6

Costs

View: Summary

	Utility	Customer	Total
2020	$188	$9,000	$9,188
2021	$188	$9,000	$9,188
2022	$188	$9,000	$9,188
2023	$188	$9,000	$9,188
2024	$188	$9,000	$9,188
2025	$188	$9,000	$9,188
2026	$188	$9,000	$9,188
2027	$188	$9,000	$9,188
2028	$188	$9,000	$9,188
2029	$188	$9,000	$9,188
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0
2036	$0	$0	$0
2037	$0	$0	$0
2038	$0	$0	$0
2039	$0	$0	$0
2040	$0	$0	$0
2041	$0	$0	$0
2042	$0	$0	$0
2043	$0	$0	$0
2044	$0	$0	$0
2045	$0	$0	$0

Targets

View: Accounts

	SF	Total
2020	6	6
2021	6	6
2022	6	6
2023	6	6
2024	6	6
2025	6	6
2026	6	6
2027	6	6
2028	6	6
2029	6	6
2030	0	0
2031	0	0
2032	0	0
2033	0	0
2034	0	0
2035	0	0
2036	0	0
2037	0	0
2038	0	0
2039	0	0
2040	0	0
2041	0	0
2042	0	0
2043	0	0
2044	0	0
2045	0	0

Water Savings

Units: afy

	Total Savings (afy)
2020	0.265066
2021	0.530131
2022	0.795197
2023	1.060262
2024	1.325328
2025	1.590393
2026	1.855459
2027	2.120524
2028	2.385590
2029	2.650655
2030	2.650655
2031	2.650655
2032	2.650655
2033	2.650655
2034	2.650655
2035	2.650655
2036	2.650655
2037	2.650655
2038	2.650655
2039	2.650655
2040	2.650655
2041	2.650655
2042	2.650655
2043	2.650655
2044	2.650655
2045	2.650655

Landscape Conversion or Turf Removal - MF, CII

Overview

Name	Landscape Conversion or Turf Removal - MF,
Abbr	M_MF CII Turf
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2020
Last Year	2029
Measure Length	10

Measure Life	
Permanent	☑

Fixture Cost per Device

	Utility	Customer	Fix/Acct
MF	$25.00	$15,000.00	1
COM	$25.00	$15,000.00	1
IND	$25.00	$15,000.00	1
INST	$25.00	$15,000.00	1

Administration Costs

Method:	Percent
Markup Percentage	25%

Description

Provide a per square foot incentive for to remove turf and replace with low water use plants or hardscape. Landscape conversion could include conversion of turf to lower-water-using turf varieties. Rebate is be based on price per square foot removed, and capped at an upper limit for multifamily or commercial residence.
>Through MWD's SoCal Water$mart:
Designed to promote water use reduction and sustainability. Following the success of other incentive programs focusing on landscaping and turf grass removal, the Turf Replacement program aims to combine turf removal, irrigation modification and rainwater retention or filtration to support reuse or soil absorption of rainwater. Every turf replacement project will include:
-3 plants per 100 square feet of area transformed
-A stormwater retention feature
-No hardscape within the transformed area, except permeable hardscape
-Replacement or modification of overhead spray sprinklers

Customer Classes

SF	MF	COM	IND	INST
☐	☑	☑	☑	☑

End Uses

	SF	MF	COM	IND	INST
Toilets		☐	☐	☐	☐
Urinals			☐	☐	☐
Lavatory Faucets		☐	☐	☐	☐
Showers		☐	☐	☐	☐
Dishwashers		☐	☐	☐	☐
Clothes Washers		☐	☐	☐	☐
Process			☐	☐	
Kitchen Spray Rinse			☐		☐
Internal Leakage		☐	☐	☐	☐
Baths		☐			
Other		☐	☐	☐	☐
Irrigation		☑	☑	☑	☑
Pools		☐			☐
Wash Down		☐			
Car Washing		☐			
External Leakage		☑	☑	☑	☑
Outdoor					
Non-Lavatory/Kitchen Faucets		☐	☐	☐	☐
Cooling			☐	☐	☐

Comments

>Utility Cost: Cost to promote and refer program
>Customer Cost: Cost of turf removal after rebate
>Administration Cost: Cost to track program participation and savings.
>End Use Water Savings Assumptions:
-Assume 5% reduction in external leakage with turf replacement.
-Research by Southern Nevada Water Authority (source: Public Policy Institute of California, Lawns and Water Demand in California) estimates that conversion from turf to low-water landscaping resulted in up to a 76 percent savings.
-Other savings estimates range from 15%- over 50%. Santa Clarita Water Agency estimates 25%, Liberty Utilities (Park Water Company) estimates 18%.
-Assumed a conservation estimate of 20% savings based on California estimates and SNWA research.
Assume 5% savings due to equipment removal/upgrade/repair.
>Targets: Target assumed to be 1% of accounts.

Results

Units	AF
Average Water Savings (afy)	29.630949
Lifetime Savings - Present Value ($)	
Utility	$713,898
Community	$713,898
Lifetime Costs - Present Value ($)	
Utility	$4,510
Community	$2,169,301
Benefit to Cost Ratio	
Utility	158.29
Community	0.33
Cost of Savings per Unit Volume ($/af)	
Utility	$6

End Use Savings Per Replacement

Method:	Percent	
	% Savings/Acct	Avg GPD/Acct
MF Irrigation	25.0%	3,465.0
COM Irrigation	25.0%	381.3
IND Irrigation	25.0%	208.0
INST Irrigation	25.0%	1,027.0
MF External Leakage	5.0%	292.2
COM External Leakage	5.0%	34.2
IND External Leakage	5.0%	19.9
INST External Leakage	5.0%	98.5

Targets

Target Method:	Percentage
% of Accts Targeted/Yr	1.000%
Only Affects New Accts	☐

Costs

View: Summary

	Utility	Customer	Total
2020	$498	$239,250	$239,748
2021	$502	$240,925	$241,427
2022	$505	$242,608	$243,114
2023	$509	$244,300	$244,809
2024	$513	$246,000	$246,513
2025	$516	$247,710	$248,226
2026	$520	$249,444	$249,963
2027	$523	$251,186	$251,710
2028	$527	$252,938	$253,465
2029	$531	$254,698	$255,229
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0
2036	$0	$0	$0
2037	$0	$0	$0
2038	$0	$0	$0
2039	$0	$0	$0
2040	$0	$0	$0
2041	$0	$0	$0
2042	$0	$0	$0
2043	$0	$0	$0
2044	$0	$0	$0
2045	$0	$0	$0

Targets

View: Accounts

	MF	COM	IND	INST	Total
2020	2	10	2	3	16
2021	2	10	2	3	16
2022	2	10	2	3	16
2023	2	10	2	3	16
2024	2	10	2	3	16
2025	2	10	2	3	17
2026	2	10	2	3	17
2027	2	10	2	3	17
2028	2	10	2	3	17
2029	2	10	2	3	17
2030	0	0	0	0	0
2031	0	0	0	0	0
2032	0	0	0	0	0
2033	0	0	0	0	0
2034	0	0	0	0	0
2035	0	0	0	0	0
2036	0	0	0	0	0
2037	0	0	0	0	0
2038	0	0	0	0	0
2039	0	0	0	0	0
2040	0	0	0	0	0
2041	0	0	0	0	0
2042	0	0	0	0	0
2043	0	0	0	0	0
2044	0	0	0	0	0
2045	0	0	0	0	0

Water Savings

Units: afy

	Total Savings (afy)
2020	3.481875
2021	6.988125
2022	10.518806
2023	14.073974
2024	17.653687
2025	21.257999
2026	24.887539
2027	28.542365
2028	32.222533
2029	35.928104
2030	35.928104
2031	35.928104
2032	35.928104
2033	35.928104
2034	35.928104
2035	35.928104
2036	35.928104
2037	35.928104
2038	35.928104
2039	35.928104
2040	35.928104
2041	35.928104
2042	35.928104
2043	35.928104
2044	35.928104
2045	35.928104

Pool & Spa Cover Incentive

Overview	
Name	Pool & Spa Cover Incentive
Abbr	M_Pool Cover
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2022
Last Year	2031
Measure Length	10

Measure Life	
Permanent	☐
Years	6
Repeat	☐

Fixture Cost per Device

	Utility	Customer	Fix/Acct
SF	$50.00	$70.00	1
MF	$50.00	$150.00	1
COM	$50.00	$150.00	1

Administration Costs

Method:	Percent
Markup Percentage	25%

Description

Provide a rebate through pool equipment supply stores for purchase of a swimming pool cover.
> Rebate amount is approx. $50.
> Assume a pool cover costs ~ $120-$300 and lasts approximately 6 years.

Customer Classes

SF	MF	COM	IND	INST
☑	☑	☑	☐	☐

End Uses

	SF	MF	COM	IND	INST
Toilets	☐	☐	☐		
Urinals			☐		
Lavatory Faucets	☐	☐	☐		
Showers	☐	☐	☐		
Dishwashers	☐	☐	☐		
Clothes Washers	☐	☐	☐		
Process			☐		
Kitchen Spray Rinse			☐		
Internal Leakage	☐	☐	☐		
Baths	☐	☐			
Other	☐	☐	☐		
Irrigation	☐	☐	☐		
Pools	☑	☑			
Wash Down	☐	☐			
Car Washing	☐	☐			
External Leakage	☐	☐	☐		
Outdoor					
Non-Lavatory/Kitchen Faucets	☐	☐	☐		
Cooling			☐		

Comments

>Utility Cost: $50 rebate cost of pool cover.
>Customer Cost: Remaining cost of pool cover after rebate.
>Administration Cost: Cost to manage program.
>End Use Water Savings Assumptions:
- Conservative savings estimate of 30% based on 30-50% savings range from evaporation and landscape design/yard layout per 2001 AWWA Annual Conference paper "Splash or Sprinkle? A Comparison of Water Use of Swimming Pools and Irrigated Landscape Area" by Peter Mayer and Lisa Maddaus.
>Targets: Target of 0.1% based on expected participation.

Results

Units	AF
Average Water Savings (afy)	0.088044
Lifetime Savings - Present Value ($)	
Utility	$2,465
Community	$2,465
Lifetime Costs - Present Value ($)	
Utility	$14,394
Community	$31,306
Benefit to Cost Ratio	
Utility	0.17
Community	0.08
Cost of Savings per Unit Volume ($/af)	
Utility	$6,288

End Use Savings Per Replacement

Method: Percent

	% Savings/Acct	Avg GPD/Acct
SF Pools	30.0%	3.9
MF Pools	30.0%	83.5

Targets

Target Method:	Percentage
% of Accts Targeted/Yr	0.100%
Only Affects New Accts	☐

Costs

View: Summary

	Utility	Customer	Total
2020	$0	$0	$0
2021	$0	$0	$0
2022	$1,689	$1,984	$3,673
2023	$1,700	$1,998	$3,698
2024	$1,712	$2,011	$3,723
2025	$1,724	$2,025	$3,749
2026	$1,736	$2,039	$3,775
2027	$1,748	$2,054	$3,801
2028	$1,760	$2,068	$3,827
2029	$1,772	$2,082	$3,854
2030	$1,784	$2,096	$3,880
2031	$1,796	$2,111	$3,907
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0
2036	$0	$0	$0
2037	$0	$0	$0
2038	$0	$0	$0
2039	$0	$0	$0
2040	$0	$0	$0
2041	$0	$0	$0
2042	$0	$0	$0
2043	$0	$0	$0
2044	$0	$0	$0
2045	$0	$0	$0

Targets

View: Accounts

	SF	MF	COM	Total
2020	0	0	0	0
2021	0	0	0	0
2022	26	0	1	27
2023	26	0	1	27
2024	26	0	1	27
2025	26	0	1	28
2026	27	0	1	28
2027	27	0	1	28
2028	27	0	1	28
2029	27	0	1	28
2030	27	0	1	29
2031	28	0	1	29
2032	0	0	0	0
2033	0	0	0	0
2034	0	0	0	0
2035	0	0	0	0
2036	0	0	0	0
2037	0	0	0	0
2038	0	0	0	0
2039	0	0	0	0
2040	0	0	0	0
2041	0	0	0	0
2042	0	0	0	0
2043	0	0	0	0
2044	0	0	0	0
2045	0	0	0	0

Water Savings

Units: afy

	Total Savings (afy)
2020	0.000000
2021	0.000000
2022	0.036984
2023	0.074223
2024	0.111717
2025	0.149467
2026	0.187481
2027	0.225759
2028	0.227317
2029	0.228885
2030	0.230461
2031	0.232056
2032	0.194042
2033	0.155764
2034	0.117221
2035	0.078415
2036	0.039344
2037	0.000000
2038	0.000000
2039	0.000000
2040	0.000000
2041	0.000000
2042	0.000000
2043	0.000000
2044	0.000000
2045	0.000000

Indoor CII Survey

Overview	
Name	Indoor CII Survey
Abbr	M_CII Survey
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2021
Last Year	2030
Measure Length	10

Measure Life	
Permanent	☐
Years	7
Repeat	☐

Fixture Cost per Device	Utility	Customer	Fix/Acct
COM	$1,000.00	$75.00	1
IND	$1,000.00	$75.00	1
INST	$1,000.00	$75.00	1

Administration Costs	
Method:	Percent
Markup Percentage	25%

Description

>Top 25 water customers from each district would be offered a free water survey that would evaluate ways for the business to save water and money. The surveys would be for large accounts (e.g., 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 25 users for each individual water district.
>Provide free water audits. Standardize on the types of services offered to reduce costs. Included would be bathrooms, kitchens, ice machines, laundry, cooling towers.
>Provide free 1.15 gpm (or lower) spray nozzles and possibly free installation for the rinse and clean operation in restaurants and other commercial kitchens. Thousands have been replaced in California going door to door; very cost-effective because saves hot water.

Customer Classes

	SF	MF	COM	IND	INST
	☐	☐	☑	☑	☑

End Uses

	SF	MF	COM	IND	INST
Toilets			☑	☑	☑
Urinals			☑	☑	☑
Lavatory Faucets			☑	☑	☑
Showers			☐	☐	☐
Dishwashers			☑	☑	☑
Clothes Washers			☑	☑	☑
Process			☑	☑	
Kitchen Spray Rinse			☑		☑
Internal Leakage			☑	☑	☑
Baths					
Other			☑	☑	☑
Irrigation			☐	☐	☐
Pools					☐
Wash Down					
Car Washing					
External Leakage			☐	☐	☐
Outdoor					
Non-Lavatory/Kitchen Faucets			☑	☑	☑
Cooling			☐	☐	☐

Comments

>Utility Costs: Survey cost is ~$500-$1,500 in-house staff or $2,000-$10,000 if contracted out. Utility cost is $60 for fixtures + 2-3 hours staff time for survey. ~$500 per survey for Utility cost. Utility costs represent fixture giveaway number distributed and costs (1.5 spray valves $50/ea, 5 aerators @ $2/ea). Approx. 1.5 nozzles can be found per CII account per Tso & Koeller 2005 report "Pre-rinse Spray Valve Programs: How are they really doing?"
>Customer Costs: reflects cost/time to install fixtures and address survey recommendations.
>End Use Water Savings Assumptions: BAWSCA Phase 1 study on Making Conservation a California Way of Life found savings of 10-15% per site. Assume 15% per site and include giveaways. Giveaways assume 1.15 gpm pre-rinse spray valve replace 2.5 gpm, 0.5 gpm aerators replace 2.2 gpm in lavatories, and 1.8 gpm replace aerators replace 2.2 gpm in non-lavatory settings (kitchens, utility rooms, etc.). This is an indoor survey only. Irrigation and landscaping will not be evaluated as part of the survey. Cooling systems will be evaluated in surveys.
>Targets: Per other CA communities < 1% of CII accounts are audited per year.

Results

Units	AF
Average Water Savings (afy)	
2.938705	
Lifetime Savings - Present Value ($)	
Utility	$83,656
Community	$269,487
Lifetime Costs - Present Value ($)	
Utility	$79,167
Community	$83,917
Benefit to Cost Ratio	
Utility	1.06
Community	3.21
Cost of Savings per Unit Volume ($/af)	
Utility	$1,036

End Use Savings Per Replacement

Method: Percent

	% Savings/Acct	Avg GPD/Acct
COM Toilets	15.0%	173.8
IND Toilets	15.0%	148.1
INST Toilets	15.0%	199.5
COM Urinals	15.0%	51.1
IND Urinals	15.0%	59.3
INST Urinals	15.0%	59.8
COM Lavatory Faucets	15.0%	30.7
IND Lavatory Faucets	15.0%	74.7
INST Lavatory Faucets	15.0%	86.2
COM Dishwashers	15.0%	61.3
IND Dishwashers	15.0%	39.5
INST Dishwashers	15.0%	59.8
COM Clothes Washers	15.0%	132.9
IND Clothes Washers	15.0%	79.0
INST Clothes Washers	15.0%	139.6
COM Process	15.0%	143.1
IND Process	15.0%	296.3
COM Kitchen Spray Rinse	15.0%	51.1
INST Kitchen Spray Rinse	15.0%	49.9
COM Internal Leakage	15.0%	102.2
IND Internal Leakage	15.0%	98.8
INST Internal Leakage	15.0%	99.7
COM Other	15.0%	102.2
IND Other	15.0%	98.8
INST Other	15.0%	129.7
COM Non-Lavatory/Kitchen Faucets	15.0%	92.0
IND Non-Lavatory/Kitchen Faucets	15.0%	63.6
INST Non-Lavatory/Kitchen Faucets	15.0%	73.4

Targets

Target Method:	Percentage
% of Accts Targeted/Yr	0.500%
Only Affects New Accts	☐

Costs

View: Summary

	Utility	Customer	Total
2020	$0	$0	$0
2021	$9,013	$541	$9,553
2022	$9,076	$545	$9,620
2023	$9,139	$548	$9,687
2024	$9,203	$552	$9,755
2025	$9,267	$556	$9,823
2026	$9,332	$560	$9,892
2027	$9,397	$564	$9,961
2028	$9,463	$568	$10,030
2029	$9,528	$572	$10,100
2030	$9,595	$576	$10,171
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0
2036	$0	$0	$0
2037	$0	$0	$0
2038	$0	$0	$0
2039	$0	$0	$0
2040	$0	$0	$0
2041	$0	$0	$0
2042	$0	$0	$0
2043	$0	$0	$0
2044	$0	$0	$0
2045	$0	$0	$0

Targets

View: Accounts

	COM	IND	INST	Total
2020	0	0	0	0
2021	5	1	1	7
2022	5	1	1	7
2023	5	1	1	7
2024	5	1	1	7
2025	5	1	1	7
2026	5	1	1	7
2027	5	1	1	8
2028	5	1	1	8
2029	5	1	1	8
2030	5	1	1	8
2031	0	0	0	0
2032	0	0	0	0
2033	0	0	0	0
2034	0	0	0	0
2035	0	0	0	0
2036	0	0	0	0
2037	0	0	0	0
2038	0	0	0	0
2039	0	0	0	0
2040	0	0	0	0
2041	0	0	0	0
2042	0	0	0	0
2043	0	0	0	0
2044	0	0	0	0
2045	0	0	0	0

Water Savings

Units: afy

	Total Savings (afy)
2020	0.000000
2021	1.092807
2022	2.182151
2023	3.268714
2024	4.353128
2025	5.435985
2026	6.517886
2027	7.599350
2028	7.621992
2029	7.645852
2030	7.670884
2031	6.574427
2032	5.478983
2033	4.384011
2034	3.289048
2035	2.193661
2036	1.097440
2037	0.000000
2038	0.000000
2039	0.000000
2040	0.000000
2041	0.000000
2042	0.000000
2043	0.000000
2044	0.000000
2045	0.000000

Partnership with Energy Utilities

Overview	
Name	Partnership with Energy Utilities
Abbr	M_Energy
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2021
Last Year	2030
Measure Length	10

Measure Life	
Permanent	☑

Fixture Cost per Device			
	Utility	Customer	Fix/Acct
SF	$21.00	$0.00	1
MF	$21.00	$0.00	3

Administration Costs	
Method:	Percent
Markup Percentage	30%

Description

Identify opportunities to partner with local energy utilities to offer incentives to customers to save both water and energy. As a first steps Walnut Valley will look into co-funded classes. Walnut Valley is currently offering classes on Garden Beautification, California Native Planting and Turf Removal through MWD. They are offering 4 sessions of each classes across the MWD service area now offered online 2020.
Other commercial opportunities may exist through SoCalGas including training seminars and food service rebate program including combination ovens, dishwashers, etc., for up to $2000.
> SoCalGas rebates: www.socalgas.com/save-money-and-energy/rebates-and-incentives/natural-gas-appliance-rebates
> SoCalGas also offer a free "Energy-efficiency Starter Kit" with 3 faucet aerators and 1 low-flow showerhead.
> SoCal Edison rebates: www.sce.com

Customer Classes	SF	MF	COM	IND	INST
	☑	☑	☐	☐	☐

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

Comments

>Utility Cost: Assume quarter hour of time for each unit at staff avg fully burdened rate with fringe and overhead is $82/hr.
>Customer Cost: no cost to customer since kit is free and does not require expert installation
>Administration Cost: Cost to market and track program participation
>End Use Water Savings Assumptions:
-Assume 1 kit per SF acct and 3 per MF (assume 3 units per MF account).
-1 "kit" includes: 1 showerhead (1.5 gpm), 1 kitchen aerator (1.5 gpm), and 2 bathroom aerators (1.2 gpm).
-Savings assume the following fixtures are replaced: 2.2 gpm showerhead and 2.2 gpm lavatory and non-lavatory faucet aerators.
-Assume only half of kit devices are either needed, used or installed and so kit device savings is halved.
>Targets: 1% per year

Results	
Units	AF
Average Water Savings (afy)	
28.846953	
Lifetime Savings - Present Value ($)	
Utility	$693,097
Community	$1,729,887
Lifetime Costs - Present Value ($)	
Utility	$62,738
Community	$62,738
Benefit to Cost Ratio	
Utility	11.05
Community	27.57
Cost of Savings per Unit Volume ($/af)	
Utility	$84

End Use Savings Per Replacement		
Method:	Percent	
	% Savings/Acct	Avg GPD/Acct
SF Lavatory Faucets	22.7%	12.7
MF Lavatory Faucets	22.7%	306.0
SF Showers	15.9%	42.4
MF Showers	15.9%	1,082.8
SF Non-Lavatory/Kitchen Faucets	15.9%	27.0
MF Non-Lavatory/Kitchen Faucets	15.9%	612.0

Targets	
Target Method:	Percentage
% of Accts Targeted/Yr	1.000%
Only Affects New Accts	☐

Costs — View: Summary

	Utility	Customer	Total
2020	$0	$0	$0
2021	$7,145	$0	$7,145
2022	$7,194	$0	$7,194
2023	$7,244	$0	$7,244
2024	$7,294	$0	$7,294
2025	$7,343	$0	$7,343
2026	$7,395	$0	$7,395
2027	$7,446	$0	$7,446
2028	$7,498	$0	$7,498
2029	$7,549	$0	$7,549
2030	$7,600	$0	$7,600
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0
2036	$0	$0	$0
2037	$0	$0	$0
2038	$0	$0	$0
2039	$0	$0	$0
2040	$0	$0	$0
2041	$0	$0	$0
2042	$0	$0	$0
2043	$0	$0	$0
2044	$0	$0	$0
2045	$0	$0	$0

Targets — View: Accounts

	SF	MF	Total
2020	0	0	0
2021	257	2	258
2022	259	2	260
2023	260	2	262
2024	262	2	264
2025	264	2	266
2026	266	2	267
2027	268	2	269
2028	269	2	271
2029	271	2	273
2030	273	2	275
2031	0	0	0
2032	0	0	0
2033	0	0	0
2034	0	0	0
2035	0	0	0
2036	0	0	0
2037	0	0	0
2038	0	0	0
2039	0	0	0
2040	0	0	0
2041	0	0	0
2042	0	0	0
2043	0	0	0
2044	0	0	0
2045	0	0	0

Water Savings — Units: afy

	Total Savings (afy)
2020	0.000000
2021	4.382672
2022	8.601053
2023	12.675081
2024	16.622169
2025	20.457519
2026	24.193980
2027	27.847725
2028	31.430073
2029	34.950922
2030	38.418925
2031	37.904773
2032	37.427330
2033	36.983322
2034	36.569793
2035	36.184078
2036	35.822494
2037	35.484713
2038	35.168701
2039	34.872620
2040	34.594805
2041	34.335614
2042	34.094603
2043	33.870268
2044	33.661248
2045	33.466307

SF HE Toilet Giveaway

Overview	
Name	SF HE Toilet Giveaway
Abbr	M_SF HE Toilet
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2021
Last Year	2025
Measure Length	5

Measure Life	
Permanent	☑

Fixture Cost per Device

	Utility	Customer	Fix/Acct
SF	$150.00	$50.00	2

Administration Costs	
Method:	Percent
Markup Percentage	25%

Description

Existing measure; however, plan the next giveaway in 2021 due to current conditions in 2020. Utility provides free 1.1 gpf toilet to SF accounts.

Customer Classes

	SF	MF	COM	IND	INST
	☑	☐	☐	☐	☐

End Uses

	SF	MF	COM	IND	INST
Toilets	☑				
Urinals					
Lavatory Faucets	☐				
Showers	☐				
Dishwashers	☐				
Clothes Washers	☐				
Process					
Kitchen Spray Rinse					
Internal Leakage	☐				
Baths	☐				
Other	☐				
Irrigation	☐				
Pools	☐				
Wash Down	☐				
Car Washing	☐				
External Leakage	☐				
Outdoor					
Non-Lavatory/Kitchen Faucets	☐				
Cooling					

Comments

>Utility Cost: Cost of toilet. The measure does include a paperwork form to do random inspection. The measure allows photograph for proof.
>Customer Cost: Cost of installation
>Administration Cost: Cost to manage program to help with parking, loading or unloading of toilets. Customers like the program. It does take staff time. Customer service enters all participants into the database so you can see who participated in the program.
>End Use Water Savings Assumptions: Assume 3.5 gpf replaced with 1.28 gpf toilet.
>Targets: 150 toilets per year for 5 years. Most customers replace 1 or 2 toilets. For this program, assume 2 toilets per house which equates to 75 single family homes or 150 toilets per year.

Results

Units	AF
Average Water Savings (afy)	5.735553
Lifetime Savings - Present Value ($)	
Utility	$143,326
Community	$143,326
Lifetime Costs - Present Value ($)	
Utility	$128,769
Community	$163,107
Benefit to Cost Ratio	
Utility	1.11
Community	0.88
Cost of Savings per Unit Volume ($/af)	
Utility	$863

End Use Savings Per Replacement

Method:	Percent	
	% Savings/Acct	Avg GPD/Acct
SF Toilets	50.0%	38.7

Targets

Target Method:	Count
% of Accts Targeted/Yr	75

Costs

View: Summary

	Utility	Customer	Total
2020	$0	$0	$0
2021	$28,125	$7,500	$35,625
2022	$28,125	$7,500	$35,625
2023	$28,125	$7,500	$35,625
2024	$28,125	$7,500	$35,625
2025	$28,125	$7,500	$35,625
2026	$0	$0	$0
2027	$0	$0	$0
2028	$0	$0	$0
2029	$0	$0	$0
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0
2036	$0	$0	$0
2037	$0	$0	$0
2038	$0	$0	$0
2039	$0	$0	$0
2040	$0	$0	$0
2041	$0	$0	$0
2042	$0	$0	$0
2043	$0	$0	$0
2044	$0	$0	$0
2045	$0	$0	$0

Targets

View: Accounts

	SF	Total
2020	0	0
2021	75	75
2022	75	75
2023	75	75
2024	75	75
2025	75	75
2026	0	0
2027	0	0
2028	0	0
2029	0	0
2030	0	0
2031	0	0
2032	0	0
2033	0	0
2034	0	0
2035	0	0
2036	0	0
2037	0	0
2038	0	0
2039	0	0
2040	0	0
2041	0	0
2042	0	0
2043	0	0
2044	0	0
2045	0	0

Water Savings

Units: afy

	Total Savings (afy)
2020	0.000000
2021	1.551046
2022	3.050162
2023	4.500592
2024	5.905380
2025	7.267383
2026	7.157164
2027	7.051071
2028	6.948913
2029	6.850508
2030	6.755684
2031	6.663786
2032	6.575575
2033	6.490882
2034	6.409543
2035	6.331405
2036	6.255918
2037	6.183379
2038	6.113652
2039	6.046607
2040	5.982121
2041	5.920726
2042	5.861603
2043	5.804648
2044	5.749764
2045	5.696855

Exterior Retrofit Irrigation Program (E-RIP)

Overview	
Name	Exterior Retrofit Irrigation Program
Abbr	E-RIP
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2020
Last Year	2024
Measure Length	5

Measure Life	
Permanent	☐
Years	10
Repeat	☐

Fixture Cost per Device			
	Utility	Customer	Fix/Acct
SF	$150.00	$300.00	1

Administration Costs	
Method:	Percent
Markup Percentage	25%

Description

>E-RIP was a Pilot Program initiated in 2019. As of June 2020, WVWD Staff are reviewing program statistics to determine if program will be continued.
>Existing Program offers customers free landscape surveys and free irrigation system retrofits conducted by EcoTch Services, Inc. Program is finishing Round 1 in June 2020. There will be changes in the potential Round 2 program as current program is expensive in the current format.
>Irrigation Retrofits include: WBIC, HE sprinkler nozzles, minor system repairs, AMI meter fast-tracking.

Customer Classes	SF	MF	COM	IND	INST
	☑	☐	☐	☐	☐

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

Comments

>Utility Cost: WVWD made $150 available per account.
>Customer Cost: Cost of upgrades that program did not cover
>Administration Cost: Program refer track program
>End Use Water Savings Assumptions: The water savings are based on the following from the 2018 Landscape Rebate Water Savings Study from Valley Water:
>Irrigation savings final estimate of 20% based on average of reported savings from irrigation controller upgrade (27%), upgrading sprinkler nozzles with (18%) and without (15.3) pressure regulation, and soil moisture sensor installation (20%).
>Targets: Target assumed to be 15 per year based on inaugural year participation.

Results	
Units	AF
Average Water Savings (afy)	
	1.023710
Lifetime Savings - Present Value ($)	
Utility	$30,904
Community	$30,904
Lifetime Costs - Present Value ($)	
Utility	$13,264
Community	$34,487
Benefit to Cost Ratio	
Utility	2.33
Community	0.90
Cost of Savings per Unit Volume ($/af)	
Utility	$498

End Use Savings Per Replacement		
Method:	Percent	
	% Savings/Acct	Avg GPD/Acct
SF Irrigation	20.0%	159.8
SF External Leakage	5.0%	13.5

Targets	
Target Method:	Count
% of Accts Targeted/Yr	15

Costs

View: Summary

	Utility	Customer	Total
2020	$2,813	$4,500	$7,313
2021	$2,813	$4,500	$7,313
2022	$2,813	$4,500	$7,313
2023	$2,813	$4,500	$7,313
2024	$2,813	$4,500	$7,313
2025	$0	$0	$0
2026	$0	$0	$0
2027	$0	$0	$0
2028	$0	$0	$0
2029	$0	$0	$0
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0
2036	$0	$0	$0
2037	$0	$0	$0
2038	$0	$0	$0
2039	$0	$0	$0
2040	$0	$0	$0
2041	$0	$0	$0
2042	$0	$0	$0
2043	$0	$0	$0
2044	$0	$0	$0
2045	$0	$0	$0

Targets

View: Accounts

	SF	Total
2020	15	15
2021	15	15
2022	15	15
2023	15	15
2024	15	15
2025	0	0
2026	0	0
2027	0	0
2028	0	0
2029	0	0
2030	0	0
2031	0	0
2032	0	0
2033	0	0
2034	0	0
2035	0	0
2036	0	0
2037	0	0
2038	0	0
2039	0	0
2040	0	0
2041	0	0
2042	0	0
2043	0	0
2044	0	0
2045	0	0

Water Savings

Units: afy

	Total Savings (afy)
2020	0.532329
2021	1.064659
2022	1.596988
2023	2.129318
2024	2.661647
2025	2.661647
2026	2.661647
2027	2.661647
2028	2.661647
2029	2.661647
2030	2.129318
2031	1.596988
2032	1.064659
2033	0.532329
2034	0.000000
2035	0.000000
2036	0.000000
2037	0.000000
2038	0.000000
2039	0.000000
2040	0.000000
2041	0.000000
2042	0.000000
2043	0.000000
2044	0.000000
2045	0.000000

APPENDIX F – CONSERVATION ANALYSIS RESULTS

This appendix presents benefit and cost analysis results for individual conservation measure and overall conservation programs. Table F-1 presents how much water the measures will save through 2045, how much they will cost, and the cost of saved water per unit volume *if the measures were to be implemented on a stand-alone basis (i.e., without interaction or overlap from other measures that might address the same end use or uses).* 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.[12] This is why a measure like Public Education may show a distorted cost in comparison to water saved. Most, if not all, measures rely on public awareness. However, it is important to note that water savings are more directly attributable to an "active" measure, like a toilet rebate, than the less "active" public education/awareness measure that informs the community of the active measure.

Since interaction between measures has not been accounted for in Table F-1, 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 measure.

Cost categories are defined as follows:

- Utility Costs – those costs that the District as a water utility will incur to operate the measure, including administrative costs.
- Utility Benefits – the avoided cost of producing water at the identified rate $1,402 per AF. More information about the source of this value can be found in Table C-1 and Section D.2.
- Customer (Community) Costs – those costs customers will incur to implement a measure in the District's conservation program and maintain its effectiveness over the life of the measure.
- Customer (Community) Benefits – the additional savings, such as energy savings resulting from reduced use of hot water. These savings are additional as customers would also have reduced water bills (since the utility costs and benefits transfer to the customers)
- Community Costs – includes Utility Costs plus Customer Costs.
- Community Benefits – includes Utility Benefits plus Customer Benefits.

The column headings in Table F-1 are defined as follows:

- Present Value (PV) of Utility and Community Costs and Benefits ($) = the present value of the 26-year time stream of annual costs or benefits, discounted to the base year.
- Utility Benefit to Cost Ratio = PV of Utility Costs divided by PV of Utility Benefits over 26 years.
- Community Benefit to Cost Ratio = (PV of Utility Benefits plus PV of customer energy savings) divided by (PV of Utility Costs plus PV of Customer Costs), over 26 years.
- Five Years of Water Utility Costs ($) = the sum of the annual Utility Costs for the years 2020–2024. The measures start in the years as specified for each measure shown in Appendix E. Utility costs include administrative costs and staff labor.
- Water Savings in 2030 (AFY) = water saved in acre-feet per year. The year 2030 is provided as requested by the District staff to correspond with the 2020 UWMP.
- Cost of Savings per Unit Volume ($/AF) = PV of Utility Costs over 26 years divided by the 26-year water savings. The analysis period is 2020–2045. This value is compared to the utility's avoided cost of water as one indicator of the cost effectiveness of conservation efforts. Note that this value somewhat minimizes the cost of savings because program costs are discounted to present value, but water benefits are not.

[12] 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 of 20%. Rather, it is the cumulative impact of the first measure reducing the use to 90% of what it was originally, without the first measure in place. Then, the revised use of 90% is reduced by another 10% (10% x 90% = 9%) to result in the use being 81% (90% - 9% = 81%). 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.

Table F-1. Estimated Conservation Measure Costs 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 2020–2024	Water Savings in 2030 (AFY)	Cost of Savings per Unit Volume ($/AF)
Commercial									
High Efficiency Urinal Incentive	$84,000	$84,000	$4,000	$20,000	23.5	4.2	$3,000	4	$41
High Efficiency Toilet & Urinal Bulk Purchase	$26,000	$26,000	$26,000	$27,000	1.0	1.0	$17,000	1	$921
Install High Efficiency Fixtures in Government Buildings, School & Commercial Buildings	$43,000	$110,000	$69,000	$125,000	0.6	0.9	$32,000	2	$1,506
Indoor CII Survey	$84,000	$269,000	$79,000	$84,000	1.1	3.2	$36,000	8	$1,036
Commercial Incentive Program	$376,000	$909,000	$2,000	$34,000	185.7	26.4	$1,000	19	$5
Irrigation									
Outdoor Water Audit – Large Landscape	$4,000	$4,000	$4,000	$6,000	1.0	0.7	$1,000	-	$897
Financial Incentives for Irrigation & Landscape Upgrades	$167,000	$167,000	$5,000	$48,000	37.1	3.5	$3,000	12	$31
Landscape Conversion or Turf Removal – SF	$53,000	$53,000	$2,000	$81,000	32.1	0.7	$1,000	3	$29
Landscape Conversion or Turf Removal – MF, CII	$714,000	$714,000	$5,000	$2,169,000	158.3	0.3	$3,000	36	$6
Exterior Retrofit Irrigation Program (E-RIP)	$31,000	$31,000	$13,000	$34,000	2.3	0.9	$14,000	2	$498

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 2020–2024	Water Savings in 2030 (AFY)	Cost of Savings per Unit Volume ($/AF)
Residential									
Residential Water Surveys	$631,000	$893,000	$306,000	$428,000	2.1	2.1	$66,000	29	$456
High Efficiency Fixture Giveaway	$241,000	$641,000	$55,000	$110,000	4.4	5.8	$58,000	11	$222
Residential Leak Repair & Plumbing Emergency Assistance	$105,000	$386,000	$109,000	$197,000	1.0	2.0	$13,000	5	$912
High Efficiency Toilet Incentive	$355,000	$355,000	$29,000	$230,000	12.1	1.5	$26,000	17	$80
SF HE Toilet Giveaway	$143,000	$143,000	$129,000	$163,000	1.1	0.9	$113,000	7	$863
Residential Washer Incentive	$168,000	$509,000	$8,000	$74,000	20.4	6.9	$9,000	8	$49
Pool & Spa Cover Incentive	$2,000	$2,000	$14,000	$31,000	0.2	0.1	$5,000	-	$6,288
Codes and Partnerships									
Landscape & Irrigation Codes	$2,886,000	$2,886,000	$844,000	$7,991,000	3.4	0.4	$220,000	102	$254
Require New Development Multi-Unit Submetering	$85,000	$290,000	$61,000	$355,000	1.4	0.8	$16,000	3	$628

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 2020–2024	Water Savings in 2030 (AFY)	Cost of Savings per Unit Volume ($/AF)
Require Fixture Retrofit on Resale or Name Change on Water Account or Renovation	$611,000	$1,304,000	$388,000	$525,000	1.6	2.5	$99,000	23	$559
Require Hot Water on Demand Structured Plumbing in New Developments	$209,000	$531,000	$196,000	$1,767,000	1.1	0.3	$51,000	8	$825
Partnership with Energy Utilities	$693,000	$1,730,000	$63,000	$63,000	11.0	27.6	$29,000	38	$84

Additional information about the water reduction methodology, perspectives on benefits and costs, and assumptions about present value parameters and measure costs/savings can be found earlier in this Plan in Appendix D.

The following table shows each conservation program's present value of water savings and utility costs, as well as cost of water saved. See Appendix D for a more detailed explanation of present value.

Table F-2. Comparison of Program Estimated Costs and Water Savings

Conservation Program	Water Utility Present Value of Water Savings	Water Utility Present Value of Utility Costs	Water Utility Cost of Water Saved ($/AF)
Program A with Plumbing Code	$6,096,000	$1,744,000	$260
Program B with Plumbing Code	$6,898,000	$2,251,000	$300
Program C with Plumbing Code	$7,653,000	$2,411,000	$290

Notes:

1. *Costs presented here are directly attributable to the District's conservation department only.*
2. *Present value costs and savings are rounded to nearest $1,000.*

Table F-3 lists participation levels for the District's Active Water Conservation Programs over the past five fiscal years. Elements of these programs have been discussed in greater detail in Section 2.3.

Table F-3. Walnut Valley Water District's Active Water Conservation Programs

Program	Description
Stage 1 Mandatory Water Conservation Measures	Effective July 26, 2016
Premium High-Efficiency Toilets – Residential	Through MWD's SoCal Water$mart, rebates of $40 per toilet are available for Premium High Efficiency toilets using 1.1 gpf or less.
Premium High-Efficiency Toilets – Commercial	Through MWD's SoCal Water$mart, Southern California businesses are eligible for generous rebates to help encourage water efficiency and conservation. The SoCal Water$mart program offers cash rebates on a wide variety of water-saving technologies. **$40 base rebate.**
Ultra Low and Zero Water Urinals	Through MWD's SoCal Water$mart, Southern California businesses are eligible for generous rebates to help encourage water efficiency and conservation. The SoCal Water$mart program offers cash rebates on a wide variety of water-saving technologies. **$40 base rebate.**
Plumbing Flow Control Valves	Through MWD's SoCal Water$mart, Southern California businesses are eligible for generous rebates to help encourage water efficiency and conservation. The SoCal Water$mart program offers cash rebates on a wide variety of water-saving technologies. **$5/Valve (minimum of 10) base rebate.**
Landscaping Equipment – commercial	Through MWD's SoCal Water$mart: • Weather Based Irrigation Controllers – $35/Station – Eligible WBIC can have a maximum of 11 inactive stations per controller • Rotating Nozzles for Pop-up Spray Heads – $2/Nozzle (minimum of 30) • Large Rotary Nozzles – 13/Set (8 set minimum) • In-stem Flow Regulators – $1/Regulator (25 device minimum) • Soil Moisture Sensor Systems – $35/Irrigation controller station – Eligible SMSS can have a maximum of 11 inactive stations per controller
Landscaping Equipment – Residential	Through MWD's SoCal Water$mart: • Weather Based Irrigation Controllers – $35/Station – Eligible WBIC can have a maximum of 11 inactive stations per controller • Rotating Nozzles for Pop-up Spray Heads – $2/Nozzle (minimum of 30) • Soil Moisture Sensor Systems – $35/Irrigation controller station – Eligible SMSS can have a maximum of 11 inactive stations per controller
Food Equipment	Through MWD's SoCal Water$mart: • Connectionless Food Steamers – $485/Compartment • Air-cooled Ice Machines – $1,000
HVAC Equipment	Through MWD's SoCal Water$mart: • Cooling Tower Conductivity Controllers – $625 • Cooling Tower ph Controllers – $1,750

Program	Description
Medical and Dental Equipment	Through MWD's SoCal Water$mart: • Dry Vacuum Pumps – $125/0.5HP • Laminar Flow Restrictors – $10/Restrictor (minimum of 10)
Water Savings Incentive Program (WSIP)	Through MWD's SoCal Water$mart: Designed for non-residential customers improving their water efficiency through upgraded equipment or services that do not qualify for standard rebates. WSIP is unique because it provides an incentive based on the amount of water customers save. This "pay-for-performance" design lets customers implement custom projects for their sites. Any project that saves at least 10,000,000 gallons of water could qualify for WSIP funding.
On-site Retrofit Program	Through MWD's SoCal Water$mart: Provides financial incentives to commercial, industrial and institutional property owners, including Homeowner Associations, who convert potable water irrigation or industrial water systems to recycled water use. This program provides incentives of $195 per acre-foot for five years of estimated water use, up to actual retrofit costs.
Turf Replacement	Through MWD's SoCal Water$mart: Designed to promote water use reduction and sustainability. Following the success of other incentive programs focusing on landscaping and turf grass removal, the Turf Replacement program aims to combine turf removal, irrigation modification and rainwater retention or filtration to support reuse or soil absorption of rainwater. Every turf replacement project will include: • 3 plants per 100 square feet of area transformed • A stormwater retention feature • No hardscape within the transformed area, except permeable hardscape • Replacement or modification of overhead spray sprinklers
Public Agency Landscape	Through MWD's SoCal Water$mart: Public Agency Landscape program is temporarily suspended pending internal review.
Clothes Washers	Through MWD's SoCal Water$mart: Rebates Start at $85 Please note: In order to receive a rebate, clothes washers must meet or exceed the CEE Tier 1 standard. Please refer to the Qualifying Products List to verify the eligibility of your clothes washer. When almost 15% of the water used inside your home goes to doing laundry, upgrading to a high efficiency washer saves water and energy.
Rain Barrels and Cisterns	Through MWD's SoCal Water$mart: Rebates Start at $35 per Barrel or $250 per Cistern
Exterior Retrofit Irrigation Program (E-RIP)	• Existing Program offers customers free landscape surveys and free irrigation system retrofits conducted by EcoTech Services, Inc. • Irrigation Retrofits include: WBIC, HE sprinkler nozzles, minor system repairs, AMI meter fast-tracking.

APPENDIX G – SAMPLE UTILITY BILL

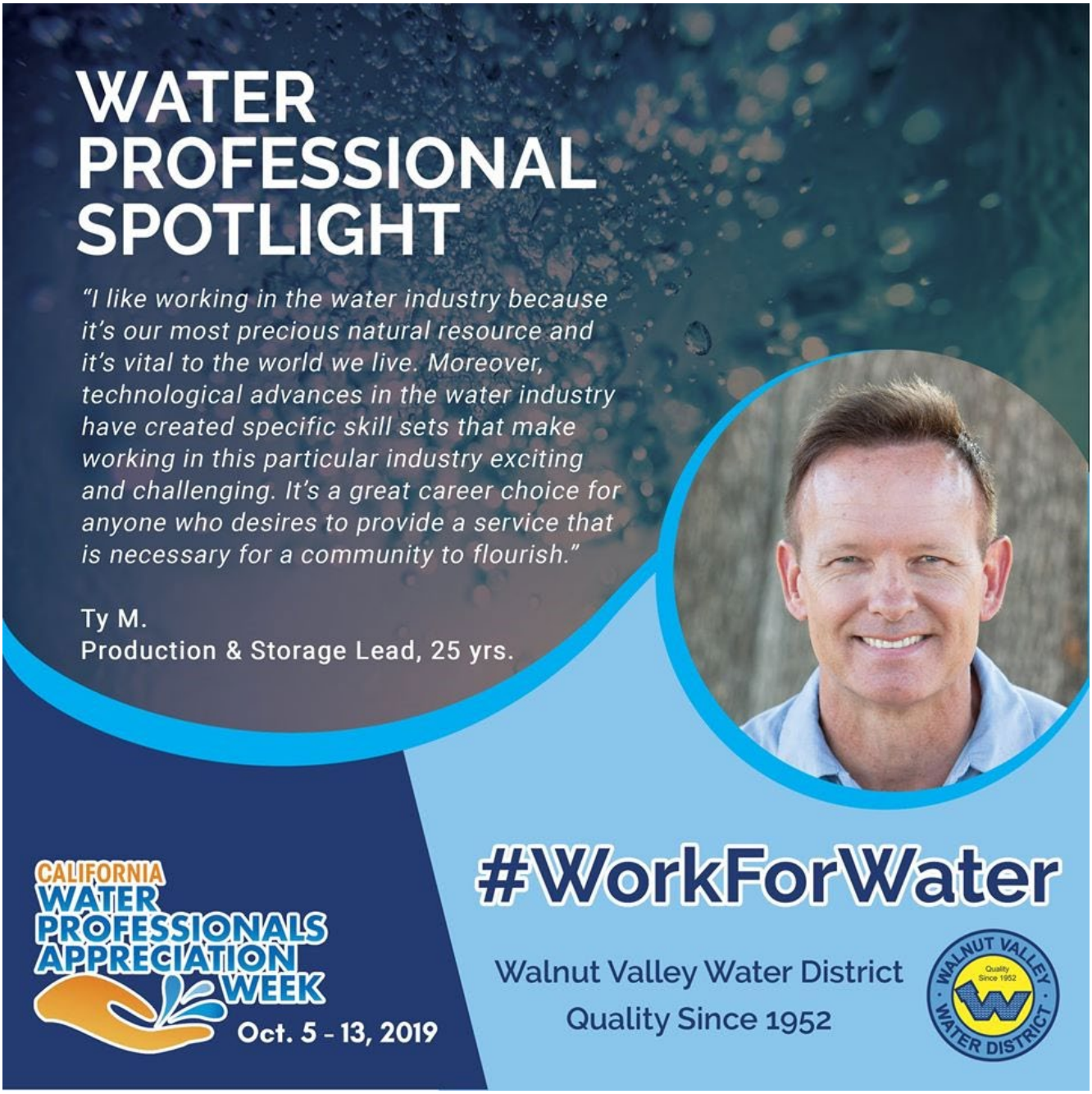
APPENDIX H – EXAMPLES OF LOCAL AND REGIONAL OUTREACH INITIATIVES

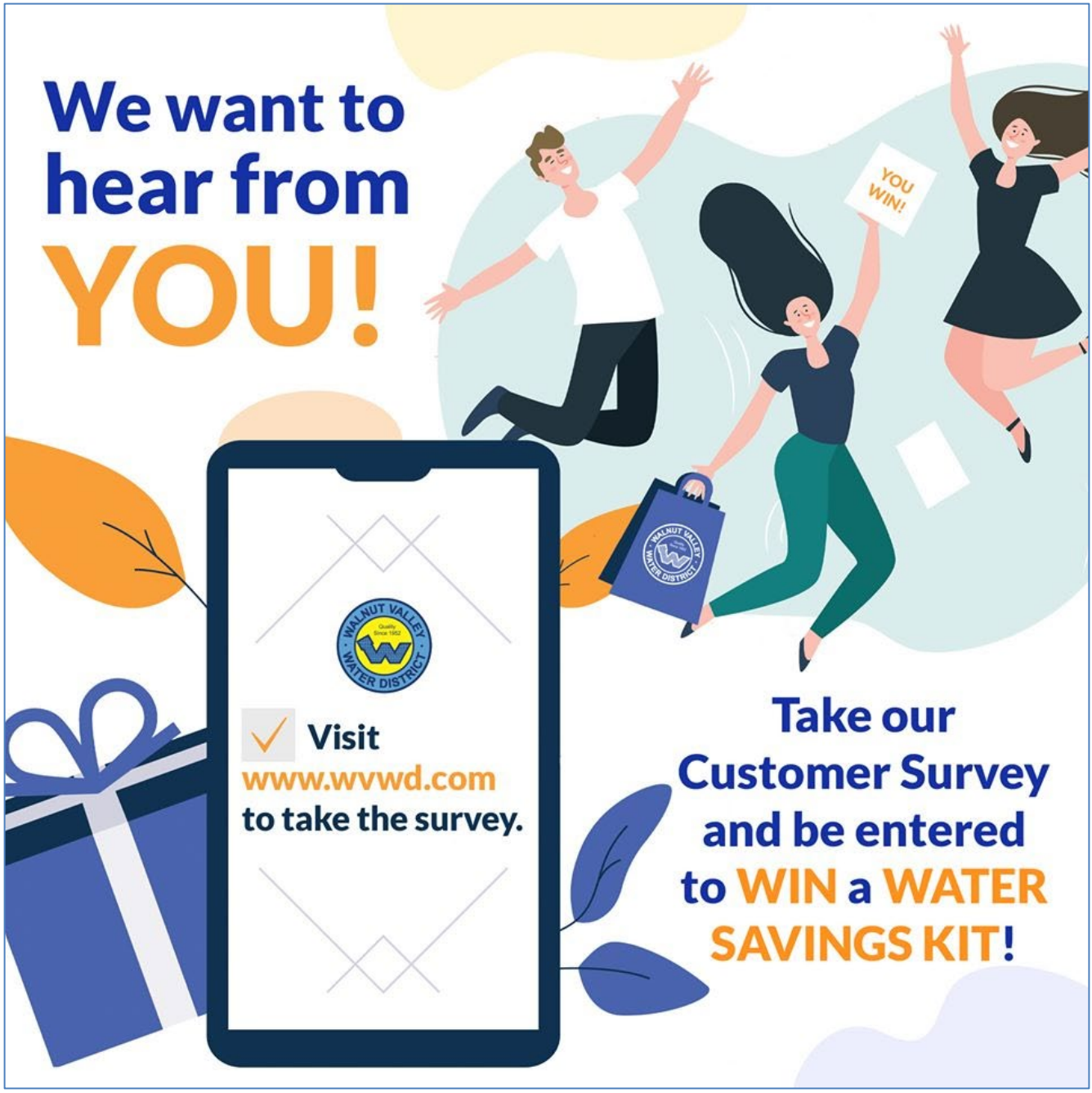
Social Media Examples


Rain boots on,
sprinklers off!
WALNUT VALLEY
WATER DISTRICT


FREE Landscape & Garden Design Workshop
Learn how to replace turf grass with gorgeous, water-wise landscaping. Information on Metropolitan Water District's $2 per sq. ft. Turf Replacement Rebate will be discussed.
WHEN
Saturday, February 29, 2020
9:00 am—12:00 pm
• REGISTRATION REQUIRED •
• BREAKFAST PROVIDED •
WHERE
City of Walnut Senior Center
21215 La Puente Rd.
Reserve your seat at
www.wvwd.com.

Online Examples




We want to hear from YOU!
YOU WIN!
WALNUT VALLEY WATER DISTRICT
Visit www.wvwd.com to take the survey.
Take our Customer Survey and be entered to WIN a WATER SAVINGS KIT!

Print Ad Examples


MAY
IS Water
Awareness
MONTH
As we head into the dry summer months in California, the month of May is a time to show our appreciation for the water that fuels our economy and sustains our ecosystems.
Rain or shine, Californians always need to use their water wisely. Conservation is a way of life.
Learn about what you can do to conserve water inside and outside of your home at SaveOurWater.com.
Rebates are still available to transform your lawn to a water-wise garden at BeWaterWise.com.
Walnut Valley Water District // 271 S Brea Canyon Rd., Walnut, CA 91789 // (909) 595-7554 // www.wvwd.com


On average, Californians use 30-60% of their water outdoors.
Visit saveourwater.com to learn what you can do to conserve water today.
Walnut Valley Water District
271 S Brea Canyon Rd.
Walnut, CA 91789
(909) 595-7554
www.wvwd.com

WALNUT VALLEY WATER DISTRICT CELEBRATES

Fix-A-Leak Week

March 16 - 20, 2020

Visit WVWD's Customer Service lobby to complete a Fix-A-Leak Week Survey or download one online at www.wvwd.com.

Turn in your completed survey in-person between March 16 - 20 and receive a **FREE Leak Detection Kit** and be entered to win a Rain Barrel!

FREE Leak Detection Class!

Register today for WVWD's FREE Leak Detection Class! You'll learn ways to detect leaks in and around your home that can help you save money on your monthly water bill!

WHEN: Tuesday, March 17, 2020
6:00pm – 8:00pm

WHERE: Walnut Valley Water District
271 S Brea Canyon Road

Reserve Your Seat At www.wvwd.com

Available to WVWD customers only

Walnut Valley Water District
271 S Brea Canyon Rd
Walnut, CA 91789
(909) 595-7554
www.wvwd.com

WALNUT VALLEY WATER DISTRICT

FREE WORKSHOP

Landscape & Garden Transformation

RESERVE YOUR SEAT TODAY!

WORKSHOP **DETAILS**

Saturday, May 30, 2020 at 9:00 a.m.

Diamond Bar Center
1600 Grand Ave, Diamond Bar, CA 91765

Free of Charge, Breakfast Provided

Register online at www.wvwd.com

Questions? Please call (909) 595-1268

(909) 595-7554 www.wvwd.com

271 South Brea Canyon Rd. Walnut, CA 91789

A **FREE** Guide to A Beautiful Landscape & Garden

Beautiful landscapes and gardens add great value to a home. These features can be both attractive and water efficient. In this class, you will learn how to develop and maintain a beautiful garden and landscape while using water efficiently and lowering your monthly bill. WVWD's landscape education classes are designed to introduce homeowners, commercial property managers, and others within its service area to the concepts of water-efficient and sustainable landscaping.

TOPICS COVERED INCLUDE:

- Sustainable Landscaping
- Understanding Water-Use Efficiency in the Landscape
- Use of California Native and Drought Tolerante Plants
- Creating Healthy Soil
- Alternatives to Lawn
- Turf Removal
- Habitat Gardening
- Water Efficient Irrigation Practices