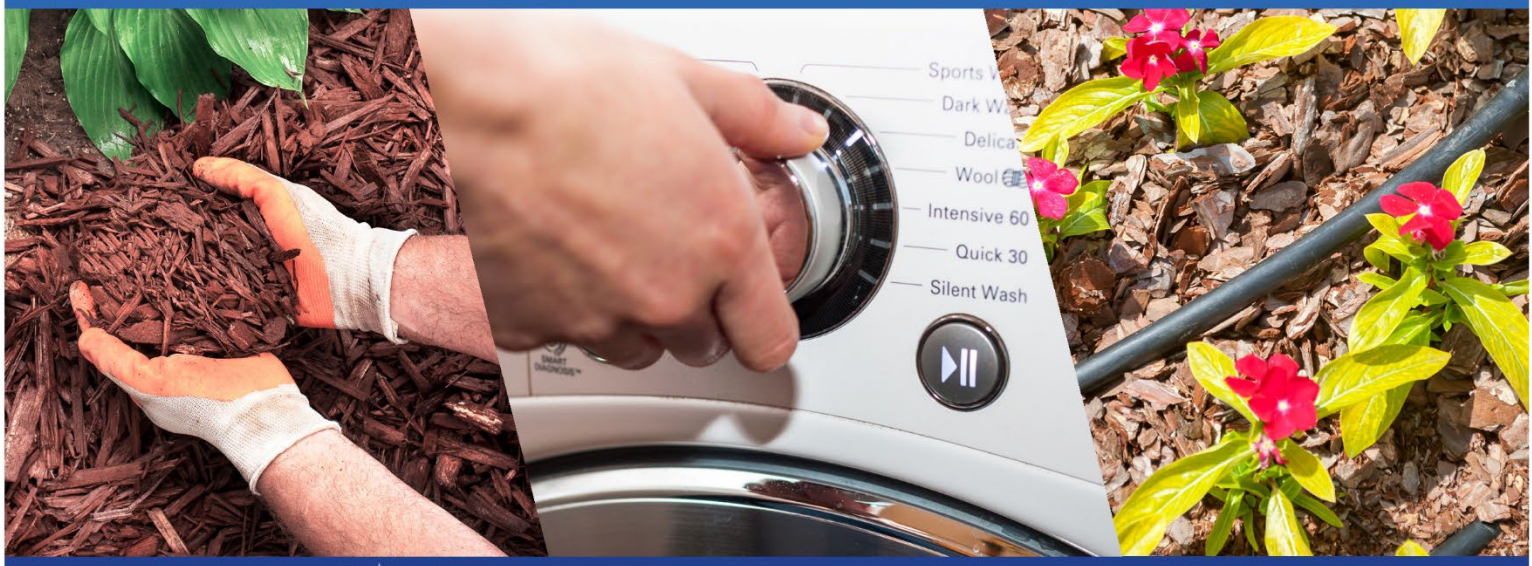
2022 WATER USE EFFICIENCY PLAN



Prepared by: MADDAUS WATER MANAGEMENT

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LIST OF ABBREVIATIONS AND ACRONYMS

AB	Assembly Bill
acct	Account
AF	Acre Feet (325,851.4 gallons)
AFY	Acre-Feet per Year
AMI	Advanced Metering Infrastructure
AWE	Alliance for Water Efficiency
AWWA	American Water Works Association
AWWARF	American Water Works Association Research Foundation
BMP	Best Management Practice
CalWEP	California Water Efficiency Partnership
CEC	California Energy Commission
cfs	cubic feet per second
COM	Commercial
CII	Commercial, Industrial, and Institutional
District	Montecito Water District
DSS Model	Demand Side Management Least Cost Planning Decision Support System
DWR	California Department of Water Resources
EPA	Environmental Protection Agency
FTE	Full Time Equivalent
GPDA	gallons per day per acre
GPCD	gallons per capita per day
gpd	gallons per day
gpf	gallons per flush
gpm	gallons per minute
HCF	hundred cubic feet (748 gallons)
HET	high efficiency toilet
HEU	high efficiency urinal
ILI	Infrastructure Leakage Index
MWELO	Model Water Efficient Landscape Ordinance
MWM	Maddaus Water Management
N/A	not applicable
NRW	Non-Revenue Water
Plan	Water Use Efficiency Plan
psi	pounds per square inch
RES	Residential
SB	Senate Bill
SBCAG	Santa Barbara County Association of Governments
SBRWEP	Santa Barbara County's Regional Water Efficiency Program (RWEP)
SWRCB	State Water Resources Control Board
UHET	Ultra-High-Efficiency Toilet
UHEU	Ultra-High-Efficiency Urinal
UWMP	Urban Water Management Plan
WBIC	weather based irrigation controller
WUE	Water Use Efficiency

EXECUTIVE SUMMARY

The Executive Summary briefly describes the Montecito Water District (District) Water Use Efficiency 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 District. The purpose of the analysis was to accomplish the following conservation study objectives in coordination with District staff:

- Evaluate current conservation measures
- Identify new conservation measures through 2045
- Estimate the costs and water savings of current and new conservation measures
- Create and evaluate conservation program options based on benefit-cost analysis
- Continue to comply with regulations including the California Urban Water Use Objective regulations starting in 2024

Program Overview

Through the identification and prioritization of conservation measures, this Plan will enable the District to project long-range demands, identify attainable conservation goals, develop strategies to raise awareness of available water conservation programs, and meet state legislative requirements including, but not limited to, Senate Bill 606 (Hertzberg), Assembly Bill 1668 (Friedman), and Senate Bill 1157 (Hertzberg)[1]. The Plan includes an effective suite of water conservation measures[2] that will help meet future water needs. By combining new initiatives with existing programs as part of a comprehensive strategy, the conservation activities proposed for Program B of this Plan are expected to save an estimated 842 acre-feet (AF) of water per year in 2045 as compared to the average demand of 4,300 AFY during the baseline period, 2019–2021. Actual savings will depend on program selection and the implementation schedule.

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. Groups of measures are termed Programs. Programs considered for evaluation included:

A. The Pilot Program scenario (Program A), consisting of 9 measures, includes existing and new measures that focus on indoor and outdoor efficiency for both Residential and Commercial, Industrial, and Institutional (CII) customers; and drought measures targeted between December 2022 and June 2023.

B. The Strategic Program scenario (Program B), includes 17 cost-effective measures that save significant amounts of water, and support community interest in conservation.

C. The All-Inclusive Program scenario (Program C), includes all 20 measures modeled, making it the most expensive suite of measures as well as the one that will achieve the most water savings.

[1]https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Water-Use-And-Efficiency/Make-Water-Conservation-A-California-Way-of-Life/Files/PDFs/Final-WCL-Primer.pdf

[2] 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.

All 20 measures are listed in Figure ES-1 and are described in more detail in Appendix D.

Figure ES-1. Montecito Water District Selected Measures for Evaluation

The average annual implementation cost for the Pilot Program, Strategic Program, and All-Inclusive Program are approximately $270,000, $480,000, and $510,000 respectively, for the period 2023–2027. This total includes all direct District costs but does not include any costs related to partners' 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 also will enable the District to select or change measures for implementation, as needed, to reach its conservation goals.

The associated GPCD water savings and costs for the three programs are in Table ES-1. The benefit to cost ratio demonstrates the relationship between the costs and benefits of a proposed program. A program is cost effective if the Benefit-Cost Ratio is greater than 1.0. It is, however, recommended to have a program above 1.0 as assurance since participation in many of these water conservation measures are voluntary.

Table ES-1. Water Demands of Selected Water Use Efficiency Programs

	Year	Pilot Program	Strategic Program	All-Inclusive Program
Acre Feet[1]	2022	4,300	4,270	4,270
	2023	4,250	4,200	4,200
	2024	4,190	4,120	4,120
	2025	4,140	4,040	4,040
	2030	4,120	4,000	4,000
	2035	4,050	3,770	3,760
	2040	4,060	3,730	3,730
	2045	4,070	3,730	3,720
District Benefit-Cost Ratio		1.13	1.92	1.86
Present Value of Water Savings[2]		$5,341,000	$16,362,000	$16,550,000
Present Value of Utility Costs[2]		$4,715,000	$8,525,000	$8,909,000
District Cost of Water Saved ($/AF)[3]		$1,690	$1,010	$1,040
2023–2027 Average Annual Cost[4]		$270,000	$480,000	$510,000

Notes:

1. Demands are rounded to 10 AF.
2. Present value costs and savings are rounded to the nearest $1,000.
3. District Cost of Water Saved is rounded to the nearest $10. Programs vary in cost due to the measures included in each.
4. 2023–2027 Average Annual Cost is rounded to the nearest $10,000.

New conservation measures will be employed, and existing measures will target higher participation rates to achieve selected Plan goals. Recommendations to assist with implementation include the following next steps:

- **Budget:** The Strategic Program has an average annual cost of approximately $480,000 for 2023–2027 to implement 17 measures.
- **Prioritize Measures for Implementation:** Measures that are relatively easy to operate with limited staff and contribute the most to meeting water saving targets are prioritized for implementation.
- **Work Plan:** Prepare an annual work plan for each year in concert with the budget planning process. Form partnerships and apply for grants where appropriate.
- **Program Data Management/Tracking**: Store and manage measure participation, cost, and other data to gauge successes and areas that need improvement.
- **Review Plan Goals:** Annually review goals and update the Plan, including actual measure participation, projected water savings, and expected per capita water use to ensure the Plan is on track to meet conservation goals. Use data from the programs and annual work planning process as the forum to amend the Plan and other elements (budgets, staffing, contracting, schedule, etc.) to stay on track.

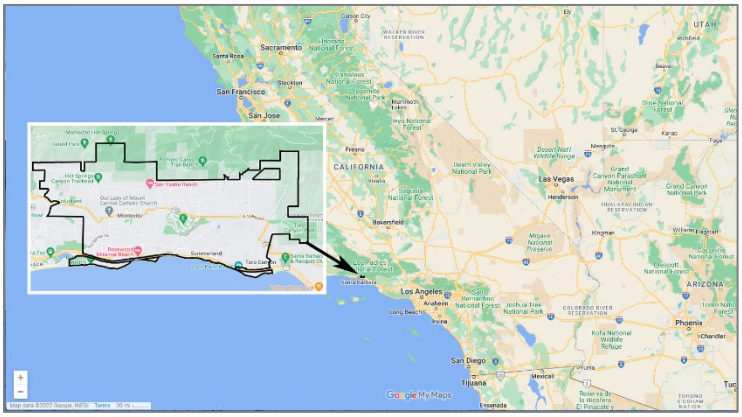
1 INTRODUCTION

This section provides an overview of the Montecito Water District (District) and background for the Water Use Efficiency Plan (Plan). It also describes the state legislation that will drive future water use objectives for the District.

1.1 Overview of the Montecito Water District System

The Montecito Water District is an Independent Special District formed in 1921 and serves the unincorporated town of Montecito and Summerland and portions of Toro Canyon and Carpinteria in Santa Barbara County, California. Local water supplies and future growth are limited, and the area is nearly built out to capacity. While close to amenities, it remains semi-rural with semi-arid coastal weather, oak groves, and hot springs. While considered an idyllic and garden-like community with large lots and extensive landscapes, the area is subject to drought and wildfires. Like many communities in the southwest United States, the communities served by the District are prone to long periods of drought and infrequent, but potentially devastating floods, as evidenced by catastrophic flooding in 2018 following the Thomas Fire of 2017.

Figure 1-1. Montecito Water District Service Area



The District is reliant on multiple sources to meet its current and future water demands.

Sources include:

- Lake Cachuma
- Jameson Lake/ Doulton Tunnel
- Local Groundwater
- Charles D. Meyer Desalination Facility Water Supply Agreement
- State Water Project water
- Supplemental Water purchases

Climate

A snapshot of climate and drought history is included below. It is important to note, however, that historical averages can obfuscate current and future conditions. For example, extreme but infrequent rain events can distort the average precipitation in an area where there are long periods of drought. In addition, historic temperatures are not necessarily a reliable predictor of future high and low ranges. Each of these factors will, in turn, influence evapotranspiration, which is the combined water loss from evaporation from the soil, and transpiration from plants.

Figure 1-2. Montecito Water District Climate

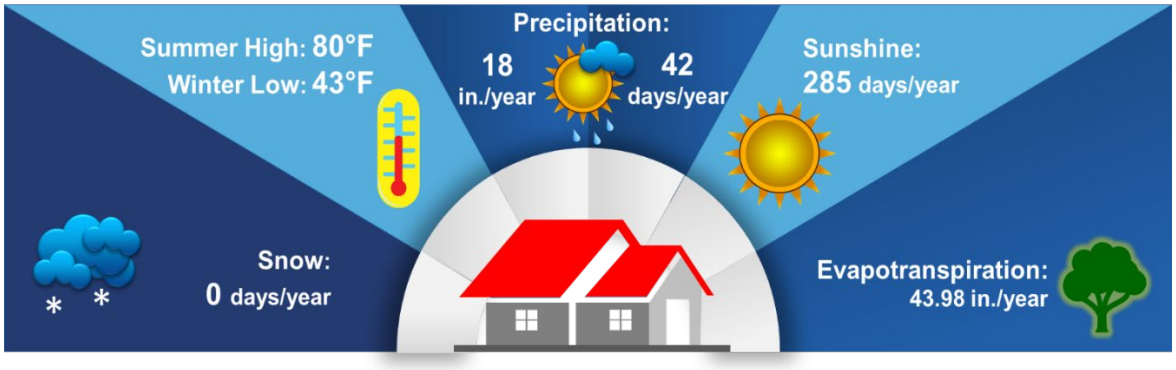


Figure 1-3. Montecito Water District Drought History

A BRIEF HISTORY OF RECENT DROUGHT AFFECTING THE

Montecito Water District

2010
Start of historic, record-breaking drought

2014
2014 Water shortage emergency declared. MWD passed District Ordinance Nos. 92, 94, 95 which implemented mandatory water restrictions, meter moratorium, conservation measures, allocations and penalties (cut demand by 50%).

2014
State Water Resources Control Board (SWRCB) adopts statewide emergency conservation regulations.

2015
MWD allocated only 5% of its full State Water Project contract amount, equates to 165 AF.

2015
Governor directs first ever Statewide Mandatory Water Reductions.

2016
Jameson Lake and Lake Cachuma are below 10% of total capacity. Cachuma allocation is zero (reservoir hits dead pool). State Water Project allocation is 5%.

2016
SWRCB adopts Regulation allowing agencies to demonstrate they have adequate water supplies. MWD repeals customer water allocations and penalties.

2017
Jameson Lake watershed affected by Thomas Fire.

2017
MWD purchases groundwater storage rights in Semitropic Water Storage District to help mitigate against future drought

2018
Historic drought culminates in Montecito's devastating flood with debris flows following the Thomas Fire. Meter moratorium is lifted.

2019
Ordinance 96 adopted and includes specific language prohibiting wasteful use by customers. These prohibitions align with state-mandated requirements.

2020
50-year Water Supply Agreement executed by Montecito Water District and the City of Santa Barbara

2021
Governor proclaims drought emergency; it expands statewide, and Californians are asked to voluntarily reduce water use by 15%. Urban Water Management Plan and Water Shortage Contingency Plan adopted new drought mitigation measures. State Water Project allocation is 5%.

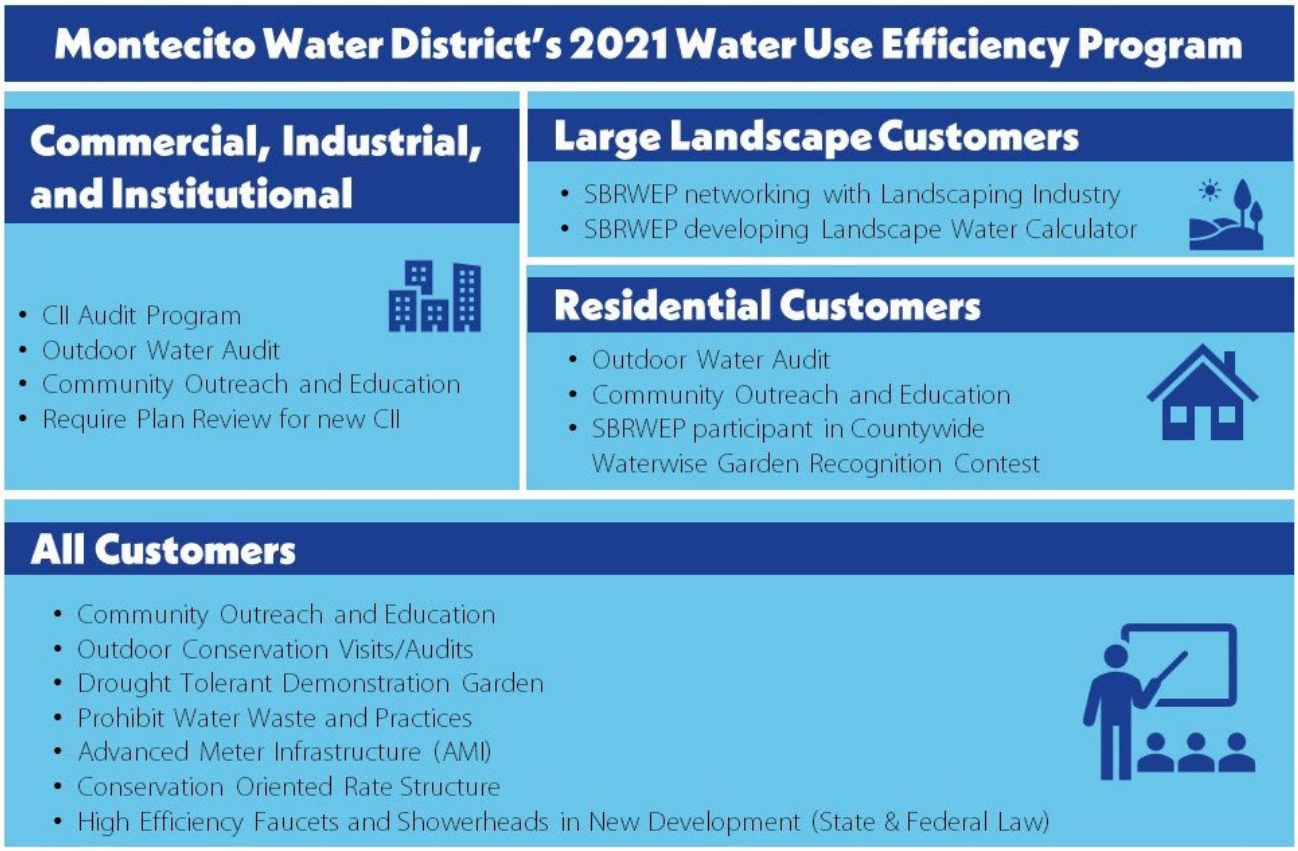
2022
MWD adopts Ordinance 97 restricting the use of water and supporting a Stage 2 drought declaration. State Water Project allocation is 5%.

2023
MWD adopts Ordinance 97 restricting the use of water and supporting a Stage 2 drought declaration. Projected 0% allocation from Lake Cachuma and State Water Project.

1.2 Project Background

The District utilizes a suite of various benchmarks to assess progress in the implementation of its existing conservation program. As of 2021, the District system wide total water use was 31% below year 2013 water use. An overview of the District's current conservation program is provided in Figure 1-4.

Figure 1-4. Montecito Water District's Current Conservation Program



To forecast and plan for long-term demand management reductions and meet water use reduction goals, the District hired Maddaus Water Management (MWM) to analyze the existing conservation program, identify new conservation measures, estimate the costs and water savings of both new and existing efforts, and to create and evaluate conservation program options based on the benefit-cost analysis. The District is also tracking state legislation metrics related to the water use objectives developed by the California Department of Water Resources (DWR) and the State Water Resources Control Board (SWRCB).

1.3 California Legislation and the Water Use Objectives

Recently a substantial shift in the challenges and drivers for water management occurred in the western United States– in part due to reoccurring drought and water supply conditions. Senate Bill 555 (Wolk) required urban retail water suppliers to submit validated water loss audits to the state of California annually beginning in 2017. In the aftermath of yet another drought from 2014–2017, the California Legislature established a framework centered on "Making Water Conservation a California Way of Life: Primer of 2018 Legislation on Water Conservation and Drought Planning Senate Bill 606 (Hertzberg) and Assembly Bill 1668 (Friedman)."[3] This

[3] California Department of Water Resources, et al. (2018). *Making Water Conservation a California Way of Life: Primer of 2018 Legislation on Water Conservation and Drought Planning Senate Bill 606 (Hertzberg) and Assembly Bill 1668 (Friedman)*.

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, SB 606 and AB 1668, established guidelines for efficient water use and a framework for the implementation and oversight of the new standards by 2024. These efforts and requirements, along with any future regulations, will have profound effects on water providers over the coming years by requiring annual water budgets for urban retail water suppliers, per-person indoor water use goals, and documented preparation for long-term droughts.

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 will require 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. Reports are due by January 1, 2024, and every year thereafter. Senate Bill 1157 (Hertzberg), signed into law in September 2022 by Governor Gavin Newsom, lowered limits for indoor residential water use even further than those established just four years prior.

The bills grant the SWRCB the authority to enforce compliance with the urban water use objectives, which is expected to include monetary penalties for non-compliance. The bills also establish a schedule for state agencies to develop the methodology for implementing the requirements. This Plan will be used for compliance in meeting the many requirements of recent legislation and additional expected state mandates. An implementation schedule for legislation is included in Table 1-1.

This Plan is aligned to the state legislative framework; however, as illustrated in Table 1-1, details of the state plan have yet to be released. When the detailed guidance is available, this Plan may need to be modified to include any new or revised actions needed by the District.

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

Date	AB 1668/SB 606 Key Requirement
Completed	1. DWR recommended to CA Legislature standards for indoor residential water use. SB 1157 (Hertzberg) was signed by Governor Newsom in September 2022 with the following standards: • 55 GPCD until 2025 • 47 GPCD from 2025 until January 2030 • 42 GPCD beginning in 2030 2. DWR provided each urban retail water supplier with data regarding irrigable lands at level of detail sufficient to verify accuracy at the parcel level
September 30, 2022	1. DWR recommended standards for outdoor residential use for adoption by SWRCB: • Incorporate Model Water Efficient Landscape Ordinance (MWELO) principles • Applies to irrigable lands • Include provisions for swimming pools, spas, etc. 2. DWR recommended 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 recommended variance provisions for: • Evaporative coolers • Horses and livestock • Seasonal populations • Soil compaction/dust control • Water to sustain wildlife • Water for fire protection 4. DWR recommended incentive provisions for recycled water 5. DWR recommended standards for outdoor irrigation of landscape areas with dedicated irrigation meters: • Incorporate MWELO principles
Pending 2023	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 Senate Bill 555) 2. SWRCB to adopt performance measures for CII water use
Pending 2023	1. Urban water supplier shall calculate its urban water use objective and report its actual water demand for the previous calendar or fiscal year: • 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 and incentives as appropriate

2 PURPOSE AND SCOPE OF PLAN

The purpose of the Plan is to systematically evaluate and quantify a long-term water conservation strategy for the District's 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. It is intended to serve as a guide for conservation programming and to set measurable targets for the District regarding future WUE investments and activities. This includes an implementation plan for the District to use to establish and administer cost-effective conservation programs to meet its WUE goals.

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 Montecito Water District service area and community. The Plan supports the District's effort to manage demand in accordance with available supply. Potential water savings from the individual conservation measures analyzed and/or combinations thereof were determined to assess their water use reduction. The Plan identifies several cost-effective, water use efficiency projects and programs that businesses, residents, and the District can implement over the short-term and long-term.

2.1 Plan Development

The Plan development included review of past documentation and data analyses. District staff worked closely with MWM to compile data on the region, the water service area, conservation measures, water production and consumption, weather, and various census data points. Together, these formed the foundation for MWM's Demand Side Management Least Cost Planning Decision Support System (DSS) Model. MWM verified and tested data against historical records to ensure accuracy and logic. 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.

MWM reviewed existing District practices to create a comprehensive list of water use conservation measures in place. MWM 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 American Water Works Association Manual of Practice, M52 Water Conservation Programs – A Planning Manual (AWWA, 2017). Following the DSS Model completion and evaluation of program options, the Draft and Final Water Use Efficiency Plans were prepared.

Project Timeline

February 2022

- Kickoff meeting with MWM and MWD staff
- Data request fulfilled

March–May 2022

- Additional data was collected from the District.
- Population and job analysis
- Demand analysis in DSS Model

August–September 2022

- MWM attended the Regular Meeting of the Operations and Customer Relations Committee to present the measures screening process and list of recommended measures on August 15, 2022.
- Measure list was reviewed and finalized by the District for conservation measures analysis.

- MWM worked directly with District staff to design individual conservation measures (program start and end date, assumed participation rates, incentive, and utility cost values, etc.).
- MWM set up and calibrated a DSS Model to evaluate water savings, costs, and benefits from potential conservation measures.
- MWM held meetings with District staff to review conservation modeling results and preliminary findings.

September 2022

- DSS Model was finalized.
- MWM attended the Regular Meeting of the Operations and Customer Relations Committee to present the draft results on September 19, 2022.
- MWM attended the Regular Meeting of the Board of Directors to present the draft results on September 27, 2022.

October 2022

- Draft Water Use Efficiency Plan was completed.

November 2022

- Draft Final Water Use Efficiency Plan to District staff for review.

December 2022

- Final Water Use Efficiency Plan to be reviewed by Committee and Board of Directors
- Completion of Final Water Use Efficiency Plan

January 2023

- Implementation begins

2.2 Modeling Future Water Conservation Program Scenarios Using the DSS Model

MWM's DSS Model prepares detailed long-range water demand and conservation water savings projections to enable a more accurate assessment of the impact of water efficiency programs on demand.[4] First developed in 1999 and continuously updated, the DSS Model is an end-use model that breaks down total water production (i.e., water demand in the service area) into specific water end uses (toilets, faucets, irrigation etc.). The DSS Model identifies measures by fixture costs, applicable customer classes, length of implementation, measure life, administrative costs, end uses, end-use savings per replacement, and a target number or percentage of accounts per measure year. This "bottom-up" approach allows for detailed criteria to be considered when estimating future demands, such as the effects of natural fixture replacement, plumbing codes, and conservation efforts. The purpose of using end-use data is to enable a more accurate assessment of the impact of water efficiency programs on demand and to provide a rigorous and defensible modeling approach necessary for projects subject to regulatory or environmental review.

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 which is input into the model from an outside source. This analysis used the Santa Barbara County Association of Governments (SBCAG) June 2019 Montecito jobs forecast. Total District jurisdiction jobs were

[4] 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.

proportioned by sector based on subregional sector breakdowns. Commercial and institutional demand growth was based on the SBCAG jobs forecast by economic sector respectively. Self-employed are assumed to not be served by commercial accounts and District staff confirmed no agricultural growth. The DSS Model evaluates conservation measures using benefit-cost analysis with the cost of water saved and benefit-to-cost ratio as economic indicators. The quantitative analysis is performed from the perspectives of both the utility and the District's customers. More background information on the DSS Model can be found in Appendix A.

2.3 District Demographics and Population

To determine the baseline population for the District service area, MWM analyzed multiple approaches including a connections-based method that applies a persons per unit factor and units per account factor to the number of single family and multifamily accounts; this approach was used in the District's 2020 UWMP.

A robust analysis of the service area population was needed since the adopted 2020 UWMP projections did not include any student population from Westmont College, nor did it consider transient (part-time) residents and short-term home rentals.

To address this nuance, District staff directed MWM to consider alternative methods of determining population. MWM thoroughly explored several options including reviewing 2020 Census datasets for the water service area communities of Montecito, Summerland and Toro Canyon; researching the local vacation home rental market via AirDNA.com; requesting a history of accounts with zero consumption; and researching second homes and vacation home rentals in the area. Using zero consumption bills as an indicator of second homes was determined to be inaccurate due to the frequency of irrigation and possibility of domestic staff. Comparison of billing addresses and account addresses was also deemed inaccurate as the District confirmed many of their full-time residents have out-of-area billing addresses. After exhaustive research, no precise data was available to estimate homeowner occupancy rates on second homes, therefore 50% was determined to be an educated estimate.

To calculate the student population the District coordinated with Westmont College facilities staff to determine the capacity for on campus housing as well as any potential for future growth in this area. With no new campus housing planned (limited by a Conditional Use Permit), and a relatively steady student population, it was determined that actual enrollment records would be the best source for this number.

Ultimately MWM and the District decided on this more thorough and accurate approach that takes each of these unique factors into account. While we believe long term calculations using this method will be more accurate, it is important to note that, prior to including short term renters, the total population difference from the 2020 UWMP was a mere 26 people for the year 2020.

The total population of 13,308 (rounded) for the year 2020 is further broken down and described in Table 2-1.

Table 2-1. Montecito Water District Population Determination

Value	Source
7,544	100 % of the U.S. Census for Montecito (8,638 per the April 1, 2020 Census) after subtracting non-institutionalized group quarters (1,094)
1,222	100 % of the U.S. Census for Summerland (1,222 per the ACS Survey 5 Year Estimate DP04) after subtracting non-institutionalized group quarters (0)
1,439	75% of the U.S. Census Toro Canyon (1,918 total per the ACS Survey 5 Year Estimate Table S0101) * 0.75 = 1,439 after subtracting noninstitutionalized group quarters (0). The 75% was calculated based on the approximate number of households served by MWD based on a map overlay.
1,140	The population of people occupying a second home in Montecito, based on 2.2 persons per household (2020 Census) multiplied by 1,036 (the number of vacant units per the 2020 Census) multiplied by an assumed 50% rate of occupancy. This percentage of the population does not characterize their Montecito home as their primary residence, implying they are there less than 50% of the year.
198	The population of people occupying a second home in Summerland, based on 1.82 persons per household (2020 Census) multiplied by 218 (the number of vacant units per 2020 Census) multiplied by an assumed 50% rate of occupancy.
253	The population of people occupying a second home in Toro, based on 2.31 persons per household (2020 Census) multiplied by 219 (75% of the 292 vacant units per 2020 Census) multiplied by an assumed 50% rate of occupancy.
378	This number represents the approximate number of total full-time equivalent people in a short-term rental, per year, using a second home when the second homeowner isn't there. This is a weighted average from data found on AirDNA.com[5]. That data includes the average number of active rentals available in 2021 (223.25), weighted using the number of rooms (resulting in an average 5.4 persons per household for the rented days), and a weighted renter occupancy rate (31.38%).
1,134	Total number of Westmont College Students Value[6] consistent with Census Spring 2022 on-campus enrollment reports 1,134 (Spring 2022 Enrollment Summary).
13,308	**Total Population**

For the population growth projection, District staff confirmed to utilize the 2019 SBCAG growth from Table 11 - Population Forecasts Unincorporated Areas, 2017–2050 for South Coast/Other, which ranges from 0.2–0.3% depending on the period. In comparison, the District's 2020 Urban Water Management Plan reportedly projected population growth by an "estimated 0.4% customer connection growth rate." While the Regional Housing Needs Allocation as an influencing factor was considered, Santa Barbara County officials confirmed the number of housing elements for the service area was not yet known.

[5] https://www.airdna.co/vacation-rental-data/app/us/california/santa-barbara/93108/overview

[6] https://www.westmont.edu/sites/default/files/2022-02/SP22CensusSummary.pdf

3 ANALYSIS OF WATER DEMAND

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. Monthly water consumption and production were analyzed (years 2010 to 2021).

3.1 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 Data Collection Workbook. Using the provided consumption and accounts values from the District, MWM and District staff confirmed the number and types of customers within the service area. Several follow-up rounds of data review were conducted 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 2010–2021 was reviewed. Water use data by customer category was aligned with the District's 2020 UWMP customer category water use projections. Residential water use was broken down into single family and multifamily categories. Using the DSS Model, historical data was segregated into indoor and outdoor water use by customer type. Non-residential categories of use were analyzed separately. Average daily commercial and institutional water use was expressed on a gallons-per-account basis.

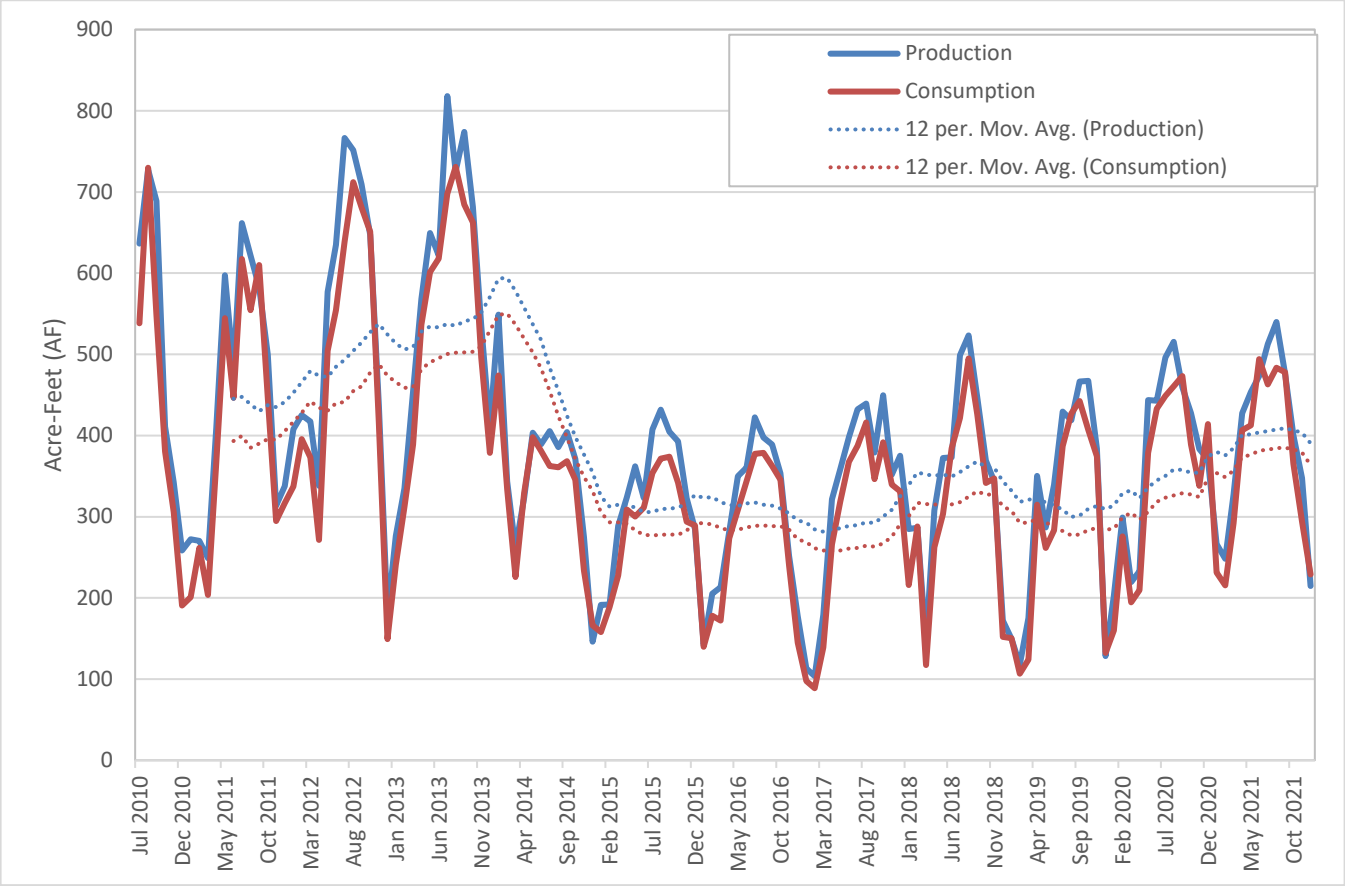
Figure 3-1 presents data topics and items requested, gathered, and stored in the Montecito Water District Data Collection Workbook.

Figure 3-1. Data Collection Workbook Topics and Items Requested

3.2 Production versus Consumption

Total water production and consumption (billed water) data were compared over the period 2010–2021. Figure 3-2. Illustrates the total production versus total consumption for the District's service area. Water production data were measured at their respective sources. Water consumption data were measured at the customer meters. Note the overall decreased water use that occurred between 2013 and 2014 is related to the District's use of water use allocations and penalties to align customer water use with reduced water supply availability resulting from severe California drought.

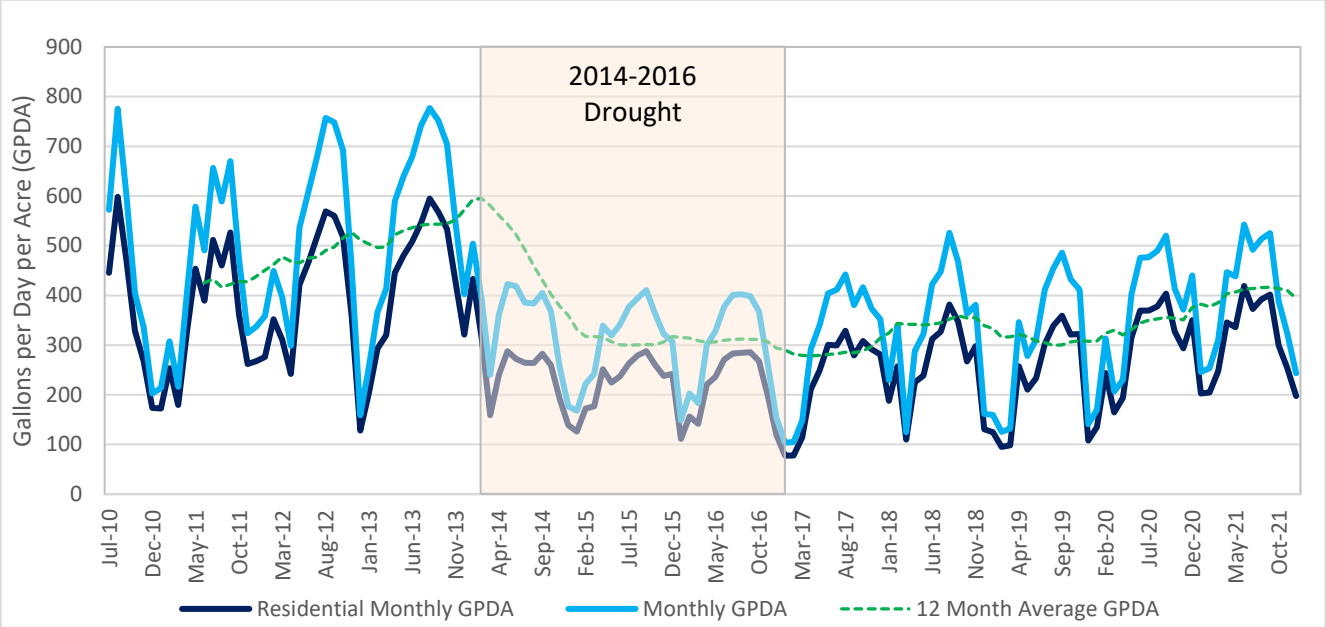
Figure 3-2. Total Production vs. Total Consumption



Note: Abnormal water years include recent local dry years in 2012–2021, and the 50% decrease in demand resulting from water use allocations and penalties that began in 2014.

Figure 3-3 shows the average monthly water use in gallons per day per acre (GPDA), for both overall GPDA and residential (single family residential and multifamily residential GPDA). The Montecito Water District service area is approximately 9,888 acres.

Figure 3-3. Water Use in Gallons per Day per Acre

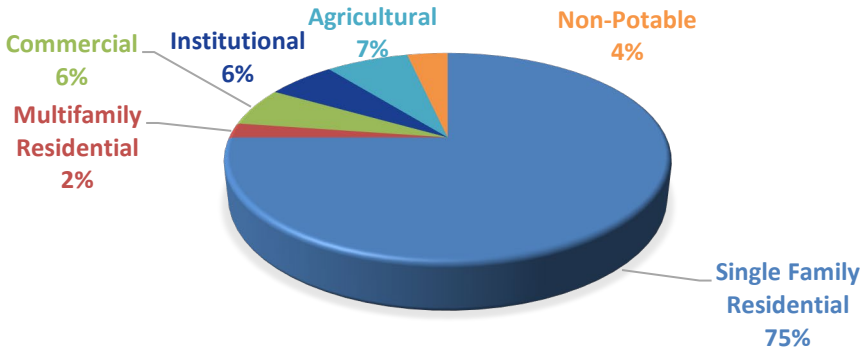


Note: Abnormal water years include recent local dry years in 2012–2021, and the 50% decrease in demand resulting from water use allocations and penalties that began in 2014.

3.3 Consumption by User Category

The District has a variety of customer categories utilized in their billing system. This Plan has organized users into Single Family Residential, Multifamily Residential, Commercial, Institutional, Agricultural, and Non-Potable categories. Figure 3-4 below illustrates the water use breakdowns within the District based on water use data. Single Family Residential is the largest category of water users, accounting for 75% of the water consumed between 2019–2021. This period was selected to represent the most recent trends in customer categories.

Figure 3-4. Consumption by Customer Category 2019–2021



To determine the indoor and outdoor water use split MWM assumed that indoor use is approximately equal to the minimum use in the winter. The years 2017–2019 were selected for this water use profile to avoid potential impacts from drought and the Covid-19 pandemic. While there may be minimal landscape watering in the winter, or leakage from irrigation systems, it is assumed this is minor, at less than 5–10% of the average winter water use. The average indoor water use for this period was 33.44% and outdoor water use was 66.56%. This analysis is aligned with recent District internal analyses of indoor and outdoor water use percentages and helped determine historical use patterns and allows water conservation planning to focus on the area with the highest overall category of use.

4 CONSERVATION MEASURE EVALUATION

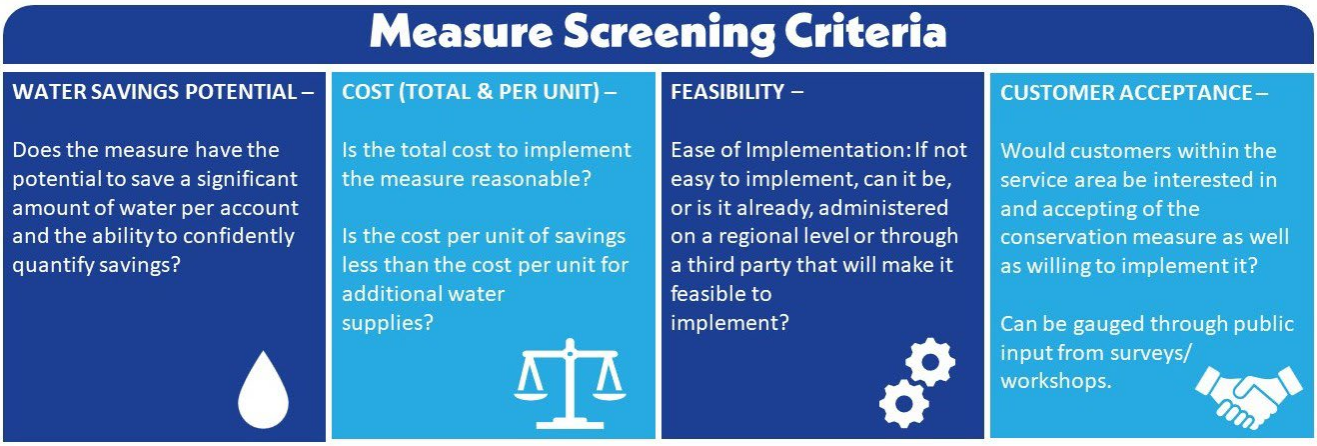
District staff identified 20 measures for further evaluation. This section presents a description, baseline assumptions, and output comparison of the conservation measures that were evaluated as part of this Plan's development. The measures also would need to be designed to address water conservation across all relevant customer categories.

4.1 Conservation Measure Screening

The experience of many utilities has shown 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 screening of these measures to a short-list for detailed evaluation (benefit-cost analysis). Potential new measures for the Plan included more than 140 potential water conservation measures drawn from MWM and District experience and a review of what other water agencies with innovative and effective conservation programs are implementing. The list of measures included devices or programs that can be used to achieve water conservation and what distribution method, or mechanism, can be used to activate the device or program (direct install, incentive, ordinance). A thorough screening process was necessary to scale a reasonable short-list of measures for evaluation in the DSS Model. District staff reduced the list of 140 measures to 20 measures based on a quantitative ranking of each measures water savings, cost to the District, public acceptance, and ease of implementation. The 20 selected measures also target water conservation across all relevant customer categories. Figure 4-1 shows the District's measure screening criteria.

Figure 4-1. Measure Screening Criteria



4.2 Conservation Measures Evaluated

Table 4-1 defines all of the 20 measures that were more thoroughly analyzed for the District's Plan. Information about the DSS Model analysis approach to measure unit costs, water savings, and market penetrations is in Appendix A. 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 D. More information on the selected program, which includes 17 measures, is included in section 6, the implementation strategy.

Table 4-1. Measure Descriptions

Measure Name	Description
AMI Customer Portal and Targeted Outreach	A WaterSmart Portal is scheduled to be rolled out in early 2023. This measure will provide online access and reporting to customers with water use comparisons to similar homes. Targeted messaging campaigns will be conducted based on consumption profiles to include irrigation cycles, leak detection, etc.
Water Loss (Montecito Water District System Leak Detection)	Utilize data from annual accounting of water production, sales by customer class, and quantity of water produced but not sold (non-revenue water) to address water loss. Perform system wide leak detection surveys. Continuously analyze billing data for system errors and mis-registering meters. Continue to calibrate, test, repair, and replace District and customer meters to ensure proper accounting of water.
Mulch Program	Reduce runoff and keep water from evaporating through the application of mulch, thereby reducing the need and frequency for watering. This measure is part of the initial pilot conservation program.
School Building Retrofit	School retrofit measure wherein school receives funding to replace fixtures, upgrade irrigation systems, or take other water saving actions.
Indoor Appliances Rebate Program – Commercial/Institutional	Provide a rebate for the installation of high efficiency commercial appliances. It is assumed the rebates would remain consistent with relevant state and federal regulations (Department of Energy, Energy Star).
Indoor Appliances Rebate Program – Residential	Provide a rebate for high efficiency appliances to single family homes and apartment complexes that have common laundry rooms. It is assumed the rebates would remain consistent with relevant state and federal regulations (Department of Energy, Energy Star).
High Efficiency Toilet (HET) Rebates – Residential	Provide a rebate to single family residential and multifamily residential customers for the installation of high efficiency toilets and urinals (HET – Toilets flushing 1.28 gpf or less).
High Efficiency Toilet (HET) and Urinal Rebates – Commercial/Institutional[1]	Provide a rebate to commercial and institutional customers for the installation of high efficiency toilets and urinals (HET) (Toilets flushing 1.28 gpf or less).
Outdoor Water Audit	Offer free outdoor water audits for existing customers who request a visit, or those with high water use and provide advice on how to save water. All accounts are eligible for free landscape water audits upon request.
Drip Irrigation Rebate	Offer rebate for drip irrigation materials and installation.
Rain Barrel Incentive[1]	Provide a rebate for installation of rain barrels that store rain water and offset irrigation use.
Smart Irrigation Controller Rebates	Provide a rebate for the purchase of a weather-based irrigation controller. These controllers have on-site weather sensors or rely on a signal from a central weather station that modifies irrigation times at least weekly. Requires local gardeners or irrigation contractors who are competent with these products, so may require sponsoring a training program in association with this measure.
Water Budgeting/ Monitoring at Parcel Level	Develop parcel specific water budgets using aerial imagery for all customers. Perform ongoing monitoring for high use relative to water budgets, and issue targeted messaging for excessive use.
Landscape Conversion/ Improvements – Residential	Provide a per square foot incentive to residential customers to remove turf and replace with low water use plants or permeable hardscape. Landscape conversion

Measure Name	Description
	could include conversion of turf to low water using orchards or drought tolerant landscaping. Rebate based on per square foot removed.
Landscape Conversion/ Improvements – Commercial/Institutional[1]	Provide a per square foot incentive to commercial and institutional customers to remove turf and replace with low water use plants or permeable hardscape. Landscape conversion could include conversion of turf to low water using orchards or drought tolerant landscaping. Rebate based on per square foot removed.
Community Outreach and Education (new customer packet, waterwise landscape award for commercial customers)	Provide a packet of water saving tips and programs to new customers when they apply for an account at the District. Sponsor an annual awards program for businesses or multifamily residences that significantly reduce water use. They would receive a plaque/recognition.
Demonstration Garden	Create a demonstration garden at the District office displaying living examples of low water-using gardens and landscaping, costs of plants, amount of water use per plant, etc. The District would provide signs and brochures to educate those people visiting the garden.
Commercial/Institutional Audit Program	All CII customers would be offered a free water audit that would evaluate ways for the business to save water and money.
Water Budget-Based Billing	Assume all customer categories would be on water-budget based billing. This measure would incentivize water used below the parcel budget and disincentivize water used in excess of the parcel budget. This measure would require a Proposition 218 rate setting process.
Grey Water System Rebates	Offer a rebate for a laundry-to-landscape program. Requires local plumbers or homeowners who are competent, so may require sponsoring a training program in association with this measure.

[1] These measures were thoroughly evaluated and analyzed using the DSS Model. They were included in the All-Inclusive Program C; however, they were not included in the selected Strategic Program, Program B. The Rain Barrel incentive was shown to be inefficient, and the two additional measures were not selected for implementation because the service area does not have a significant proportion of CII development.

4.3 Conservation Measure Analysis

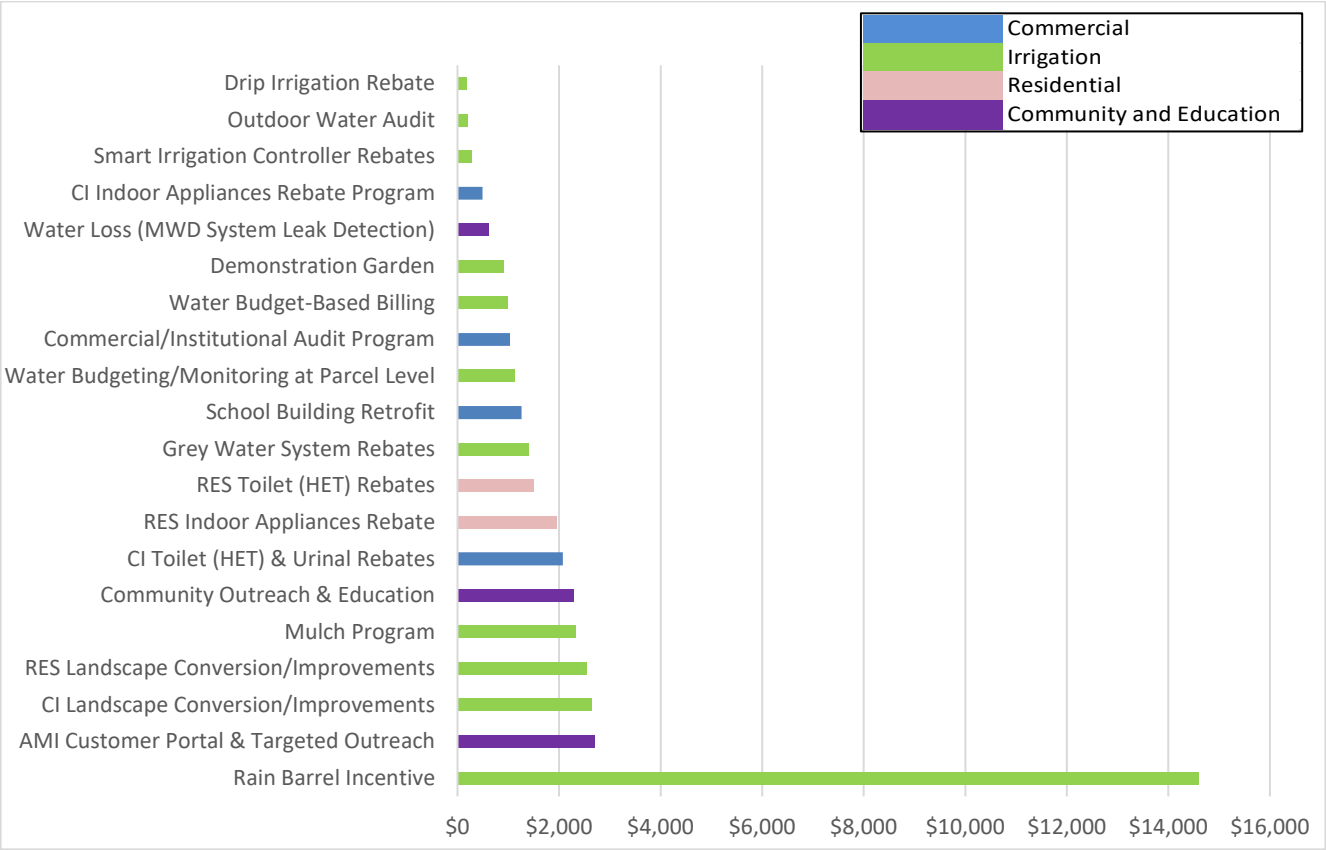
MWM conducted an economic evaluation of each selected water conservation measure using the DSS Model. Appendix D presents detailed results including how much water each measure will save through 2045, how much each will cost, and the cost of saved water per unit volume if the measure were to be implemented 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 D. While each measure was analyzed independently, it is important to note very few measures operate independently. For example, higher efficiency indoor fixtures go together with indoor water checkups and public education.

It should be noted the water savings from the education measure is not double counted with other conservation measures. As a result, costs appear significantly higher for education than for other measures due to the very minimal water savings estimated for the singular cost investment. However, other measures certainly would be less effective or possibly infeasible without an active outreach program. Without community and school education initiatives, customers would be unaware of other conservation measures and participation would likely be reduced.

[7] Montecito's weighted unit cost of water of all sources in fiscal year 2022 was $2,762/AF.

Figure 4-2 below shows the comparison of cost of savings per unit volume of all modeled measures for the All-Inclusive Program, Program C.

Figure 4-2. Cost of Savings per Unit Volume ($/AF)



Estimated individual conservation measure costs and savings are included in Appendix D.

5 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 the Pilot Program, Strategic Program, and All-Inclusive Program:

- Existing conservation measures
- Conservation measures recommended by AWWA, CalWEP, DWR and others
- New and innovative measures
- Measure equitability among customer categories
- Customer demographics and acceptance
- Service area match
- Water savings potential
- Cost
- Ease of implementation

5.1 Measure Selection for Conservation Program Alternatives

Using the data gathered, MWM created a list of all potential program concepts appropriate for the District service area to meet regulatory and conservation compliance mandates. 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). While program measures are generally more comprehensive moving from A to C, some commercial measures were removed from Program B as the District's service area does not reflect a significant volume of CII water use proportionately. As such, these measures would not result in significant savings.

Figure 5-1 includes brief descriptions of the resulting programs:

- **Program A: Pilot Program.** Includes 9 measures that focus on indoor and outdoor efficiency for both Residential and Commercial, Industrial, and Institutional (CII) customers; and drought measures targeted between December 2022 and June 2023.
- **Program B: Strategic Program.** Includes 17 cost-effective measures that save significant amounts of water, and support community interest in conservation.
- **Program C: All-Inclusive Program.** Includes all 20 measures modeled in this effort.

Figure 5-1. Conservation Program Options

5.2 Conservation Program Analysis

Table 5-1 shows the estimated annual demands in acre-feet in five-year increments for all three programs. District benefit to cost ratios are presented, as well as the present value of water savings and utility costs.

Table 5-1. Comparison of Program Results

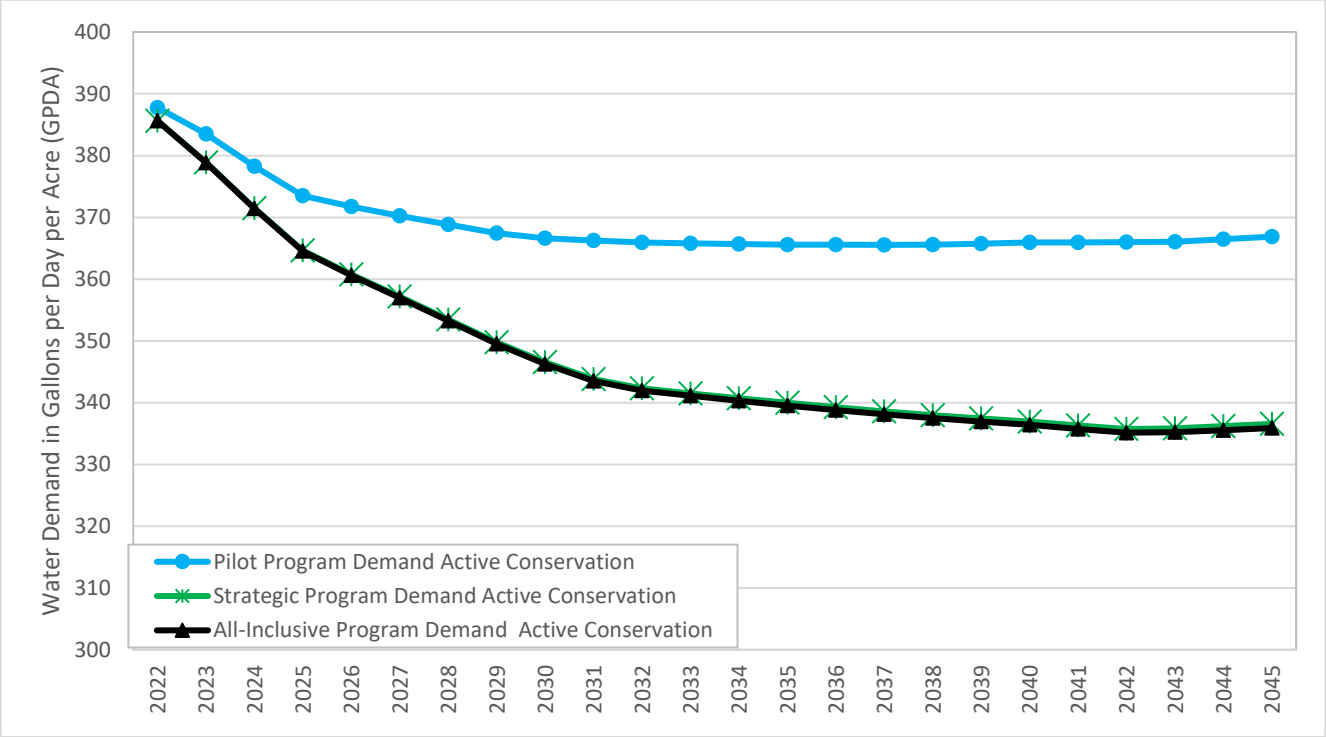
	Year	Pilot Program	Strategic Program	All-Inclusive Program
Acre Feet[1]	2022	4,300	4,270	4,270
	2023	4,250	4,200	4,200
	2024	4,190	4,120	4,120
	2025	4,140	4,040	4,040
	2030	4,120	4,000	4,000
	2035	4,050	3,770	3,760
	2040	4,060	3,730	3,730
	2045	4,070	3,730	3,720
District Benefit-Cost Ratio		1.13	1.92	1.86
Present Value of Water Savings[2]		$5,341,000	$16,362,000	$16,550,000
Present Value of Utility Costs[2]		$4,715,000	$8,525,000	$8,909,000
District Cost of Water Saved ($/AF)[3]		$1,690	$1,010	$1,040
2023–2027Average Annual Cost[4]		$270,000	$480,000	$510,000

Notes:

1. Demands are rounded to 10 AF.
2. Present value costs and savings are rounded to the nearest $1,000.
3. Water Utility Cost of Water Saved is rounded to the nearest $10.
4. 2023–2027 Average Annual Cost is rounded to the nearest $10,000.
5. Montecito's weighted unit cost of water of all sources in fiscal year 2022 was $2,762/AF.

Figure 5-2 presents estimated average projected demand from active and passive conservation.

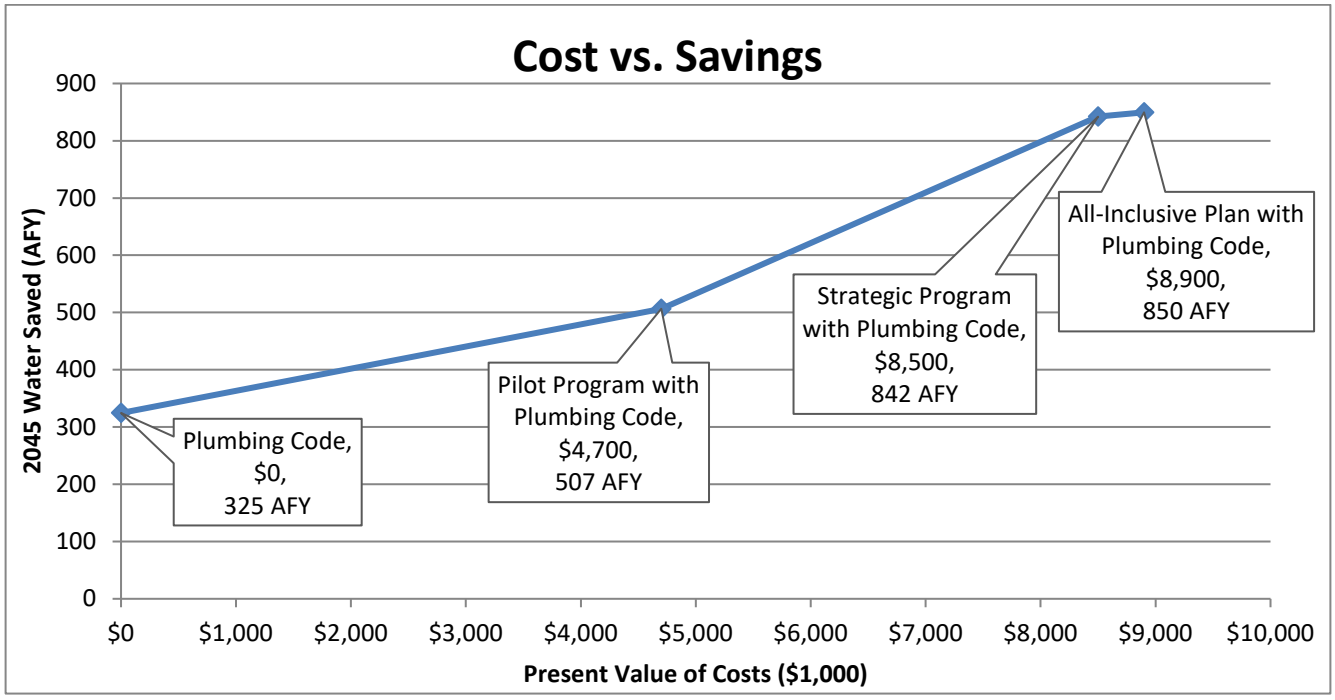
Figure 5-2. Projected Demand (GPDA)



Note: All line types shown in the legend are presented in the graph, but the Strategic Program and the All-Inclusive Program are close in value and therefore may be indistinguishable. Savings do not include plumbing code savings.

Figure 5-3 illustrates how marginal returns change as more money is spent to achieve water savings in AF 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 only a slight decrease in demands is achieved when graduating from the Strategic Program to the All-Inclusive Program.

Figure 5-3. Present Value of Utility Costs vs. Water Saved in 2045



Note: Water saved is for active conservation and plumbing code.

The estimated five-year (2023–2027) average annual cost to the District to implement the Pilot Program, Strategic Program, and All-Inclusive Program, as described in the Plan without administration cost or staff labor, is approximately $270,000, $480,000, and $510,000, respectively. The budget includes expenses (materials, rebates, giveaways, etc.) and was developed by evaluating the level of activity by year. Opportunities for funding measures 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 D.

5.3 Selected Program

The District has elected to implement the Strategic Program (Program B). The Strategic Program has high utility and customer benefit-cost ratios, offering significant savings for an appropriate cost. The Strategic Program was selected because many of the measures are being done already and the other measures could be reasonably accomplished with existing staffing, or with consulting assistance. More details on the Strategic Program results, including a breakout of demand by customer category, are presented in Appendix B. The All-Inclusive Program offers little more savings for more cost to both the District and its customers. The additional measures in the All-Inclusive Program can be pursued if the drought continues and calls for more drastic conservation measures are made. The All-Inclusive Program also represents a move towards “Making Water Conservation a California Way of Life.”

6 IMPLEMENTATION STRATEGY

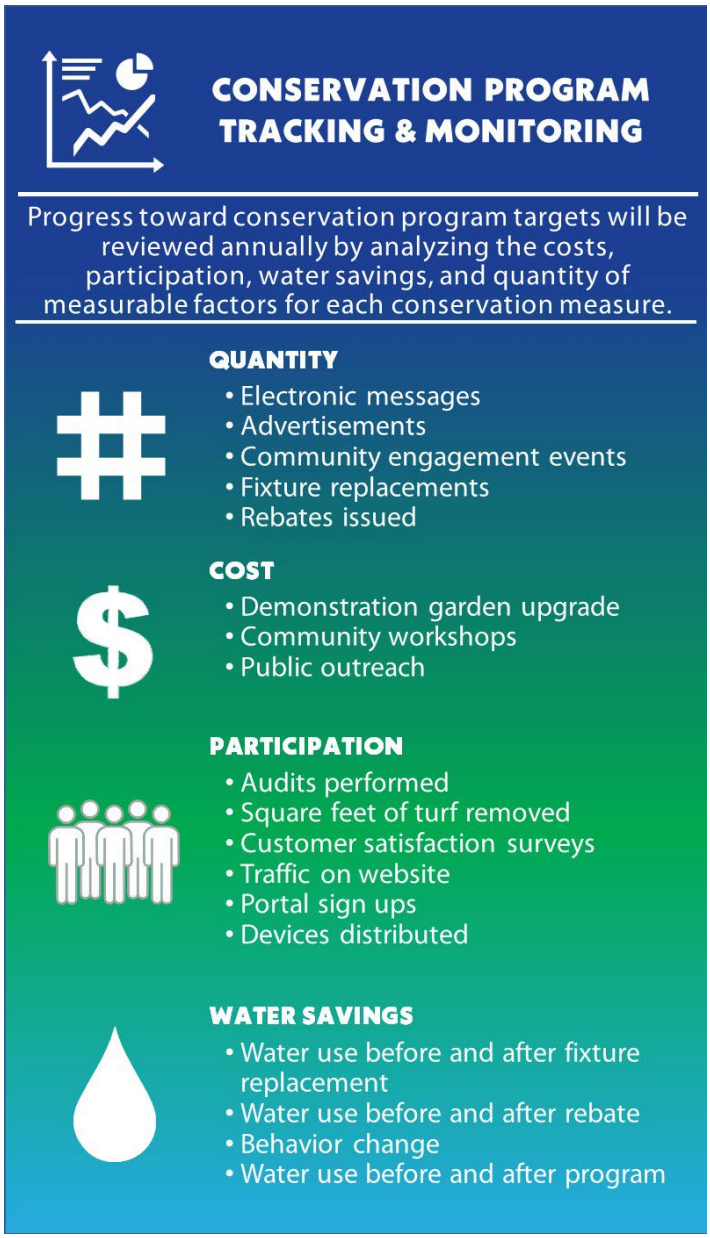
This section presents an overview of the conservation planning options for the service area including budgeting and data monitoring strategies.

6.1 Monitoring Progress

MWM will provide the District with a template tool to track the level of participation and program effectiveness of the District's conservation programs. This tracking tool is an Excel spreadsheet that can store data collected by the District for each conservation measure. The tracking tool incorporates the following data based on program participation by individual accounts:

- Customer information – Name, address, account number, type of business (CII customers)
- WUE measure or device – Quantity
- Cost information – Rebate amount
- Turf removal rebates – Number and square footage
- Collaboration with County of Santa Barbara Planning Department to quantify and verify compliance with water efficiency codes
- Social Media posts, engagement, comments, shares
- Number of attendees at special events
- Number of people who sign up for assistance or surveys at an event
- Number of leaks repaired and volume of water saved
- Number of accounts signed up for the customer portal or frequency of visits

Figure 6-1. Program Tracking and Monitoring



6.2 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:

- Engage in state processes to establish the requirement associated with implementation of legislation. Review state documents; present key information to District stakeholders and receive feedback; submit written comments as needed; and participate in public workshops and stakeholder groups.

- 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.
- Track the U.S. Environmental Protection Agency (EPA) WaterSense new technologies and updated equipment lists of newly labeled products and services.[8] 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 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 products.

Staying on or ahead of the curve with tracking new technologies could lead to water savings 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.

6.3 Proposed Implementation Schedule

Table 6-2 presents an implementation schedule for each individual measure through 2045. A description of each measure can be found in Table 4-1.

[8] https://www.epa.gov/watersense/watersense-products

Table 6-1. Conservation Measures Implementation Schedule (2022–2045)

Measure	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
AMI Customer Portal and Targeted Outreach [B,C]																								
Water Loss (MWD System Leak Detection) [B,C]																								
Mulch Program [A,B,C]																								
School Building Retrofit [B,C]																								
Indoor Appliances Rebate Program – Commercial/Institutional [A,B,C]																								
Indoor Appliances Rebate Program – Residential [A,B,C]																								
High Efficiency Toilet (HET) Rebates – Residential [A,B,C]																								
Outdoor Water Audit [B,C]																								
Drip Irrigation Rebate [A,B,C]																								
Smart Irrigation Controller Rebates [A,B,C]																								
Water Budgeting/Monitoring at Parcel Level [B,C]																								
Landscape Conversion/Improvements – Residential [A,B,C]																								
Community Outreach and Education [B,C]																								
Demonstration Garden [B,C]																								
Commercial/Institutional Audit Program [B,C]																								
Water Budget-Based Billing [B,C]																								
Grey Water System Rebates [B,C]																								

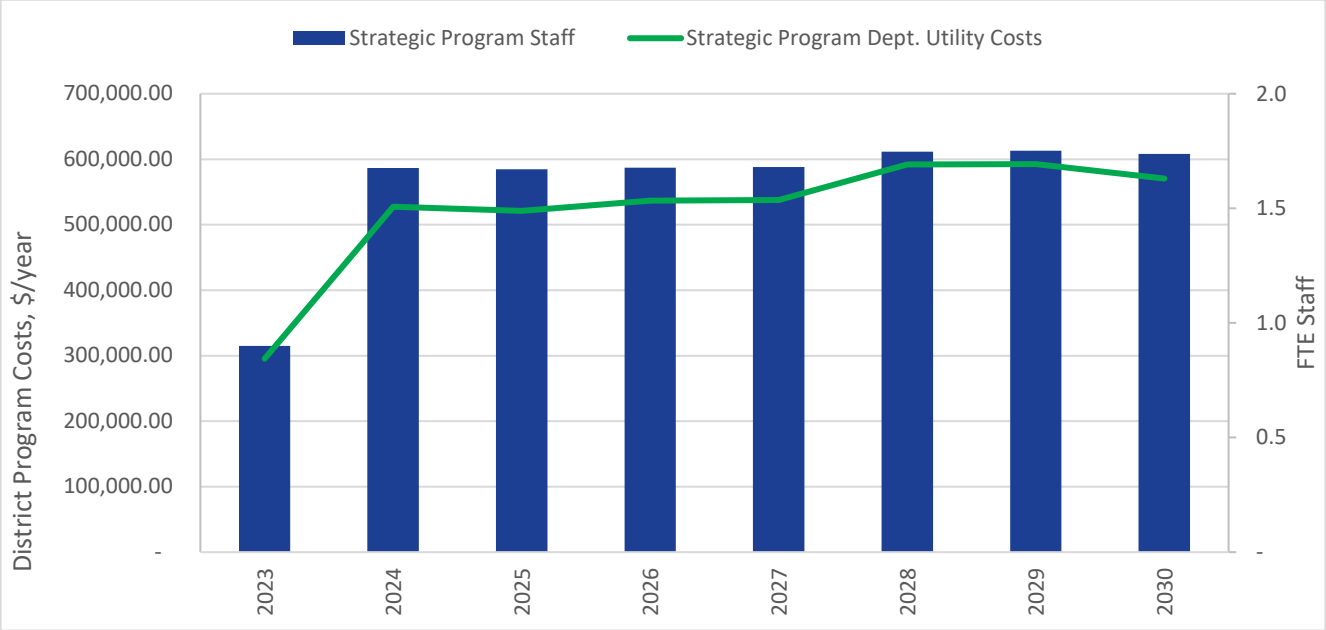
Notes:

1. Conservation programs are described in Table 4-1. This schedule does not include any measures that were not included in the Strategic Program.
2. Superscript notes are defined as follows:
    a. A = measures in the Pilot Program
    b. B = measures in the Strategic Program
    c. C = measures in the All-Inclusive Program

6.4 Staffing

As part of the analysis, staffing needs for each of the conservation programs was considered. For the Strategic Program to be implemented, the District will likely need to consider increasing the full-time equivalent (FTE) staff by 1 to 2 people. MWM recommends rounding up to two people to address upcoming state reporting. During the process of measure design, in consultation with the District, each measure is assigned a markup percentage to account for administrative costs. Collectively, these costs are then summed and divided by an average rate to determine the number of FTE staff required to administer the program. The District plans to have CalWEP mass market most measures and process their rebates. If CalWEP no longer offers this service, or the District decided to not utilize their services for rebates any longer, but wants to keep the conservation programs, the time and staffing needs would need to be included in the District internal outreach program. Additionally, the District will need to be prepared for CalWEP's fee to increase over time with cost of living, staffing issues, etc. Figure 6-2 shows the District annual department costs and staffing needs with CalWEP administrative support for all 3 modeled programs.

Figure 6-2. Program Costs and Staffing with CalWEP Administrative Support



6.5 Five-Year Implementation Recommendations

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

- Continue to utilize the information and support offered to urban water agencies provided by the California Water Efficiency Partnership. The District joined as a member of the organization in 2022.
- Before launching implementation of any new 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 professional services support, such as water surveyors or other sources of funding) that is needed or wanted to run these programs?
- Develop Implementation Plans that detail how each conservation measure will be implemented.
- Use the input from the District's annual work planning process as the forum to amend the Plan, budgets, staffing, contracting, schedule, etc. to stay on track.
- Track upcoming state regulations regarding residential, CII, landscape, and water loss management.

- Consider launching pilot studies for new measures.
- 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.
- Become a U.S. Environmental Protection Agency WaterSense Partner.[9] Take advantage of their many resources including outreach in the form of infographics, videos, template press releases, social media graphics, advertisements, bill stuffers and more.
- 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 or use the MWM provided Excel tool 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.

6.6 Suggestions for Future DSS Model Updates

There are two types of updates envisioned for the DSS Model: 1) regular monitoring of costs and water savings; and 2) model recalibrations 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 demand is an average of 2019–2021. Depending on water demand and account growth rates, it is advisable to update the base year on a five-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 shift in the cost of water (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 the 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
- New codes or regulations that affect Montecito Water District conservation goals or requirements (historically including but not limited to SB 555, AB 1668, SB 606, SB 1157.
- Alternatives for staffing versus outsourced contracting or other changes to cost of implementation of a conservation measure (change to conservation measure worksheet only)

[9] https://www.epa.gov/watersense/join-watersense#utilities

- 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)

7 NEXT STEPS AND CONCLUSIONS

This section presents recommended next steps and conclusions. Current conditions have encouraged the District to implement the Strategic Program and pursue the additional measures in the All-Inclusive Program only as needed to achieve their water use objective, or if drought conditions worsen 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 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 depend 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.

7.1 Selected Program Estimated Water Savings and Budget

The estimated cost to the District to implement the Strategic Program as described in the Plan is approximately $480,000 per year for years 2023–2027. The budget includes expenses (materials, rebates, giveaways, admin etc.). Costs and staffing covered by CalWEP and other partners are not included. The opportunities for cost sharing partnership with other utilities (energy, sewer, or neighboring water utilities), or other means for lowering the cost of a conservation measure, will lower the budgetary needs for implementation.

Approximately 75% of the District's service area water usage is associated with residential water use. Consequently, residential and irrigation conservation programs will produce the most savings. The District's service area overall does not include intensive commercial and industrial activity (approximately 12% of total water use), and thus the conservation potential for this sector is less than in many communities.

Some overall conclusions are as follows:

- The average cost of water saved for the Plan's selected Program B, from the District's standpoint, is $1,010/AF (which is significantly less than the avoided cost of water at $2,762 /AF; avoided cost was calculated by the District as a weighted average of all sources delivered in FY2022.
- All Programs have the possibility to reduce per capita water use in a cost-effective manner based on the implementation level of the plan.

Figure 7-1. Selected Program

7.2 Recommended Funding Sources and Partnerships

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 service area demographics.

Partnership and funding sources may include the following:

- Montecito Water 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

Montecito Water District may also partner with neighboring water agencies such as the City of Santa Barbara or Carpinteria Valley Water District to create a stronger presence in the regional area. The District intends to create, continue, or extend these partnerships to both achieve program goals for minimum cost and maximize outreach and customer awareness and/or participation.

7.3 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. Implementation of these measures should reduce per capita water use and potentially reduce and/or defer the need for further infrastructure expansion and/or water supply acquisition. 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: Primer of 2018 Legislation on Water Conservation and Drought Planning Senate Bill 606 (Hertzberg) and Assembly Bill 1668 (Friedman)" legislation.[10] District staff should continue tracking developments of the DWR framework into new state law and update this Plan as necessary to comply with those new mandates.[11],[12]
- Through the DSS Model analysis, the District identified fixture costs, applicable customer classes, an implementation schedule, 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 future water rate studies 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 legislation.
    - Maintaining a program in line with Best Management Practices.
    - Measuring, tracking, and reducing Non-Revenue Water Losses as outlined in SB 555.

[10]https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Water-Use-And-Efficiency/Make-Water-Conservation-A-California-Way-of-Life/Files/PDFs/Final-WCL-Primer.pdf

[11] https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/california_statutes.html

[12] https://water.ca.gov/Programs/Water-Use-And-Efficiency

    - Implementing the mandated statewide prohibitions in the governor's Executive Orders going forward (e.g., no watering for 48 hours after a rain event, no washing of hardscapes).
- Based on the analysis, the District has selected to implement the Strategic Program. With 17 measures, the Strategic Program has a benefit cost ratio of 1.92 and a cost of water saved of $1,010/AF versus the estimated avoided cost of water of $2,762/AF.

8 REFERENCES

All links were accessed in October 2022 unless otherwise indicated.

Alliance for Water Efficiency. (2016). *The Status of Legislation, Regulation, Codes & Standards on Indoor Plumbing Water Efficiency*. http://www.allianceforwaterefficiency.org/Codes-Standards-White-Paper.aspx

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

Ibid. (2017). *M52 Water Conservation Programs – A Planning Manual*, *2nd Edition*. https://www.awwa.org/Store/Product-Details/productId/61841578

California Department of Water Resources. (2015). *Model Water Efficient Landscape Ordinance*. https://govt.westlaw.com/calregs/Browse/Home/California/CaliforniaCodeofRegulations?guid=I55B69DB0D45A11DEA95CA4428EC25FA0&originationContext=documenttoc&transitionType=Default&contextData=(sc.Default)

California Department of Water Resources et al. (2018). *Making Water Conservation a California Way of Life: Primer of 2018 Legislation on Water Conservation and Drought Planning Senate Bill 606 (Hertzberg) and Assembly Bill 1668 (Friedman).* https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Water-Use-And-Efficiency/Make-Water-Conservation-A-California-Way-of-Life/Files/PDFs/Final-WCL-Primer.pdf

California Department of Water Resources. Water Use Efficiency. https://water.ca.gov/Programs/Water-Use-And-Efficiency

California Energy Commission. (2015). *Appliance Efficiency Regulations, California Code of Regulations, Title 20, Sections 1601-1609, Toilet, Urinal, Faucet, and Showerhead Regulations*. https://efiling.energy.ca.gov/GetDocument.aspx?tn=206010

Ibid. (2013). *Analysis of Standards Proposal for Residential Faucets and Faucet Accessories*, Docket #12-AAER-2C, prepared by Energy Solutions and Natural Resources Defense Council. https://efiling.energy.ca.gov/GetDocument.aspx?tn=71714&DocumentContentId=8058

Ibid. (2014). *Staff Analysis of Toilets, Urinals and Faucets*, Report # CEC-400-2014-007-SD. https://efiling.energy.ca.gov/GetDocument.aspx?tn=203718&DocumentContentId=11538

California Executive Order B-37-16. (2016). https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/docs/5_9_16_eo_b37_16.pdf

California Green (CALGreen) Building Standards 2019 Code, effective January 1, 2020. https://www.dgs.ca.gov/BSC/CALGreen

California Urban Water Conservation Council (CUWCC, now California Water Efficiency Partnership). (2005). Best Management Practices (BMP) Cost and Savings Study. https://owl.cwp.org/mdocs-posts/an-technical-services-2005/

California Water Efficiency Partnership (formerly CUWCC) Website. https://calwep.org/

California State Legislature. Assembly Bill 715 (Laird), October 11, 2007. https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200720080AB715

Ibid. Assembly Bill 1668 (Friedman), May 31, 2018. http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180AB1668

Ibid. Senate Bill 1157 (Hertzberg), September 28, 2022.

https://leginfo.legislature.ca.gov/faces/billHistoryClient.xhtml?bill_id=202120220SB1157

Ibid. Senate Bill 407 (Padilla), October 11, 2009. https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200920100SB407

Ibid. Senate Bill 555 (Wolk), October 9, 2015. https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160SB555

Ibid. Senate Bill 606 (Hertzberg), May 31, 2018. http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180AB606

Ibid. Senate Bill 837 (Blakeslee), July 1, 2011. http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201120120SB837

Consortium for Efficient Energy website. https://www.cee1.org/

DeOreo, W.B. (2016). *Residential End Uses of Water, Version 2 – 4309.* Denver, Colorado: AWWA Research Foundation. https://www.waterrf.org/research/projects/residential-end-uses-water-version-2

DeOreo, W.B., P.W. Mayer, Leslie Martien, Matthew Hayden, Andrew Funk, Michael Kramer-Duffield, Renee Davis, James Henderson, Bob Raucher, Peter Gleick, and Matt Heberger. (2011). *California Single-Family Water Use Efficiency Study*. Sacramento, California: Department of Water Resources. https://www.waterboards.ca.gov/waterrights/water_issues/programs/hearings/byron_bethany/docs/exhibits/pt/wr71.pdf

Dziegielewski, B., J. C. Kiefer, W. DeOreo, P. Mayer, E. M. Opitz, G. A. Porter, G. L. Lantz, and J. O. Nelson. (2000). *Commercial and Institutional End Uses of Water*. Denver, Colorado: AWWA, Research Foundation and American Water Works Association with Cooperation of the U.S. Bureau of Reclamation. Catalog No.90806. 264 pp. ISBN 1-58321-035-0. http://ufdc.ufl.edu/WC13511002/00001

Energy Star. (2011). *Unit Shipment and Market Penetration Report Calendar Year 2011 Summary*. http://www.energystar.gov/ia/partners/downloads/unit_shipment_data/2011_USD_Summary_Report.pdf

Federal Regulations. (2022). Subpart O – Commercial Prerinse Spray Valves, 87 FR 13910, as amended Mar. 11, 2022. https://www.ecfr.gov/current/title-10/chapter-II/subchapter-D/part-431/subpart-O

GMP Research, Inc. (2019). 2019 U.S. WaterSense Market Penetration Industry Report, commissioned by Plumbing Manufacturers International. https://www.safeplumbing.org/files/safeplumbing.org/documents/misc/7-1-19-WaterSense-2019-Report.pdf

Oak Ridge National Laboratory, Energy Division. (1998). "Bern Clothes Washer Study, Final Report," prepared for U.S. Department of Energy. https://digital.library.unt.edu/ark:/67531/metadc691712/

Plumbing Efficiency Research Coalition. (2012). *The Drainline Transport of Solid Waste in Buildings, PERC Phase 1 Report*, Table 2-A: Water Consumption by Water-Using Plumbing Products and Appliances – 1980-2012. http://www.map-testing.com/assets/files/PERC%20Report_Final_Phase%20One_Nov%202011_v1.1.pdf

Santa Clara Valley Water District Water Use Efficiency Unit. (2008). *SCVWD CII Water Use and Baseline Study*.

State Water Resources Control Board (SWRCB). California Statutes web page (defining "Making Conservation a California Way of Life"). https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/california_statutes.html

U.S. Census Bureau. Explore Census Data web page. https://data.census.gov/cedsci/

Ibid. 2010 Census Data web page. https://www.census.gov/programs-surveys/decennial-census/data/datasets.2010.html

U.S. Census Reporter. Montecito web page. https://censusreporter.org/profiles/16000US0648844-montecito-ca/

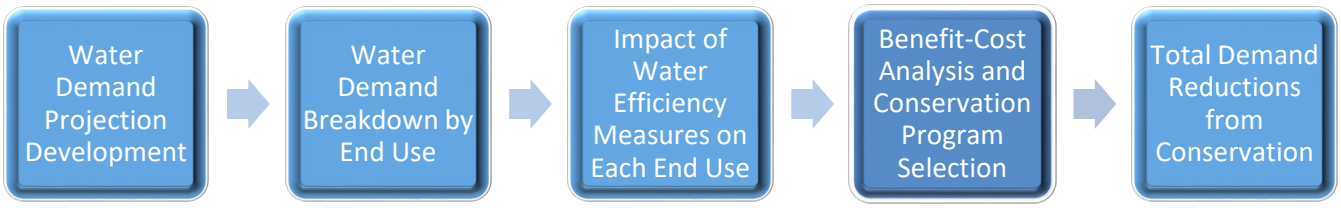
U.S. Congress. Energy Policy Act of 1992; amended in 2005. https://www.congress.gov/bill/102nd-congress/house-bill/776/text/enr; https://www.epa.gov/laws-regulations/summary-energy-policy-act; https://www.gpo.gov/fdsys/pkg/BILLS-109hr6enr/pdf/BILLS-109hr6enr.pdf

U.S. Department of Energy. EnergyStar Calculators. Online: https://www.energystar.gov/

U.S. Environmental Protection Agency. WaterSense Products. Online: https://www.epa.gov/watersense/watersense-products

Ibid. WaterSense Partners. https://www.epa.gov/watersense/join-watersense#utilities

APPENDIX A. DSS MODEL OVERVIEW



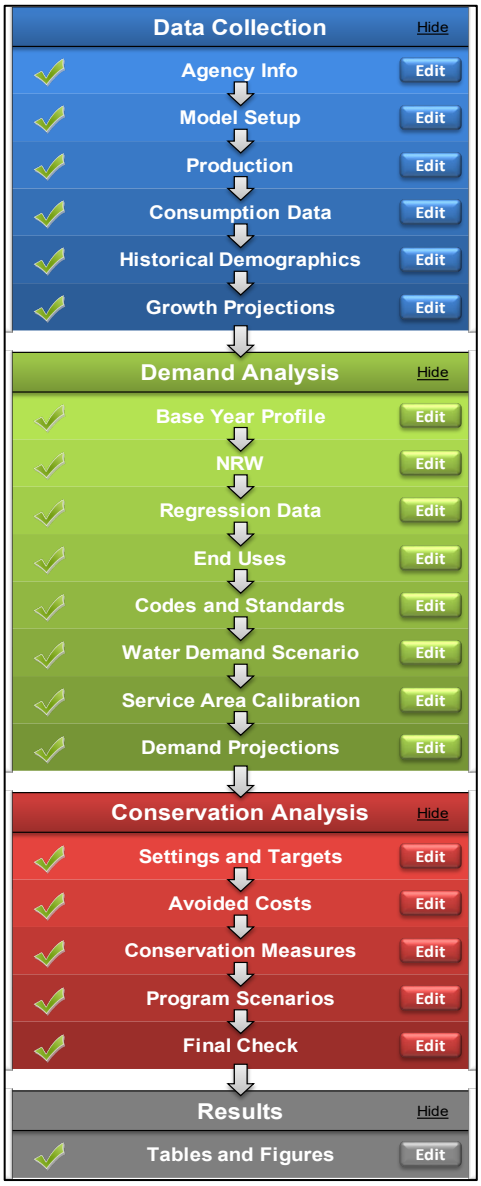


Figure A-1. DSS Model Main Page

DSS Model Overview: The Demand Side Management Least Cost Planning Decision Support System (DSS Model) as shown in the left figure 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.

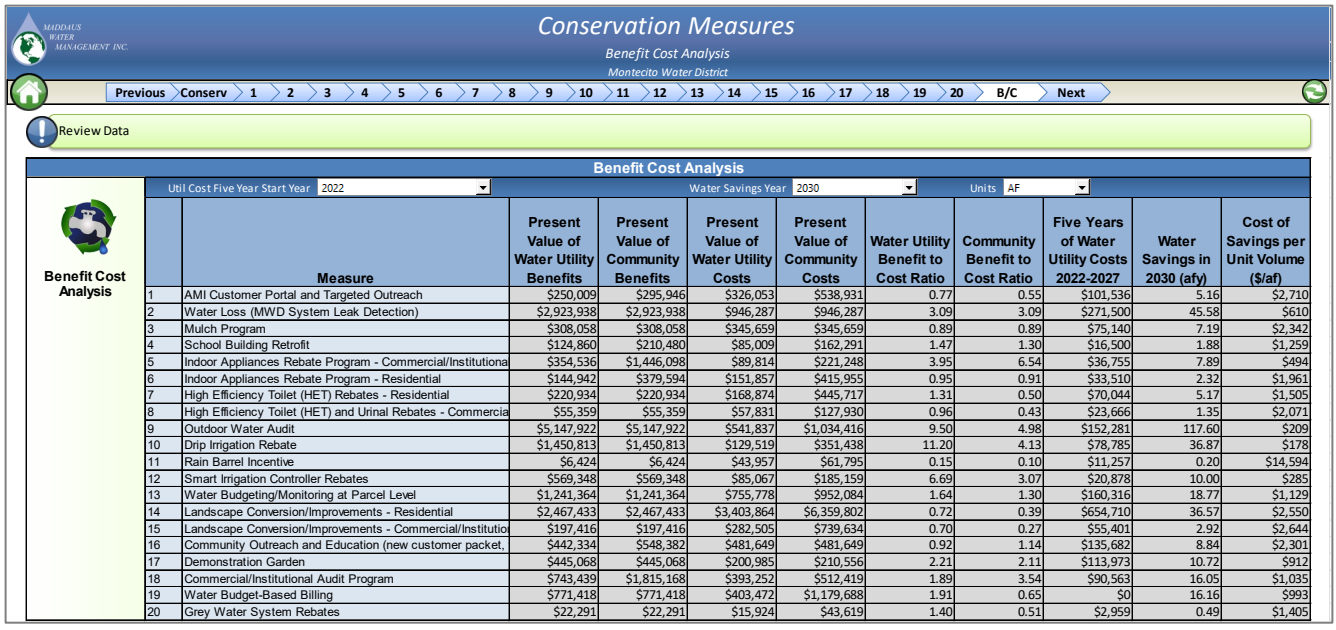
Originally developed in 1999 and continuously updated, the DSS Model is an "end-use" model that breaks down total water production (water demand in the service area) to specific water end uses, such as plumbing fixtures and appliance uses. The model uses a bottom-up approach that allows for multiple 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 those 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 A-2. Sample Benefit-Cost Analysis Summary



Conservation Measures

Benefit Cost Analysis

Montecito Water District

Previous | Conserv | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | B/C | Next

Review Data

Benefit Cost Analysis

Benefit Cost Analysis

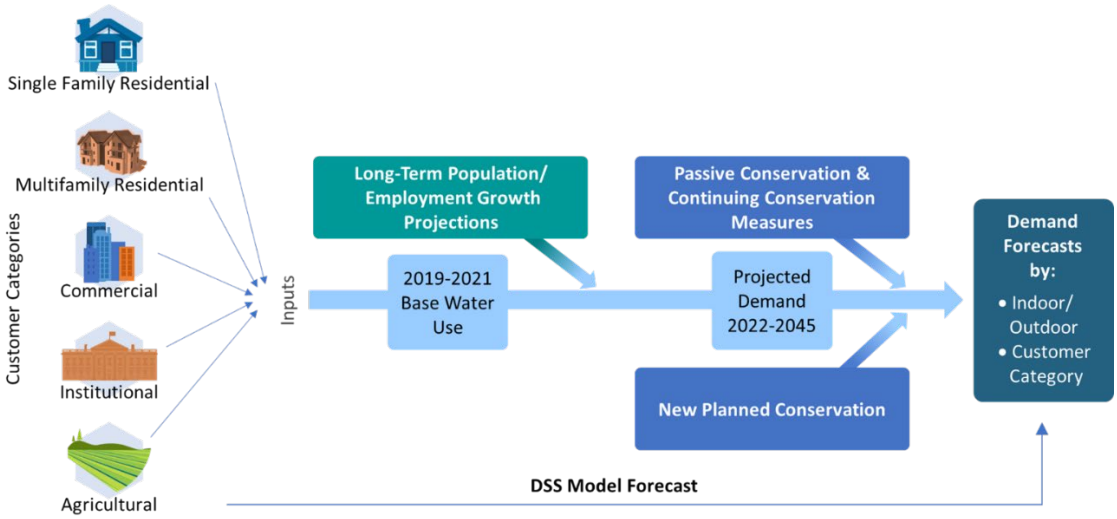
Util Cost Five Year Start Year: 2022 | Water Savings Year: 2030 | Units: AF

	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 2022-2027	Water Savings in 2030 (afy)	Cost of Savings per Unit Volume ($/af)
1	AMI Customer Portal and Targeted Outreach	$250,009	$295,946	$326,053	$538,931	0.77	0.55	$101,536	5.16	$2,710
2	Water Loss (MWD System Leak Detection)	$2,923,938	$2,923,938	$946,287	$946,287	3.09	3.09	$271,500	45.58	$610
3	Mulch Program	$308,058	$308,058	$345,659	$345,659	0.89	0.89	$75,140	7.19	$2,342
4	School Building Retrofit	$124,860	$210,480	$85,009	$162,291	1.47	1.30	$16,500	1.88	$1,259
5	Indoor Appliances Rebate Program - Commercial/Institutiona	$354,536	$1,446,098	$89,814	$221,248	3.95	6.54	$36,755	7.89	$494
6	Indoor Appliances Rebate Program - Residential	$144,942	$379,594	$151,857	$415,955	0.95	0.91	$33,510	2.32	$1,961
7	High Efficiency Toilet (HET) Rebates - Residential	$220,934	$220,934	$168,874	$445,717	1.31	0.50	$70,044	5.17	$1,505
8	High Efficiency Toilet (HET) and Urinal Rebates - Commercia	$55,359	$55,359	$57,831	$127,930	0.96	0.43	$23,666	1.35	$2,071
9	Outdoor Water Audit	$5,147,922	$5,147,922	$541,837	$1,034,416	9.50	4.98	$152,281	117.60	$209
10	Drip Irrigation Rebate	$1,450,813	$1,450,813	$129,519	$351,438	11.20	4.13	$78,785	36.87	$178
11	Rain Barrel Incentive	$6,424	$6,424	$43,957	$61,795	0.15	0.10	$11,257	0.20	$14,594
12	Smart Irrigation Controller Rebates	$569,348	$569,348	$85,067	$185,159	6.69	3.07	$20,878	10.00	$285
13	Water Budgeting/Monitoring at Parcel Level	$1,241,364	$1,241,364	$755,778	$952,084	1.64	1.30	$160,316	18.77	$1,129
14	Landscape Conversion/Improvements - Residential	$2,467,433	$2,467,433	$3,403,864	$6,359,802	0.72	0.39	$654,710	36.57	$2,550
15	Landscape Conversion/Improvements - Commercial/Institutio	$197,416	$197,416	$282,505	$739,634	0.70	0.27	$55,401	2.92	$2,644
16	Community Outreach and Education (new customer packet,	$442,334	$548,382	$481,649	$481,649	0.92	1.14	$135,682	8.84	$2,301
17	Demonstration Garden	$445,068	$445,068	$200,985	$210,556	2.21	2.11	$113,973	10.72	$912
18	Commercial/Institutional Audit Program	$743,439	$1,815,168	$393,252	$512,419	1.89	3.54	$90,563	16.05	$1,035
19	Water Budget-Based Billing	$771,418	$771,418	$403,472	$1,179,688	1.91	0.65	$0	16.16	$993
20	Grey Water System Rebates	$22,291	$22,291	$15,924	$43,619	1.40	0.51	$2,959	0.49	$1,405

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. The California Water Efficiency Partnership, or CalWEP, 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.

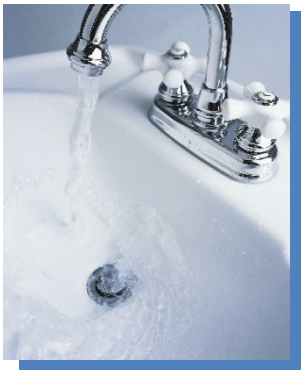
The DSS Model can use one of the following: 1) a statistical approach to forecast demands (e.g., an econometric model); 2) a forecasted increase in population and employment; 3) predicted future demands; or 4) a demand projection entered into the model from an outside source. For the District, baseline demand was developed based on an increase in residential population and to align with the 2020 UWMP. The following figure presents the flow of information in the DSS Model Analysis.

Figure A-3. DSS Model Analysis Flow



APPENDIX B. DSS MODEL PLUMBING CODE ASSUMPTIONS

This section presents the methodology used to determine the 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.



B.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 – 1.0 to 1.2.8 gal/min dependent on spray force

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 6.5. 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 around 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.

B.2 State Plumbing Codes

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

B.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).

B.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 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.

B.2.3 2019 CALGreen and 2020 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 2020 California Code of Regulations Title 20 Appliance Efficiency Regulations adopted by the California Energy Commission (CEC) on December 9th, 2020. The CEC 2020 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 resulting from the standards set for 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
- Commercial Pre-Rinse Spray Valves – January 2019: 1.28 gpm at more than 8.0 ounces per force (ozf) and shall be equipped with an integrated automatic shutoff.

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 2020 California Code of

Regulations Title 20 Appliance 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 2020 CEC Title 20 regulations that are exclusively for appliances sold in California. Showerheads manufactured on or after July 1, 2016, and prior to July 1, 2018, should have a flow rate no higher than 2.0 gpm at 80 psi. Showerheads manufactured on or after July 1, 2018 should have a flow rate no higher than 1.8 gpm at 80 psi. 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 have likewise been regulated by the 2020 CEC Title 20 regulations exclusively for appliances sold in California. Residential faucets and aerators manufactured on or after July 1, 2016 should have a flow rate no greater than 1.2 gpm at 60 psi. Public lavatory and kitchen faucets/aerators sold or offered for sale on or after July 1, 2016 should have a flow rate no greater than 0.5 gpm at 60 psi, and 1.8 gpm with optional temporary flow of 2.2 gpm at 60 psi, respectively. Previously, all faucets were regulated by the 2010 California Green Building Code at 2.2 gpm at 60 psi.

Commercial Pre-Rinse Spray Valves flow rates have been regulated in Title 10 of the Code of Federal Regulations. Pre-rinse spray valves manufactured on or after January 28, 2019 shall have a maximum flow rate of 1.28 gpm at more than 8.0 ounces per force (ozf) and shall be equipped with an integrated automatic shutoff.

B.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. 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 B-1. List of Key Assumptions

Parameter	Model Input Value, Assumptions, and Key References				
Model Start Year for Analysis	2022				
Water Demand Basis	2019–2021 (3-year average)				
Population Projection Source	2020 Census-derived year 2020 population start with growth projection using 2019 SBCAG Table 11 – Population Forecasts Unincorporated Areas, 2017–2050 for South Coast/Other regional				
Avoided Cost of Water	$2,762/AF				
Potable Water System Base Year Water Use Profile					
Customer Categories	**Start Year Accounts**	**Start Year Total Water Use Distribution**	**Start Year Demand Factors (gpd/acct)**	**Start Year Indoor Use %**	**Start Year Residential Indoor Water Use (GPCD)**
Single Family Residential	4,258	75%	629	38%	98
Multifamily Residential	66	2%	1,244	67%	27
Commercial	135	6%	1,583	56%	N/A
Institutional	131	6%	1,631	40%	N/A
Agricultural	42	7%	6,135	N/A	N/A
Non-Potable	8	4%	15,782	N/A	N/A
Total/Avg	**4,640**	**100%**	**N/A**	**N/A**	**N/A**

Table B-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.

Parameter	Resource
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.
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.

Parameter	Resource
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

B.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."

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 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 the District's 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 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.
- Adding the change due to rebate measure minus the "free rider effect".[13]

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 model is capable of modeling multiple types of fixtures, including ones 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. 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 fixtures is listed as a percentage within the DSS Model. A value of 100% would indicate that all toilets installed would be of one flush volume. A value of 75% means that three out of every four toilets installed would be of that particular flush volume.

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.

[13] 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 C. DSS MODEL MEASURE 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.

C.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. 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.

C.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 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. For this reason, a planning period of 10 years or longer is used because costs and benefits that occur beyond 10 years have very little influence on the total present value of 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.

C.3 Measure Cost and Water Savings Assumptions

Appendix D 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, 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 included 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 D. INDIVIDUAL CONSERVATION MEASURE DESIGN INPUTS AND RESULTS

The following figures present the DSS Model starting values for the conservation measures that were analyzed for possible inclusion into the Montecito Water District conservation program.

1. AMI Customer Portal and Targeted Outreach

AMI Customer Portal and Targeted Outreach

Overview

Name	AMI Customer Portal and Targeted Outreach
Abbr	1
Category	Default
Measure Type	Standard Measure

Time Period

First Year	2023
Last Year	2045
Measure Length	23

Measure Life

Permanent	☐
Years	5
Repeat	☐

Fixture Cost per Device

	Utility	Customer	Fix/Acct
SFR	$649.00	$500.00	1
MFR	$649.00	$500.00	1
COM	$649.00	$500.00	1
INST	$649.00	$500.00	1
AG	$649.00	$500.00	1

Administration Costs

Method:	Percent
Markup Percentage	18%

Description

A WaterSmart Portal is scheduled to be rolled out in early 2023. This measure will provide online access and reporting to customers with water use comparisons to similar homes. Targeted messaging campaigns will be conducted based on consumption profiles to include irrigation cycles, leak detection, etc.

Customer Classes

SFR	MFR	COM	INST	AG	NP
☑	☑	☑	☑	☑	☐

End Uses

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

Comments

- Utility Cost: Portal cost is approx. $15,000 per year.
- Admin Cost: Engineering will track for leaks and reach out to customers. $60/hr. Assumes approx. 2 hours per account to track, reach out, and follow up.
- Customer Cost: Assumed average cost for leak repair assuming the use of a plumber which is common in MWD service area to fix leaks.
- End Use Water Savings: AMI savings based on significant reductions to leakage and irrigation end uses. Savings based on San Francisco Public Utilities Commission (SFPUC) case study per Julie Ortiz ppt at 2019 Peer-to-Peer "AMI: Everything you need to know to run a successful program." Savings are estimated to be 20%-50% on leakage, assumes average of 30% (internal and external) with a potential additional 5% savings on all other end uses due to behavioral changes, 5% savings to irrigation.
- Targets: Recent Montecito Program found 900 out of 4,600 meters had leaks as of 2022 field survey by manual read staff. Assume 5% of the 900 meter leaks will be fixed in the first year of the program.

Results

Units	AF
Average Water Savings (afy)	5.013131
Lifetime Savings - Present Value ($)	
Utility	$250,009
Community	$295,946
Lifetime Costs - Present Value ($)	
Utility	$326,053
Community	$538,931
Benefit to Cost Ratio	
Utility	0.77
Community	0.55
Cost of Savings per Unit Volume ($/af)	
Utility	$2,710

End Use Savings Per Replacement

Method: Percent

	% Savings/Acct	Avg GPD/Acct
SFR Internal Leakage	30.0%	40.3
MFR Internal Leakage	30.0%	112.0
COM Internal Leakage	30.0%	88.9
INST Internal Leakage	30.0%	130.4
SFR Irrigation	5.0%	325.0
MFR Irrigation	5.0%	343.4
COM Irrigation	5.0%	541.1
INST Irrigation	5.0%	714.6
SFR External Leakage	30.0%	27.4
MFR External Leakage	30.0%	29.0
COM External Leakage	30.0%	48.6
INST External Leakage	30.0%	68.5
AG External Leakage	30.0%	429.5

Targets

Target Method: Detailed

Enter Annual Targets Below

Costs

View: Utility Detai

	Fixture Costs	Admin Costs	Util Total
2022	$0	$0	$0
2023	$33,748	$6,075	$39,823
2024	$22,281	$4,011	$26,292
2025	$14,995	$2,699	$17,695
2026	$15,023	$2,704	$17,727
2027	$15,050	$2,709	$17,759
2028	$15,078	$2,714	$17,792
2029	$15,105	$2,719	$17,824
2030	$15,133	$2,724	$17,857
2031	$15,180	$2,732	$17,912
2032	$15,227	$2,741	$17,968
2033	$15,274	$2,749	$18,023
2034	$15,321	$2,758	$18,079
2035	$15,369	$2,766	$18,135
2036	$15,419	$2,775	$18,194
2037	$15,469	$2,784	$18,253
2038	$15,519	$2,793	$18,313
2039	$15,570	$2,803	$18,372
2040	$15,620	$2,812	$18,432
2041	$15,656	$2,818	$18,474
2042	$15,691	$2,824	$18,516
2043	$15,727	$2,831	$18,558
2044	$15,763	$2,837	$18,600
2045	$15,798	$2,844	$18,642

Targets

View: Accounts

	SFR	MFR	COM	INST	AG	Total
2022	0	0	0	0	0	0
2023	45	1	3	3	0	52
2024	30	0	2	2	0	34
2025	21	0	1	1	0	23
2026	21	0	1	1	0	23
2027	21	0	1	1	0	23
2028	21	0	1	1	0	23
2029	22	0	1	1	0	23
2030	22	0	1	1	0	23
2031	22	0	1	1	0	23
2032	22	0	1	1	0	23
2033	22	0	1	1	0	24
2034	22	0	1	1	0	24
2035	22	0	1	1	0	24
2036	22	0	1	1	0	24
2037	22	0	1	1	0	24
2038	22	0	1	1	0	24
2039	22	0	1	1	0	24
2040	22	0	1	1	0	24
2041	22	0	1	1	0	24
2042	22	0	1	1	0	24
2043	22	0	1	1	0	24
2044	22	0	1	1	0	24
2045	22	0	1	1	0	24

Water Savings

Units: afy

	Total Savings (afy)
2022	0.000000
2023	2.461437
2024	4.080051
2025	5.105596
2026	6.133315
2027	7.163211
2028	5.733849
2029	5.149491
2030	5.160387
2031	5.172614
2032	5.186179
2033	5.201086
2034	5.217341
2035	5.234948
2036	5.252714
2037	5.270640
2038	5.288727
2039	5.306977
2040	5.325391
2041	5.342896
2042	5.359488
2043	5.375162
2044	5.389913
2045	5.403736

2. Water Loss (MWD System Leak Detection)

Water Loss (MWD System Leak Detection)

Overview	
Name	Water Loss (MWD System Leak D
Abbr	2
Category	Default
Measure Type	Water Loss Measure

Time Period	
First Year	2022

Backlog Costs	
Total Backlog Work Costs	$1,303,200
Years to Complete Backlog	24

Maintenance Costs	
Annual Maintenance Costs	$4,300

Target	
Total GPCD Reduction	8.0

Description

Utilize data from annual accounting of water production, sales by customer class, and quantity of water produced but not sold (non-revenue water) to address water loss. Perform system wide leak detection surveys. Continuously analyze billing data for system errors and mis-registering meters. Continue to calibrate, test, repair, and replace District and customer meters to ensure proper accounting of water.

Results

Units: AF

Average Water Savings (afy)	
	0.057683
Lifetime Savings - Present Value ($)	
Utility	$2,923,938
Community	$2,923,938
Lifetime Costs - Present Value ($)	
Utility	$946,287
Community	$946,287
Benefit to Cost Ratio	
Utility	3.09
Community	3.09
Cost of Savings per Unit Volume ($/af)	
Utility	$1,871

Comments

MWD is proactive on CIP projects. No known leaks. No set goal for water loss, but will strive to achieve the 6% NRW. Currently reactive to fix leaks. In the future will do proactive leak detection.

Costs

	Utility
2022	$54,300
2023	$54,300
2024	$54,300
2025	$54,300
2026	$54,300
2027	$54,300
2028	$54,300
2029	$54,300
2030	$54,300
2031	$54,300
2032	$54,300
2033	$54,300
2034	$54,300
2035	$54,300
2036	$54,300
2037	$54,300
2038	$54,300
2039	$54,300
2040	$54,300
2041	$54,300
2042	$54,300
2043	$54,300
2044	$54,300
2045	$54,300

Targets

	Projected NRW Percent
2022	6.8%
2023	6.8%
2024	6.8%
2025	6.7%
2026	6.7%
2027	6.6%
2028	6.6%
2029	6.6%
2030	6.5%
2031	6.5%
2032	6.4%
2033	6.4%
2034	6.4%
2035	6.3%
2036	6.3%
2037	6.2%
2038	6.2%
2039	6.2%
2040	6.1%
2041	6.1%
2042	6.0%
2043	6.0%
2044	6.0%
2045	5.9%

Water Savings (AFY)

	Total Savings
2022	4.993368
2023	10.007817
2024	15.043412
2025	20.100221
2026	25.164637
2027	30.244872
2028	35.340961
2029	40.452944
2030	45.580856
2031	50.789722
2032	56.027905
2033	61.295531
2034	66.592725
2035	71.919612
2036	77.292917
2037	82.698485
2038	88.136465
2039	93.607004
2040	99.110251
2041	104.536546
2042	109.984280
2043	115.453520
2044	120.944328
2045	126.456770

3. Mulch Program

Mulch Program

Overview	
Name	Mulch Program
Abbr	3
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2023
Last Year	2043
Measure Length	21

Measure Life	
Permanent	☐
Years	2
Repeat	☐

Fixture Cost per Device

	Utility	Customer	Fix/Acct
SFR	$85.00	$0.00	2
MFR	$85.00	$0.00	2
COM	$85.00	$0.00	2
INST	$85.00	$0.00	2

Administration Costs

Method: Percent

Markup Percentage	47%

Description

Reduce runoff and keep water from evaporating through the application of mulch, thereby reducing the need and frequency for watering. This measure is part of the initial pilot conservation program.

Customer Classes

SFR	MFR	COM	INST	AG	NP
☑	☑	☑	☑	☐	☐

End Uses

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

Comments

- Utility Cost: Similar to the measure within the City of Santa Barbara. Delivery cost of $85. Assumes two deliveries per year. Total $170 for deliveries. Will pay for nursery mulch up to $200 per customer if they want to upgrade to a higher quality mulch.
- Admin Cost: Rebate processing cost of $40 per rebate for CalWEP Smart Rebate to run the website and have customers sign up to participate; processing customers as well.
- Customer Cost: None. Assume no supplemental customer cost to purchase mulch.
- End Use Water Savings: Per SaveOurWater.com (https://saveourwater.com/en/How-to-Save-Water/Around-the-Yard), mulch saved 20-30 gallons per 1,000 sq. ft. each watering incident.
- Targets: Assume 2% of customers participate annually, but only 25% of that in 2023 since the program won't begin at the start of the year.

Results

Units: AF

Average Water Savings (afy)	
	6.149187
Lifetime Savings - Present Value ($)	
Utility	$308,058
Community	$308,058
Lifetime Costs - Present Value ($)	
Utility	$345,659
Community	$345,659
Benefit to Cost Ratio	
Utility	0.89
Community	0.89
Cost of Savings per Unit Volume ($/af)	
Utility	$2,342

End Use Savings Per Replacement

Method: Percent

	% Savings/Acct	Avg GPD/Acct
MFR Showers	0.0%	157.4
SFR Irrigation	10.0%	325.0
MFR Irrigation	10.0%	343.4
COM Irrigation	10.0%	541.1
INST Irrigation	10.0%	714.6

Targets

Target Method: Detailed

Enter Annual Targets Below

Costs

View: Utility Detai

	Fixture Costs	Admin Costs	Util Total
2022	$0	$0	$0
2023	$3,923	$1,844	$5,767
2024	$15,692	$7,375	$23,068
2025	$15,736	$7,396	$23,131
2026	$15,764	$7,409	$23,174
2027	$15,793	$7,423	$23,216
2028	$15,822	$7,436	$23,258
2029	$15,851	$7,450	$23,301
2030	$15,880	$7,464	$23,343
2031	$15,929	$7,487	$23,416
2032	$15,978	$7,510	$23,488
2033	$16,028	$7,533	$23,561
2034	$16,078	$7,556	$23,634
2035	$16,127	$7,580	$23,707
2036	$16,180	$7,604	$23,784
2037	$16,232	$7,629	$23,862
2038	$16,285	$7,654	$23,939
2039	$16,338	$7,679	$24,017
2040	$16,391	$7,704	$24,095
2041	$16,428	$7,721	$24,150
2042	$16,466	$7,739	$24,205
2043	$16,503	$7,756	$24,260
2044	$0	$0	$0
2045	$0	$0	$0

Targets

View: Accounts

	SFR	MFR	COM	INST	Total
2022	0	0	0	0	0
2023	21	0	1	1	23
2024	86	1	3	3	92
2025	86	1	3	3	93
2026	86	1	3	3	93
2027	86	1	3	3	93
2028	86	1	3	3	93
2029	86	1	3	3	93
2030	86	1	3	3	93
2031	87	1	3	3	94
2032	87	1	3	3	94
2033	87	1	3	3	94
2034	87	1	3	3	95
2035	88	1	3	3	95
2036	88	1	3	3	95
2037	88	1	3	3	95
2038	88	1	3	3	96
2039	89	1	3	3	96
2040	89	1	3	3	96
2041	89	1	3	3	97
2042	89	1	3	3	97
2043	90	1	3	3	97
2044	0	0	0	0	0
2045	0	0	0	0	0

Water Savings

Units: afy

	Total Savings (afy)
2022	0.000000
2023	0.887487
2024	4.437436
2025	7.111700
2026	7.130819
2027	7.145461
2028	7.160117
2029	7.174790
2030	7.189478
2031	7.208769
2032	7.232682
2033	7.256647
2034	7.280664
2035	7.304734
2036	7.329316
2037	7.354417
2038	7.379578
2039	7.404800
2040	7.430084
2041	7.452060
2042	7.470709
2043	7.489384
2044	3.749364
2045	0.000000

4. School Building Retrofit

School Building Retrofit

Overview	
Name	School Building Retrofit
Abbr	4
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2024
Last Year	2045
Measure Length	22

Measure Life	
Permanent	☑

Fixture Cost per Device			
	Utility	Customer	Fix/Acct
INST	$5,000.00	$5,000.00	1

Administration Costs	
Method:	Percent
Markup Percentage	10%

Description

School retrofit measure wherein school receives funding to replace fixtures, upgrade irrigation systems, or take other water saving actions.

Customer Classes	SFR	MFR	COM	INST	AG	NP
	☐	☐	☐	☑	☐	☐

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

Comments

Will be a new measure.
• Utility Cost: $5,000 utility cost assumes replacement of high use toilets and some irrigation system improvement (where applicable).
• Admin Cost: Cost to reach out and set up audit
• Customer Cost: $5,000 customer will match the program to pay for retrofits.
• End Use Water Savings: Savings similar to CII survey and incentive measures combined.
• Targets: 9 schools total in the service area. 5 schools of decent size. Assumes that the schools will do repeat every 10 years.

Results	
Units	AF
Average Water Savings (afy)	
2.813556	
Lifetime Savings - Present Value ($)	
Utility	$124,860
Community	$210,480
Lifetime Costs - Present Value ($)	
Utility	$85,009
Community	$162,291
Benefit to Cost Ratio	
Utility	1.47
Community	1.30
Cost of Savings per Unit Volume ($/af)	
Utility	$1,259

End Use Savings Per Replacement		
Method:	Percent	
	% Savings/Acct	Avg GPD/Acct
INST Toilets	15.0%	71.7
INST Urinals	15.0%	16.9
INST Faucets	15.0%	13.0
INST Showers	15.0%	65.2
INST Dishwashers	15.0%	39.1
INST Clothes Washers	15.0%	91.3
INST Kitchen Spray Rinse	15.0%	78.2
INST Internal Leakage	15.0%	130.4
INST Other	15.0%	97.8
INST Irrigation	15.0%	714.6
INST Pools	15.0%	48.9
INST Cooling	15.0%	146.8
INST External Leakage	15.0%	68.5
INST Non-Lavatory/Kitchen Faucets	15.0%	48.2

Targets		
Target Method:	Count	
Targets/ Yr	1	

Costs

View: Summary

	Utility	Customer	Total
2022	$0	$0	$0
2023	$0	$0	$0
2024	$5,500	$5,000	$10,500
2025	$5,500	$5,000	$10,500
2026	$5,500	$5,000	$10,500
2027	$5,500	$5,000	$10,500
2028	$5,500	$5,000	$10,500
2029	$5,500	$5,000	$10,500
2030	$5,500	$5,000	$10,500
2031	$5,500	$5,000	$10,500
2032	$5,500	$5,000	$10,500
2033	$5,500	$5,000	$10,500
2034	$5,500	$5,000	$10,500
2035	$5,500	$5,000	$10,500
2036	$5,500	$5,000	$10,500
2037	$5,500	$5,000	$10,500
2038	$5,500	$5,000	$10,500
2039	$5,500	$5,000	$10,500
2040	$5,500	$5,000	$10,500
2041	$5,500	$5,000	$10,500
2042	$5,500	$5,000	$10,500
2043	$5,500	$5,000	$10,500
2044	$5,500	$5,000	$10,500
2045	$5,500	$5,000	$10,500

Targets

View: Accounts

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

Water Savings

Units: afy

	Total Savings (afy)
2022	0.000000
2023	0.000000
2024	0.271396
2025	0.540291
2026	0.809436
2027	1.077975
2028	1.345952
2029	1.613405
2030	1.880370
2031	2.146831
2032	2.412862
2033	2.678492
2034	2.943750
2035	3.208659
2036	3.473256
2037	3.737554
2038	4.001571
2039	4.265327
2040	4.528839
2041	4.792122
2042	5.055193
2043	5.318063
2044	5.580747
2045	5.843255

5. Indoor Appliances Rebate Program – Commercial/ Institutional

Indoor Appliances Rebate Program - Commercial/ Institutional

Overview	
Name	Indoor Appliances Rebate Progr
Abbr	5
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2023
Last Year	2032
Measure Length	10

Measure Life	
Permanent	☑

Fixture Cost per Device			
	Utility	Customer	Fix/Acct
COM	$2,000.00	$3,000.00	1
INST	$2,000.00	$3,000.00	1

Administration Costs	
Method:	Percent
Markup Percentage	3%

Description

Provide a rebate for the installation of high efficiency commercial appliances. It is assumed the rebates would remain consistent with relevant state and federal regulations (Department of Energy, Energy Star).

Customer Classes	SFR	MFR	COM	INST	AG	NP
	☐	☐	☑	☑	☐	☐

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

Comments

• Utility Cost: Up to $2,000 per site.
• Admin Cost: $40 per rebate processing per customer. Program will be administered by CalWEP staff. MWD would have additional costs to track and monitor the program.
• End Use Water Savings:
> Dishwashers: Per Energy Star, commercial dishwashers are 50% more water efficient than standard models. https://www.energystar.gov/products/commercial_dishwashers
> Clothes Washers: Water savings of 45% between conventional and Energy Star machines www.energystar.gov/products/commercial_clothes_washers
> Pre-Rinse Spray Valves: Assumes 1.15 gpm nozzles are replacing 2.5 gpm nozzles.
> Lavatory Faucets: Assumes 2.5 gpm faucets replaced with 0.5 gpm faucets.
> Showerheads: Assumes 2.5 gpm showerheads replaced with 1.8 gpm showerheads.
> Kitchen/Non-Lavatory faucets: Assumes 2.5 gpm faucets replaced with 1.0 gpm faucets.
• Targets: Approx. 6 accounts (or 2%) per year; except only 25% of that in 2023 since the program won't begin at the start of the year.

Results	
Units	AF
Average Water Savings (afy)	
7.575325	
Lifetime Savings - Present Value ($)	
Utility	$354,536
Community	$1,446,098
Lifetime Costs - Present Value ($)	
Utility	$89,814
Community	$221,248
Benefit to Cost Ratio	
Utility	3.95
Community	6.54
Cost of Savings per Unit Volume ($/af)	
Utility	$494

End Use Savings Per Replacement		
Method:	Percent	
	% Savings/Acct	Avg GPD/Acct
COM Faucets	80.0%	21.3
INST Faucets	80.0%	13.0
COM Showers	28.0%	80.0
INST Showers	28.0%	65.2
COM Dishwashers	50.0%	88.9
INST Dishwashers	50.0%	39.1
COM Clothes Washers	45.0%	133.3
INST Clothes Washers	45.0%	91.3
COM Kitchen Spray Rinse	54.0%	59.6
INST Kitchen Spray Rinse	54.0%	78.2
COM Non-Lavatory/Kitchen Faucets	60.0%	56.9
INST Non-Lavatory/Kitchen Faucets	60.0%	48.2

Targets	
Target Method:	Detailed
Enter Annual Targets Below	

Costs

View: Utility Detail

	Fixture Costs	Admin Costs	Util Total
2022	$0	$0	$0
2023	$2,731	$68	$2,800
2024	$10,925	$273	$11,198
2025	$11,068	$277	$11,345
2026	$11,134	$278	$11,412
2027	$11,200	$280	$11,480
2028	$11,265	$282	$11,547
2029	$11,331	$283	$11,614
2030	$11,397	$285	$11,682
2031	$11,476	$287	$11,763
2032	$11,556	$289	$11,844
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
2022	0	0	0
2023	1	1	1
2024	3	3	5
2025	3	3	6
2026	3	3	6
2027	3	3	6
2028	3	3	6
2029	3	3	6
2030	3	3	6
2031	3	3	6
2032	3	3	6
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)
2022	0.000000
2023	0.278677
2024	1.368250
2025	2.435000
2026	3.521501
2027	4.609304
2028	5.698983
2029	6.791057
2030	7.885998
2031	8.985676
2032	10.090376
2033	10.074801
2034	10.060547
2035	10.047514
2036	10.035455
2037	10.024426
2038	10.014350
2039	10.005154
2040	9.996774
2041	9.989230
2042	9.982387
2043	9.976192
2044	9.970596
2045	9.965553

6. Indoor Appliances Rebate Program – Residential

Indoor Appliances Rebate Program - Residential

Overview	
Name	Indoor Appliances Rebate Progr
Abbr	6
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2023
Last Year	2045
Measure Length	23

Measure Life	
Permanent	☑

Fixture Cost per Device	Utility	Customer	Fix/Acct
SFR	$200.00	$400.00	1
MFR	$200.00	$400.00	1

Administration Costs	
Method:	Percent
Markup Percentage	15%

Description

Provide a rebate for high efficiency appliances to single family homes and apartment complexes that have common laundry rooms. It is assumed the rebates would remain consistent with relevant state and federal regulations (Department of Energy, Energy Star).

Customer Classes	SFR	MFR	COM	INST	AG	NP
	☑	☑	☐	☐	☐	☐

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

Comments

• Utility Cost: Offer $200 per house for interior house conversion to more efficient devices.
• Admin Cost: $40 per rebate processing per customer run by CalWEP staff. MWD would have additional costs to track and monitor the program.
• Customer Cost: Average remaining cost for fixtures and installation.
• End Use Water Savings:
> Clothes Washers: 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 for MF units.
> Dishwashers: Assumes older units function at an estimated 7.5 gallons per cycle. When replaced with 5 gallons per cycle units, there is 33% savings.
> Lavatory Faucets: Assumes 2.5 gpm faucets replaced with 0.5 gpm faucets.
> Showerheads: Assumes 2.5 gpm showerheads replaced with 1.8 gpm showerheads.
> Kitchen/Non-Lavatory faucets: Assumes 2.5 gpm faucets replaced with 1.0 gpm faucets.
• Targets: assumes 2% of accounts would participate in rebate program; except only 25% of that in 2023 since the program won't begin at the start of the year.

Results	
Units	AF
Average Water Savings (afy)	
	3.225986
Lifetime Savings - Present Value ($)	
Utility	$144,942
Community	$379,594
Lifetime Costs - Present Value ($)	
Utility	$151,857
Community	$415,955
Benefit to Cost Ratio	
Utility	0.95
Community	0.91
Cost of Savings per Unit Volume ($/af)	
Utility	$1,961

End Use Savings Per Replacement		
Method:	Percent	
	% Savings/Acct	Avg GPD/Acct
SFR Dishwashers	33.0%	2.8
SFR Clothes Washers	25.0%	30.8
MFR Dishwashers	33.0%	9.9
MFR Clothes Washers	11.3%	136.1

Targets	
Target Method:	Detailed
Enter Annual Targets Below	

Costs

View: Utility Detai

	Fixture Costs	Admin Costs	Util Total
2022	$0	$0	$0
2023	$4,342	$651	$4,994
2024	$8,265	$1,240	$9,505
2025	$8,266	$1,240	$9,506
2026	$8,266	$1,240	$9,506
2027	$8,267	$1,240	$9,506
2028	$8,267	$1,240	$9,507
2029	$8,267	$1,240	$9,507
2030	$8,268	$1,240	$9,508
2031	$8,269	$1,240	$9,509
2032	$8,269	$1,240	$9,510
2033	$8,270	$1,241	$9,511
2034	$8,271	$1,241	$9,511
2035	$8,272	$1,241	$9,512
2036	$8,272	$1,241	$9,513
2037	$8,273	$1,241	$9,514
2038	$8,274	$1,241	$9,515
2039	$8,275	$1,241	$9,516
2040	$8,276	$1,241	$9,517
2041	$8,276	$1,241	$9,518
2042	$8,277	$1,242	$9,518
2043	$8,277	$1,242	$9,519
2044	$8,278	$1,242	$9,520
2045	$8,278	$1,242	$9,520

Targets

View: Accounts

	SFR	MFR	Total
2022	0	0	0
2023	21	0	22
2024	40	1	41
2025	40	1	41
2026	40	1	41
2027	40	1	41
2028	40	1	41
2029	40	1	41
2030	40	1	41
2031	40	1	41
2032	40	1	41
2033	40	1	41
2034	40	1	41
2035	40	1	41
2036	40	1	41
2037	40	1	41
2038	40	1	41
2039	40	1	41
2040	40	1	41
2041	40	1	41
2042	40	1	41
2043	40	1	41
2044	40	1	41
2045	40	1	41

Water Savings

Units: afy

	Total Savings (afy)
2022	0.000000
2023	0.195323
2024	0.526980
2025	0.803614
2026	1.115902
2027	1.423729
2028	1.727098
2029	2.026009
2030	2.320463
2031	2.611148
2032	2.897570
2033	3.179726
2034	3.457608
2035	3.731210
2036	4.000687
2037	4.265897
2038	4.526828
2039	4.783467
2040	5.035803
2041	5.282834
2042	5.525382
2043	5.763436
2044	5.996983
2045	6.225955

7. High Efficiency Toilet (HET) Rebates – Residential

High Efficiency Toilet (HET) Rebates - Residential

Overview	
Name	High Efficiency Toilet (HET) Reba
Abbr	7
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2023
Last Year	2032
Measure Length	10

Measure Life	
Permanent	☑

Fixture Cost per Device

	Utility	Customer	Fix/Acct
SFR	$100.00	$200.00	2
MFR	$100.00	$200.00	4

Administration Costs

Method:	Percent
Markup Percentage	22%

Description

Provide a rebate to single family residential and multifamily residential customers for the installation of high efficiency toilets and urinals (HET – Toilets flushing 1.28 gpf or less).

Customer Classes

	SFR	MFR	COM	INST	AG	NP
	☑	☑	☐	☐	☐	☐

End Uses

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

Comments

- Utility Cost: Rebate of $100/toilet, up to 2 toilets per SFR account. Assumes MFR accounts will have more toilets.
- Admin Cost: Time spent to run and track program. $40 per rebate processing per customer. Measure will be administered by CalWEP staff. MWD would have additional costs to track and monitor the program.
- Customer Cost: Remaining cost of fixture and installation.
- End Use Water Savings: Assumes 1.6 gpm toilets are replaced with 1.28 gpf or less.
- Targets: Assumes 2% of residential accounts will participate in the rebate measure per year; except only 25% of that in 2023 since the program won't begin at the start of the year.

Results

Units	AF
Average Water Savings (afy)	4.676600
Lifetime Savings - Present Value ($)	
Utility	$220,934
Community	$220,934
Lifetime Costs - Present Value ($)	
Utility	$168,874
Community	$445,717
Benefit to Cost Ratio	
Utility	1.31
Community	0.50
Cost of Savings per Unit Volume ($/af)	
Utility	$1,505

End Use Savings Per Replacement

Method:	Percent	
	% Savings/Acct	Avg GPD/Acct
SFR Toilets	20.0%	40.3
MFR Toilets	20.0%	201.3

Targets

Target Method:	Detailed
Enter Annual Targets Below	

Costs

View: Utility Detai

	Fixture Costs	Admin Costs	Util Total
2022	$0	$0	$0
2023	$4,409	$970	$5,378
2024	$17,634	$3,880	$21,514
2025	$17,671	$3,888	$21,559
2026	$17,699	$3,894	$21,593
2027	$17,727	$3,900	$21,627
2028	$17,755	$3,906	$21,661
2029	$17,782	$3,912	$21,695
2030	$17,810	$3,918	$21,729
2031	$17,861	$3,929	$21,790
2032	$17,912	$3,941	$21,853
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: Fixtures

	SFR	MFR	Total
2022	0	0	0
2023	43	1	44
2024	171	5	176
2025	171	5	177
2026	172	5	177
2027	172	5	177
2028	172	5	178
2029	172	5	178
2030	173	5	178
2031	173	5	179
2032	174	5	179
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)
2022	0.000000
2023	0.201522
2024	0.975467
2025	1.701658
2026	2.427917
2027	3.137043
2028	3.829984
2029	4.507641
2030	5.170867
2031	5.819605
2032	6.455823
2033	6.382244
2034	6.311044
2035	6.242127
2036	6.175122
2037	6.110243
2038	6.047404
2039	5.986522
2040	5.927517
2041	5.871473
2042	5.817063
2043	5.764222
2044	5.712888
2045	5.663000

8. High Efficiency Toilet (HET) and Urinal Rebates – Commercial/ Institutional

High Efficiency Toilet (HET) and Urinal Rebates - Commercial/ Institutional

Overview	
Name	High Efficiency Toilet (HET) and
Abbr	8
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2023
Last Year	2032
Measure Length	10

Measure Life	
Permanent	☑

Fixture Cost per Device			
	Utility	Customer	Fix/Acct
COM	$300.00	$400.00	4
INST	$300.00	$400.00	4

Administration Costs	
Method:	Percent
Markup Percentage	10%

Description

Provide a rebate to commercial and institutional customers for the installation of high efficiency toilets and urinals (HET) (Toilets flushing 1.28 gpf or less).

Customer Classes	SFR	MFR	COM	INST	AG	NP
	☐	☐	☑	☑	☐	☐

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

Comments

- Utility Cost: Rebate of $300/toilet and $300/urinal for fixture and installation. Assumes average CII account will replace 4 devices total.
- Admin Cost: $40 per rebate processing per customer. Measure will be administered by CalWEP staff. MWD would have additional costs to track and monitor the program.
- Customer Cost: Remaining cost of toilet and urinal.
- End Use Water Savings:
  > Toilets: Assumes 1.6 gpm toilets are replaced with 1.28 gpf or less.
  > Urinals: Assumes 0.5 gpf urinals replaced with 0.125 gpf or less.
- Targets: Target at least 4 accounts per year; except only 25% of that in 2023 since the program won't begin at the start of the year.

Results	
Units	AF
Average Water Savings (afy)	
	1.163276
Lifetime Savings - Present Value ($)	
Utility	$55,359
Community	$55,359
Lifetime Costs - Present Value ($)	
Utility	$57,831
Community	$127,930
Benefit to Cost Ratio	
Utility	0.96
Community	0.43
Cost of Savings per Unit Volume ($/af)	
Utility	$2,071

End Use Savings Per Replacement		
Method:	Percent	
	% Savings/Acct	Avg GPD/Acct
COM Toilets	20.0%	115.6
INST Toilets	20.0%	71.7
COM Urinals	75.0%	31.1
INST Urinals	75.0%	16.9

Targets	
Target Method:	Detailed
Enter Annual Targets Below	

Costs

View: Utility Detai

	Fixture Costs	Admin Costs	Util Total
2022	$0	$0	$0
2023	$1,639	$164	$1,803
2024	$6,555	$656	$7,211
2025	$6,641	$664	$7,305
2026	$6,680	$668	$7,348
2027	$6,720	$672	$7,392
2028	$6,759	$676	$7,435
2029	$6,799	$680	$7,479
2030	$6,838	$684	$7,522
2031	$6,886	$689	$7,574
2032	$6,933	$693	$7,627
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: Fixtures

	COM	INST	Total
2022	0	0	0
2023	3	3	5
2024	11	11	22
2025	11	11	22
2026	11	11	22
2027	11	11	22
2028	11	11	23
2029	11	11	23
2030	11	11	23
2031	12	11	23
2032	12	12	23
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)
2022	0.000000
2023	0.054312
2024	0.261481
2025	0.455794
2026	0.647466
2027	0.832382
2028	1.010795
2029	1.182949
2030	1.349075
2031	1.508595
2032	1.662628
2033	1.629443
2034	1.597242
2035	1.565989
2036	1.536280
2037	1.507466
2038	1.479518
2039	1.452405
2040	1.426098
2041	1.400311
2042	1.375295
2043	1.351024
2044	1.327472
2045	1.304615

9. Outdoor Water Audit

Outdoor Water Audit

Overview	
Name	Outdoor Water Audit
Abbr	9
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2022
Last Year	2045
Measure Length	24

Measure Life	
Permanent	☐
Years	10
Repeat	☐

Fixture Cost per Device

	Utility	Customer	Fix/Acct
SFR	$200.00	$200.00	1
MFR	$200.00	$200.00	1
COM	$200.00	$200.00	1
INST	$200.00	$200.00	1

Administration Costs

Method: Percent

Markup Percentage	10%

Description

Offer free outdoor water audits for existing customers who request a visit, or those with high water use and provide advice on how to save water. All accounts are eligible for free landscape water audits upon request.

Customer Classes

SFR	MFR	COM	INST	AG	NP
☑	☑	☑	☑	☐	☐

End Uses

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

Comments

Current Measure

• Utility Cost: Audits are conducted in house. Assume ~4 hours per appointment for all customer categories. Assumes staff time is ~$50/hour. The average cost for Large Water Use Landscape Audit: $200 per appointment. They take ~4 hours per appointment due to more area to cover.

• Admin Cost: staff time to schedule appointments and paperwork.

• Customer Cost: Cost to fix leaks and/or upgrade equipment. Assumes customer to utilize rebate program to cover additional upgrading costs. SFR has same cost as CII and MFR due to the size of the estates.

• End Use Water Savings: According MWD previous survey participant, water savings analysis using 1 year of data and using 84 sites saved an overall average of 24% of total account water use reduction. Audits are focused on outdoor water use so value is conservative on the irrigation and irrigation water leakage.

• Targets: Current MWD staff runs approx. 130 audits per year. Plan to keep this same level of auditing per year.

Results

Units: AF

Average Water Savings (afy)	
	107.863847
Lifetime Savings - Present Value ($)	
Utility	$5,147,922
Community	$5,147,922
Lifetime Costs - Present Value ($)	
Utility	$541,837
Community	$1,034,416
Benefit to Cost Ratio	
Utility	9.50
Community	4.98
Cost of Savings per Unit Volume ($/af)	
Utility	$209

End Use Savings Per Replacement

Method: Percent

	% Savings/Acct	Avg GPD/Acct
SFR Irrigation	24.0%	325.0
MFR Irrigation	24.0%	343.4
COM Irrigation	24.0%	541.1
INST Irrigation	24.0%	714.6
SFR External Leakage	5.0%	27.4
MFR External Leakage	5.0%	29.0
COM External Leakage	5.0%	48.6
INST External Leakage	5.0%	68.5

Targets

Target Method: Percentage

Targets/ Yr	3.000%
Only Affects New Accts	☐

Costs

View: Utility Detai

	Fixture Costs	Admin Costs	Util Total
2022	$27,540	$2,754	$30,294
2023	$27,616	$2,762	$30,378
2024	$27,692	$2,769	$30,462
2025	$27,769	$2,777	$30,546
2026	$27,820	$2,782	$30,602
2027	$27,870	$2,787	$30,657
2028	$27,921	$2,792	$30,713
2029	$27,972	$2,797	$30,770
2030	$28,023	$2,802	$30,826
2031	$28,110	$2,811	$30,921
2032	$28,197	$2,820	$31,017
2033	$28,285	$2,828	$31,113
2034	$28,372	$2,837	$31,209
2035	$28,460	$2,846	$31,306
2036	$28,552	$2,855	$31,408
2037	$28,645	$2,865	$31,510
2038	$28,738	$2,874	$31,612
2039	$28,832	$2,883	$31,715
2040	$28,925	$2,893	$31,818
2041	$28,991	$2,899	$31,890
2042	$29,057	$2,906	$31,963
2043	$29,123	$2,912	$32,036
2044	$29,189	$2,919	$32,108
2045	$29,256	$2,926	$32,181

Targets

View: Accounts

	SFR	MFR	COM	INST	Total
2022	128	2	4	4	138
2023	128	2	4	4	138
2024	128	2	4	4	138
2025	129	2	4	4	139
2026	129	2	4	4	139
2027	129	2	4	4	139
2028	129	2	4	4	140
2029	129	2	4	4	140
2030	130	2	4	4	140
2031	130	2	4	4	141
2032	130	2	4	4	141
2033	131	2	4	4	141
2034	131	2	4	4	142
2035	131	2	4	4	142
2036	132	2	4	4	143
2037	132	2	4	4	143
2038	133	2	4	5	144
2039	133	2	5	5	144
2040	133	2	5	5	145
2041	134	2	5	5	145
2042	134	2	5	5	145
2043	134	2	5	5	146
2044	135	2	5	5	146
2045	135	2	5	5	146

Water Savings

Units: afy

	Total Savings (afy)
2022	12.920524
2023	25.884217
2024	38.891131
2025	51.941317
2026	65.018323
2027	78.122176
2028	91.252905
2029	104.410538
2030	117.595105
2031	130.823444
2032	131.175126
2033	131.527600
2034	131.880912
2035	132.235105
2036	132.608416
2037	133.000927
2038	133.412723
2039	133.843887
2040	134.294503
2041	134.735500
2042	135.166831
2043	135.588450
2044	136.000310
2045	136.402365

10. Drip Irrigation Rebate

Drip Irrigation Rebate

Overview

Name	Drip Irrigation Rebate
Abbr	10
Category	Default
Measure Type	Standard Measure

Time Period

First Year	2023
Last Year	2029
Measure Length	7

Measure Life

Permanent ☑

Fixture Cost per Device

	Utility	Customer	Fix/Acct
SFR	$450.00	$825.00	1
MFR	$450.00	$825.00	1
COM	$450.00	$825.00	1
INST	$450.00	$825.00	1

Administration Costs

Method: Percent

Markup Percentage	7%

Description

Offer rebate for drip irrigation materials and installation.

Customer Classes

SFR	MFR	COM	INST	AG	NP
☑	☑	☑	☑	☐	☐

End Uses

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

Comments

- Utility Cost: Assumes $0.75/ft. rebated. Assumes approx. 600 feet of drip irrigation.
- Admin Cost: $40 per rebate processing per customer. Measure will be administered by CalWEP staff. MWD would have additional costs to track and monitor the program.
- Customer Cost: Remaining cost of drip irrigation. Assumes average cost (if DIY) is $1.00/sq ft, and ~$3.00/sq.ft. if using an installer. Assumes a mixture of both for all customer classes, therefore average total customer cost is $1.88/sq ft. Customer cost after rebate is $1.13/sq. ft. X 600 feet = $825
- End Use Water Savings: Drip/micro-irrigation have an efficiency of 80-95%, compared to landscape spray systems which ranges from 40-65% efficiency (Irrigation Association). Thus, switching from the latter to the former, water savings could be between 15-55%. It really depends on initial irrigation efficiency, but on average, drip saves 30-50% more water when compared to conventional sprinkler irrigation. Assume 30% savings to be conservative.
- Targets: Target 2% of accounts per year; except only 25% of that in 2023 since the program won't begin at the start of the year.

Results

Units: AF

Average Water Savings (afy)	
	30.337085
Lifetime Savings - Present Value ($)	
Utility	$1,450,813
Community	$1,450,813
Lifetime Costs - Present Value ($)	
Utility	$129,519
Community	$351,438
Benefit to Cost Ratio	
Utility	11.20
Community	4.13
Cost of Savings per Unit Volume ($/af)	
Utility	$178

End Use Savings Per Replacement

Method: Percent

	% Savings/Acct	Avg GPD/Acct
SFR Irrigation	30.0%	325.0
MFR Irrigation	30.0%	343.4
COM Irrigation	30.0%	541.1
INST Irrigation	30.0%	714.6

Targets

Target Method: Detailed

Enter Annual Targets Below

Costs

View: Utility Detai

	Fixture Costs	Admin Costs	Util Total
2022	$0	$0	$0
2023	$10,385	$727	$11,112
2024	$21,055	$1,474	$22,529
2025	$21,088	$1,476	$22,564
2026	$21,104	$1,477	$22,581
2027	$21,120	$1,478	$22,598
2028	$21,135	$1,479	$22,615
2029	$21,151	$1,481	$22,632
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

	SFR	MFR	COM	INST	Total
2022	0	0	0	0	0
2023	21	0	1	1	23
2024	40	1	3	3	47
2025	40	1	3	3	47
2026	40	1	3	3	47
2027	40	1	3	3	47
2028	40	1	3	3	47
2029	40	1	3	3	47
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)
2022	0.000000
2023	2.662461
2024	8.338131
2025	14.029482
2026	19.728113
2027	25.434023
2028	31.147213
2029	36.867683
2030	36.867683
2031	36.867683
2032	36.867683
2033	36.867683
2034	36.867683
2035	36.867683
2036	36.867683
2037	36.867683
2038	36.867683
2039	36.867683
2040	36.867683
2041	36.867683
2042	36.867683
2043	36.867683
2044	36.867683
2045	36.867683

11. Rain Barrel Incentive

Rain Barrel Incentive

Overview	
Name	Rain Barrel Incentive
Abbr	11
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2024
Last Year	2038
Measure Length	15

Measure Life	
Permanent	☐
Years	5
Repeat	☐

Fixture Cost per Device	Utility	Customer	Fix/Acct
SFR	$75.00	$35.00	4
MFR	$75.00	$35.00	4

Administration Costs	
Method:	Percent
Markup Percentage	15%

Description

Provide a rebate for installation of rain barrels that store rain water and offset irrigation use.

Customer Classes	SFR	MFR	COM	INST	AG	NP
	☑	☑	☐	☐	☐	☐

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

Comments

- Utility Cost: Utility will provide a $75 rebate for up to 4 rain barrels per customer.
- Admin Cost: $40 per rebate processing per customer. Program will be administered by CalWEP staff. MWD would have additional costs to track and monitor the program.
- Customer Cost: Remaining cost of rain barrel and supplies
- End Use Water Savings: Savings varies per tank size and landscape irrigation demand, system costs vary. 1% savings based on Maddaus rainwater harvesting calculator for 50 gallons barrel and average roof catchment for single family home. Estimated savings based on Santa Barbara CIMIS Station # 107 Evapotranspiration for November 2017 - October 2018 and precipitation data per 2000 - 2021 National Climate Data Center (NOAA) station number for USC00047902 - SANTA BARBARA, CA US
- Targets: Assume low participation

Results	
Units	AF
Average Water Savings (afy)	
	0.125504
Lifetime Savings - Present Value ($)	
Utility	$6,424
Community	$6,424
Lifetime Costs - Present Value ($)	
Utility	$43,957
Community	$61,795
Benefit to Cost Ratio	
Utility	0.15
Community	0.10
Cost of Savings per Unit Volume ($/af)	
Utility	$14,594

End Use Savings Per Replacement		
Method:	Percent	
	% Savings/Acct	Avg GPD/Acct
SFR Irrigation	1.0%	325.0
MFR Irrigation	1.0%	343.4

Targets	
Target Method:	Percentage
Targets/ Yr	0.250%
Only Affects New Accts	☐

Costs — View: Utility Detai

	Fixture Costs	Admin Costs	Util Total
2022	$0	$0	$0
2023	$0	$0	$0
2024	$3,257	$489	$3,745
2025	$3,264	$490	$3,753
2026	$3,269	$490	$3,759
2027	$3,274	$491	$3,765
2028	$3,279	$492	$3,771
2029	$3,284	$493	$3,777
2030	$3,289	$493	$3,783
2031	$3,299	$495	$3,793
2032	$3,308	$496	$3,804
2033	$3,317	$498	$3,815
2034	$3,327	$499	$3,826
2035	$3,336	$500	$3,837
2036	$3,347	$502	$3,849
2037	$3,357	$504	$3,860
2038	$3,367	$505	$3,872
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

	SFR	MFR	Total
2022	0	0	0
2023	0	0	0
2024	11	0	11
2025	11	0	11
2026	11	0	11
2027	11	0	11
2028	11	0	11
2029	11	0	11
2030	11	0	11
2031	11	0	11
2032	11	0	11
2033	11	0	11
2034	11	0	11
2035	11	0	11
2036	11	0	11
2037	11	0	11
2038	11	0	11
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)
2022	0.000000
2023	0.000000
2024	0.039576
2025	0.079236
2026	0.118957
2027	0.158741
2028	0.198587
2029	0.198920
2030	0.199232
2031	0.199595
2032	0.200010
2033	0.200478
2034	0.200998
2035	0.201571
2036	0.202154
2037	0.202748
2038	0.203352
2039	0.162923
2040	0.122379
2041	0.081711
2042	0.040918
2043	0.000000
2044	0.000000
2045	0.000000

12. Smart Irrigation Controller Rebates

Smart Irrigation Controller

Overview	
Name	Smart Irrigation Controller Rebates
Abbr	12
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2023
Last Year	2040
Measure Length	18

Measure Life	
Permanent	☐
Years	15
Repeat	☐

Fixture Cost per Device

	Utility	Customer	Fix/Acct
SFR	$200.00	$150.00	1
MFR	$500.00	$2,500.00	1
COM	$500.00	$2,500.00	1
INST	$500.00	$2,500.00	1

Administration Costs

Method: Percent

Markup Percentage	25%

Description

Provide a rebate for the purchase of a weather-based irrigation controller. These controllers have on-site weather sensors or rely on a signal from a central weather station that modifies irrigation times at least weekly. Requires local gardeners or irrigation contractors who are competent with these products, so may require sponsoring a training program in association with this measure.

Customer Classes

SFR	MFR	COM	INST	AG	NP
☑	☑	☑	☑	☐	☐

End Uses

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

Comments

- Utility Cost: Rebate amount
- Admin Cost: $40 per rebate processing per customer. Measure will be administered by CalWEP staff. MWD would have additional costs to track and monitor the program.
- Customer Cost: Remaining cost of irrigation controller and installation.

> Assumes residential controller is ~$350.
> Assumes commercial controller is ~$3,000.

- End Use Water Savings: Based on 2014 "Estimates of Savings Achievable from Irrigation Controller" study by A. Williams, H. Fuchs, and C. Whitehead from Environmental Energy Technologies Division of Lawrence Berkeley National Laboratory in Berkeley, CA.
- Targets: Assumes 0.5% of accounts participate; except only 25% of that in 2023 since the program won't begin at the start of the year.

Results

Units: AF

Average Water Savings (afy)	
12.415216	
Lifetime Savings - Present Value ($)	
Utility	$569,348
Community	$569,348
Lifetime Costs - Present Value ($)	
Utility	$85,067
Community	$185,159
Benefit to Cost Ratio	
Utility	6.69
Community	3.07
Cost of Savings per Unit Volume ($/af)	
Utility	$285

End Use Savings Per Replacement

Method: Percent

	% Savings/Acct	Avg GPD/Acct
SFR Irrigation	15.0%	325.0
MFR Irrigation	15.0%	343.4
COM Irrigation	15.0%	541.1
INST Irrigation	15.0%	714.6
SFR External Leakage	5.0%	27.4
MFR External Leakage	5.0%	29.0
COM External Leakage	5.0%	48.6
INST External Leakage	5.0%	68.5

Targets

Target Method: Detailed

Enter Annual Targets Below

Costs

View: Utility Detai

	Fixture Costs	Admin Costs	Util Total
2022	$0	$0	$0
2023	$1,281	$320	$1,601
2024	$5,125	$1,281	$6,406
2025	$5,143	$1,286	$6,429
2026	$5,154	$1,288	$6,442
2027	$5,165	$1,291	$6,456
2028	$5,176	$1,294	$6,470
2029	$5,187	$1,297	$6,484
2030	$5,198	$1,300	$6,498
2031	$5,216	$1,304	$6,520
2032	$5,234	$1,308	$6,542
2033	$5,252	$1,313	$6,565
2034	$5,270	$1,317	$6,587
2035	$5,287	$1,322	$6,609
2036	$5,306	$1,326	$6,632
2037	$5,324	$1,331	$6,655
2038	$5,343	$1,336	$6,679
2039	$5,361	$1,340	$6,702
2040	$5,380	$1,345	$6,725
2041	$0	$0	$0
2042	$0	$0	$0
2043	$0	$0	$0
2044	$0	$0	$0
2045	$0	$0	$0

Targets

View: Accounts

	SFR	MFR	COM	INST	Total
2022	0	0	0	0	0
2023	5	0	0	0	6
2024	21	0	1	1	23
2025	21	0	1	1	23
2026	21	0	1	1	23
2027	21	0	1	1	23
2028	22	0	1	1	23
2029	22	0	1	1	23
2030	22	0	1	1	23
2031	22	0	1	1	23
2032	22	0	1	1	23
2033	22	0	1	1	24
2034	22	0	1	1	24
2035	22	0	1	1	24
2036	22	0	1	1	24
2037	22	0	1	1	24
2038	22	0	1	1	24
2039	22	0	1	1	24
2040	22	0	1	1	24
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)
2022	0.000000
2023	0.342270
2024	1.711351
2025	3.084988
2026	4.461448
2027	5.840735
2028	7.222852
2029	8.607802
2030	9.995587
2031	11.387980
2032	12.784991
2033	14.186630
2034	15.592907
2035	17.003832
2036	18.419593
2037	19.840202
2038	20.923399
2039	20.984658
2040	21.046243
2041	19.669783
2042	18.290495
2043	16.908379
2044	15.523429
2045	14.135644

13. Water Budgeting/Monitoring at Parcel Level

Water Budgeting/ Monitoring at Parcel Level

Overview

Name	Water Budgeting/Monitoring at Parcel Lev
Abbr	13
Category	Default
Measure Type	Standard Measure

Time Period

First Year	2024
Last Year	2042
Measure Length	19

Measure Life

Permanent ☑

Fixture Cost per Device

	Utility	Customer	Fix/Acct
SFR	$1,050.00	$300.00	1
MFR	$1,050.00	$300.00	1
COM	$1,050.00	$300.00	1
INST	$1,050.00	$300.00	1

Administration Costs

Method: Percent

Markup Percentage	10%

Description

Develop parcel specific water budgets using aerial imagery for all customers. Perform ongoing monitoring for high use relative to water budgets, and issue targeted messaging for excessive use.

Customer Classes

SFR	MFR	COM	INST	AG	NP
☑	☑	☑	☑	☐	☐

End Uses

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

Comments

- Utility Cost: Estimated based on Montecito investing using AMI software, Google Earth, Google imagery, Aerial, GIS data. Follow-up with field verification.
- Admin Cost: Estimated staff time to run program and annual service fee - challenge with tree canopy and don't have dedicated irrigated meters. Also have hedge and gates.
- Customer Cost: Customer cost represents average cost to implement any water savings actions done by customers as a result of their budget.
- End Use Water Savings: Using variance program and Aurora program estimates on average customers are 15% over budget or "expected" water use. Assume targeted customers adjust to be within budget.
- Targets: Assumes 1% of accounts would be over budget and adjust their irrigation to be within budget.

Results

Units: AF

Average Water Savings (afy)	
	27.900088
Lifetime Savings - Present Value ($)	
Utility	$1,241,364
Community	$1,241,364
Lifetime Costs - Present Value ($)	
Utility	$755,778
Community	$952,084
Benefit to Cost Ratio	
Utility	1.64
Community	1.30
Cost of Savings per Unit Volume ($/af)	
Utility	$1,129

End Use Savings Per Replacement

Method: Percent

	% Savings/Acct	Avg GPD/Acct
SFR Irrigation	15.0%	325.0
MFR Irrigation	15.0%	343.4
COM Irrigation	15.0%	541.1
INST Irrigation	15.0%	714.6

Targets

Target Method: Percentage

Targets/ Yr	1.000%
Only Affects New Accts	☐

Costs

View: Utility Detai

	Fixture Costs	Admin Costs	Util Total
2022	$0	$0	$0
2023	$0	$0	$0
2024	$48,462	$4,846	$53,308
2025	$48,595	$4,860	$53,455
2026	$48,684	$4,868	$53,553
2027	$48,773	$4,877	$53,651
2028	$48,862	$4,886	$53,749
2029	$48,952	$4,895	$53,847
2030	$49,041	$4,904	$53,945
2031	$49,193	$4,919	$54,112
2032	$49,345	$4,935	$54,280
2033	$49,498	$4,950	$54,448
2034	$49,651	$4,965	$54,616
2035	$49,805	$4,980	$54,785
2036	$49,967	$4,997	$54,964
2037	$50,129	$5,013	$55,142
2038	$50,292	$5,029	$55,321
2039	$50,456	$5,046	$55,501
2040	$50,619	$5,062	$55,681
2041	$50,735	$5,073	$55,808
2042	$50,850	$5,085	$55,935
2043	$0	$0	$0
2044	$0	$0	$0
2045	$0	$0	$0

Targets

View: Accounts

	SFR	MFR	COM	INST	Total
2022	0	0	0	0	0
2023	0	0	0	0	0
2024	43	1	1	1	46
2025	43	1	1	1	46
2026	43	1	1	1	46
2027	43	1	1	1	46
2028	43	1	1	1	47
2029	43	1	1	1	47
2030	43	1	1	1	47
2031	43	1	1	1	47
2032	43	1	1	1	47
2033	44	1	1	1	47
2034	44	1	1	1	47
2035	44	1	1	1	47
2036	44	1	1	1	48
2037	44	1	1	1	48
2038	44	1	1	2	48
2039	44	1	2	2	48
2040	44	1	2	2	48
2041	45	1	2	2	48
2042	45	1	2	2	48
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)
2022	0.000000
2023	0.000000
2024	2.662461
2025	5.333775
2026	8.010576
2027	10.692870
2028	13.380664
2029	16.073963
2030	18.772772
2031	21.480539
2032	24.197284
2033	26.923025
2034	29.657782
2035	32.401575
2036	35.154769
2037	37.917387
2038	40.689452
2039	43.470987
2040	46.262016
2041	49.060032
2042	51.865047
2043	51.865047
2044	51.865047
2045	51.865047

14. Landscape Conversion/Improvements – Residential

Landscape Conversion/ Improvements - Residential

Overview	
Name	Landscape Conversion/Improve
Abbr	14
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2023
Last Year	2045
Measure Length	23

Measure Life	
Permanent	☑

Fixture Cost per Device

	Utility	Customer	Fix/Acct
SFR	$3,000.00	$2,650.00	1
MFR	$6,000.00	$5,000.00	1

Administration Costs

Method:	Percent
Markup Percentage	2%

Description

Provide a per square foot incentive to residential customers to remove turf and replace with low water use plants or permeable hardscape. Landscape conversion could include conversion of turf to low water using orchards or drought tolerant landscaping. Rebate based on per square foot removed.

Customer Classes

	SFR	MFR	COM	INST	AG	NP
	☑	☑	☐	☐	☐	☐

End Uses

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

Comments

• Utility Cost: Assume rebate of $2/sq. foot of turf removed for a no-water-using replacement surface. Or $1/sq foot if replacing turf with low-water using plants (this equates to approximately 25% of total project cost).
• Admin Cost: $40 per rebate processing per customer. Measure will be administered by CalWEP staff. MWD would have additional costs to track and monitor the program.
• Customer Cost: Remaining cost of project and installation.
• End Use Water Savings:
> 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%.
> Conservatively assuming 20% savings based on California estimates and SNWA research.
> Assume 5% leak savings due to equipment removal/upgrade/repair.
• Targets: Assumes 2% of accounts will participate; except only 25% of that in 2023 since the program won't begin at the start of the year.

Results

Units	AF
Average Water Savings (afy)	
	55.617551
Lifetime Savings - Present Value ($)	
Utility	$2,467,433
Community	$2,467,433
Lifetime Costs - Present Value ($)	
Utility	$3,403,864
Community	$6,359,802
Benefit to Cost Ratio	
Utility	0.72
Community	0.39
Cost of Savings per Unit Volume ($/af)	
Utility	$2,550

End Use Savings Per Replacement

Method:	Percent	
	% Savings/Acct	Avg GPD/Acct
SFR Irrigation	20.0%	325.0
MFR Irrigation	20.0%	343.4
SFR External Leakage	5.0%	27.4
MFR External Leakage	5.0%	29.0

Targets

Target Method:	Detailed
Enter Annual Targets Below	

Costs

View: Utility Detail

	Fixture Costs	Admin Costs	Util Total
2022	$0	$0	$0
2023	$66,128	$992	$67,120
2024	$187,953	$2,819	$190,773
2025	$187,970	$2,820	$190,790
2026	$202,983	$3,045	$206,027
2027	$202,995	$3,045	$206,040
2028	$218,008	$3,270	$221,278
2029	$218,020	$3,270	$221,291
2030	$218,033	$3,270	$221,303
2031	$218,056	$3,271	$221,327
2032	$218,079	$3,271	$221,350
2033	$218,102	$3,272	$221,373
2034	$218,125	$3,272	$221,397
2035	$218,148	$3,272	$221,420
2036	$218,173	$3,273	$221,446
2037	$218,198	$3,273	$221,471
2038	$218,223	$3,273	$221,496
2039	$218,248	$3,274	$221,522
2040	$218,274	$3,274	$221,548
2041	$218,290	$3,274	$221,565
2042	$218,307	$3,275	$221,582
2043	$218,324	$3,275	$221,599
2044	$218,340	$3,275	$221,616
2045	$218,357	$3,275	$221,633

Targets

View: Accounts

	SFR	MFR	Total
2022	0	0	0
2023	21	0	22
2024	60	1	61
2025	60	1	61
2026	65	1	66
2027	65	1	66
2028	70	1	71
2029	70	1	71
2030	70	1	71
2031	70	1	71
2032	70	1	71
2033	70	1	71
2034	70	1	71
2035	70	1	71
2036	70	1	71
2037	70	1	71
2038	70	1	71
2039	70	1	71
2040	70	1	71
2041	70	1	71
2042	70	1	71
2043	70	1	71
2044	70	1	71
2045	70	1	71

Water Savings

Units: afy

	Total Savings (afy)
2022	0.000000
2023	1.616417
2024	6.183768
2025	10.751338
2026	15.691001
2027	20.630828
2028	25.942748
2029	31.254832
2030	36.567081
2031	41.879630
2032	47.192480
2033	52.505632
2034	57.819085
2035	63.132843
2036	68.446927
2037	73.761340
2038	79.076082
2039	84.391154
2040	89.706557
2041	95.022178
2042	100.338018
2043	105.654077
2044	110.970356
2045	116.286854

15. Landscape Conversion/Improvements – Commercial/Institutional

Landscape Conversion/ Improvements - Commercial/ Institutional

Overview	
Name	Landscape Conversion/Improve
Abbr	15
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2023
Last Year	2045
Measure Length	23

Measure Life	
Permanent	☑

Fixture Cost per Device	Utility	Customer	Fix/Acct
COM	$6,000.00	$10,000.00	1
INST	$6,000.00	$10,000.00	1

Administration Costs	
Method:	Percent
Markup Percentage	3%

Description

Provide a per square foot incentive to commercial and institutional customers to remove turf and replace with low water use plants or permeable hardscape. Landscape conversion could include conversion of turf to low water using orchards or drought tolerant landscaping. Rebate based on per square foot removed.

Customer Classes	SFR	MFR	COM	INST	AG	NP
	☐	☐	☑	☑	☐	☐

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

Comments

• Utility Cost: Assume rebate of $1/sq. foot of turf removed (equates to approximately 25% of total project cost).
• Admin Cost: $40 per rebate processing per customer. Measure will be administered by CalWEP staff. MWD would have additional costs to track and monitor the program.
• Customer Cost: Remaining cost of project.
• End Use Water Savings:
> 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%.
> Assume a conservation estimate of 20% savings based on California estimates and SNWA research. Assume 5% leak savings due to equipment removal/upgrade/repair.
• Targets: Assumes 1% of accounts will participate; except only 25% of that in 2023 since the program won't begin at the start of the year.

Results	
Units	AF
Average Water Savings (afy)	
4.451494	
Lifetime Savings - Present Value ($)	
Utility	$197,416
Community	$197,416
Lifetime Costs - Present Value ($)	
Utility	$282,505
Community	$739,634
Benefit to Cost Ratio	
Utility	0.70
Community	0.27
Cost of Savings per Unit Volume ($/af)	
Utility	$2,644

End Use Savings Per Replacement		
Method:	Percent	
	% Savings/Acct	Avg GPD/Acct
COM Irrigation	20.0%	541.1
INST Irrigation	20.0%	714.6
COM External Leakage	5.0%	48.6
INST External Leakage	5.0%	68.5

Targets	
Target Method:	Detailed
Enter Annual Targets Below	

Costs

View: Utility Detai

	Fixture Costs	Admin Costs	Util Total
2022	$0	$0	$0
2023	$4,097	$123	$4,220
2024	$16,388	$492	$16,880
2025	$16,602	$498	$17,100
2026	$16,701	$501	$17,202
2027	$16,799	$504	$17,303
2028	$16,898	$507	$17,405
2029	$16,997	$510	$17,507
2030	$17,095	$513	$17,608
2031	$17,214	$516	$17,731
2032	$17,333	$520	$17,853
2033	$17,452	$524	$17,976
2034	$17,571	$527	$18,098
2035	$17,690	$531	$18,221
2036	$17,798	$534	$18,332
2037	$17,906	$537	$18,443
2038	$18,014	$540	$18,554
2039	$18,122	$544	$18,665
2040	$18,230	$547	$18,777
2041	$18,343	$550	$18,893
2042	$18,455	$554	$19,009
2043	$18,568	$557	$19,125
2044	$18,681	$560	$19,241
2045	$18,793	$564	$19,357

Targets

View: Accounts

	COM	INST	Total
2022	0	0	0
2023	0	0	1
2024	1	1	3
2025	1	1	3
2026	1	1	3
2027	1	1	3
2028	1	1	3
2029	1	1	3
2030	1	1	3
2031	1	1	3
2032	1	1	3
2033	1	1	3
2034	1	1	3
2035	1	1	3
2036	1	1	3
2037	1	1	3
2038	1	2	3
2039	2	2	3
2040	2	2	3
2041	2	2	3
2042	2	2	3
2043	2	2	3
2044	2	2	3
2045	2	2	3

Water Savings

Units: afy

	Total Savings (afy)
2022	0.000000
2023	0.098203
2024	0.491017
2025	0.889070
2026	1.289525
2027	1.692381
2028	2.097637
2029	2.505295
2030	2.915354
2031	3.328311
2032	3.744164
2033	4.162914
2034	4.584562
2035	5.009107
2036	5.436305
2037	5.866157
2038	6.298664
2039	6.733824
2040	7.171638
2041	7.612204
2042	8.055523
2043	8.501593
2044	8.950417
2045	9.401992

16. Community Outreach and Education

Community Outreach and Education (new customer packet, waterwise landscape award for commercial customers)

Overview	
Name	Community Outreach and Educa
Abbr	16
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2022
Last Year	2045
Measure Length	24

Measure Life	
Permanent	☐
Years	2
Repeat	☐

Fixture Cost per Device

	Utility	Customer	Fix/Acct
SFR	$10.00	$0.00	1
MFR	$10.00	$0.00	1

Administration Costs

Method: Percent

Markup Percentage	25%

Description

Provide a packet of water saving tips and programs to new customers when they apply for an account at the District.
Sponsor an annual awards program for businesses or multifamily residences that significantly reduce water use. They would receive a plaque/recognition.

Customer Classes

SFR	MFR	COM	INST	AG	NP
☑	☑	☐	☐	☐	☐

End Uses

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

Comments

Current Measure
• Utility Cost: Approx budget $20k per year for packet materials and waterwise landscape awards.
• Admin Cost: Time for staff to table, do out reach, attend events, etc.
• Customer Cost: No costs to customers. Assumes customers would partake in other rebate programs.
• End Use Water Savings: Assume minimal savings on all end uses due to behavioral changes.
• Targets: Target 50% of population every other year, therefore 100% of population is reached every 2 years.

Results

Units: AF

Average Water Savings (mgd)	
0.007780	
Lifetime Savings - Present Value ($)	
Utility	$442,334
Community	$548,382
Lifetime Costs - Present Value ($)	
Utility	$481,649
Community	$481,649
Benefit to Cost Ratio	
Utility	0.92
Community	1.14
Cost of Savings per Unit Volume ($/mg)	
Utility	$7,062

End Use Savings Per Replacement

Method: Percent

	% Savings/Acct	Avg GPD/Acct
SFR Toilets	0.3%	40.3
MFR Toilets	0.3%	201.3
SFR Faucets	0.3%	7.8
MFR Faucets	0.3%	55.1
SFR Showers	0.3%	44.8
MFR Showers	0.3%	157.4
SFR Dishwashers	0.3%	2.8
MFR Dishwashers	0.3%	9.9
SFR Clothes Washers	0.3%	30.8
MFR Clothes Washers	0.3%	136.1
SFR Internal Leakage	0.3%	40.3
MFR Internal Leakage	0.3%	112.0
SFR Baths	0.3%	6.2
MFR Baths	0.3%	21.3
SFR Other	0.3%	28.5
MFR Other	0.3%	35.4
SFR Irrigation	0.3%	325.0
MFR Irrigation	0.3%	343.4
SFR Pools	0.3%	7.8
MFR Pools	0.3%	8.3
SFR Wash Down	0.3%	15.7
MFR Wash Down	0.3%	16.5
SFR Car Washing	0.3%	15.7
MFR Car Washing	0.3%	16.5
SFR External Leakage	0.3%	27.4
MFR External Leakage	0.3%	29.0
SFR Non-Lavatory/Kitchen Faucets	0.3%	35.6
MFR Non-Lavatory/Kitchen Faucets	0.3%	102.3

Targets

Target Method:	Percentage
Targets/ Yr	50.000%
Only Affects New Accts	☐

Costs

View: Utility Detai

	Fixture Costs	Admin Costs	Util Total
2022	$21,620	$5,405	$27,025
2023	$21,666	$5,416	$27,082
2024	$21,711	$5,428	$27,139
2025	$21,757	$5,439	$27,196
2026	$21,791	$5,448	$27,239
2027	$21,825	$5,456	$27,282
2028	$21,860	$5,465	$27,325
2029	$21,894	$5,473	$27,367
2030	$21,928	$5,482	$27,410
2031	$21,991	$5,498	$27,488
2032	$22,053	$5,513	$27,567
2033	$22,116	$5,529	$27,645
2034	$22,179	$5,545	$27,724
2035	$22,242	$5,561	$27,803
2036	$22,311	$5,578	$27,888
2037	$22,379	$5,595	$27,974
2038	$22,448	$5,612	$28,059
2039	$22,516	$5,629	$28,145
2040	$22,585	$5,646	$28,232
2041	$22,631	$5,658	$28,289
2042	$22,676	$5,669	$28,345
2043	$22,722	$5,681	$28,403
2044	$22,768	$5,692	$28,460
2045	$22,814	$5,703	$28,517

Targets

View: Accounts

	SFR	MFR	Total
2022	2,129	33	2,162
2023	2,133	33	2,167
2024	2,138	33	2,171
2025	2,143	33	2,176
2026	2,146	33	2,179
2027	2,149	33	2,183
2028	2,153	33	2,186
2029	2,156	33	2,189
2030	2,159	33	2,193
2031	2,165	34	2,199
2032	2,172	34	2,205
2033	2,178	34	2,212
2034	2,184	34	2,218
2035	2,190	34	2,224
2036	2,197	34	2,231
2037	2,204	34	2,238
2038	2,210	34	2,245
2039	2,217	34	2,252
2040	2,224	34	2,259
2041	2,229	35	2,263
2042	2,233	35	2,268
2043	2,238	35	2,272
2044	2,242	35	2,277
2045	2,247	35	2,281

Water Savings

Units: afy

	Total Savings (mgd)
2022	0.004139
2023	0.008147
2024	0.008037
2025	0.007937
2026	0.007926
2027	0.007914
2028	0.007903
2029	0.007894
2030	0.007885
2031	0.007883
2032	0.007887
2033	0.007891
2034	0.007897
2035	0.007903
2036	0.007911
2037	0.007920
2038	0.007930
2039	0.007940
2040	0.007951
2041	0.007959
2042	0.007962
2043	0.007966
2044	0.007971
2045	0.007976

17. Demonstration Garden

Demonstration Garden

Overview	
Name	Demonstration Garden: Low / N
Abbr	17
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2022
Last Year	2031
Measure Length	10

Measure Life	
Permanent	☐
Years	20
Repeat	☐

Fixture Cost per Device

	Utility	Customer	Fix/Acct
SFR	$2,000.00	$100.00	1
MFR	$2,000.00	$100.00	1

Administration Costs

Method: Percent

Markup Percentage	5%

Description

Create a demonstration garden at the District office displaying living examples of low water-using gardens and landscaping, costs of plants, amount of water use per plant, etc. The District would provide signs and brochures to educate those people visiting the garden.

Customer Classes

SFR	MFR	COM	INST	AG	NP
☑	☑	☐	☐	☐	☐

End Uses

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

Comments

Current Measure

- Utility Cost: $20k to update Demo Garden contracted out and recommend to use Firescaping plant list. Fire Department involvement is encouraged when replacing the plantings to be Montecito and Firescaping friendly for the local area.
- Admin Cost: minimal admin time
- Customer Cost: assumes some cost to update landscaping.
- End Use Water Savings: Savings represent irrigation savings for those participants who take action by replacing turf with xeriscape or replacing irrigation equipment. Conservative value as it is an estimate on who would be inspired.
- Targets: Assume 0.25% of accounts will go to demo garden and make changes in their own yard.
- Measure Life: longer measure life because need a shorter time period so the utiltiy cost can occur in the near term, but still get some savings from folks.

Results

Units: AF

Average Water Savings (afy)	
	9.186966
Lifetime Savings - Present Value ($)	
Utility	$445,068
Community	$445,068
Lifetime Costs - Present Value ($)	
Utility	$200,985
Community	$210,556
Benefit to Cost Ratio	
Utility	2.21
Community	2.11
Cost of Savings per Unit Volume ($/af)	
Utility	$912

End Use Savings Per Replacement

Method: Percent

	% Savings/Acct	Avg GPD/Acct
SFR Irrigation	30.0%	325.0
MFR Irrigation	30.0%	343.4

Targets

Target Method: Percentage

Targets/ Yr	0.250%
Only Affects New Accts	☐

Costs

View: Summary

	Utility	Customer	Total
2022	$22,701	$1,081	$23,782
2023	$22,749	$1,083	$23,832
2024	$22,797	$1,086	$23,883
2025	$22,845	$1,088	$23,933
2026	$22,881	$1,090	$23,970
2027	$22,917	$1,091	$24,008
2028	$22,953	$1,093	$24,046
2029	$22,989	$1,095	$24,083
2030	$23,025	$1,096	$24,121
2031	$23,090	$1,100	$24,190
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

	SFR	MFR	Total
2022	11	0	11
2023	11	0	11
2024	11	0	11
2025	11	0	11
2026	11	0	11
2027	11	0	11
2028	11	0	11
2029	11	0	11
2030	11	0	11
2031	11	0	11
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)
2022	1.182284
2023	2.367063
2024	3.554343
2025	4.744129
2026	5.935779
2027	7.129295
2028	8.324682
2029	9.521941
2030	10.721076
2031	11.923628
2032	11.923628
2033	11.923628
2034	11.923628
2035	11.923628
2036	11.923628
2037	11.923628
2038	11.923628
2039	11.923628
2040	11.923628
2041	11.923628
2042	10.741345
2043	9.556565
2044	8.369285
2045	7.179499

18. Commercial/Institutional Audit Program

mmercial/
titutional
t Program

Overview	
Name	Commercial/Institutional Audit
Abbr	18
Ca	Default
Measur	Standard Measure

Time Period	
First Year	2023
Last Year	2045
Measure Length	23

Measure Life	
Perm nent	
Years	10
R peat	

Fixture Cost per Device	Utility	Customer	Fix/Acct
COM	$1,500.00	$500.00	1
INST	$1,500.00	$500.00	1

Administration Costs	
thod: Percent	
Markup Percentage	10%

Description

All CII customers would be offered a free water audit that would evaluate ways for the business to save water and money.

Customer Classes	SFR	MFR	COM	INST	AG	NP
	☐	☑	☑	☐	☐	

End Uses	SFR	MFR	COM	INST	AG	NP
Toilets	☑	☑				
Urinals	☑	☑				
Faucets	☑	☑				
Show ers	☑	☑				
Dishw ashers	☑	☑				
Clothes Washers	☑	☑				
Process	☑					
Kitchen Spray Rinse	☑	☑				
Internal Leakage	☑	☑				
Baths						
Other	☑	☑				
Irrigation	☐	☐				
Pools		☐				
Wash Down						
Cooling	☑	☑				
Car Washing						
External Leakage	☐	☐				
Outdoor						
Non-Lavatory/Kitchen Faucets	☑	☑				

Comments

Current Measure

- Utility Cost: Survey cost is ~$300-$1,000 in-house staff or $2,000-$10,000 if contracted out. Utility cost is 2-3 hours staff time for survey + 2-3 additional hours for scheduling, post survey report, and follow up. Assumes $50/hour. Assumes 2 staff per survey.
- Admin Cost: Additional time for outreach and program tracking.
- Customer Cost: reflects cost/time to install fixtures and address survey recommendations. Assumes customer would participate in other rebate programs.
- End Use Water Savings: BAWSCA Phase 1 study on Making Conservation a California Way of Life found savings of 10-15% per site. Cooling systems will be evaluated in surveys. Assume 15% per site
- Targets: Target around 15 accounts per year

Results	
Units	AF
Average Water Savings (afy)	
15.838861	
Lifetime Savings - Present Value ($)	
Utility	$743,439
Community	$1,815,168
Lifetime Costs - Present Value ($)	
Utility	$393,252
Community	$512,419
Benefit to Cost Ratio	
Utility	1.89
Community	3.54
Cost of Savings per Unit Volume ($/af)	
Utility	$1,035

End Use Savings Per Replacement

thod: Percent

	% Savings/Acct	Avg GPD/Acct
COM Toilets	15.0%	115.6
INST Toilets	15.0%	71.7
COM Urinals	15.0%	31.1
INST Urinals	15.0%	16.9
COM Faucets	15.0%	21.3
INST Faucets	15.0%	13.0
COM Showers	15.0%	80.0
INST Showers	15.0%	65.2
COM Dishwashers	15.0%	88.9
INST Dishwashers	15.0%	39.1
COM Clothes Washers	15.0%	133.3
INST Clothes Washers	15.0%	91.3
COM Process	15.0%	124.5
COM Kitchen Spray Rinse	15.0%	59.6
INST Kitchen Spray Rinse	15.0%	78.2
COM Internal Leakage	15.0%	88.9
INST Internal Leakage	15.0%	130.4
COM Other	15.0%	88.9
INST Other	15.0%	97.8
COM Cooling	15.0%	104.1
INST Cooling	15.0%	146.8
COM Non-Lavatory/Kitchen Faucets	15.0%	56.9
INST Non-Lavatory/Kitchen Faucets	15.0%	48.2

Targets	
et Method:	Percentage
Targets/ Yr	5.000%
Only Affects New cts	☐

Costs

View: Utility Detai

	Fixture Costs	Admin Costs	Util Total
2022	$0	$0	$0
2023	$20,217	$2,022	$22,239
2024	$20,485	$2,048	$22,533
2025	$20,752	$2,075	$22,828
2026	$20,876	$2,088	$22,963
2027	$20,999	$2,100	$23,099
2028	$21,123	$2,112	$23,235
2029	$21,246	$2,125	$23,371
2030	$21,369	$2,137	$23,506
2031	$21,518	$2,152	$23,670
2032	$21,667	$2,167	$23,833
2033	$21,815	$2,182	$23,997
2034	$21,964	$2,196	$24,160
2035	$22,112	$2,211	$24,324
2036	$22,247	$2,225	$24,472
2037	$22,382	$2,238	$24,621
2038	$22,517	$2,252	$24,769
2039	$22,652	$2,265	$24,917
2040	$22,787	$2,279	$25,066
2041	$22,928	$2,293	$25,221
2042	$23,069	$2,307	$25,376
2043	$23,210	$2,321	$25,531
2044	$23,351	$2,335	$25,686
2045	$23,492	$2,349	$25,841

Targets

ew Accounts

	COM	INST	Total
2022	0	0	0
2023	7	7	13
2024	7	7	14
2025	7	7	14
2026	7	7	14
2027	7	7	14
2028	7	7	14
2029	7	7	14
2030	7	7	14
2031	7	7	14
2032	7	7	14
2033	7	7	15
2034	7	7	15
2035	7	7	15
2036	7	7	15
2037	7	7	15
2038	7	8	15
2039	8	8	15
2040	8	8	15
2041	8	8	15
2042	8	8	15
2043	8	8	15
2044	8	8	16
2045	8	8	16

Water Savings

its afy

	Total Savings (afy)
2022	0.000000
2023	2.010373
2024	4.004236
2025	5.984824
2026	7.993805
2027	10.004007
2028	12.016035
2029	14.030451
2030	16.047777
2031	18.069979
2032	20.098274
2033	20.203733
2034	20.299356
2035	20.385147
2036	20.473644
2037	20.564238
2038	20.656870
2039	20.751485
2040	20.848033
2041	20.944544
2042	21.041212
2043	21.137998
2044	21.234865
2045	21.331781

19. Water Budget-Based Billing

Water Budget-Based Billing

Overview	
Name	Water Budget-Based Billing
Abbr	19
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2028
Last Year	2042
Measure Length	15

Measure Life	
Permanent	☐
Years	5
Repeat	☐

Fixture Cost per Device

	Utility	Customer	Fix/Acct
SFR	$240.00	$500.00	1
MFR	$240.00	$500.00	1
COM	$240.00	$1,000.00	1
INST	$240.00	$1,000.00	1

Administration Costs

Method: Percent

Markup Percentage	15%

Description

Assume all customer categories would be on water-budget based billing. This measure would incentivize water used below the parcel budget and disincentivize water used in excess of the parcel budget. This measure would require a Proposition 218 rate setting process.

Customer Classes

SFR	MFR	COM	INST	AG	NP
☑	☑	☑	☑	☐	☐

End Uses

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

Comments

- Utility Cost: Would work with a rate consultant to get this program set up - minimum of $50,000 for a rate study. Set up $50k to happen over period. Also cost to work with IT and Finance to make water budgets current with any recent changes in accounts.
- Admin Cost: Cost for MWD staff to updated information and water budgets as needed based on landscape changes.
- Customer Cost: Customer would make changes on their property to lower their water use on site.
- End Use Water Savings: Assume savings of 10% of irrigation water use.
- Targets: Assume only 3% of accounts make adjustments to their irrigation as a result of being above their water budget.

Results

Units: AF

Average Water Savings (afy)	
	16.921322
Lifetime Savings - Present Value ($)	
Utility	$771,418
Community	$771,418
Lifetime Costs - Present Value ($)	
Utility	$403,472
Community	$1,179,688
Benefit to Cost Ratio	
Utility	1.91
Community	0.65
Cost of Savings per Unit Volume ($/af)	
Utility	$993

End Use Savings Per Replacement

Method: Percent

	% Savings/Acct	Avg GPD/Acct
SFR Irrigation	10.0%	325.0
MFR Irrigation	10.0%	343.4
COM Irrigation	10.0%	541.1
INST Irrigation	10.0%	714.6

Targets

Target Method: Percentage

Targets/ Yr	3.000%
Only Affects New Accts	☐

Costs

View: Utility Detail

	Fixture Costs	Admin Costs	Util Total
2022	$0	$0	$0
2023	$0	$0	$0
2024	$0	$0	$0
2025	$0	$0	$0
2026	$0	$0	$0
2027	$0	$0	$0
2028	$33,506	$5,026	$38,531
2029	$33,567	$5,035	$38,602
2030	$33,628	$5,044	$38,672
2031	$33,732	$5,060	$38,792
2032	$33,837	$5,076	$38,912
2033	$33,942	$5,091	$39,033
2034	$34,047	$5,107	$39,154
2035	$34,152	$5,123	$39,275
2036	$34,263	$5,139	$39,402
2037	$34,374	$5,156	$39,531
2038	$34,486	$5,173	$39,659
2039	$34,598	$5,190	$39,788
2040	$34,710	$5,207	$39,917
2041	$34,789	$5,218	$40,008
2042	$34,869	$5,230	$40,099
2043	$0	$0	$0
2044	$0	$0	$0
2045	$0	$0	$0

Targets

View: Accounts

	SFR	MFR	COM	INST	Total
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	129	2	4	4	140
2029	129	2	4	4	140
2030	130	2	4	4	140
2031	130	2	4	4	141
2032	130	2	4	4	141
2033	131	2	4	4	141
2034	131	2	4	4	142
2035	131	2	4	4	142
2036	132	2	4	4	143
2037	132	2	4	4	143
2038	133	2	4	5	144
2039	133	2	5	5	144
2040	133	2	5	5	145
2041	134	2	5	5	145
2042	134	2	5	5	145
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)
2022	0.000000
2023	0.000000
2024	0.000000
2025	0.000000
2026	0.000000
2027	0.000000
2028	5.375587
2029	10.762184
2030	16.159804
2031	21.575338
2032	27.008827
2033	27.084721
2034	27.167638
2035	27.257605
2036	27.348459
2037	27.440207
2038	27.532855
2039	27.626411
2040	27.720882
2041	27.810526
2042	27.895320
2043	22.351189
2044	16.788119
2045	11.206063

20. Grey Water System Rebates

Grey Water System Rebates

Overview	
Name	Grey Water System Rebates
Abbr	20
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2025
Last Year	2038
Measure Length	14

Measure Life	
Permanent	☐
Years	10
Repeat	☐

Fixture Cost per Device	Utility	Customer	Fix/Acct
SFR	$300.00	$600.00	1

Administration Costs	
Method:	Percent
Markup Percentage	15%

Description

Offer a rebate for a laundry-to-landscape program. Requires local plumbers or homeowners who are competent, so may require sponsoring a training program in association with this measure.

Customer Classes	SFR	MFR	COM	INST	AG	NP
	☑	☐	☐	☐	☐	☐

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

Comments

- Utility Cost: Assume $300/system rebate amount
- Admin Cost: $40 per rebate processing per customer. Program will be administered by CalWEP staff. MWD would have additional costs to track and monitor the program.
- Customer Cost: Remaining cost of device and install.
- End Use Water Savings: Per 2013 Grey Water Action survey, annual average household savings is 14,565 gallons. The average per capita daily savings was 17 gallons per day (gpcd) (https://greywateraction.org/wp-content/uploads/2014/12/GW_Study_revised-2013.pdf).
- Targets: Assumes small number of participants.

Results	
Units	AF
Average Water Savings (afy)	0.472316
Lifetime Savings - Present Value ($)	
Utility	$22,291
Community	$22,291
Lifetime Costs - Present Value ($)	
Utility	$15,924
Community	$43,619
Benefit to Cost Ratio	
Utility	1.40
Community	0.51
Cost of Savings per Unit Volume ($/af)	
Utility	$1,405

End Use Savings Per Replacement		
Method:	Fixed	
	Savings GPD/Acct	Avg GPD/Acct
SFR Irrigation	17.0	325.0

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

Costs — View: Utility Detai

	Fixture Costs	Admin Costs	Util Total
2022	$0	$0	$0
2023	$0	$0	$0
2024	$0	$0	$0
2025	$1,286	$193	$1,478
2026	$1,288	$193	$1,481
2027	$1,290	$193	$1,483
2028	$1,292	$194	$1,485
2029	$1,294	$194	$1,488
2030	$1,296	$194	$1,490
2031	$1,299	$195	$1,494
2032	$1,303	$195	$1,498
2033	$1,307	$196	$1,503
2034	$1,310	$197	$1,507
2035	$1,314	$197	$1,511
2036	$1,318	$198	$1,516
2037	$1,322	$198	$1,521
2038	$1,326	$199	$1,525
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

	SFR	Total
2022	0	0
2023	0	0
2024	0	0
2025	4	4
2026	4	4
2027	4	4
2028	4	4
2029	4	4
2030	4	4
2031	4	4
2032	4	4
2033	4	4
2034	4	4
2035	4	4
2036	4	4
2037	4	4
2038	4	4
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)
2022	0.000000
2023	0.000000
2024	0.000000
2025	0.081653
2026	0.163434
2027	0.245343
2028	0.327380
2029	0.409546
2030	0.491841
2031	0.574370
2032	0.657135
2033	0.740135
2034	0.823371
2035	0.825192
2036	0.827141
2037	0.829218
2038	0.831425
2039	0.749259
2040	0.666964
2041	0.584435
2042	0.501671
2043	0.418671
2044	0.335434
2045	0.251960