



2013

ORANGE COUNTY WATER USE EFFICIENCY MASTER PLAN





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List of Acronyms

| | |
|-------|-----------------------------------------------|
| AF | Acre Feet |
| AWE | Alliance for Water Efficiency |
| BMP | Best Management Practice |
| CII | Commercial, Industrial, and Institutional |
| CUWCC | California Urban Water Conservation Council |
| GPCD | Gallons per Capita Daily |
| GPM | Gallon per Minute |
| HE | High Efficiency |
| HECW | High Efficiency Clothes Washer |
| HOA | Home Owners Association |
| HVAC | Heating, Ventilation, and Air Conditioning |
| MOU | Memorandum of Understanding |
| MS4 | Municipal Separate Storm Sewer System |
| MWDOC | Municipal Water District of Orange County |
| NAICS | North American Industry Classification System |
| RES | Residential |
| UWMP | Urban Water Management Plan |
| ULF | Ultra Low Flush |
| WF | Water Factor |
| WUE | Water Use Efficiency |



Executive Summary

The Municipal Water District of Orange County (MWDOC) is the primary wholesale water facilitator and resource planning agency for Orange County. While individual agencies retain overall responsibility for their individual resource planning and water supply investments, MWDOC works closely with client agencies and Metropolitan to secure overall improvements to Orange County's water resources and dependability.

Local water supplies meet nearly half of Orange County's total water demand. To meet the remaining demand, MWDOC purchases imported water from Northern California and the Colorado River through the Metropolitan Water District of Southern California (Metropolitan). As a Metropolitan member agency, MWDOC delivers imported water to its 28 member agencies, which provide retail water services to the public.

MWDOC has developed this Water Use Efficiency (WUE) Master Plan in coordination with its member agencies, the cities of Anaheim, Fullerton and Santa Ana, Metropolitan, and other stakeholders in support of its mission to provide a reliable and efficient supply of water for its customers. In addition, Senate Bill SBx7-7 (approved in November 2009) requires all urban retail suppliers to reduce per capita water use by 20 percent by 2020 (and an interim target of 10 percent by 2015). This law contains consequences for urban retail suppliers who do not meet the mandated target:

- Conditions eligibility for state water grants and loans on compliance as of January 1, 2016.
- Failure to meet targets establishes a violation of law for administrative or judicial proceedings after January 1, 2021.

The purpose of the MWDOC Water Use Efficiency (WUE) Master Plan is to:

- Create a strategy and set forth a blueprint to meet water demand reduction targets.
- Deliver customized tools required to track performance and to adapt to changing circumstances.

The MWDOC WUE Master Plan is organized by the following chapters.

Chapter 1 Overview and Strategy. The goals and objectives of this WUE Master Plan includes program and marketing strategies uniquely adapted to MWDOC to effectively reach the ultimate end-users of water:

1. Deliver Regionally Cost-Effective Water Use Efficiency Programs.
2. Achieve Countywide Implementation of Metropolitan's Integrated Resources Plan (IRP).
3. Achieve 20% or More Reduction in Per Capita Water Use by 2020.
4. Pursue Innovation in Water Use Efficiency in Orange County.
5. Transform Public Perception of the Value of Water.



6. Support Local Agency Water Use Efficiency Planning and Implementation.

Chapter 2 Planning Process. Working in partnership with MWDOC, the research team gathered and organized data from member agencies and a wide range of other sources. With the data, the Master Plan summarizes existing market characteristics and remaining WUE opportunities. Programs are examined in terms of their water savings potential as well as funding opportunities and feasibility of implementation. A recommended portfolio of programs was selected from a number of alternatives. In addition to the recommended WUE programs, the Master Plan process developed a number of useful tools and data sources.

Chapter 3 Demand Assessment and Savings Potential. The Master Plan is built on a foundation of knowledge about the MWDOC service area. Chapter 3 summarizes the demand assessment of end-use customers, land use, and businesses. Data sources include Urban Water Management Plans (UWMPs), consumption records, housing and population demographics, assessor parcel data, and business types. Of the total water use in the MWDOC, single-family customers consume the greatest share (43.9%), followed by commercial customers (21.5%), and other sectors (34.6%). It is estimated that 49% of residential use is outdoor use.

Chapter 4 Water Savings Goals and Compliance Assessment. Over the past two decades, MWDOC's WUE programs have delivered water savings from toilets, clothes washers, irrigation equipment, cooling towers, and other devices. Moving forward, the strategies and programs included in the Master Plan are designed to meet the WUE requirements of the MWDOC's role as wholesaler, and also to support its retailers. The Master Plan supports MWDOC's obligations as a member of the California Urban Water Conservation Council (CUWCC) by supporting its Best Management Practices (BMPs). Finally, the Master Plan supports MWDOC and its retailers in their compliance with regional IRP goals and Senate Bill SBx7-7, which requires urban retail suppliers to reduce per capita water use by 20 percent by 2020.

Chapter 5 Identify WUE Projects, Programs, and Policies. To achieve the WUE goals, MWDOC will need to implement several programs that deliver savings through 2020, and in some cases years beyond. At the completion of the WUE Master Plan development process there were ten programs selected for implementation. Collectively, the programs offer the following:

- Water measures available to all customer segments
- Incentives that provide many customers a choice of either prescriptive *rebates* or Pay for Performance *customized incentive packages*.
- Significant and cost-effective water savings

The programs and the reasons for each selection are listed in Table E-1.



| Program | Reason Program was Selected: |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. HOA WaterSmart Landscape Program | <ul style="list-style-type: none"> • Landscape market is prime target for MWDOC • HOAs manage many large scale landscape sites |
| 2. Large Landscape Pay for Performance | <ul style="list-style-type: none"> • Large Landscape market offers huge water savings potential • Pay for Performance format allows customer to create the installation package that works best for them • All installations should be cost effective due to pre-installation approval requirement |
| 3. Public Spaces Program | <ul style="list-style-type: none"> • Turf replacement |
| 4. So Cal WaterSmart Landscape Rebates | <ul style="list-style-type: none"> • Landscape market is largely “untapped” • Several reliable measures available • Long life products • Most measures highly cost-effective |
| 5. Home Certification Program | <ul style="list-style-type: none"> • Motivates customers to improve overall water use efficiency |
| 6. California Sprinkler Adjustment Notification System | <ul style="list-style-type: none"> • Landscape market offers large water savings potential • Notification system complements controller technologies |
| 7. MWDOC Turf Removal Incentive Program | <ul style="list-style-type: none"> • Large savings potential and interest from stakeholders |
| 8. Industrial Pay for Performance | <ul style="list-style-type: none"> • Industrial market has potential for high volume water savings • Owners/managers look for money saving opportunities • Pay for Performance payment format allows customer to design best installation package for their needs • Installations must be cost effective in order to be approved |
| 9. So Cal WaterSmart CII Rebates | <ul style="list-style-type: none"> • Strong CII market for water savings |
| 10. Hotel Program | <ul style="list-style-type: none"> • Non-retrofitted hotels offer significant water savings opportunities • Toilets and urinals have long life and high cost benefit |
| 11. So Cal WaterSmart Residential Rebates | <ul style="list-style-type: none"> • Although residential market more saturated, still viable opportunities for select measures • HECWs have low saturation rates • Residential customers should have WUE measures available to them • Rebates offered are cost effective |

Table E-1 WUE Programs



Chapter 6 Recommended Program Details. This chapter contains detailed stand-alone descriptions of each of the recommended programs. Each description includes an overview and context, who will implement the program, advantages and disadvantages, specifics of the measures offered, incentive amounts, cost-effectiveness, and savings.

Chapter 7 Implementation Plan. MWDOC will coordinate the administration of regional programs, including responsibility for securing outside funding, managing vendors, planning and scheduling, tracking, and reporting. To effectively implement and oversee the identified program initiatives, enhanced coordination between MWDOC and retail agencies will be required to manage outsourced program implementation to consultants and companies that carry specific expertise. This chapter describes the program ramp up dates, staffing, and details of implementation tasks.

The MWDOC WUE Master Plan is designed to be an adaptable and flexible plan that can be changed to meet MWDOC Board directives, new circumstances and challenges, and the changing political climate.



Chapter 1: OVERVIEW AND STRATEGY

Water availability is crucial to both businesses and residents in Orange County. Ongoing population growth, periodic drought intervals, and regulatory restrictions have the potential to diminish the quality and quantity of water supply. Armed with stewardship for the provision of safe and reliable water supplies, MWDOC is committed to the development of sustainable water supplies at an economical cost.

This WUE Master Plan is for all of Orange County including Anaheim, Fullerton and Santa Ana, and MWDOC provides a leadership role to develop the plan on behalf of the agencies. While all agencies choose to “opt-in” to MWDOC’s program portfolio, other agencies desire to initiate their own programs and marketing outreach.

Local water supplies provide less than half of the total water demand in Orange County. To provide for the remaining portion, more expensive imported water must be purchased from Metropolitan Water District of Southern California (MWD). The Municipal Water District of Orange County (MWDOC) delivers this purchased water to its 28 member agencies for distribution to end use customers.

MWDOC and its member agencies recognize the vital role that water use efficiency plays today and long into the future. MWDOC’s role as a regional water wholesaler means that unique marketing efforts and program strategies need to be developed to achieve water use efficiency specific for each member agency, customer group and end-users of water.

The process to create a Water Use Efficiency Master Plan is challenging, complicated, and costly. In order to accomplish this undertaking, MWDOC staff pursued a United States Bureau of Reclamation (Reclamation) grant to fund development of a Water Use Efficiency (WUE) Master Plan. USBR selected MWDOC’s proposal submittal and awarded a grant to cover half the costs of technical consulting assistance and stakeholder feedback facilitation.

Development of the plan took ten months to complete, with the active involvement of a number of stakeholders including:

- MWDOC Staff and Board Members
- MWDOC Member Agencies Staff and Elected Officials
- City Representatives
- Environmental Representatives
- Public Works and Watershed Representatives
- Business and Service Representatives

A & N Technical Services, Inc. was contracted to conduct the analyses and to prepare the WUE Master Plan, in collaboration with Maureen Erbeznik and Associates.



What is a Water Use Efficiency Master Plan?

MWDOC’s completed WUE Master Plan is an essential roadmap for the next five years; providing a living document that outlines the strategies, programs and tactics to deliver significant cost-effective water savings over the next 20 years.

MWDOC’s WUE Master Plan encompasses both broad program objectives as well as detailed numeric targets for water use efficiency activities and research to support and fulfill its mission.

The WUE Master Plan provides a number of valuable resources and will be used as:

- ✓ A Planning Tool- projects the long-range demands and defines the role of water use efficiency.
- ✓ A Marketing Tool- identifies best target markets, their size, and their response potential.
- ✓ A Business Plan- provides the overall strategy and the economic benefit of water use efficiency versus developing new supplies.
- ✓ A Means to Raise Political Awareness- promotes water use efficiency as sound strategy, establishes partnerships, and clears the way for other projects.
- ✓ A Means for Program(s) Integration- provides opportunities for complementary efforts for regional, local and retail agencies.

Why Water Use Efficiency?

In November of 2009, California’s state senate passed SBx7-7 requiring that all urban retail suppliers reduce per capita water use by 10% by 2015 and 20% by 2020. The law contains consequences for urban retail suppliers not meeting the mandated targets. Urban retailers who fall short will be ineligible for state water grants and loans starting January 1, 2016. Additionally, failure to meet targets establishes a violation of law for administrative or judicial proceedings after January 1, 2021. Agencies must set their own targets, but the law allows compliance through a regional approach as well.

In response, Orange County established a “Regional Alliance” which includes all retail agencies. The Regional Alliance target was calculated by weighting each retail agency target by population. (Table 1-1)

| Regional Alliance Target in Gallons per Capita Daily (GPCD) | | |
|-------------------------------------------------------------|-----------|-----------------|
| YEAR | 2010 UWMP | 2012 UPDATE (1) |
| 2015 target | 174 | 175 |
| 2020 target | 157 | 158 |

(1) The update uses the 2010 Census population data.

Table 1-1 Regional Alliance Target



Estimates show that the Orange County Regional Alliance will exceed the mandated target reductions if current conditions remain the same. If this is the case, why then should MWDOC and the retail agencies continue the drive for even higher levels of water use efficiency?

There are a number of reasons why water use efficiency plays a continual role today and in future planning:

1. The SBx7-7 target dictates the minimum level of water use reduction, not the optimum level of achievement possible.
2. Water use efficiency is one of the most cost effective methods to increase water supplies.
3. Despite today's positive results in per capita water use reduction, it is likely that demand will rebound as the economy recovers, as drought restrictions are lifted, and as population grows.
4. Future droughts are an inevitable part of California's hydrologic variability, and water use efficiency planning is part of the overall process of planning to prevent shortages and adapt to them should they occur.
5. Hydrologic variability also potentially impacts the Regional Alliance's ability to meet the 2015 and 2020 targets.
6. Water use efficiency diversifies the water resource portfolio.
7. Water use efficiency brings broader benefits beyond water use reductions:
 - Energy savings
 - Reduced runoff and non-point source pollution
 - Reduced overspray damage
 - Improved plant health
 - Resource stewardship

In addition MWDOC has committed to meeting its share of the Metropolitan Water District Integrated Resources Plan water usage reduction goals. The regional Integrated Resource Planning effort aims to improve Water System reliability with the most cost-effective portfolio of water resources, including water use efficiency and recycled water. MWDOC's commitment for Orange County equates to roughly 16% of the overall Metropolitan goal in 2020.

Charged with the responsibility to provide safe and reliable water supplies, MWDOC will continue to rely on water use efficiency as a major component of all resource planning.

The Planning Process

Beyond MWDOC and the retail agencies, there are a number of industry businesses and organizations with a vested interest in the design and implementation of the MWDOC WUE Master Plan. Orange County cities, public works and watershed departments, environmental groups, and industry associated businesses all play a part and receive direct or ancillary benefits from the WUE programs. As such, these diverse stakeholders came together to work through the steps of the planning process and mold the final plan.



MWDOC contracted with A & N Technical Services, Inc. to direct the development of the WUE Master Plan. As delivery of major tasks took place, three stakeholder meetings were held to gain consensus on the selected water use efficiency programs.

Mission Statement

The initial stakeholder meeting took place in October of 2012. After a general overview of the planning process, the first step in the WUE Master Plan process began with stakeholders' development of a mission statement as articulation of the overarching goal of the plan. The group created the following straight-forward mission statement to define the overriding purpose of the WUE Master Plan:

“Promote water use efficiency for all of Orange County”

Stakeholder Guiding Principles

With the mission statement in place, stakeholders moved on to establish guiding principles. The group wanted to draft the principles that, moving forwards, would provide a context for decision-making and a stable point of reference from which to operate during the development process of the Plan.

The stakeholders agreed on the following guiding principles for the final product:

1. Implement WUE programs that are cost-effective for water agencies throughout Orange County.
2. Address additional potential benefits to communities in Orange County and the environment.
3. Seek multiple partners and identify outside funding for program implementation.
4. Fortify regional (Metropolitan) and retail agency WUE efforts.
5. Develop WUE programs that have broad support from water agencies, customers, and other stakeholders.
6. Build adaptability into all programs specifically:
 - Incorporate measurement, verification and evaluation into all programs.
 - Implement pilot programs to test new technologies and delivery methods.
 - Adapt programs as circumstances change.
7. Continually evaluate programs to:
 - Improve existing implementation.
 - Quantify water savings, runoff volume and pollution prevention performance metrics.
8. Develop WUE programs that encourage collaboration, have consistent messages and encourage customer engagement.
9. Discontinue programs that have exhausted opportunity; sequence new WUE programs to reflect future potential savings.
10. Comply with applicable local, state, and federal regulation.



11. Provide information and a common understanding of WUE in Orange County.

Stakeholder Goals

Grounded by the mission statement and guiding principles, the stakeholders established the five goals that defined overall success and were of vital importance to the project. The goals are as follows:

1. Achieve Countywide Implementation of Metropolitan’s Integrated Resources Plan (IRP).
2. Achieve 20% or More Reduction in Per Capita Water Use by 2020.
3. Pursue Innovation in Water Use Efficiency in Orange County.
4. Transform Public Perception of the Value of Water.
5. Support Local Agency Water Use Efficiency Planning and Implementation.

Program Tactics

A program tactic outlines the methodology to be used to achieve a goal. Due to the multiple goals and overall complexities of the WUE Master Plan, a number of program tactics were devised in order to deliver the desired water savings and economic goals.

Program tactics include the following policies:

- 1. Continue active participation in Metropolitan’s Regional Programs.** Enhanced Metropolitan’s base incentives with supplemental funding from Grants and contributions from retail agencies to customers and drive response rates by providing regional messaging. The Metropolitan SoCal WaterSmart Program, Industrial Pay for Performance and the Landscape Pay for Performance will be central incentive delivery mechanisms for MWDOC’s WUE programs.
- 2. Implement Comprehensive Landscape Program Offerings.** The landscape market has long remained an “untapped” market opportunity. With the development of new technologies and increased customer awareness, this market segment is beginning to yield positive results and will be a top priority for program implementation and landscape transformation.
- 3. Implement a Focused Commercial, Industrial, and Institutional Offering.** The commercial and industrial market offers a significant opportunity for water savings in the MWDOC territory. MWDOC will offer programs to all commercial customers but will target specific high-potential commercial and industrial sectors and, where ever possible, offer enhanced incentives and valuable technical assistance to ensure the highest water savings.
- 4. Provide Utility Operations Support to Local Water Agencies’ Operations.** MWDOC will continue to aid local agencies with support such as distribution system audits, leak detection and repair, technical assistance to evaluate and implement budget-

based tiered rates, implementation of metering and sub-metering, and facilitation of education and outreach activities.

5. **Continue to Provide and Expand Education and Public Outreach.** MWDOC will continue successful water education programs and public outreach activities and refine or supplement programs to provide added educational value.

By pursuing these Goals, and making the most of outside funding opportunities, the WUE Master Plan seeks to maximize the achieved cost-effective water savings from MWDOC-facilitated WUE programs in Orange County.

Program Implementation Approach

Successful strategies are built by leveraging opportunities and creating customer motivation to take action to begin a market transformation. For WUE programs specifically, this starts by selecting the highest water consuming sectors and then creating an attractive implementation package. The next step is to identify ways to break through traditional market barriers by testing out innovative technologies and/or delivery mechanisms. Last of all, an aggressive program marketing campaign needs to be launched, utilizing a full spectrum of varying outreach methods. (Figure 1-1)

Implementation Design Steps

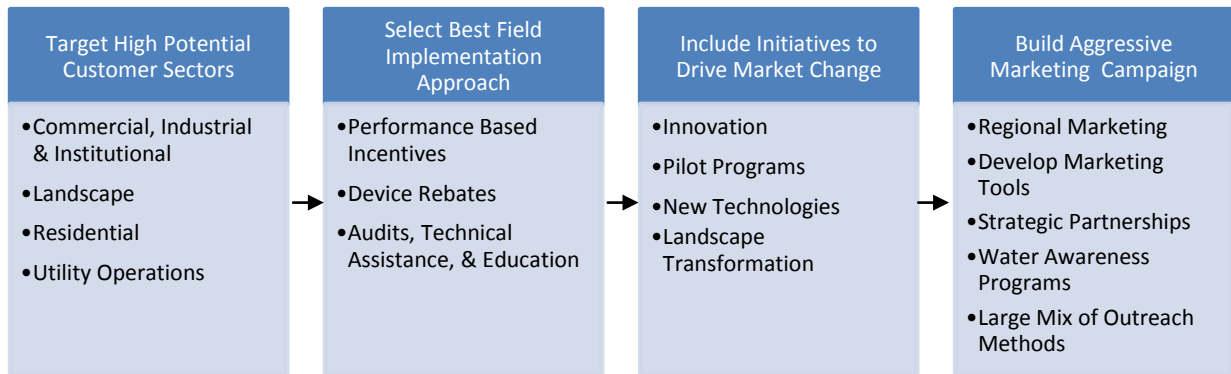


Figure 1-1 Implementation Design Steps

Target High Potential Customers

MWDOC has organized their WUE marketing and implementation efforts into four Program Sectors identified as having the highest water savings potential. This organization leverages the commonality of technologies within a sector and provides for a more focused and fitting communication strategy. Each sector’s high potential is based upon the existence of quality water saving technologies that address the water issues for that particular segment. In other words, certain devices meet the needs of many CII customers but most likely are not applicable to the Landscape or Residential customer. The four Program Sectors are:



1. Commercial, Industrial, and Institutional (CII) Sector
2. Landscape Sector
3. Residential Sector
4. Utility Operations Sector

Select Field Implementation Approach

Through evaluation of past programs, it has been shown that there are three Implementation approaches that are particularly effective at securing water savings in a cost-effective and long term manner. These implementation approaches have been built into the MWDOC program designs, with the most appropriate approach selected for each customer sector. The three implementation approaches are:

1. **Performance based incentives-** this payment format works especially well for the large landscape and CII sectors due to the array of site specific needs and custom processes and equipment at these sites. These incentives are highly customizable from site to site and they pay only for verified savings.
2. **Standardized Device rebates-** rebates are most applicable for the more “cookie cutter” type measures where there are similar technologies for a given market and savings rates for devices are well defined. These incentives are the predominant payment method for residential and commercial plumbing fixtures, and for small- to medium-sized landscape improvements.
3. **Audits, assistance and education-** All customer segments benefit from additional support services. This includes services such as audits for CII and large landscape customers, sprinkler adjustment notices for the landscape segment and home water audits or certification programs for the residential customers.

Driving Market Transformation

WUE programs will include the provision to test new products and program formats. Over the past twenty years, there have been many innovation successes but, unfortunately, there were also a few product missteps (e.g., first generation ultra-low-flow-flush toilets). For this reason, innovation will be monitored, pilot format tested, and evaluated in a methodical fashion prior to a large-scale roll out. Typically, a retailer and/or MWDOC will identify a product or program format worthy of investigation. The product will first be research and tested by MWDOC and the retailer. The retailer will host the pilot and MWDOC will fund and conduct an evaluation. A full scale program can then be rolled out based upon positive evaluation results.

It is the goal of MWDOC and the retailers to transform markets and drive each customer segment to a higher level of water efficiency. The far reaching goal is to produce a heightened customer consciousness about the value and importance of water use efficiency, **causing customers to take action on their own** to increase their water use efficiency.



Marketing

The last implementation design step is the creation of the marketing and outreach initiatives. As stated, the core goal of marketing, under the WUE Master Plan, is to increase public perception of the value of water. Once customers comprehend its value, they will be much more inclined to take action and increase their level of WUE at their homes and places of business. To accomplish this feat, *the value of water* will be a message that is threaded through all marketing initiatives. This message will enhance the value of programs that already offer sound technologies, affordable devices and customer ease-of-participation.

MWDOC's marketing and outreach strategies are to:

- Increase participation in WUE rebate and incentive programs through regional marketing efforts.
- Develop marketing tools that will allow retail agencies to promote rebate/incentives and awareness programs at the local level.
- Work collaboratively with Metropolitan and its member agencies to develop regional messages, coordinated outreach tools, and market transformation initiatives, as required per agency.
- Build strategic partnerships with water saving equipment manufacturers and distributors, industry trade organizations, non-profits, environmental groups, and other organizations.
- Utilize water awareness programs to educate the public about the value of water.

One of MWDOC's key marketing strengths lies in the extensiveness of partnerships and collaborations. This includes close ties with Orange County cities, Metropolitan and MWDOC member agencies, Orange County storm water agencies, grant funding agencies, non-profits and more. These networks provide strategic opportunities to cross-market, to secure additional funding, and to collaborate.

Program messaging and promotion will be launched through an array of communication channels and partnerships. For instance, MWDOC will cross market SoCal Water\$mart rebates with Orange County Storm Water Program (including the H2OC educational resources), as well as at community events, landscape events and partner promotions.

Promotion will be initiated through print and digital media such as websites, custom landing pages, email marketing, e-newsletters, social media, quick response codes, water bill inserts, water bill messages and promotional materials.

Marketing campaigns will be modified, as needed, to either ramp up participation or announce a program change.

Selected Programs and Water Reduction Goals

To meet water reduction goals in a cost-effective manner, MWDOC and the stakeholders selected to implement 11 programs. The programs will deliver water savings through the 2015



and 2020 target years and beyond due to the long life for several of the measures. Table 1-2 is an overview of the lifetime water savings for each of the programs:

Lifetime Water Savings by WUE Programs

| Water Use Efficiency Program | Estimated Lifetime Water Savings (AF) |
|-----------------------------------------------------|---------------------------------------|
| SoCal Water\$mart Residential Rebates | 13,804 |
| SoCal Water\$mart Commercial Rebates | 13,578 |
| SoCal Water\$mart Landscape Rebates | 6,989 |
| HOA WaterSmart Landscape Program | 3,436 |
| MWDOC Turf Removal Incentives Program | 2,800 |
| Landscape Pay for Performance Incentives | 2,049 |
| Public Spaces Program | 854 |
| Industrial Pay for Performance Incentives | 60 |
| Hotel Water Reduction Program | Included in SoCal Water\$mart Savings |
| Home Certification Program | Included in SoCal Water\$mart Savings |
| California Sprinkler Adjustment Notification System | Not quantified |
| Total | 43,570 |

Table 1-2: Lifetime Water Savings by WUE Program

It is important to understand the assumptions behind the water savings calculations for some of the selected programs:

- In the chart above, the savings from landscape measures are calculated with a 5-year or 10-year savings life. These measures may very well have longer savings lives, but a conservative value was selected because many of the landscape devices are relatively new to market.
- Although marketed for a number of years, high efficiency clothes washers still offer a significant potential and are projected to deliver significant activity over the next five years and hence the large volume of savings in the SoCal Water\$mart Residential Program.
- Please note that the Industrial Process Pay for Performance Program budgets reflect low production due to the long lead time needed by industrial customers to identify, evaluate, finance, construct, and fine tune water savings manufacturing improvements. A conservative participation estimate is plugged into the budget although MWDOC expects to see a higher number of projects implemented. Additionally, the projection



covers only a two year period due to the grant end date. Metropolitan’s Water Savings Incentive Program is expected to continue through all five years, and, thus, it may ultimately be a funding source for the Industrial Process Pay for Performance Program .

Table 1-3 is the estimated lifetime water savings totaled by program sector. Because landscape has a large potential for savings, it has been prioritized in this plan.

Program Sector Lifetime Water Savings

| Program Sector | Estimated Lifetime Water Savings (AF) |
|-------------------------------------------|---------------------------------------|
| Landscape | 16,128 |
| Commercial, Industrial, and Institutional | 13,638 |
| Residential | 13,804 |
| Total | 43,570 |

Table 1-3: Program Sector Lifetime Water Savings

The Plan is estimated to save over 43,570 acre-feet of water over the lifetime of the measures. Overall, the programs selected will deliver the following collective results as shown in Table 1-4. The cost of implementing the program including incentives and staff time is \$415 per acre foot over the life the plan. The value of these water use efficiency savings benefits is approximately \$47.0 million dollars as—as estimated by the avoided cost of supply that derives directly from the plan. Program costs are expected to be \$14.6 million in present value terms (\$16.1 million nominal). Note that these costs include the cost to MWDOC as well as its co-funding agencies (Metropolitan, USBR, and DWR). Appendix B contains details of economic analysis.

Plan Overview

| | |
|-------------------------------|---------------------|
| Lifetime Water Savings | 43,570 Acre-feet |
| Overall Cost per Acre-foot | \$415 per Acre-foot |
| Program Costs (Present Value) | \$14,653,915 |
| Avoided Costs (Present Value) | \$47,297,495 |

Table 1-4: Plan Overview



Chapter 2: PLANNING PROCESS

MWDOC received a grant from the United States Bureau of Reclamation to produce a Water Use Efficiency Master Plan (Plan). The work approach to develop the Plan was conducted in a logical and transparent manner. Tasks were well specified, as part of the grant process, with clearly defined deliverables for each task milestone. The tasks and deliverables are delineated in Table 2-1.

Grant Tasks and Deliverables

| Task | Deliverables |
|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Task 1: Management and Administration | <ul style="list-style-type: none"> Outline plan and timeline to complete water use efficiency master plan |
| Task 2: Coordination and Stakeholder Involvement | <ul style="list-style-type: none"> Develop a stakeholder group Facilitate three stakeholder meetings |
| Task 3: Preparatory Work and Research | <ul style="list-style-type: none"> Perform literature review Quantify active and passing savings achievements Project water demand through 2035 Develop water savings target |
| Task 4: Identify Water Use Efficiency Projects, Programs, and Policies | <ul style="list-style-type: none"> Develop list of existing and new potential WUE projects Rank and prioritize water use efficiency projects Identify insufficient information areas |
| Task 5: Analyze Costs and Benefits and Determine Cost Effectiveness | <ul style="list-style-type: none"> Identify quantitative and qualitative performance measures Conduct cost-effective analysis for existing and potential water use efficiency projects Estimate avoided-cost savings Develop a spreadsheet-based model for analyzing and tracking performance |
| Task 6: Implementation, Financing, and Staffing Plan | <ul style="list-style-type: none"> Develop implementation plan Identify budgets, staff requirements, and personnel qualifications Prepare financing plan Update and incorporate MWDOC water use efficiency marketing plan Develop tracking methods |
| Task 7: Water Use Efficiency Plan Development | <ul style="list-style-type: none"> Prepare and present the Water Use Efficiency Plan |

Table 2-1: Grant Tasks and Deliverables



The planning process began with collecting and compiling a database in order to disaggregate end-use data within MWDOC's territory. Descriptive statistics with details of agency consumption, population, estimated landscape usage, and device saturation are summarized in *Chapter 3*. In addition, historical water use efficiency programs were evaluated for remaining water savings opportunities.

With known opportunities and markets for specific technologies, the goal was to develop a list of programs to be further evaluated--both new and existing programs. The list was a "first pass" at program concepts. These concepts are similar to puzzle pieces in that they are not fully designed programs but, instead, are components of a successful program. A concept might be a technology that offers high water savings or a marketing strategy that is known to deliver a high customer response.

A cost benefit analysis was then conducted for the initial list of programs. The programs were evaluated using the Alliance for Water Efficiency's conservation program evaluation tool (Tracking Tool). Additionally, a scorecard was created and the programs were rated by MWDOC for each program's ability to deliver desired outcomes. Final selection of programs was then completed.

In addition the research team conducted a compliance assessment for:

- SBx 7-7 - Governor's call for 20% per capita water use reduction by 2020
- Metropolitan Water District's Integrated Resources Plan water reduction goals
- California Urban Water Conservation Council's Best Management Practices
- Assembly Bill 1420 Statute

Stakeholder Involvement

Beyond MWDOC and the retail agencies, there are a number of industry businesses and organizations with a vested interest in the design and implementation of the MWDOC WUE Master Plan. Orange County cities, public works and watershed departments, environmental groups, and industry associated businesses all play a part and receive direct or ancillary benefits from the WUE programs. As such, these diverse stakeholders came together to work through the steps of the planning process and mold the final plan.

With a vested interest, the stakeholders were committed to development of the MWDOC WUE Master Plan. This diverse group included:

- 43 Water District Staff and Board Members
- 13 City Representatives
- 6 Environmental Representatives
- 7 Orange County Public Works and Watershed Agency Representatives
- 3 Business and Service Representatives
- 1 Federal Representative (USBR)

The group attended three stakeholder meetings held over a six month period. MWDOC staff and the A&N team prepared meeting presentation materials and facilitated each meeting.



The three stakeholder meetings and agenda items are below:

October 2012:

- Review the planning process
- Define water use efficiency and a WUE plan
- Come to an agreement on mission statement, guiding principles and goals
- Brainstorm program ideas

February 2013:

- Review demand, device saturation and market potential
- Review full list of existing and new potential programs
- Determine evaluation criteria

April 2013:

- Review cost effectiveness and pros/cons of the full list of programs
- Define final list of programs

MWDOC Staff also sought input for the Plan through briefings that followed each of the stakeholder meetings, the Board's Planning and Operations Committee, member agency managers, and water use efficiency coordinators.



Chapter 3: DEMAND ASSESSMENT AND SAVINGS POTENTIAL

In order to complete the required tasks for the WUE Plan, a comprehensive data collection and analysis process was undertaken. The sources of data utilized in the Plan are identified in this section along with relevant statistics that characterize MWDOC and its member agency's service areas. In addition, this chapter presents data analysis results for future water use efficiency measures with the highest potential for success in reaching MWDOC's regional water savings goals.

Retail Service Areas

MWDOC is the regional water wholesaler and resource planning agency that manages all of Orange County's imported water supply with the exception of water imported to the cities of Anaheim, Fullerton, and Santa Ana. MWDOC serves more than 2.3 million residents in a 600-square-mile service area, and its mission is to ensure water reliability for the communities it serves.

MWDOC member agencies include 28 water retailers comprised of cities and water districts, including:

- City of Brea
- City of Buena Park
- City of Fountain Valley
- City of Garden Grove
- City of Huntington Beach
- City of La Habra
- City of La Palma
- City of Newport Beach
- City of Orange
- City of San Clemente
- City of San Juan Capistrano
- City of Seal Beach
- City of Tustin
- City of Westminster
- East Orange County Water District
- El Toro Water District
- Emerald Bay Services District
- Golden State Water Company
- Irvine Ranch Water District
- Laguna Beach County Water District
- Mesa Water District
- Moulton Niguel Water District
- Orange County Water District
- Santa Margarita Water District
- Serrano Water District
- South Coast Water District
- Trabuco Canyon Water District
- Yorba Linda Water District

On the following pages is information regarding population, overall demand, future demand forecast, past achieved conservation and future market potential in the MWDOC service territory.

Population

The population of the Orange County as of January 2012 is 3,055,792. Population for the County is expected to grow by 500,000 in 2035. Figure 3-1 shows historical and projected population growth for all of the Orange County Water suppliers, including the Cities of Anaheim, Fullerton, and Santa Ana. Table 3-1 displays the most recent population estimates based on the 2010 Census, as developed by the California State Fullerton Center for Demographic Research.

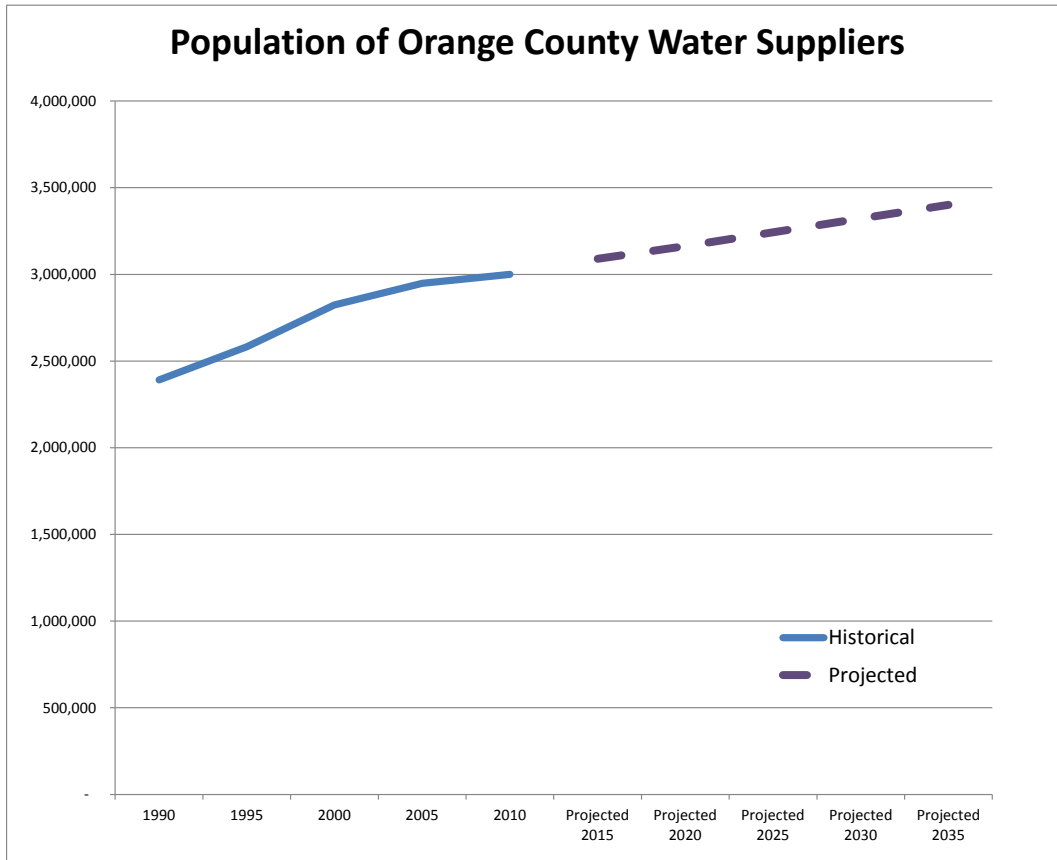


Figure 3-1 Population History and Projection (Source: Population of OC Water Agencies.xlsx)



| Population by Orange County Water Supplier | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|--------------------------------|
| Water Supplier | 2010 (Census Data) | 2011 (CDR Estimate) | 2012 (CDR Estimate) |
| Anaheim, City of, includ. SW Anaheim | 343,704 | 349,256 | 351,963 |
| Brea | 39,240 | 39,779 | 40,646 |
| Buena Park | 80,909 | 80,840 | 81,440 |
| East Orange CWD Retail Zone | 3,666 | 3,228 | 3,205 |
| El Toro WD [1] | 47,861 | 47,959 | 48,288 |
| Emerald Bay SD | 1,273 | 1,092 | 1,082 |
| Fountain Valley, City of | 55,756 | 56,302 | 56,686 |
| Fullerton, City of | 135,090 | 135,292 | 137,308 |
| Garden Grove, City of | 172,108 | 173,326 | 174,641 |
| Golden State Water Co. | 163,456 | 166,161 | 167,018 |
| Huntington Beach, City of | 191,542 | 191,376 | 192,565 |
| Irvine Ranch WD includ. OPA | 332,282 | 341,745 | 348,418 |
| La Habra | 60,193 | 60,179 | 60,587 |
| La Palma | 14,841 | 14,503 | 14,603 |
| LBCWD <i>without Emerald Bay</i> | 18,370 | 18,776 | 18,909 |
| Mesa WD | 104,423 | 104,388 | 105,099 |
| Moulton Niguel WD | 163,725 | 165,282 | 166,880 |
| Newport Beach | 65,668 | 64,587 | 65,036 |
| Orange | 134,994 | 136,019 | 136,890 |
| San Clemente | 50,970 | 50,130 | 50,448 |
| San Juan Capistrano | 37,299 | 37,269 | 37,578 |
| Santa Ana | 325,414 | 325,538 | 327,847 |
| Santa Margarita WD | 150,043 | 150,734 | 151,164 |
| Seal Beach | 23,501 | 23,253 | 23,388 |
| Serrano WD | 6,146 | 6,319 | 6,365 |
| South Coast WD | 34,636 | 34,187 | 34,447 |
| Trabuco Canyon WD | 13,168 | 12,439 | 12,506 |
| Tustin | 66,647 | 66,663 | 66,910 |
| Westminster | 91,218 | 91,543 | 92,281 |
| Yorba Linda WD | 72,083 | 71,520 | 72,498 |
| <i>Subtotal OC Water Suppliers</i> | <i>3,000,226</i> | <i>3,019,685</i> | <i>3,046,696</i> |
| Other population [2] | 8,629 | 9,161 | 9,096 |
| Orange County Total | 3,008,855 | 3,028,846 | 3,055,792 |
| [1] El Toro WD population numbers could change, pending resolution of a question on the 2010 Census populaton of some border area housing units. | | | |
| [2] Other population includes residents of border areas served by Los Angeles County water suppliers, small private water systems with their own wells, and individuals not connected to any water system. | | | |
| Source: Center for Demographic Research (CDR) at CSU Fullerton. 2010 based on the 2010 Census. | | | |

Table 3-1 Water Supply Population



Accounts and Water Use by Customer Class

This section provides a breakdown of the total water accounts across Orange County. Table 3-2 presents the number and type of accounts for the entire MWDOC service area and their associated water use in fiscal year 2010-11. Key takeaways:

- Single family is the largest customer class.
- Residential use, comprised of single- and multi-family water use adds up to nearly 60 percent of the total use.
- The large majority of recycled water use is for large landscape irrigation.
- By adding recycled and irrigation water customer classes together, large landscape irrigation water use is nearly 13 percent of the total.

| Customer Class | Demand (AF) | Share of Demand (%) | Number of Accounts | Share of Accounts (%) |
|-----------------------------|----------------|---------------------|--------------------|-----------------------|
| Single Family | 237,658 | 43.9% | 612,389 | 80.5% |
| Multi-Family | 85,462 | 15.8% | 65,026 | 8.5% |
| Commercial (CII) | 116,226 | 21.5% | 63,426 | 8.3% |
| Irrigation | 32,638 | 6.0% | 12,680 | 1.7% |
| Recycled | 36,010 | 6.7% | 7,597 | 1.0% |
| Non Revenue Water | 32,982 | 6.1% | - | 0.0% |
| Total (excluding Ag) | 540,976 | 100% | 761,118 | 100% |

Table 3-2 Summary of M&I Accounts and Use by Class FY 2010-11.

Source: FY 2010-11 M&I use data from Orange County Water Suppliers Water Rates and Financial Information.

Figure 3-2 visually depicts the percentage of water use and accounts by customer class.

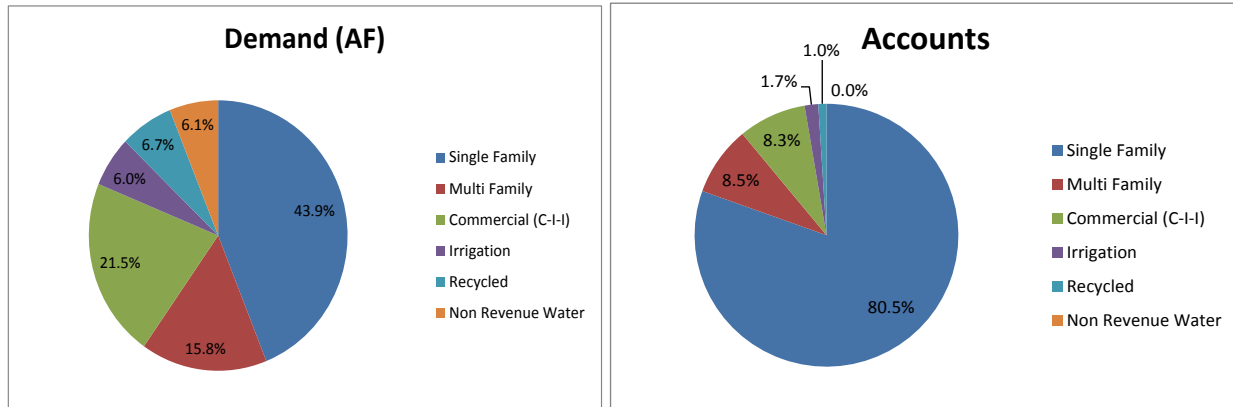


Figure 3-2 Water Use and Accounts by Customer Class

Water Use by Program Sector

For program planning and implementation purposes, MWDOC has organized customers into program or market sectors:

- Residential indoor
- Commercial, industrial, institutional indoor
- Landscape across all sectors

Table 3-3 shows the breakdown of water use by MWDOC program sector.

| Use by Market Sector | Demand (AF) | Percent |
|-------------------------------------------------|----------------|-------------|
| Residential (Indoor) | 180,698 | 36% |
| Landscape | 247,321 | 49% |
| Commercial, Industrial and Institutional | 79,975 | 16% |
| Total | 507,994 | 100% |

Table 3-3 Water Use by Market Sector

Landscape Water Use

Outdoor water use is a significant part of Orange County demand. The climate in Orange County is Mediterranean semi-arid coastal. The average annual precipitation is 14 inches¹, comprised mostly of winter rainfall. Average evapotranspiration (ET_o) is almost 50 inches per year, with water need greatest in the summer months. Figure 3-3 shows the seasonal pattern of water use

¹ NOAA, Santa Ana Fire Station, California 1971-2000, mean precipitation total.

based on the 5-year average of monthly M&I water use (municipal and industrial, non-agricultural water use).²

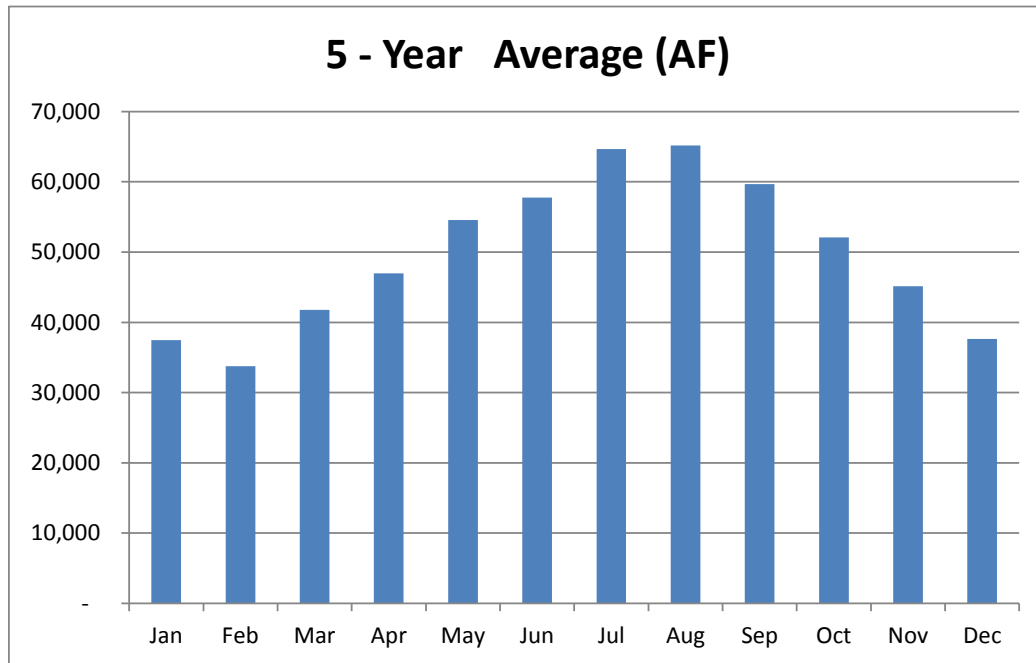


Figure 3-3 Monthly Water Use, Five Year

Water used for landscaping is generally not directly metered (except in those cases where dedicated irrigation meters exist). For this reason, outdoor water demand is necessarily estimated. Two estimation methods are provided. Method 1 reflects the widely used “minimum month” approach and is provided for comparison purposes. Method 2 reflects a more accurate method that allows for nonzero winter irrigation use.

Method 1. A common method used to infer outdoor use is to assume that all winter use is categorized as indoor consumption. For example, if we calculate winter minimum use over 12 months we have inferred total indoor use for the year. Total use for the year minus indoor use then equals outdoor use. Method 1 underestimates outdoor use because there is winter irrigation in dry climates such as MWDOC’s territory. Using the minimum month method, outdoor water use is 37% of total.

Method 2. The second method to infer outdoor water use consists of employing the pattern of seasonal variation used by dedicated irrigation meters and applying it to other sectors with mixed meters. With dedicated irrigation meters, winter irrigation is directly measured. Thus, we can measure relative water use in winter and summer irrigation seasons and apply the pattern of use to other sectors. Applying this percent to mixed meters results in an overall

² Data source is the annual survey of water suppliers, Orange County Water Suppliers Water Rates and Financial Information (2011 is the most recent published survey).

estimate of 49% outdoor use, considerably higher estimate of outdoor water use than Method 1. Figure 3-4 shows total use (M&I including recycled and irrigation), with winter irrigation delineated from indoor use, per Method 2.

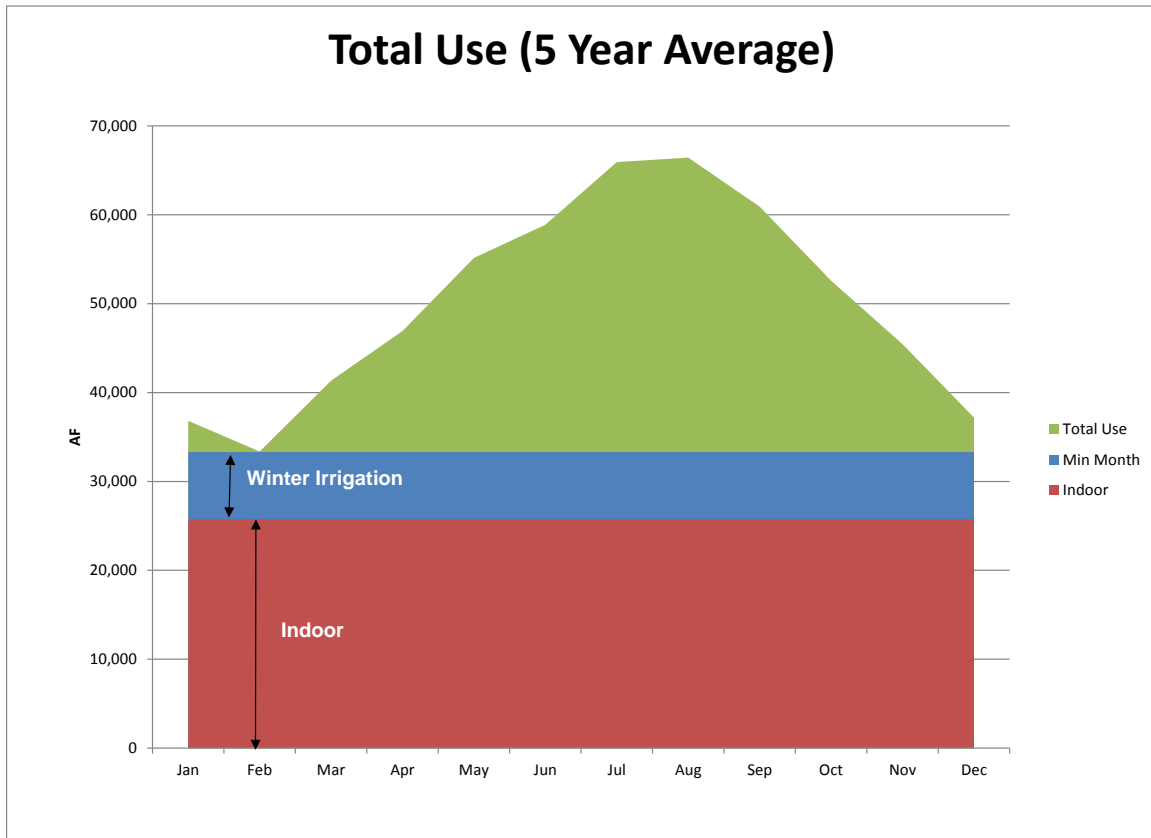


Figure 3-4 Seasonal Water Use

Summing across all months in the year, Table 3-4 provides the estimated split in total water use between indoor and outdoor end uses.

| | Total Use | Demand (AF) | Percent |
|---------|-----------|-------------|---------|
| Indoor | | 308,885 | 51% |
| Outdoor | | 292,009 | 49% |

Table 3-4 Indoor and Outdoor Water Use (Five Year Average)

Demand Forecast

Figure 3-5 shows the demand history and forecast for MWDOC. Notice the decline in historical demand over the past few years that reflect a combination of economic downturn and drought water restrictions. The rebound that is projected will be realized if these conditions change and if new growth appears as expected.

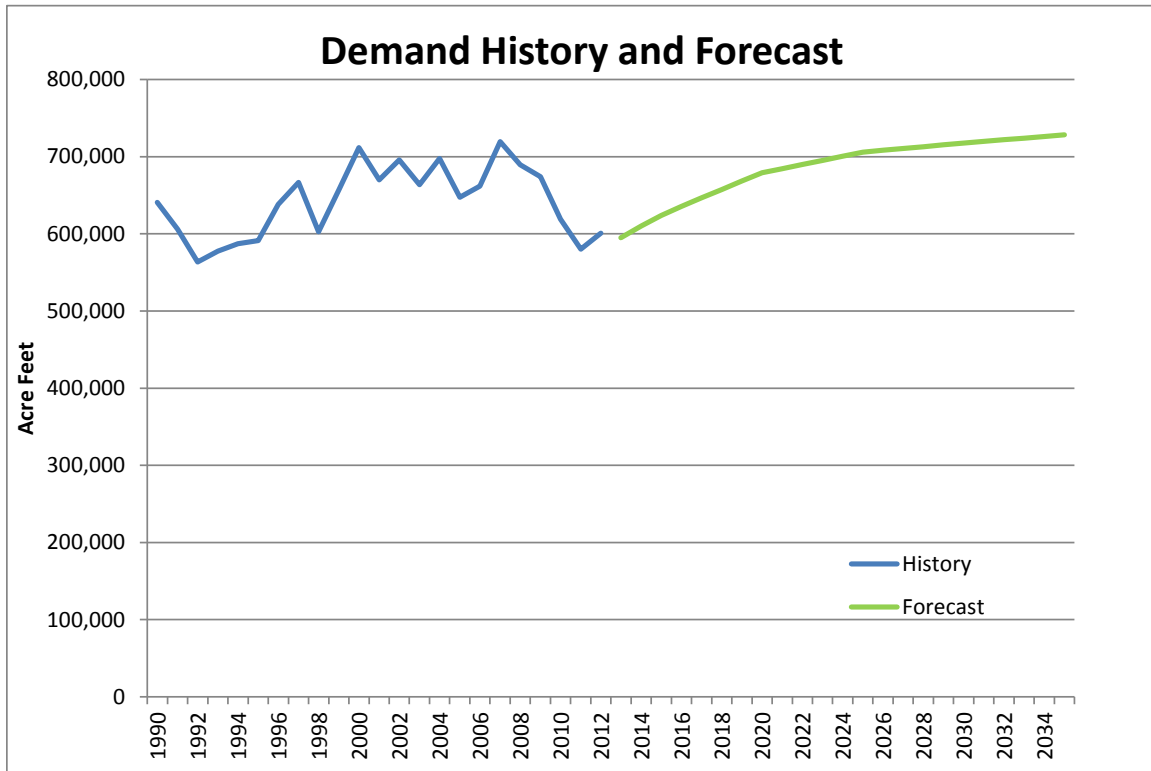


Figure 3-5 Demand History and Forecast

Source: Historical data from GPCD Calculation_2010 Census Update.xlsx and forecast provided by MWDOC.

Past Achieved Conservation

Data from MWD’s regional incentive programs were collected for MWDOC and for the Cities of Anaheim, Fullerton, and Santa Ana over the period 1991 to 2012 to summarize past achieved conservation in Orange County. Past-achieved conservation is important to incorporate into the WUE planning process to better understand remaining conservation potential.

For each of the series of graphs that follow, the conservation activity is plotted over time revealing the evolution of conservation incentives.

Figure 3-6 shows the number of ultra-low-flow and high-efficiency toilet rebates implemented from 1992 to present. Notice the high level of activity through the year 2004; these incentives moved the market through the transition from toilets using 3.5 gallons per flush (gpf) or greater to toilets with 1.6 gpf. Activity slowed when MWDOC and Metropolitan reprioritized programs to landscape measures. In 2007, the program transitioned from ultra-low-flush to high efficiency models which are rated at 1.28 gpf or less.

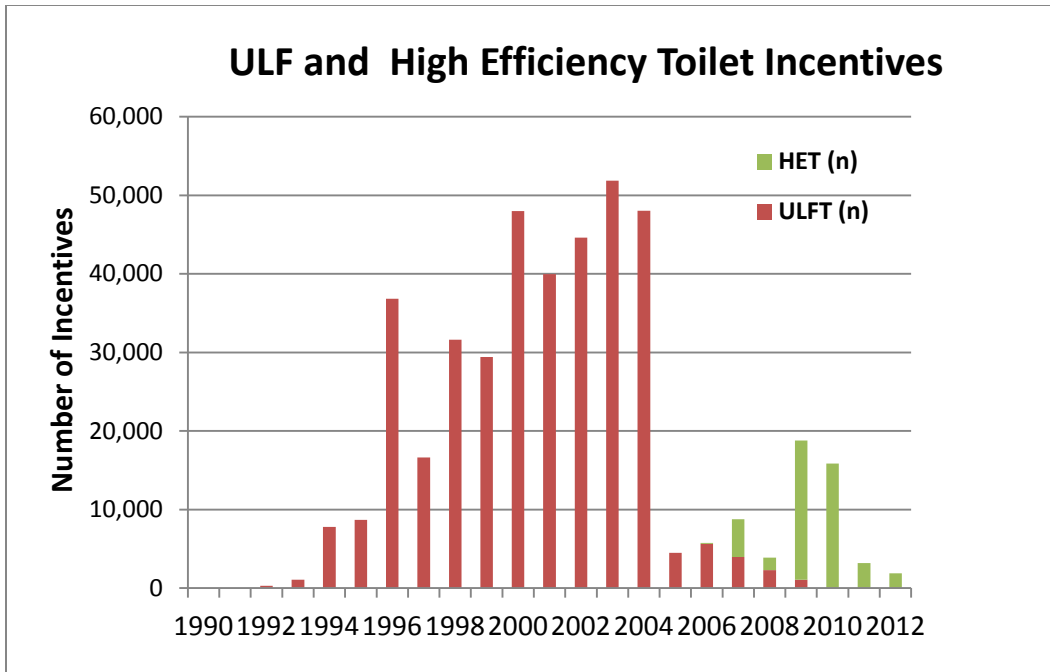


Figure 3-6 ULF and High Efficiency Toilet Incentives 1992 - Present

Figure 3-7 shows the number of high efficiency washer incentives implemented from 1999 to 2012 for both the commercial and residential markets. As depicted in the graph, residential washer’s rebates saw a sharp increase in 2007 and have since transitioned to more efficient fixtures with a water factor of 4 or less.

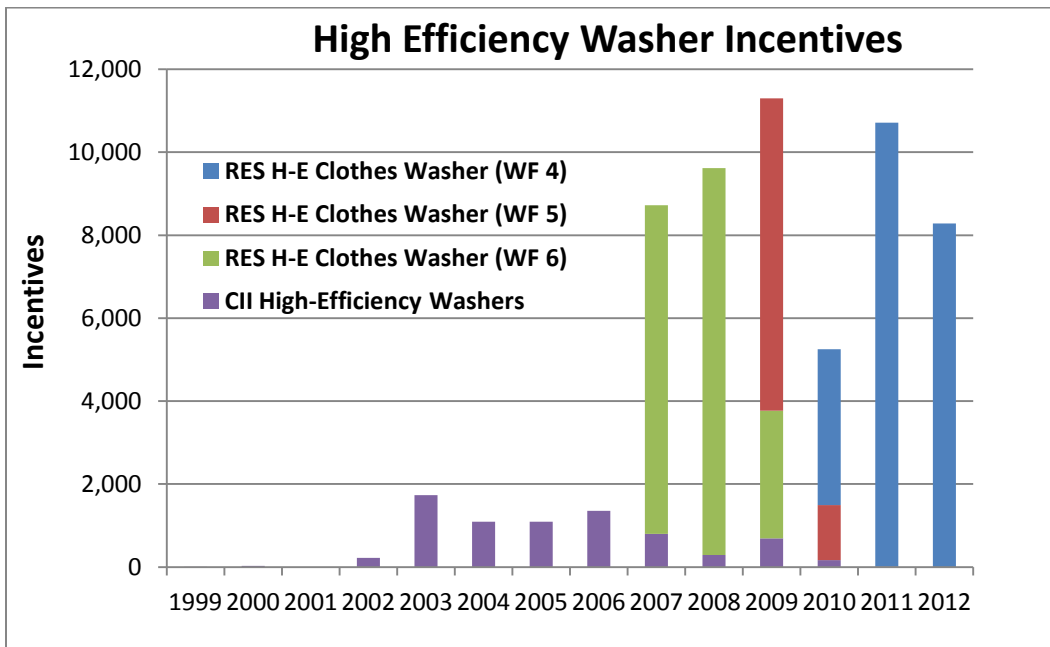


Figure 3-7 High Efficiency Washer Incentives 2000 2012

Figure 3-8 shows the number of smart irrigation controllers and Figure 3-9 shows the number of high efficiency nozzles for pop up spray heads. In both of these graphs it shows an increase in landscape measure installation in 2007, reflecting the changing priorities to landscape water use efficiency.

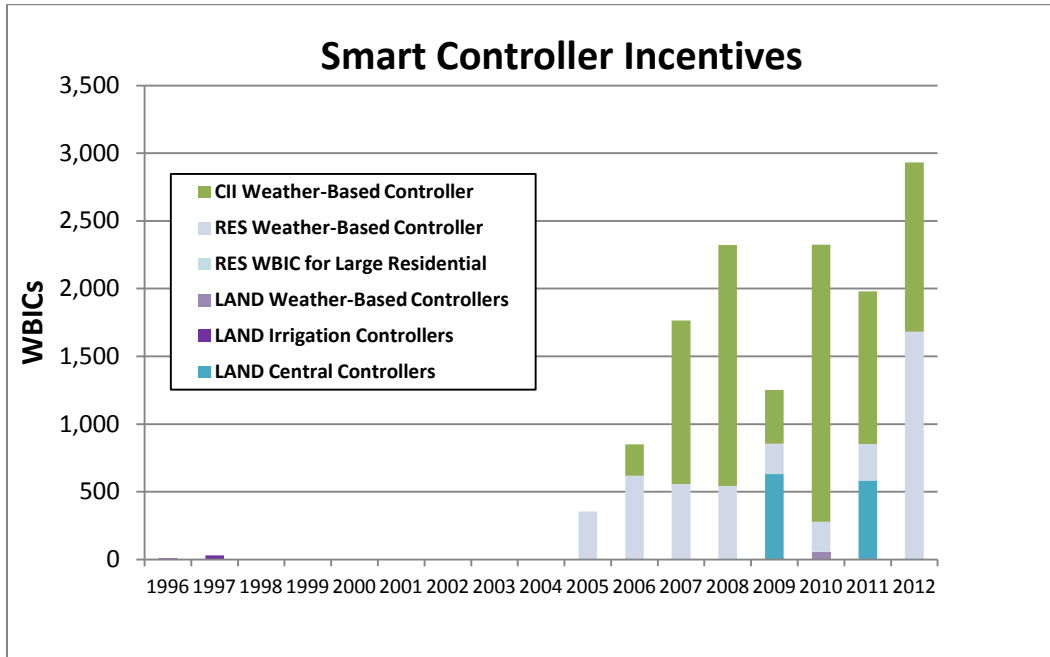


Figure 3-8 Smart Controller Incentives 1196 – Present

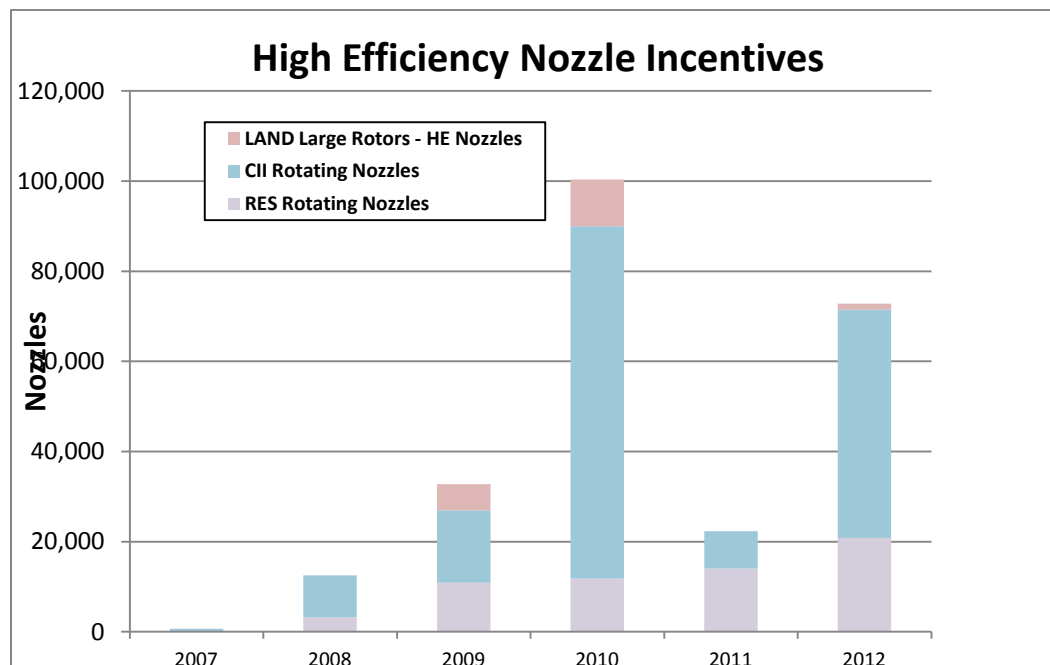


Figure 3-9 High Efficiency Nozzle Incentives 2007 – Present

Figure 3-10 shows the recent history of the HOA WaterSmart Landscape Program (formerly the Landscape Performance Certification Program). The dedicated meters defined as “enrolled” are all sites in the program that are receiving monthly irrigation performance reports. This program has been demonstrated to save significant water at extremely cost effective levels.

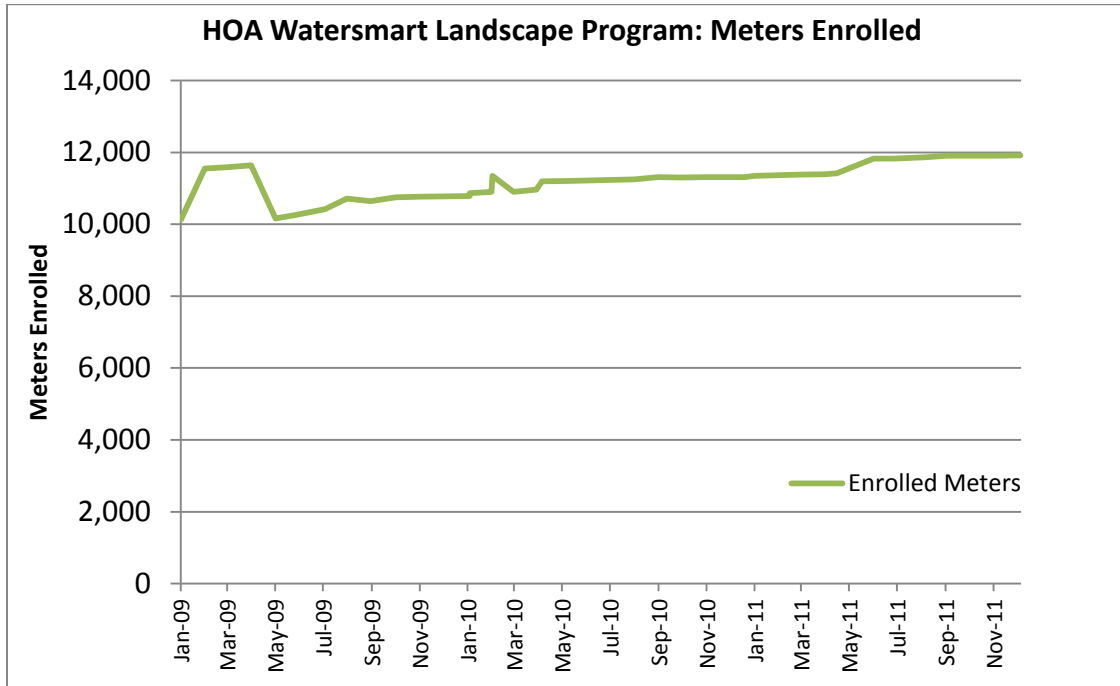


Figure 3-10 HOA WaterSmart Number of Meters Enrolled and with Budgets 2009 – 2011

Figure 3-11 shows the square feet of turf removal and synthetic turf incentivized. Synthetic turf was the only measure offered for the first 3 years. Turf removal incentives were added in 2011.

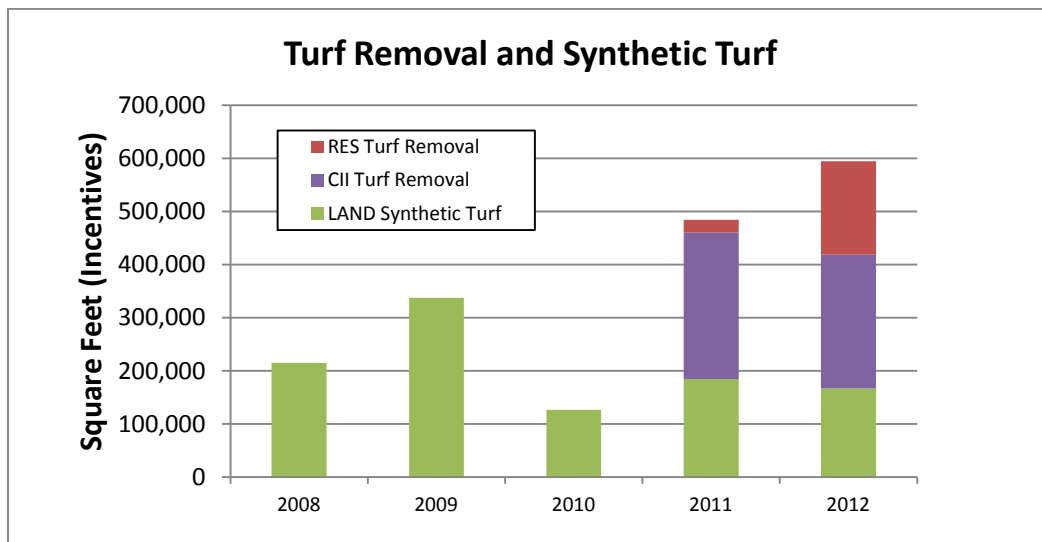


Figure 3-11 Turf Removal and Synthetic Turf Incentives 2008 – 2012

Figure 3-12 shows the savings that resulted from all of the active conservation activities. Over the life of the measures, these activities in total will save 357,000 acre-feet, and as much as 23,000 acre-feet per year. Savings were estimated with Metropolitan’s savings and useful life assumptions applied in the corresponding year the measure was implemented.

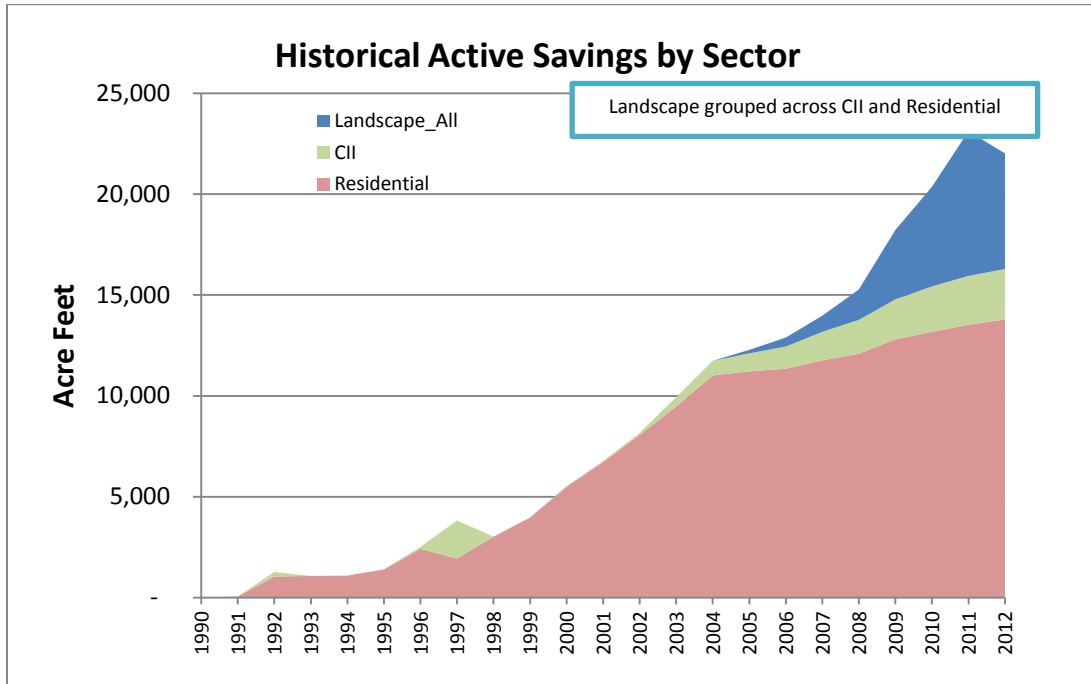


Figure 3-12 Historical Active Savings by Sector

Market Potential for Water Use Efficiency (WUE)

An important step in developing a WUE plan is to calculate the future potential water savings from conservation measures that could be implemented in the region in the near-term.

Table 3-5 summarizes sources of remaining water use efficiency potential by market sector. Within each sector the table lists sources of conservation, the stage of programmatic development, description of how the potential is derived, and the qualitative range from low to high. This broad overview organizes the more detailed discussion of conservation potential in what follows.



| Sector, Measures, End Uses | Stage | Description of Potential | Potential |
|--------------------------------------|-----------------|-----------------------------------------------------|-----------|
| Residential Indoor | | | |
| Toilets | Late | Small number 3.5gpf, ULF to HET, >HET? | Low |
| Faucets, Aerators, Flow Restrictors | Late | Small remaining potential | Low |
| Showerheads | Late | Very low flow rates, behaviour | Low |
| Clothes Washers | Mid | Low saturation | High |
| Pressure Regulating Valves | Pilot, Research | Covers all end uses | High |
| Surveys, Education, Outreach | Ongoing | Gateway program, behaviour | Low-Mid |
| Conservation Rates | Developing | Covers all end uses | High |
| Landscape | | | |
| Controllers | Early | SF Residential large remaining potential | High |
| Nozzles | Early | Large remaining potential | High |
| Turf Replacement, Low Water Plants | Early | Large technical potential; small economic potential | High |
| Artificial Turf | Early | Large technical potential; small economic potential | High |
| Pressure Regulating Valves | Pilot, Research | Covers all end uses | High |
| Landscape Management | Ongoing | Gateway program, behaviour, communication | High |
| Surveys, Education, Outreach | Ongoing | Gateway program, behaviour | Low-Mid |
| Conservation Rates | Developing | Covers all end uses | High |
| CII (Non-Landscape) | | | |
| Toilets | Mid | Small number 3.5gpf, ULF to HET, >HET? | Mid |
| Urinals | Mid | High traffic sites | Mid |
| Faucets, Aerators, Flow Restrictors | Late | Small remaining potential | Low |
| Showerheads | Mid | Sports facilities, accomodation | Mid |
| Food Service Equipment | Mid | Needs short pay back | Mid |
| Laundry | Mid | High water use is economic incentive | High |
| Industrial Processes and Manufacturi | Mid | Acceptance, regulatory issues, competitiveness | High |
| Cooling | Mid | Needs short pay back | High |
| Pressure Regulating Valves | Pilot, Research | Covers all end uses | High |
| Surveys, Education, Outreach | Ongoing | Gateway program, behaviour | Low-Mid |
| Conservation Rates | Developing | Covers all end uses | High |

Table 3-5 Remaining Water Use Efficiency Potential

Residential Indoor Opportunity

This section examines the saturation level and future market potential for indoor water use efficiency devices in both single and multi-family sectors.

Efficient plumbing device saturation was estimated based on the existing plumbing codes and prior conservation activities. The Orange County Saturation Study (2002) found the saturation of efficient toilets at 45.8 percent in Orange County in 2000. (Table 3-6).

| Variable | Single-Family | Multi-Family | Full Sample |
|----------|---------------|--------------|-------------|
|----------|---------------|--------------|-------------|

| Variable | Single-Family | Multi-Family | Full Sample |
|--------------------------------------|-----------------|-----------------|-----------------|
| Toilet flush volume (gallons) | Pre-1992 | Pre-1992 | Pre-1992 |
| 1.60 or less | 48.6% | 37.6% | 45.8% |
| 3.50 | 35.4% | 47.6% | 38.5% |
| 5.00 | 15.3% | 13.9% | 14.9% |
| 7.00+ | 0.6% | 1.0% | 0.7% |

Table 3-6 ULF Toilet Saturation - 2002 OC Saturation Study

Since the adoption of the Energy Policy Act of 1992 required ULF toilets (1.6 gpf) on all toilets available for sale, the annual toilet replacement rate for all toilets in existence in 1992 can be estimated and reasonably assumed to be ULF toilet replacement. Similarly, new post-1992 housing stock can be assumed to solely contain efficient ULF toilets.

The inferred rate of toilet replacement of 5.5 percent per year is used to define the input parameters for the AWE Tracking Tool, which was utilized to estimate passive conservation over time. By applying the assumption that the 1992 to 2000 rate of “non-active” or “natural” replacement continues through the year 2012, and accounting for active conservation, the estimated saturation rate for efficient toilets (both ULF toilets and HE toilets) is 85 percent in 2012 as shown in Figure 3-13.

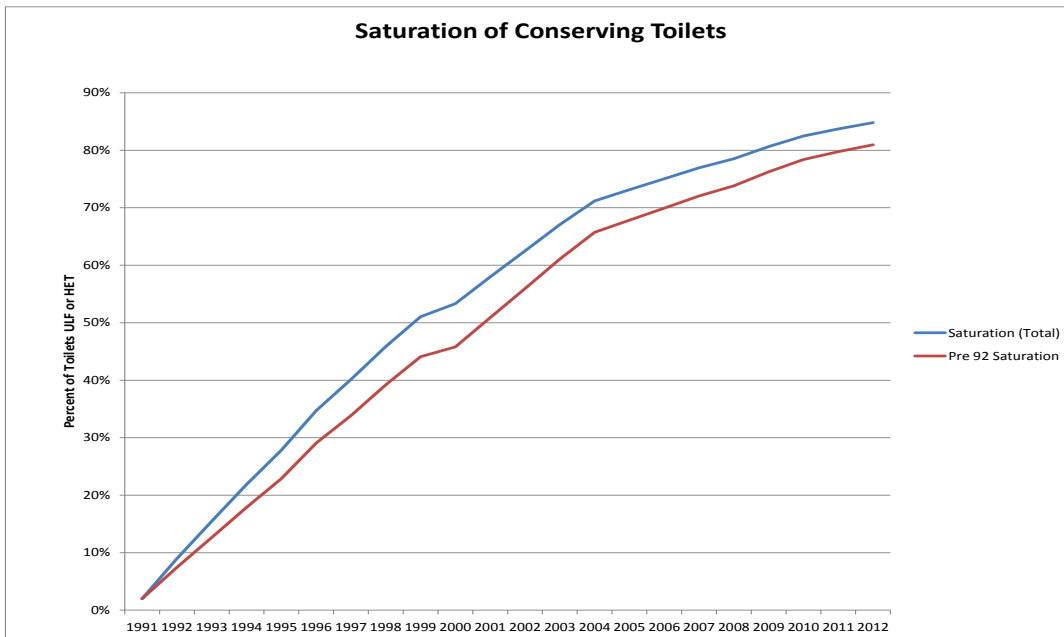


Figure 3-13 Saturation of ULF and High Efficiency Toilets through 2012



Toilet Conservation Potential. Market potential in this sector is limited to programs that target sites with high volume fixtures. With toilet saturation of 85 percent, there are some 325,000 old toilets remaining. Assuming a 10 percent linear replacement of natural replacement, this would imply there are still 250,000 older high volume toilets in the remaining potential. In addition HETs become mandated in 2014. Direct install programs can ensure verification of high volume existing fixtures.

Showerhead Conservation Potential. Performing an analysis similarly for low flow showerheads yields the result that approximately 96% of showerheads are conserving. It can be construed that there is little remaining conservation potential for low flow showerheads because of the high rate of current saturation. As of the 1992 plumbing code, all new units installed must be efficient at using not more than 2.5 gallons per minute (gpm). MWDOC could support legislation to establish a 2.0 gpm showerhead manufacturing standard.

High Efficiency Clothes Washer Conservation Potential. There are approximately 850,000 clothes washers in the residential sector.³ The AWE Tracking Tool estimates the number of high efficiency clothes washers derived from energy code standards and natural replacement at 130,000 by 2013. There have been approximately 87,000 residential clothes washer rebates throughout Orange County since 2000. The resulting calculation shows 26 percent of the market is saturated with HE washers. In sum, the existing installed stock of clothes washers is far from saturated; this is a significant potential source of market potential.

Other sources of remaining residential conservation potential include leak detection and pressure regulating valves. Savings potential has not been quantified for this analysis. However, we note anecdotal evidence that suggests a high percentage of failure of pressure regulating valves on the customer side of the meter which cause higher leakage rates for existing leaks and possible new leaks. Additionally, failed pressure regulating valves will also cause higher flow rates for some plumbing fixtures such as faucets and showerheads.

Landscape Opportunity

Residential Landscape.

Residential landscape water use from single-family and multi-family mixed-use meters comprises approximately 58 percent of all landscape demand in Orange County. This along with the low saturation of WUE landscape measures confirms that there is significant opportunity for water savings in the residential landscape market. Records of past achieved conservation show 103,961 high efficiency nozzle rebates in the residential sector. This saturation is minor in comparison to the total number of spray heads available for retrofit in the Orange County market. Virtually any site with an irrigation system has pop up spray heads. This translates to millions of spray heads available for retrofit. Likewise irrigation controllers may present a large opportunity for savings given there is estimated to be

³ Calculated by multiplying the number of housing units' times the share of housing units with clothes washers are reported in the American Housing Survey (2005 survey, composite national figures, <http://www.census.gov/hhes/www/housing/ahs/ahs05/tab2-25.pdf>).



450,000 controllers in the Orange County market and less than 5,300 residential timers have been replaced through active WUE programs. Also, drip irrigation and turf removal represent very large sources of potential water conservation. Single family landscape represents the highest water use within all sectors at 118,829 acre-feet per year.

Large Landscape.

The large landscape market includes sites such as parks, homeowner association (HOA) common areas, and large commercial sites. There are 20,277 irrigation and recycled water accounts in Orange County that consumed 68,648 acre-feet of water in fiscal year 2010-11. Currently, 11,939 meters are enrolled in the HOA WaterSmart program. A number of these meters have been enrolled in the program longer than Metropolitan's 5-year funding eligibility.

Furthermore, some number of the enrolled meters no longer have valid contact information in the database and thus do not receive information on their performance to their water budget. This contact information gap occurs as HOA board member, landscape contractor, and property manager representation changes over time. Potential exists to enroll those meters that are not in the program and to outreach those that are not up to date. Recently, several major landscape maintenance contractors have expressed an interest to assist MWDOC to reestablish the loop of accountability for their clients including property owners and property managers.

Many of these sites are also a prime target for site specific upgrades that could be funded through the Landscape Pay for Performance Program as well as standard rebate incentives available through Metropolitan's SoCal WaterSmart Program.

Commercial Landscape (nozzles, controllers, turf removal).

The commercial landscape market includes all commercial dedicated- and mixed-use meters. As with residential, any site with and in-ground irrigation system will have pop up spray heads and an irrigation controller. Only a small number of these nozzles and controllers have been retrofitted through active WUE programs. This leaves significant potential for WUE measures.

Turf Removal.

Cutting across all sectors with landscape, turf replacement has enormous technical potential. However, due to the high cost of replacement, the incentive that can be justified at a cost-effective level for this measure has limits from a practical economic perspective. Thus, to tap this large potential it is important to develop grant funding to offset local investments. In this vein, the Metropolitan Board of Directors will be considering increasing their base incentive from \$0.30 per square of turf grass removed to \$1.00 per square foot at their September 2013 meeting. Turf removal also can serve as a program "gateway" to other irrigation upgrades and storm water capture low-impact design standards.

Commercial, Industrial, and Institutional (CII) Indoor Opportunity

The wide range of commercial, industrial, and institutional activity in Orange County is represented in the labor statistics collected by the U.S. Bureau of the Census.

The source of business data is the U.S. Census Bureau County Business Patterns (CBP) and Zip Code Business Patterns. Data from the CBP were extracted using Metropolitan's list of zip codes



for Orange County, and then summarized by North American Industry Classification System (NAICS) codes. The businesses included are those with employees, excluding government and certain other sectors. Also excluded are non-employer businesses, which make up the majority of businesses in the U.S. even though they represent only 4 percent of economic activity.

After reviewing the full set of CBP data, several industries were identified as good targets for WUE initiatives. They have either a high volume of sites or high water use, and they are good candidates for commonly available technologies that offer high water savings. Table 3-7 shows the employment and number of establishments by 3-digit NAICS code for target industries in the MWDOC territory.

| Market | Number of Employees | Number of Establishments |
|----------------------------------------------------|---------------------|--------------------------|
| Hotels (721) | 26,223 | 453 |
| Residential Care (623) | 22,663 | 640 |
| Restaurants (722) | 125,235 | 6,196 |
| Large Landscape Site (e.g., 712, 713, 812, 611) | 24,637 | 331 |
| Hospitals (622) | 21,781 | 42 |
| Industrial (Misc.) | 161,762 | 5,337 |

Table 3-7 Employment and Establishment for Target Industries (3-digit NAICS)

Table 3-8 drills down to the 6-digit level for Residential Care, which is one of the 3-digit NAICS codes shown above. This detailed data is available for all NAICS codes and it could be useful for identifying business types to target for WUE programs.

| NAICS* | Description | Employment | Establishments |
|--------|----------------------------------------------------------|---------------|----------------|
| | Residential Care | | |
| 623110 | Nursing care facilities | 9,813 | 105 |
| 623210 | Residential mental health facilities | 1,921 | 158 |
| 623220 | Residential mental health and substance abuse facilities | 792 | 47 |
| 623311 | Continuing care retirement communities | 2,832 | 36 |
| 623312 | Homes for the elderly | 6,140 | 235 |
| 623990 | Other residential care facilities | 1,165 | 59 |
| | Total | 22,663 | 640 |

Table 3-8 Employment and Establishments in Example Industries (3-digit NAICS)

Overall the remaining opportunity includes the indoor categories listed below. These categories are reflective of technologies available for retrofit in the targeted industries discussed above.

- Plumbing Measures
- Food Service Measures
- HVAC (Cooling Tower) Measures
- Industrial Process Water Use Reduction and Reuse

Toilets. Although the rate of natural replacement may not be the same for CII sector as for residential, we expect a medium level of saturation for efficient toilets. The most cost effective remaining potential exists in high traffic and older sites.

Urinals. Due to the high cost of replacement the urinal market has a lower potential for savings—at least cost-effective savings. As with toilets, the greatest potential existing in high traffic and older sites

Industrial. Industry uses water for landscaping, cooling, and laundry, in kitchens and restrooms, and for overall processing needs, like fabricating, diluting, incorporating water into a product, and/or for sanitation needs within the facility. The majority of water used by a facility is often used for processing, although cooling—most notably for oil refineries, high tech, and food processing facilities—also consumes a lot of water. There are several hundred industrial sites in Orange County which offer a high potential for savings.

Potential opportunities were identified as a result of the data evaluation. The analysis of water demand by market type revealed the following:



- Landscape water use comprises the highest water use at estimated 292,009 acre-feet per year.
- The commercial sector has opportunity for plumbing, food service, and cooling tower retrofits.
- Restaurants and hospitals represent a significant number of customers.
- Industrial opportunities are significant, but may be agency-specific.

The analysis of measure saturation and potential yielded the following information:

- Turf removal offers extremely high water savings potential.
- Smart controllers and high efficiency nozzles offer a high water savings potential.
- Toilets (from all sectors) still offer a high volume of savings despite their high saturation rate. The impact of the impending regulations must be factored, as well as the ability to target high volume units.
- Industrial process is a large water savings opportunity; however the lead time from initial contact to installation of efficiency measures can take 2-3 years.

The documentation of savings potential as described in this chapter is a necessary step in the planning process, but understanding conservation costs and benefits is also needed to make informed planning decisions. After the discussion of goals and compliance in Chapter 4, Chapter 5 continues by assessing the costs to deliver conservation programs and the benefits they derive in economic terms.



Chapter 4: WUE WATER SAVINGS GOALS AND COMPLIANCE ASSESSMENT

The strategies and programs included in the WUE Plan are designed to meet the compliance requirements of the following:

- SBx 7-7 - Governor’s call for 20% per capita water use reduction by 2020
- Metropolitan Water District’s Integrated Resources Plan
- California Urban Water Conservation Council’s (CUWCC) Best Management Practices
- Assembly Bill 1420 Statute

Water Savings Goals

MWDOC devised a strategy to meet all compliance requirements in the most cost-effective manner feasible. Table 4-1 shows each of the compliance requirements and associated strategies.

Compliance Requirements

| Regulatory Agency or State Organization | Requirements | Approach |
|------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SBx 7-7 20x2020 | - Per Capita Water Use of 175 by 2015 - Per Capita Water Use of 158 by 2020 | MWDOC agencies are projected to be on track to meet per capita water reduction goals for both target years. MWDOC will continue to track performance annually as the region may see an increase in water use as the economy rebounds. |
| Metropolitan Regional IRP Goal | 92,827 acre-feet | MWDOC and its agencies can meet this goal through a combination of water use efficiency and/or recycled water. |
| CUWCC | Meet MOU BMP Requirements | MWDOC and its agencies that are Signatories are expected to meet BMP Requirements. |
| AB 1420 | Fulfill BMP commitments | Lines up with actions taken to meet CUWCC BMP compliance. |

Table 4-1 Compliance Requirements

SBx 7-7 and the Orange County 20x2020 Regional Alliance

SBx 7-7 establishes a statewide urban per capita water use reduction of 20% by 2020. This initiative applies to all urban retail water suppliers serving a minimum of 3,000 customers or



supplying annually 3,000 acre-feet or more annually. Urban retail water suppliers established a baseline GPCD water use in their 2010 urban water management plans.

MWDOC in collaboration with its retail agencies as well as the cities of Anaheim, Fullerton, and Santa Ana, established the Orange County 20x2020 Regional Alliance (Regional Alliance) in MWDOC’s 2010 Regional Urban Water Management Plan (RUWMP). The Regional Alliance was created to provide flexibility to meet the per capita reductions on a regional basis without adding additional risk to the retail agencies, who can still achieve compliance on the individual level. Under the Regional Alliance, all retail water agencies can benefit from pooling their investments in water use efficiency, which under the law includes recycled water projects, such as the Groundwater Replenishment System.

As the reporting agency for the Regional Alliance, MWDOC provides annual reports on progress towards compliance with Regional Alliance targets.

2012 Per Capita Update

For fiscal year 2011-12, the Regional Alliance per capita water use level was **142 GPCD**. This total is **19 percent** below the Regional Alliance goal of **175 GPCD for 2015** and **10 percent** below the final goal of **158 GPCD for 2020** (Table 4-2). Table 4-2 shows the targets calculated for the 2010 UWMP as well as recently recalculated targets based on the 2010 Census.⁴

Regional Alliance Targets

| Regional Alliance Target in GPCD | | |
|----------------------------------|-----------|-------------|
| YEAR | 2010 UWMP | 2012 UPDATE |
| 2015 target | 174 | 175 |
| 2020 target | 157 | 158 |

Table 4-2 Regional Alliance Target

Note that compliance with the law will be measured on the actual performance in the compliance years of 2015 and 2020. The current per capita demand levels are likely to rebound to some degree with improvements in economic factors and lifting of drought response measures. Demands will also be influenced by changes in weather conditions. The economic cycle caused reductions of 4-5% at the depth of the recession. Recovery from this worst recession in two decades has been slow. Though estimates of the time to fully "rebound" from recession vary, one to two percent annual increases in per capita demand can be expected for the next several years as part of the recovery process.

⁴ Additional detail on these calculations can be found in “2012 Progress Report Orange County 20x2020 Regional Alliance,” Final.

Figure 4-1 is a chart illustrating the Regional Alliance’s annual per capita water use compared against the 2015 and 2020 targets.

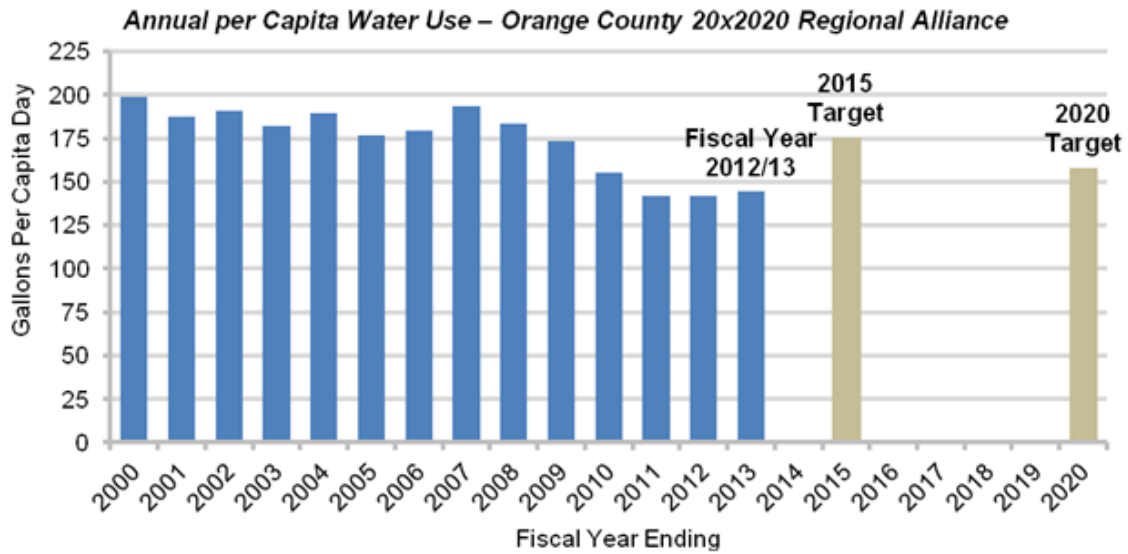


Figure 4-1 Annual per Capita Water Use - Orange County 20 X 2020 Regional Alliance

Integrated Resources Plan Goals for WUE

In 2010 Metropolitan Water District developed a Southern California Long Term Conservation Plan as part of their Integrated Resources Plan (IRP). The IRP established water supply portfolio and reliability goals for the region. The plan established regional WUE goals that are more ambitious than those required for SBx7-7. The 2010 IRP update established regional GPCD targets for new water savings as follows:

- 159 gallons per day in 2015
- 141 gallons per day in 2020

Figure 4-2 depicts the regional conservation goals that include an additional increment for WUE above the SBx7-7 20X2020 requirements. The goals extend to 2035.

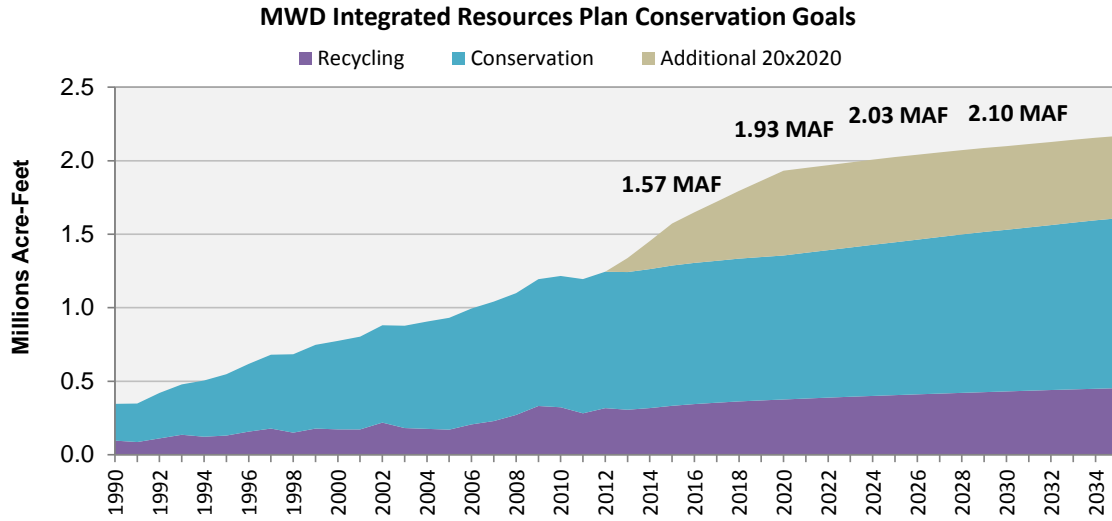


Figure 4-2 Metropolitan Integrated Resources Plan Conservation Goals

MWDOC inferred the Orange County share of this regional WUE goal by determining its proportionate share of regional demand (approximately 16.1 percent of total baseline demand, prior to accounting for the effects of WUE). Figure 4-3 reveals that progress to date in Orange County—the sum of quantified recycled water, passive WUE, and active WUE—is approximately 183,000 acre-feet. Additional investments in recycled water and WUE will be required to meet the regional IRP Goal in future years.

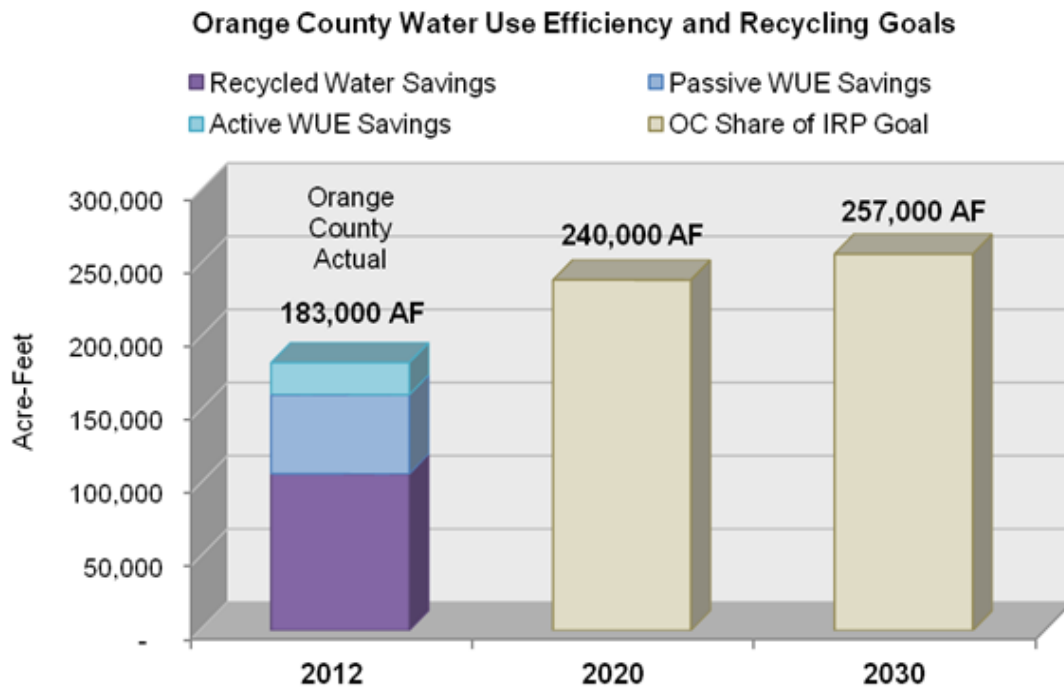


Figure 4-3 Orange County Share of IRP WUE Goals



CUWCC MOU Compliance

MWDOC and 18 retail agencies are signatories to the Memorandum of Understanding (MOU) regarding Urban Water Conservation in California and are members of the CUWCC. As one of the original signatories to the MOU in 1991, MWDOC’s highest conservation priority has been to ensure that good-faith efforts are made in implementing Water Use Efficiency Best Management Practices (BMPs) locally.

Over the last 22 years, MWDOC has been committed to developing and implementing many core regional conservation programs that have been designed on the foundation of BMPs, and these programs continue to serve as a key component in the overall regional water resource management portfolio for the region.

As signatories to the MOU, MWDOC and signatory member agencies are required to provide BMP “Activity Reports” biennially. These reports provide specific details of the agency’s efforts to implement each particular BMP.

The following compliance assessment is based on MWDOC BMP reporting data through 2010, the last year for which data is available, and provided by MWDOC staff. (A technical memorandum providing a full assessment of MWDOC’s MOU compliance assessment was provided as part of developing the WUE Master Plan.)

Table 4-3 provides a summary of assessment results. Based on the most recently available BMP reporting information, MWDOC is currently meeting all applicable wholesale water supplier BMP obligations. Two of the six wholesale BMPs – water loss control and metering with commodity rates – are not applicable to MWDOC since it does not own, operate, or maintain a physical water distribution system.

| BMP No. | BMP Name | Compliance Status |
|---------|--------------------------------------|-------------------------|
| 1.1(1) | Conservation Coordinator | Full Compliance |
| 1.1(3) | Wholesale Agency Assistance Programs | Full Compliance |
| 1.2 | Water Loss Control | Not Applicable to MWDOC |
| 1.3 | Metering with Commodity Rates | Not Applicable to MWDOC |
| 2.1 | Public Information Programs | Full Compliance |
| 2.2 | School Education Programs | Full Compliance |

Table 4-3 BMP Compliance

The BMPs are functionally equivalent to the Demand Management Measures (DMM) written in Water Code Section 10631 of the Urban Water Management Planning Act (Act). The Act requires an agency to describe each of the DMMs that have been implemented unless the



agency is a signatory to the MOU. The Act allows an agency to provide the BMP Activity Report in-lieu of describing each of the DMMs. Therefore, MWDOC included its FY 2008-09 and 2009-10 BMP Activity Reports in the 2010 Urban Water Management Plan.

The remaining 13 agencies are not signatories to the MOU. However they all actively promote WUE programs to their customers, and they provide DMM Implementation reports in their Urban Water Management Plans.

Note AB 1420 (Laird/Feuer), effective January 1, 2009, makes award of all state water management grants and loans contingent on “full” compliance with the implementation of water demand management practices described in the UWMP. DMMs are defined as water conservation measures, programs and incentives that prevent the waste of water and promote the reasonable, beneficial and efficient use and reuse of available supplies.

Why Water Use Efficiency?

Estimates show that the Orange County Regional Alliance will, in all likelihood, exceed the mandated target reductions. If this is the case, why then should MWDOC and the retail agencies continue the drive for even higher levels of water use efficiency?

There are a number of reasons why water use efficiency plays a continual role today and in future planning:

1. The SBx7-7 target dictates the minimum level of water use reduction, not the optimum level of achievement possible.
2. Additional investments in water use efficiency are needed in Orange County to achieve our share of Metropolitan's Integrated Resources Plan goal for regional water supply reliability.
3. Water use efficiency is a cost effective method to increase water supplies.
4. Despite today's positive results in per capita water use reduction, there is the possibility of a rebound effect due to economic changes and population growth.
5. Future droughts are an inevitable outcome of California's hydrologic cycle.
6. Water use efficiency diversifies the water resource portfolio risk.
7. Water use efficiency brings broader benefits beyond water use reductions:
 - Energy savings
 - Dry weather runoff and non-point source pollution reduction
 - Reduced irrigation overspray damage to structures and street surfaces
 - Improved plant health and aesthetic quality
 - Resource stewardship
 - Increase public awareness
 - Improve water quality

For example that in addition to water savings goals, cities are subject to Regional Water Quality Control Board Municipal Separate Storm Sewer Systems (MS4) Stormwater Permits, such as in



the San Diego Region that “prohibits excessive sprinkler/irrigation water that results in discharges to the storm drain system.”



Chapter 5: IDENTIFY WUE PROJECTS, PROGRAMS, AND POLICIES

A key goal of the process was to create a comprehensive list of programs and measures that corresponded to MWDOC’s water demand characteristics and savings potential. A broad range of possibilities were listed, with the understanding that many of these programs would not make the final cut.

The research team examined the remaining market opportunities, including the predominant customer segments, technologies available, and retail water agency needs. In addition, at the second stakeholder meeting, the team obtained feedback from participants on which measures and programs they thought would be effective in Orange County, and if appropriate, in their local territory.

The team next analyzed delivery mechanisms for each market opportunity and created viable program concept designs. These new program designs were created to “fill in the gaps” in addressing MWDOC’s water demand profile. The new potential programs were then added into the mix for consideration, along with the existing programs with quantified water savings. Table 5-1 lists potential programs with quantified savings.

| Program | Why Considered? |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Landscape Programs | |
| HOA WaterSmart Landscape | Existing successful program with remaining opportunity to enlist new customers and re-engage existing participants. |
| Large Landscape Survey Program | Metropolitan provides \$200 per acre for an audited commercial landscape survey. |
| Large Landscape Pay for Performance Incentives | New Metropolitan program format which offers custom incentives specific to site. MWDOC state and federal grants will enhance Metropolitan’s base incentive to increase participation. Large opportunity within MWDOC district. |
| Public Spaces Program | Existing Proposition 84 grant that offers landscape marketing transformation demonstration projects. |
| SoCal Water\$mart Landscape Incentives <ul style="list-style-type: none"> • Smart Timers • Rotary Nozzles • Central Computer Irrigation Controllers | Base incentives provided by Metropolitan. Ease of operation for MWDOC. Offers delivery mechanism of devices for other program umbrellas (i.e. |



Program

Why Considered?

| | |
|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • In-Stem Flow Regulators | Home Certification Program). MWDOC can enhance Metropolitan base incentives with grant and other local funding to increase participation rates. |
| Turf Removal Program | Existing grant that targets the largest use of water (landscape). Large potential and interest from stakeholders. Considered a gateway to other water saving activities such as Smart Timers, drip irrigation, etc. |
| Home Certification Program | Existing grant that targets largest residential water use sector (single family residential). Used as a platform to recommend increased efficiencies and incentive programs. |
| Smart Controller Direct Installation Program | Targets largest water use (landscape). Ensure controllers will be installed and programmed correctly. |
| Soil Moisture Sensor Rebate Program | New technology soon to be approved and offered as rebate through Metropolitan. MWDOC state and federal grants will enhance Metropolitan’s base incentive to increase participation. |
| Rain Shut Off Device Rebate Program | Low cost product that is of interest to large volume of customers. |
| High Efficiency Nozzle Voucher Program | Potential large savings due to the large number of pop up spray heads in Orange County. Easy to retrofit measure. |
| Pressure Regulating Spray Body Incentive Program | Potential large savings due to the large number of pop up spray heads in Orange County. |
| California Sprinkler Adjustment Notification System | New education-type program to improve irrigation scheduling. Interest from many stakeholders. |
| Artificial Turf Rebate Program | Interest from stakeholders. |
| Recycled Water Conversion Incentive Program | Large opportunity to convert sites. |
| Rainwater Capture (Rain barrel) Distribution Program | Interest from stakeholders. Considered a gateway to other activities. |
| Commercial, Industrial and Institutional Programs | |



| Program | Why Considered? |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Industrial Process Pay for Performance Program | Existing program with large potential savings per site. Requires significant lead time to realize savings. |
| SoCal Water\$mart Commercial Device Incentives <ul style="list-style-type: none"> • High Efficiency Toilets • UL or Zero Water Urinals • Cooling Tower pH & Conductivity Controllers • Dry-Vacuum Pumps • Connectionless Food Steamer • Air Cooled Ice Machines • Laminar Flow Restrictors | Majority of funding from MWD. Ease of operation for MWDOC. Offers delivery mechanism of devices marketed under other program umbrellas (i.e. Hotel Program). MWDOC can enhance Metropolitan base incentives with grant and other local funding to increase participation. |
| Hotel Program | Existing grant. |
| Urinal Valve Retrofit Program | Low cost alternative to replacing entire urinal. Large number of urinals in Orange County. |
| Dipper Well in Food Service Program | Continuous flow of water used in dipper wells is considered a waste of water beyond what is needed for public health. |
| Residential Indoor Programs | |
| SoCal Water\$mart Residential Device Rebate Program <ul style="list-style-type: none"> • High Efficiency Clothes Washers • High Efficiency Toilets | Majority of funding from Metropolitan. Ease of operation for MWDOC. High efficiency washers provide good public relations opportunity. MWDOC can enhance Metropolitan base incentives with grant and other local funding to increase participation. |
| Swimming Pool and Spa Cover Rebate Program | Interest from stakeholders. |

Table 5-1 Potential Programs

Program selection was not a cut-and-dried process. The evaluation team recognized that some of the water efficiency possibilities would not meet other MWDOC criteria for selection, such as the cost per acre-foot, market need, or overall program budget dollars. The evaluation team also worked to maximize access to Metropolitan funding and grant opportunities that are available.

With possible solutions listed, we then ran each measure through the Alliance for Water Efficiency Water Conservation Tracking Tool, an economic analysis model to compare against MWDOC’s avoided cost of supply, and to better examine the pros and cons of each possible solution.



A thorough analysis of the avoided costs from conservation was conducted. Appendix A contains details of the analysis of the benefits of WUE as defined as the avoided operating costs and the costs avoided by deferring or downsizing new projects. With an avoided cost of \$902 in 2013, a number of conservation program possibilities are cost effective. Although cost effectiveness was not the only consideration in selecting programs, it was a critical evaluation component. The lower the cost per acre-foot, the more attractive the program is to include in the regional program portfolio. Potential Programs were compared according to the following economic attributes:

- Low overall costs
- High acre-foot lifetime savings
- Low cost per acre-foot

The economic analysis resulted in each activity's cost per acre-foot as shown in Table 5-2. Note that a program may be made up of many activities. Activities are evaluated separately because they have different costs and savings, which in turn translate to different cost per acre-foot.

| Program/Activity | Unit Cost per Acre-foot |
|---------------------------------------------------------------------------|-------------------------|
| Landscape Programs | |
| HOA WaterSmart Landscape Program | \$38 |
| SoCal WaterSmart Landscape – Commercial Large Rotary Nozzles | \$85 |
| SoCal WaterSmart Landscape – In-Stem Flow Regulator | \$92 |
| High Efficiency Nozzle Voucher Program | \$167 |
| Recycled Water Conversion Incentive | \$170 |
| Landscape Pay for Performance Program | \$176 |
| Rain Shut Off Device – Residential | \$192 |
| SoCal WaterSmart Landscape – Central Computer Irrigation Controller | \$232 |
| SoCal WaterSmart Landscape – High Efficiency Nozzles | \$288 |
| Pressure Regulating Spray Body Rebate | \$326 |
| SoCal WaterSmart Landscape – Commercial Smart Controller | \$555 |
| Rain Shut Off Device – Commercial | \$616 |
| Smart Controller Direct Installation – Commercial | \$775 |
| MWDOC –Turf Removal Rebate Program | \$884 |
| Rainwater (Rain Barrel) Distribution Program | \$1,150 |
| Smart Controller Direct Installation – Residential | \$1,408 |
| SoCal WaterSmart Landscape – Residential Smart Controller Enhanced Rebate | \$1,408 |
| Public Spaces Program | \$1,865 |
| Artificial Turf Rebate | \$2,506 |
| Commercial, Industrial and Institutional Programs | |



| Program/Activity | Unit Cost per Acre-foot |
|----------------------------------------------------------------------------------------------------------|-------------------------|
| SoCal Water\$mart Commercial – High Efficiency Toilet Standard Rebate | \$106 |
| SoCal Water\$mart Commercial – Ultra Low Volume Urinal | \$149 |
| SoCal Water\$mart Commercial – Laminar Flow Restrictors | \$185 |
| SoCal Water\$mart Commercial – Cooling Tower pH Controller | \$209 |
| SoCal Water\$mart Commercial – High Efficiency Toilet Enhanced Rebate | \$214 |
| SoCal Water\$mart Commercial – Cooling Tower Conductivity Controller | \$226 |
| SoCal Water\$mart Commercial – Dry Vacuum Pump | \$235 |
| SoCal Water\$mart Commercial –Connectionless Food Steamers | \$242 |
| Industrial Pay for Performance Program | \$364 |
| SoCal Water\$mart Commercial – Cooling Tower pH Controller Enhanced Rebate | \$405 |
| SoCal Water\$mart Commercial – High Efficiency Toilet Enhanced Rebate Verified Installation (Tank Type) | \$424 |
| Urinal Valve Retrofit Program | \$472 |
| SoCal Water\$mart Commercial – High Efficiency Toilet Enhanced Rebate Verified Installation (Flusometer) | \$532 |
| SoCal Water\$mart Commercial – Air Cooled Ice Machine Enhanced Rebate | \$993 |
| Residential Indoor Programs | |
| SoCal Water\$mart Residential – High Efficiency Toilet | \$119 |
| SoCal Water\$mart Residential – High Efficiency Washer Rebate | \$360 |
| SoCal Water\$mart Residential – High Efficiency Washer Enhanced Rebate | \$1,129 |
| Swimming Pool and Spa Cover Rebate | \$1,305 |

Table 5-2 Potential Programs Cost per Acre-foot

As stated above, direct program cost is not the only consideration in selecting programs. In order to understand the goals of the WUE plan clearly, it was first necessary to define the elements of “success.” The team, along with the stakeholder group, determined that the following criteria were the major elements of success for the WUE Master Plan:

Major Elements of Success

- Cost effectiveness – The program provides economical water savings compared to the avoided cost of water supply.
- Certainty of water savings – The program uses “tried and true” measures that have proven savings.
- Market potential – The program has an opportunity for large volume of water savings.
- Market innovation/transformation – Program helps to forge the way into a specific market (such as landscape) so that vendors offer water use efficiency measures and customers make water use efficiency upgrades on their own.
- Ease of implementation – The program is not burdensome for MWDOC to operate.



- Outside funding potential – There is a possibility of third-party funding or grant money, which would reduce overall program costs and increase MWDOC’s benefit-to-cost ratio.
- Regulatory compliance – The program fulfills 20x2020, BMP and other regulatory compliance requirements, AB 1420 Urban Water Management Plans, and Small Municipal Separate Storm Sewer System (MS4) Program.
- Broad Support – Customers, water agencies and other stakeholders respond well to the program and support its implementation.
- Other benefits – The program has additional benefits such as reduced runoff, reduced non-point source pollution, reduced wastewater, or improved water quality.

Armed with the results of the economic analysis (Appendices A and B), the team compared each of the potential programs against the full list of evaluation criteria. The final step in the process was to assimilate all the findings and create the best portfolio of programs for the future.

Based upon the evaluation results, several programs were eliminated from the list, some were put on hold until Metropolitan began funding or grants were obtained. Others were slated for research to quantify water savings. A list of these programs and their current status is provided in Table 5-3.

Programs Eliminated or On Hold

| <i>Program</i> | <i>Why Eliminated or Put on Hold?</i> |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Landscape Programs | |
| Smart Controller Direct Installation Program | Higher cost per acre-foot. Will continue to solicit grants to offset additional costs. |
| Rain Shut Off Device Rebate Program | Low water savings opportunity. Better solutions are smart controllers and soil moisture sensors. |
| High Efficiency Nozzle Voucher Program | Installation rates not certain. Will wait to consider implementation after Metropolitan completes evaluation, measurement and verification study. |
| Pressure Regulating Spray Body Incentive Program | Savings are not proven and funding from Metropolitan is currently not available. California Water Service Company is currently implementing a program. Will wait until programs results are available to consider implementation. |
| Artificial Turf Rebate Program | Cost per acre-foot too expensive. |
| Recycled Water Conversion Incentive Program | Metropolitan considering offering incentive. MWDOC will implement once incentives are available. |
| Rainwater Capture (Rain barrel) Giveaway/Co-pay | Not cost effective. |



| <i>Program</i> | <i>Why Eliminated or Put on Hold?</i> |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Commercial, Industrial and Institutional Programs | |
| Urinal Valve Retrofit Program | Metropolitan may consider offering incentive after savings have been verified. If Metropolitan funds MWDOC will consider implementing project. |
| Dipper Well in Food Service Program | Solutions (i.e. full replacement, retrofit device) are not well understood. Savings and cost are not well known. MWDOC will evaluate program as more data is available. |
| Residential Indoor Programs | |
| Swimming Pool and Spa Cover Rebate Program | Not cost effective. Study has shown that covers are not used during hottest time of the year and therefore savings are lower than expected. |

Table 5-3 Programs Eliminated or On Hold

The end result yielded 11 programs. The final program list, along with reasons for each selection is shown in Table 5-4. As shown below, the final list of programs predominantly focuses on the greatest water demand: outdoor water use.

Selected Programs

| <i>Program</i> | <i>Why Selected?</i> |
|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Landscape Programs | |
| HOA WaterSmart Landscape | Focuses on largest water use and highest cost effectiveness. |
| Large Landscape Pay for Performance Incentives | Focuses on largest water use. |
| Public Spaces Program | Highly visible demonstration projects will impact landscape market transformation. |
| SoCal Water\$mart Landscape Incentives | Majority of funding from Metropolitan. Ease of operation for MWDOC. Added Soil Moisture Sensors because base incentive will be paid by |



| | |
|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Metropolitan. Another irrigation smart controller technology. |
| Home Certification Program | Existing grant that targets largest use of water use. |
| California Sprinkler Adjustment Notification System | Focuses on largest water use. Solution for all customers with sprinkler timers. |
| MWDOC Turf Removal Incentive Program | Large savings potential and stakeholder support. |
| Commercial, Industrial and Institutional Programs | |
| Industrial Process Pay for Performance Program | Existing program with large savings per site potential. |
| SoCal Water\$mart Commercial Device Incentives | Majority of funding from Metropolitan. Ease of operation for MWDOC. Offers delivery mechanism of devices for other program umbrellas (i.e. Hotel Program) |
| Hotel Program | Existing grant. |
| Residential Indoor Programs | |
| SoCal Water\$mart Residential Device Rebate Program | Majority of funding from Metropolitan. Ease of operation for MWDOC. High efficiency washers provide good public relations opportunity. |

Table 5-4 Selected Programs

In addition several education-based programs were selected for continuance, including the award winning MWDOC Water Education School Program, the partnership with the Discovery Science Center, the O.C. Water Hero Program, the Water Education Poster and Slogan Contest, the Water Do more with Less Program, and additional education materials on the MWDOC website.

Chapter 6: RECOMMENDED PROGRAM DETAILS

Chapter 6 contains comprehensive details about each of the individual programs, pilots and services chosen for inclusion in the WUE Master Plan.

The field programs were selected because they provide the best opportunities for *quantified* water savings within the CII, landscape, and residential markets with the technologies available today. Most of the field programs provide solutions for one or more of the general customer segments; CII, landscape, or residential, while other programs are focused narrowly on a particular niche market such as hotels.

Understanding that product advancements make their way into the marketplace every day, the plan also includes pilot programs and studies to test new technologies and delivery options for possible inclusion in future programs. The over-reaching goal is to drive water efficiency levels ever higher through market transformation and, eventually, to have customers strive for WUE in a self-driven mode. Market transformation strategies must consider who can have significant impact: end users, such as water agency customers or retailers, landscape planners, engineers, builders or possibly manufacturers and suppliers. As shown in Figure 6.1, there are a number of strategies targeted to affect change (although not necessarily in this order): education, pilot projects, programs, incentives (financial and non-financial), requests for voluntary change, and regulatory or ordinance change.⁵

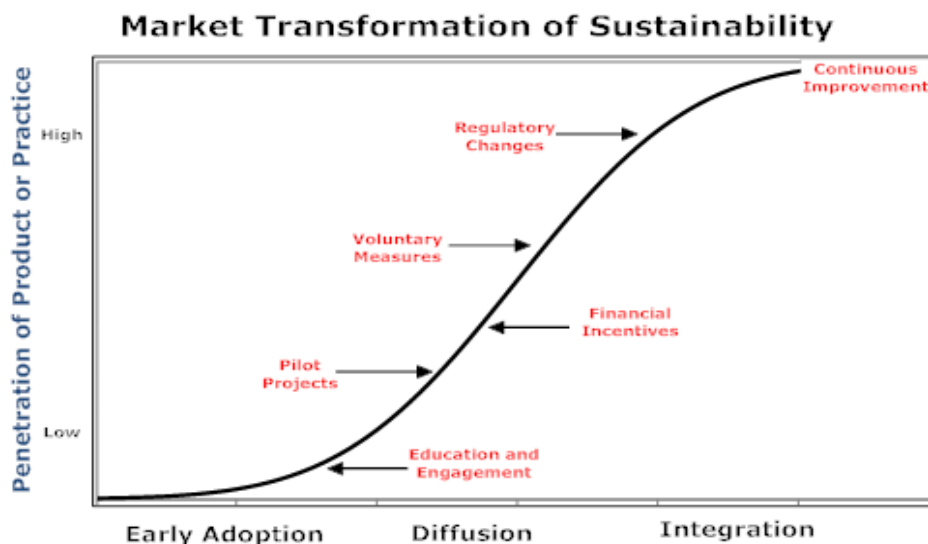


Figure 6-1 Program Sector Implementation Approaches

⁵ T. Chesnutt, M. Erbezniak, D. Pekelney, Case Studies of Market Transformation as a Means for Delivering Regional Conservation Results. Prepared for The Metropolitan Water District of Southern California, April 2010.



In addition, evaluation programs are to be performed to better study existing technologies and market approaches. The results of the evaluations will help further refine programs and maximize their results.

Lastly, the WUE Master Plan makes provisions for support services that are valuable to the retail suppliers. These are categorized under the program segment *Utility Operations*. This category contains services such as distribution system audits, leak detection and repair, budget based rate technical assistance, as well as school education and public education programs.

The result desired from this collection of programs and services is twofold:

1. Transformation from a utility-driven WUE market to a customer-driven WUE market
2. Persistent water savings that increase over time as the market transforms

Field Implementation Approaches and Program Segments

The programs included in the WUE Master Plan cut across a number of market segments and differ in their delivery formats (Figure 6-2). There are intentional reasons for this varied approach. Through evaluation of past programs, it has been shown that there are three Implementation approaches that are particularly effective at securing water savings in a cost-effective and persistent manner. These implementation approaches have been built into each of MWDOC's program offerings and matched up with the appropriate program sector as follows:

1. **Performance based incentives**- this payment format works especially well for the large landscape and CII sectors due to the array of site specific needs and custom processes and equipment at these sites.
2. **Standardized device rebates**- rebates are most applicable for the more "cookie cutter" type measures where there is a limited number of products and styles and well defined water savings rates. These incentives are the predominant payment method for residential, small commercial, and small to medium sized landscape markets.
3. **Audits, assistance and education**- All customer segments benefit from additional technical support services. This includes services such as audits for CII customers, sprinkler adjustment notices for the landscape segment and home water audits or certification programs for residential customers.

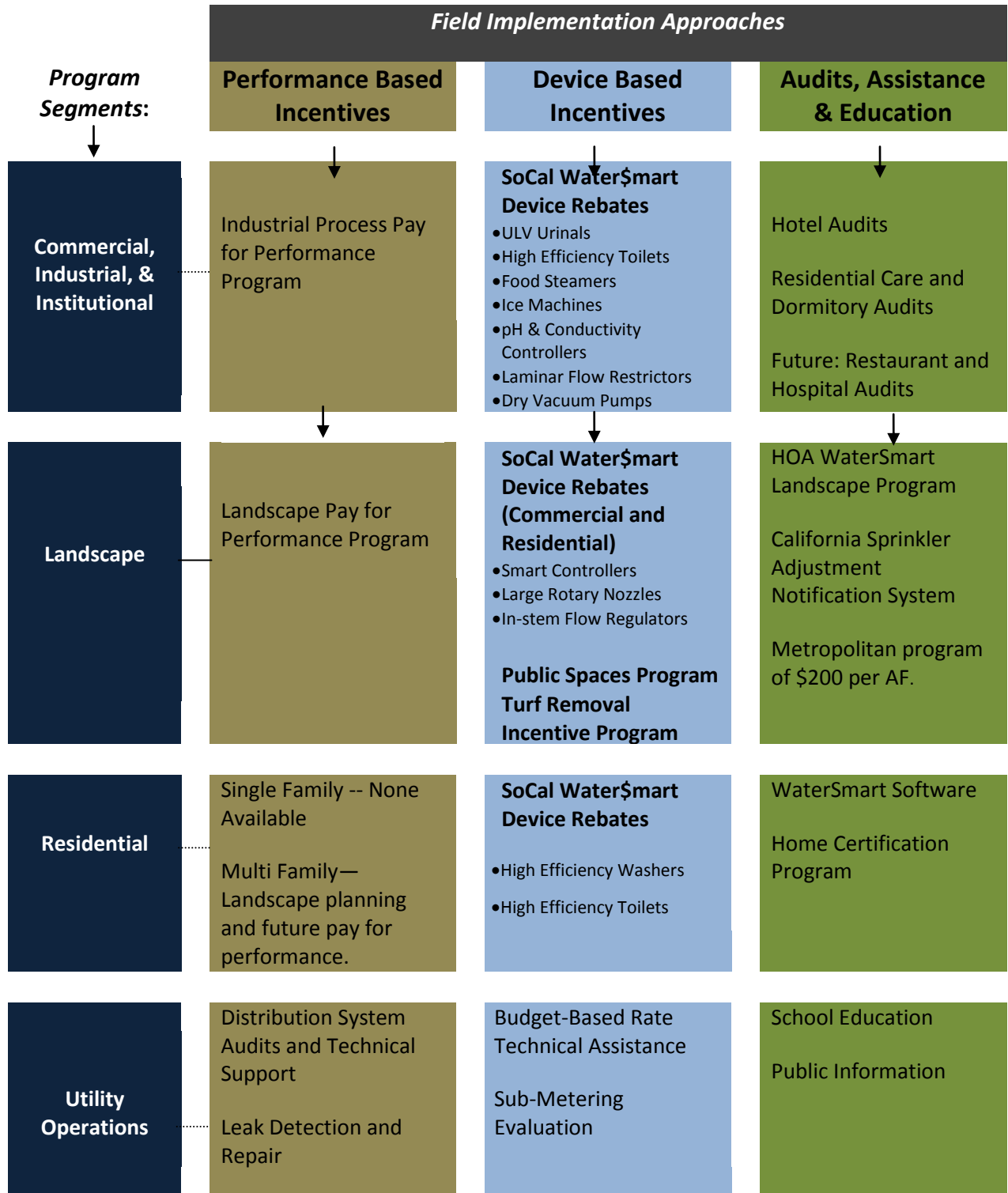


Figure 6-2 Program Sector Implementation Approaches



Below are the Program Detail Sheets, containing comprehensive information about the programs to be offered over the next five years. The Detail Sheets are organized in the following manner:

The first write ups comprise the *major programs and targeted segment programs that have quantifiable and verifiable water savings*— typically device installation programs. Sections within these write ups include:

- Eligible program sectors
- Overview of the program operations
- Program measures separated by residential, landscape and CII:
 - Each measure’s incentive amount, market description, per unit water savings, and cost per acre foot
- The Five Year Annual Activity per measure
- Marketing and outreach for the program
- Recommended local agency support and reporting
- Program interconnectivity
- Measurement and verification activities
- MWDOC primary contact person
- Funding sources
- Program water savings projections

Following the Program Detail write ups are overviews of the programs “soft savings” or un-quantified water savings. Since these programs do not have water savings data; the information is presented in narrative form. The programs in this section include:

- Educational Based Programs
- Pilots, Research, and Studies
- Utility Operations

Program Detail Sheets

Below are the Program Detail Sheets for each of the water use efficiency programs to be offered over the next 5 years.



SoCal Water\$mart Rebate Program

Program Sectors: Residential, CII and Landscape

The SoCal Water\$mart Program offers residential and commercial customer incentives for a menu of indoor and outdoor devices. The largest opportunities for water savings in the MWDOC territory are within the landscape and commercial sectors. In order to drive up participation rates for device retrofits within these high-potential sectors, MWDOC provides additional funding, or enhanced funding, for the following: smart irrigation controllers, high efficiency toilets, cooling tower conductivity and pH controllers, connectionless food steamers and air cooled ice machines.

These enhanced incentives are provided through program umbrellas, specifically the Hotel and Home Certification Programs. These programs provide site audits and drive customers to the SoCal Water\$mart enhanced rebates. If MWDOC can secure funding through additional grants, MWDOC will target restaurants and hospitals to provide technical assistance and enhanced incentives.

In addition MWDOC is transitioning to promoting a comprehensive approach to landscape conservation. Metropolitan is helping with that by providing— new for Fiscal Year 13/14 —several changes to the program including:

- Contractor Enrollment for Direct Payment. Contractors will now be able to enroll on-line and will be approved for receiving the incentive, based upon set criteria. They will also be re-checked once per year to ensure the customer is aware of the rebates and the contractor is following program policies.
- Increased Marketing. Metropolitan will be increasing marketing efforts to drive higher participation rates.
- Metropolitan will again offer rebates for residential high efficiency toilets as a *last chance rebate* to motivate customers to make the upgrade before HETs become mandatory in 2014. In addition, the commercial incentive for tank type units may be increased to \$100.
- The list of approved smart controllers will transition from SWAT tested to EPA Water Sense approved.
- As soon as soil moisture sensors are SWAT tested or Water Sense approved they will be added to the program.

The SoCal Water\$mart Program is operated by EGIA, Metropolitan's regional vendor. Metropolitan will continue the program through FY 2013/14.

Following is a list of the incentivized devices categorized by market type: residential, landscape and commercial. MWD will continue to add measures as devices are deemed to perform, have a market, and to save water. Currently MWD is proposing to add soil moisture sensors, rain barrels and drip irrigation. Each measure has a different market potential depending on the number of units available within the MWDOC territory, the saturation of the technology, and the savings per device.

RESIDENTIAL INDOOR MEASURES


High efficiency clothes washers represent the majority of projected savings for the menu of residential indoor measures offered under SoCal Water\$mart Program.



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|  <p>High Efficiency Clothes Washers (HECWs)</p> | <p><u>Standard Incentive:</u> \$85 per washer</p> <p><u>Enhanced Incentive:</u> Varies by participating agency.</p> <p><u>Market Description:</u> Although HECWs have been incentivized heavily in recent years, the MWDOC market is far from saturated. Approximately 26% saturation rate with a potential of 650,000 units in the market that have yet to be changed out for high efficiency models.</p> <p><u>Per Unit Savings:</u></p> <p>31 gallons per day</p> <p>15 year useful life</p> <p>.52 acre-feet lifetime savings</p> <p><u>Cost per Acre-foot:</u> \$360 with base rebate; \$1,129 with enhanced rebate</p> |
|  <p>High Efficiency Toilets (HETs)</p> | <p><u>Standard Incentive:</u> \$50 per toilet</p> <p><u>Enhanced Incentive:</u> Varies by participating agency. <u>Market Description:</u> Ultra low flush toilets, and in more recent years, high efficiency toilets have been heavily targeted over the last 20 years. 85% saturation rate with a potential of 250,000 – 350,000 residential units in the market that have yet to be changed out for high efficiency models.</p> <p><u>Per Unit Savings:</u></p> <p>38 gallons per day</p> <p>20 year useful life</p> |



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| | <p>.85 acre-feet lifetime savings</p> <p><u>Cost per Acre-foot:</u> \$119 per acre-foot</p> |
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| <p>LANDSCAPE MEASURES</p> |
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Smart controllers represent the majority of projected savings for the menu of landscape measures offered under SoCal WaterSmart Program.

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|  <p>High Efficiency Sprinkler Nozzles (HENS)</p> | <p><u>Incentive:</u> \$4 per nozzle for residential, commercial and irrigation customers</p> <p><u>Market Description:</u> The market for high efficiency spray nozzles has only emerged in recent years and has a tremendous potential. Hundreds of thousands of inefficient pop up heads are installed in the MWDOC territory. Virtually any site with irrigation will have pop up spray heads.</p> <p><u>Per Unit Savings:</u></p> <p>3.6 gallons per day per nozzle</p> <p>5 year useful life</p> <p>0.02 acre-feet lifetime savings</p> <p><u>Cost per Acre-foot:</u> \$288 per acre-foot</p> |
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|  <p>Smart Controllers (Weather-Based Irrigation Controllers)</p> <p>Soil Moisture Sensor Systems and Add-Ons to be Added FY 13/14</p> | <p><u>Standard Residential Incentive:</u> \$80 per controller</p> <p><u>Enhanced Residential Incentive:</u> Additional \$300 per controller</p> <p><u>Standard Commercial Incentive:</u> \$25 per station</p> <p><u>Per Unit Residential Savings:</u></p> <p>37 gpd (WBIC) to 41 gpd (Soil Moisture Sensor)</p> <p>10 year useful life</p> <p>0.41 to .46 acre-feet lifetime savings</p> <p><u>Per Unit Commercial Savings:</u></p> <p>11.52 gallons per day per station</p> <p>10 year useful life</p> <p>0.13 acre-feet lifetime savings per station</p> <p><u>Market Description:</u> The market for smart or weather based irrigation controllers has been advancing in recent years yet the market is estimated to have only a 10-20% saturation rate.</p> <p><u>Cost per Acre-foot:</u></p> <p>Residential \$1,106 to \$1,408 enhanced incentive, \$586 standard incentive</p> <p>Commercial \$555 per acre-foot</p> |
|  <p>Central Computer Irrigation Controllers</p> | <p><u>Standard Incentive:</u> \$25 per station</p> <p><u>Per Unit Savings:</u></p> <p>Same as standalone smart controllers</p> <p>11.52 gallons per day per station</p> <p>10 year useful life</p> <p>0.13 acre-feet lifetime savings per station</p> <p><u>Market Description:</u> The market for central</p> |


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| | <p>irrigation controllers are customers with multiple sites and multiple controllers. Central controller allows for customers to remotely manage their irrigation. Part of the technology includes weather based scheduling. Typical customers are cities, school districts, universities, multi-family owners and other large landscape sites.</p> <p><u>Cost per Acre-foot:</u> \$232 per acre-foot</p> |
|  <p>Large Rotary Nozzles</p> | <p><u>Standard Incentive:</u></p> <p>\$13 per set of two nozzles</p> <p><u>Per Unit Savings:</u></p> <p>16 gallons per day per set of two nozzles</p> <p>10 year useful life</p> <p>0.18 acre-feet lifetime savings per set of two nozzles</p> <p><u>Market Description:</u> Large rotary nozzles are brass nozzle inserts for large rotary sprinkler heads. Large rotary nozzles are used at golf courses and large athletic fields, irrigating extremely large turf areas.</p> <p><u>Cost per Acre-foot:</u> \$85 per acre-foot.</p> |
|  <p>In-Stem Flow Regulators</p> | <p><u>Standard Incentive:</u></p> <p>\$1 per flow regulator</p> <p><u>Per Unit Savings:</u></p> <p>1.4 – 2.7 gallons per day per station</p> <p>5 year useful life</p> <p>0.015 - 0.0076 acre-feet lifetime savings per station</p> <p><u>Market Description:</u> <i>Valvette Systems</i> is currently the only approved manufacturer of in-stem flow regulators. There are hundreds of thousands of the pop up sprinklers in MWDOC's territory, however much of the time customers will prefer</p> |



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| | <p>to retrofit just the nozzle.</p> <p><u>Cost per Acre-foot:</u> \$92 per acre foot.</p> |
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| <p>COMMERCIAL INDOOR MEASURES</p> |
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High efficiency toilets represent the majority of projected savings for the menu of commercial measures offered under SoCal WaterSmart Program.

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|  <p>Ultra Low Water / Zero Water Urinals</p> | <p><u>Standard Incentive:</u> \$200</p> <p><u>Per Unit Savings:</u></p> <p>110 gallons per day</p> <p>20 year useful life</p> <p>2.45 acre-feet lifetime savings</p> <p><u>Market Description:</u> Urinal installations are highest in public, high-traffic areas. Building managers often do not have the capital improvement budgets to change fixtures. Thus, incentives may help participation rates.</p> <p><u>Cost per Acre-foot:</u></p> <p>Standard Incentive: \$149 per acre-foot</p> |
|  <p>High Efficiency Toilet (HETs)</p> | <p><u>Standard Incentive:</u></p> <p>\$50 for Tank Type (this may be increased to \$100)</p> <p>\$100 for Flushometer Type</p> <p><u>Enhanced Incentive:</u> The regular CII indoor program does not, per se, have enhanced incentives. The Hotel Program enhances some devices, and certain agencies enhance some devices. We also have new grants that will allow us to enhance some devices, but those enhanced incentives have not yet been officially set.</p> |

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| | <p>\$100 for Non-Verified Units</p> <p>\$200 for Verified Existing 3.5 gpf</p> <p><u>Per Unit Savings:</u></p> <p>38 gallons per day</p> <p>20 year useful life</p> <p>0.85 acre-feet lifetime savings</p> <p><u>Market Description:</u> High efficiency toilets are the highest use indoor fixture in many facilities; they are also the most universal device located in just about any facility regardless of facility purpose.</p> <p><u>Cost per Acre-foot:</u></p> <p>Standard Tank Type: \$106 per acre-foot</p> <p>Enhanced Tank Type: \$214 per acre-foot</p> <p>Verified Tank Type: \$454 per acre-foot (if toilet is verified >=3.5 gpf)</p> |
|  <p>Connectionless Food Steamers (aka Boiler-less)</p> | <p><u>Standard Incentive:</u> \$485 per compartment</p> <p><u>Enhanced Incentive:</u> Additional \$100 per compartment</p> <p><u>Per Unit Savings:</u></p> <p>223 gallons per day</p> <p>10 year useful life</p> <p>2.5 acre-feet lifetime savings</p> <p><u>Market Description:</u> The best opportunities for use of connectionless food steamers are in food service facilities with large batch cooking such as cafeterias, institutions, and large family style restaurants.</p> <p><u>Cost per Acre-foot:</u></p> |

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| | <p>Standard Incentive: \$242 per acre-foot</p> <p>Enhanced Incentive: \$287 per acre-foot</p> |
|  <p>Air-Cooled Ice Machines</p> | <p><u>Standard Incentive:</u> \$1,000 per machine</p> <p><u>Enhanced Incentive:</u> Additional \$250 per machine</p> <p><u>Per Unit Savings:</u></p> <p>137 gallons per day</p> <p>10 year useful life</p> <p>1.54 acre-feet lifetime savings</p> <p><u>Market Description:</u> Ice machines are located in all food service operations, bars, supermarkets, convenience stores, hotels and many other operations throughout Orange County territory.</p> <p><u>Cost per Acre-foot:</u></p> <p>Standard Incentive: \$809 per acre-foot</p> <p>Enhanced Incentive: \$993 per acre-foot</p> |
|  <p>Standard Cooling Tower Conductivity Controller</p> | <p><u>Standard Incentive:</u> \$625 per controller</p> <p><u>Per Unit Savings:</u></p> <p>575 gallons per day</p> <p>5 year useful life</p> <p>3.22 acre-feet lifetime savings</p> <p><u>Cost per Acre-foot:</u> \$226 per acre-foot.</p> |

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|  <p>pH-Cooling Tower Controller</p> | <p><u>Standard Incentive:</u> \$1,750 per controller</p> <p><u>Enhanced Incentive:</u> Additional \$1,800</p> <p><u>Per Unit Savings:</u></p> <p>1,735 gallons per day</p> <p>5 year useful life</p> <p>9.72 acre-feet lifetime savings</p> <p><u>Market Description:</u> Cooling towers are located at large buildings (typically anything over three stories), industrial process operations and locations with large cooling requirement such as supermarkets. There are thousands of cooling towers in the MWDOC territory.</p> <p><u>Cost per Acre-Foot:</u></p> <p>Standard Incentive: \$209 per acre-foot.</p> <p>Enhanced Incentive: \$405 per acre-foot.</p> |
|  <p>Laminar Flow Restrictors</p> | <p><u>Incentive:</u> \$10 per restrictor</p> <p><u>Per Unit Savings:</u></p> <p>10.3 gallons per day</p> <p>5 year useful life</p> <p>0.06 acre-feet lifetime savings</p> <p><u>Market Description:</u> Laminar flow restrictors force water through a small opening reducing the flow while inhibiting bacterial growth. They are recommended in hospitals and other health care facilities, making them a target for program outreach.</p> <p><u>Cost per Acre-foot:</u> \$185 per acre-foot.</p> |

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|  <p>Dry Vacuum Pumps</p> | <p><u>Incentive:</u> \$125 per 0.5 Horse Power</p> <p><u>Per Unit Savings:</u></p> <p>81.8 gallons per day</p> <p>7 year useful life</p> <p>0.64 acre-feet lifetime savings</p> <p><u>Market Description:</u> Dry vacuum pumps are used at dental and medical facilities to create suction and remove excess air and byproducts. The largest opportunity is in dental offices.</p> <p><u>Cost per Acre-foot:</u> \$235 per acre-foot.</p> |
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Hotel Water Use Reduction Program

Program Sectors: Commercial

Water used in hotels and other lodging businesses accounts for approximately 15 percent of the total water use in commercial and institutional facilities in the United States. The largest uses of water in hotels are restrooms, laundry operations, landscaping, and kitchens. Recognizing this strong opportunity, MWDOC solicited grants from the State of California Department of Water Resources and the United States Bureau of Reclamation. The grant funding is in addition to the base incentives available through Metropolitan’s SoCal Water\$mart rebate program.

The Hotel Program provides technical assistance in the form of water use surveys, customized facility reports, technical assistance and enhanced incentives to hotels that invest in water use efficiency improvements. Enhanced rebates are available for high efficiency toilets, ultra low volume urinals, cooling tower pH and conductivity controllers, connectionless food steamers, and air-cooled ice machines promoted through the program. (Nozzles, WBICs and CCIC are also available).


MWDOC utilizes WaterWise Consulting to conduct the surveys and provide technical assistance.



Although there are 453 hotels in MWDOC’s territory, many have upgraded and program response has fallen in the last year. MWDOC is now transitioning the program to residential care/assisted living facilities and dormitories, which all have similar water use patterns. There are 643 residential care facilities in Orange County, and all of the universities in the county have dormitories.




Following is a list of the measures offered to customers under the program. The measures are paid and tracked through the SoCal Water\$mart Program, therefore the annual activity and associated savings is credited to the SoCal Water\$mart Program.

MEASURES

High efficiency toilets represent the majority of projected savings for the Hotel Program.

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|  <p>High Efficiency Toilets (HETs)</p> | <p><u>Incentive:</u></p> <p>\$50 for Tank Type</p> <p>\$100 for Flushometer Type</p> <p><u>Enhanced Incentive:</u></p> <p>\$150 for Tank Type</p> <p>\$150 for Flushometer Type</p> |
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| | <p>\$250 for Verified Existing 3.5 gpf Units</p> <p><u>Per Unit Savings:</u></p> <p>38 gallons per day</p> <p>20 year useful life</p> <p>0.85 acre-feet lifetime savings</p> <p><u>Market Description:</u> Hotels have tank type toilets in their guest rooms and flush valve toilets in their public restrooms. Residential care and dormitories may have both tank and flush valve type toilets.</p> |
|  <p>Ultra Low Water / Zero Water Urinals</p> | <p><u>Enhanced Incentive:</u> \$300</p> <p><u>Per Unit Savings:</u></p> <p>110 gallons per day</p> <p>20 year useful life</p> <p>2.45 acre-feet lifetime savings</p> <p><u>Market Description:</u> Hotels, residential care and dormitories have urinals in men’s restrooms.</p> |
|  <p>High Efficiency Sprinkler Nozzles (HENs)</p> | <p><u>Incentive:</u> \$4 per nozzle for residential, commercial and irrigation customers</p> <p><u>Per Unit Savings:</u></p> <p>3.6 gallons per day per nozzle</p> <p>5 year useful life</p> <p>0.02 acre-feet lifetime savings</p> <p><u>Market Description:</u> If a hotel, residential care or dormitory has landscape they will have pop up sprinklers that could be retrofitted with high efficiency nozzles.</p> |

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|  <p>Smart Controllers (Weather-Based Irrigation Controllers)</p> | <p><u>Enhanced Incentive:</u> \$50 per station</p> <p><u>Per Unit Commercial Savings:</u></p> <p>11.52 gallons per day per station</p> <p>10 year useful life</p> <p>0.13 acre-feet lifetime savings per station</p> <p><u>Market Description:</u> If a hotel, residential care or dormitory has landscaping they may benefit from installing a smart controller.</p> |
|  <p>Cooling Tower Conductivity and pH Controllers</p> | <p><u>Incentive, pH Controller, Up to \$3,550 per controller. Only pH controllers get enhanced incentive. Base incentive is \$1750.</u></p> <p>Conductivity controller base incentive \$650.</p> <p><u>Per Unit Savings:</u></p> <p>575 – 1,736 gallons per day</p> <p>5 year useful life</p> <p>3.22 – 9.72 acre-feet lifetime savings</p> <p><u>Market Description:</u> Larger hotels, residential care and dormitories may have cooling towers as part of their air conditioning system.</p> |
|  <p>Air-Cooled Ice Making Machines</p> | <p><u>Enhanced Incentive:</u> \$1,250 per machine</p> <p><u>Per Unit Savings:</u></p> <p>137 gallons per day</p> <p>10 year useful life</p> <p>1.54 acre-feet lifetime savings</p> <p><u>Market Description:</u> Ice machines are located in food service operations, bars, and many times on every floor of a hotel. In addition, many</p> |



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| | dormitories and residential care facilities have ice machines. |
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Savings source: Metropolitan Water District

Annual activity is provided under the SoCal WaterSmart Program.

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| MARKETING/OUTREACH | |
| The program vendor conducts outreach to the targeted facilities through business-to-business phone calls and mailings. | |
| RECOMMENDED LOCAL AGENCY SUPPORT AND REQUIRED REPORTING Build a target list of customers specifically hotels, motels, residential care facilities and sites with dormitories. Conduct focused outreach to targeted customers. | |
| PROGRAM INTERCONNECTIVITY The program’s enhanced rebates are paid and tracked through the SoCal WaterSmart Program. Program reduces waste water costs to participants and waste water flows to the sanitation agency. | |
| MEASUREMENT AND VERIFICATION Surveys allow for verification of the existing fixtures. MWDOC conducts periodic installation verification inspections supplemented with additional inspections by Metropolitan. | MWDOC PRIMARY CONTACT Beth Fahl |
| FUNDING SOURCES | WATER SAVINGS PROJECTIONS |
| The program is currently funded through Metropolitan standard incentives. Grants obtained by MWDOC from DWR and USBR provide for enhanced incentives. | Water savings are accounted for under the SoCal WaterSmart Program. |



Industrial Pay for Performance Program

Program Sectors: Industrial

Industrial process water use comprises approximately 5 percent of all demand in the United States. In order to reduce process water usage, MWDOC obtained grants from the United States Bureau of Reclamation and DWR. These funds enhance MWD's incentives provided through their Water Savings Incentive Program. The program will provide the following for industrial customers:

1. Engineering surveys
2. Technical assistance and
3. Performance based incentives (based on the actual water saved)

The USBR Grant runs through Fiscal Year 14/15.

The program targets the highest water use industrial sectors with available water reduction, water recycling or water reuse technologies. The target sectors are textile, metals, electronics, laundries, food processing, and pharmaceuticals. MWDOC uses the Orange County Sanitation District's list of discharge permits to market the program. The program offers two levels of surveys:

- Level 1 (Focused Survey): A preliminary survey to ascertain the magnitude of water savings possible and the best possible opportunities.
- Level 2 (Comprehensive Survey): A more detailed study of the customer's process which includes customized retrofit recommendations, estimated costs, savings in water and sewer discharge costs, and a simple return on investment.


Incentives are calculated via a "Pay for Performance" model based on water savings and monitored for one year. Qualified participants receive the lesser of:

- Up to \$.60 per 1,000 gallons of water saved for a period of up to 10 years.
- Fifty (50) percent of the total amount of the retrofit cost(s). The incentives are paid in two payments:
 - The first payment after verification of equipment installation and startup
 - The second payment after a one-year monitoring period to measure water savings.

Customers can also be paid savings based upon engineering estimates. These incentives are paid at a lower rate of \$0.46 per 1,000 gallons of water saved. MWDOC utilizes the engineering firm, *URS Corporation* to conduct the customer outreach, surveys and technical assistance. Types of projects that have been implemented include treating and reusing water in manufacturing processes or for cooling towers and new wash equipment with upgraded washers, nozzles and automated control systems. Examples of successful program sites include Boeing, Sunopta, Oakley, and TIC.

In an effort to close more projects, the program is changing to provide additional follow up and technical assistance. All Level 1 survey participants are being contacted to offer the additional service.

MWDOC is also working with USBR and West Basin on a research project to gain more market intelligence and understand the barriers to implementing water use efficiency projects in the industrial market.

| MEASURES | |
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|  <p>Process water reuse and reduction.</p> | <p><u>Incentive:</u></p> <p>\$4.37 per 1,000 gallons of water saved (\$3.00 from Metropolitan and \$1.37 from USBR Grant)</p> <p><u>Per Project Savings:</u></p> <p>13,391 gallons per day</p> <p>10 year useful life</p> <p>150 acre-feet lifetime savings</p> <p><u>Market Description:</u> Customers on the Orange County Sanitation Discharge permit list in targeted sectors.</p> |

Savings source: MWDOC Analysis of Orange County Sanitation District Discharge Permits Usage done for USBR Grant Submittal.

| Measure | Annual Activity | | | | |
|-------------------------------|-----------------|---------------|----------|----------|----------|
| | FY 13/14 | FY 14/15 | FY 15/16 | FY 16/17 | FY 17/18 |
| Process Water Use improvement | 0.2 projects* | 0.2 projects* | 0 | 0 | 0 |

*The Annual Activity estimate stated is a conservative number. Actual Activity is expected to be higher.

| MARKETING/OUTREACH |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The program vendor, <i>URS Corporation</i> conducts outreach to the targeted facilities through business-to-business phone calls. The target list of customers comes from the Orange County Sanitation District’s discharge permit list in the sectors of are textile, metals, electronics, laundries, food processing, and pharmaceuticals. Current outreach is to Level 1 survey participants.</p> |



| | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>RECOMMENDED LOCAL AGENCY SUPPORT AND REQUIRED REPORTING</p> <p>Review industrial list of customers in local service area. Contact industrial customers to explain program value.</p> | |
| <p>PROGRAM INTERCONNECTIVITY</p> <p>The program incentives are paid through Metropolitan’s Water Savings Incentive Program. Program reduces waste water costs to participants and waste water flows to the sanitation agency.</p> | |
| <p>MEASUREMENT AND VERIFICATION</p> <p>All projects are inspected prior to implementation, after installation and at the end of the first year of implementation. Savings are monitored through sub-meters.</p> | <p>MWDOC PRIMARY CONTACT</p> <p>Melissa Baum-Haley</p> |
| <p>FUNDING SOURCES</p> <p>The program is currently funded through Metropolitan pay for performance incentives. Grants obtained by MWDOC from USBR provide for enhanced incentive funding – approximately 29%.</p> | <p>WATER SAVINGS PROJECTIONS</p> <p><u>Lifetime Savings</u> 60 Acre-Feet The Annual Activity estimate stated is a conservative number. Actual Activity is expected to be higher.</p> |



HOA WaterSmart Landscape Program

Program Sectors: Landscape

MWDOC’s HOA (Home Owners Association) WaterSmart Program provides customers, with sites that have dedicated irrigation meters, information on their monthly or bi-monthly usage versus a budget allocation. Each customer is given a water budget allocation based on the size of their irrigated acreage, plant material and the local weather. The water budget allocation varies monthly based on seasonal outdoor watering needs.

Customers are sent a report via email with detailed information regarding their site and their monthly budget versus their actual use. The water budget provides information and guidance as to reasonable water usage for a customer’s site. The budget is a tool customers can use to make informed choices about their water usage each month. If a customer is over their budgeted amount they could be given a list of recommendations and next steps.

Currently there are 11,200 dedicated irrigation meters enrolled in the WaterSmart Landscape Program out of 20,227 total dedicated irrigation meters. MWDOC will continue to solicit program enrollment for the remaining 8,800 meters. MWDOC will evaluate the feasibility of sending an additional “over budget” notice for meters exceeding their water budget. In addition, MWDOC is going to validate email addresses for existing customers in order to reengage them in evaluating their water use and making water use efficiency upgrades.

The HOA WaterSmart Program is currently the most cost effective program in the MWDOC portfolio of programs. In order to maintain this high level of cost effectiveness, MWDOC will add a number of valuable new services. This includes the addition of performance based contracts, ROI calculator and on-line irrigation and landscape training courses for contactor usage.

MWDOC will also utilize the California Landscape Contractors Association and members to promote the program to their customer base. Contractors, through the Irrigation Management course, can use the WaterSmart Landscape water budget component to meet their reporting requirements.

| MEASURES | |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Landscape and Irrigation Water Use Reduction | <p>No incentives. Measures are determined by customer and implemented by the customer.</p> <p><u>Per Site Savings:</u></p> <p>365 gallons per day</p> <p>5 year useful life</p> <p>2.04 acre-feet lifetime savings</p> <p><i>Savings source: A&N study of the Landscape Performance Certification Program (June 2004).</i></p> |



| | |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p><i>Savings are based upon an average use and a 20% water use reduction.</i></p> <p><u>Market Description:</u></p> <p>12,680 dedicated irrigation meters</p> <p>7,597 recycled water irrigation meters</p> |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Measure | Annual Activity | | | | |
|----------------------------------------------|-----------------|----------|----------|----------|----------|
| | FY 13/14 | FY 14/15 | FY 15/16 | FY 16/17 | FY 17/18 |
| Landscape and Irrigation Water Use Reduction | 500 | 500 | 500 | 500 | 500 |

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| MARKETING/OUTREACH | |
| Marketing primarily consists of outreach through H2O for HOA forum, direct outreach to dedicated irrigation meter customers, promotion from the retail water agency, newsletter articles, participation in green industry events, and posts on water agency websites. | |
| RECOMMENDED LOCAL AGENCY SUPPORT AND REQUIRED REPORTING | |
| Pull the full and updated list of dedicated irrigation meter accounts. Cross reference list with list of current participants. Verify email addresses for participants. | |
| Contact non-participants to educate customers on the program and its value. | |
| PROGRAM INTERCONNECTIVITY | |
| Program is promoted through Orange County partnerships such as the Orange County Storm water Agency. | |
| MEASUREMENT AND VERIFICATION | MWDOC PRIMARY CONTACT |
| Sites are monitored to verify savings. | Melissa Baum-Haley |
| FUNDING SOURCES | WATER SAVINGS PROJECTIONS |
| The program is currently funded 50/50 by Metropolitan and MWDOC. | <p><u>Lifetime Savings</u></p> <p>3,436 Acre-Feet</p> |



Large Landscape Pay for Performance Program

Program Sectors: Landscape

The largest water consumption sector in MWDOC’s service territory is landscape water use, which accounts for an estimated 50 percent of the total water demand in Orange County. The ultimate goal of Large Landscape Pay for Performance Program is to reduce water consumption in landscape irrigation through customized incentives for site-specific upgrades or water management services.

Currently customers can receive performance based incentives through MWD’s Water Savings Incentive Program. The incentive payment amount is up to \$0.60 per 1,000 gallons saved per year over the project life, up to a maximum of 10 years. Incentives are limited to 50% of the eligible project costs. Savings can be paid on monitored savings or engineered estimates. Engineering estimated savings are paid at a lower rate of \$0.46 per 1,000 gallons saved. Eligible costs directly pertain to the project installation or water management services and may include audits, design, engineering, construction, equipment and materials (including plant material), hardware, software, freight, shipping, third party labor, and contract water management services.

Customers submit their planned project with details of the upgrades, baseline usage, and estimated savings to Metropolitan. If approved, Metropolitan will fund Water Management Services annually based upon the actual water savings.

MWDOC has submitted a grant through the State of California Proposition 84 program. Additional funds will provide for additional customers support services and enhanced incentives beginning in 2014.

| MEASURES | |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Landscape and Irrigation System Upgrades | <p><u>Incentive:</u></p> <p>\$0.60 per 1,000 gallons of water saved per year</p> <p><u>Average Per Project Savings:</u></p> <p>5,226 gallons per day</p> <p>10 year useful life</p> <p>56 acre-feet lifetime savings</p> <p><i>Savings source: MWDOC Analysis done for the Prop 84 Grant Submittal.</i></p> <p><u>Market Description:</u></p> |



| | | | | | |
|------------------------------------------|----------------------------------------|-----------------|-----------------|-----------------|-----------------|
| | 12,680 dedicated irrigation meters | | | | |
| | 7,597 recycled water irrigation meters | | | | |
| | Annual Activity | | | | |
| Measure | FY 13/14 | FY 14/15 | FY 15/16 | FY 16/17 | FY 17/18 |
| Landscape and Irrigation System Upgrades | 35 acres | 35 acres | 35 acres | 35 acres | 35 acres |

| | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| MARKETING/OUTREACH | |
| <p>MWDOC will design and produce marketing promotional advertising pieces to be included in monthly targeted trade publications. Promotional pieces and personal outreach will encourage site participation in the Program by logging onto the Program website to read about Program rules and regulations, to download a Program application, and to learn about rebate levels through the Program. Marketing will primarily consist of publication advertisement pages, newsletter articles, direct customer outreach, participation in green industry events, and posts on water agency websites.</p> <p>MWDOC will also conduct informational workshops/webinars for landscape contractors and irrigation equipment suppliers. Once developed, MWDOC will share the return on investment calculator with contactors and customers.</p> | |
| RECOMMENDED LOCAL AGENCY SUPPORT AND REQUIRED REPORTING | |
| <p>Water providers and storm water permit holders (MS4) should conduct outreach to all large landscape customers including HOAs, cities, parks, school districts and universities.</p> | |
| PROGRAM INTERCONNECTIVITY | |
| <p>MSF permit requirements reduced runoff and improved water quality. The program incentives are paid through Metropolitan’s Water Savings Incentive Program. WaterSmart HOA program is also interconnected.</p> | |
| MEASUREMENT AND VERIFICATION | MWDOC PRIMARY CONTACT |
| <p>All projects are inspected prior to implementation, after installation and at the end of the first year of implementation.</p> <p>Savings are monitored through sub-meters.</p> | Melissa Baum-Haley |
| FUNDING SOURCES | WATER SAVINGS PROJECTIONS |
| The program is currently funded through Metropolitan pay for performance incentives | <p><u>Lifetime Savings</u></p> <p>2,049 Acre-Feet</p> |



Public Spaces Program

Program Sectors: Landscape

The Public Spaces Water Smart Landscape Program provides incentives for water efficient landscape improvement projects at public spaces in South Orange County. MWDOC received an Integrated Regional Watershed Management Program implementation grant through Prop 84 to expand the current program.

The Program specifically targets the implementation of comprehensive landscape improvements for publicly owned and other commercial landscape properties throughout the South Orange County Integrated Regional Watershed Management Plan area. The Program encourages:

- Removal of non-functional turf grass
- Upgrade of antiquated irrigation timers to smart (weather-based and/or soil-moisture) self-adjusting irrigation timers
- Conversion of high-precipitation rate fixed spray irrigation to low-precipitation rate rotating nozzles and/or drip irrigation

The sites targeted have high visibility and are meant to act as demonstration sites illustrating the beauty of regionally appropriate landscape and efficient irrigation.

MWDOC provides an incentive of up to \$2.00 per square foot or 35% of total project cost, whichever is less, to participating cities whose renovations meet the Program’s participation criteria. The city is responsible for the match share at a rate of \$3.99 per square foot for the individual project. Eligible match costs include invoicing and purchase receipts for the landscape renovation work completed.

As part of the landscape renovation effort, MWDOC provides signage to be placed at each retrofitted site. MWDOC works with each participating city to create signage appropriate for the city and its local renovation projects. The purpose of the signage is to inform the public of the project, promote the landscape renovation benefits, and describe how renovations of this type can be accomplished at other properties throughout Orange County.

If the participating cities fail to use them, the Program may be opened up to any commercial site. At that point, a promotional campaign may be developed to make commercial sites aware of the program. This last aspect may be a couple of years away. If this commercial component is implemented, MWDOC will work with the local retail water agencies.

| MEASURES | |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Turf Removal, Smart Controller and Low Precipitation Irrigation | <u>Incentive:</u> \$2.00 per square foot of turf removed <u>Per Unit Savings:</u> .125 gallons per day per square foot |



| | |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>5 year useful life</p> <p>.0014 acre-feet lifetime savings per square foot</p> <p><i>Savings source: Metropolitan Turf Removal Estimates</i></p> <p><u>Market Description:</u> All cities throughout Orange County.</p> |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Measure | Annual Activity (sq. ft.) | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------------|-----------------------------------------------------|---------------------|----------|
| | FY 13/14 | FY 14/15 | FY 15/16 | FY 16/17 | FY 17/18 |
| Turf Removal | 152,460 square feet | 152,460 square feet | 152,460 square feet | 152,460 square feet | 0 |
| MARKETING/OUTREACH | | | | | |
| <p>The benefactors of the program are the South County cities. Promotion of the program began in Spring of 2013. A number of city applications have been received. Cities have been given an allocation of the program funds and a time period to use those funds. Once that time period has been exhausted, the South County water districts will be able to use any remaining funds and it may be offered to commercial sites.</p> | | | | | |
| RECOMMENDED LOCAL AGENCY SUPPORT AND REQUIRED REPORTING | | | | | |
| Contact local cities to promote program. | | | | | |
| PROGRAM INTERCONNECTIVITY | | | | | |
| <p>This PSP is intended to be a market transformation program serving as demonstration to the general public of what they can do at home. Also, it demonstrates MS4 Permit compliance to eliminate runoff and employ Low Impact Development (LID).</p> | | | | | |
| MEASUREMENT AND VERIFICATION | | | MWDOC PRIMARY CONTACT | | |
| All sites are inspected pre and post improvements. | | | Steve Hedges | | |
| FUNDING SOURCES | | | WATER SAVINGS PROJECTIONS | | |
| <p>Local cities fund 50% of project costs.</p> <p>Grants obtained by MWDOC from DWR provide for incentive funding.</p> <p>In addition Metropolitan and local agencies fund standard device incentives.</p> | | | <p><u>Lifetime Savings</u></p> <p>854 Acre-Feet</p> | | |

Home Certification Pilot Program


Program Sectors: Landscape


The Home Certification Program provides technical assistance in the form of a home water survey and it offers rebate incentives to facilitate installation of high efficiency washers, smart controllers, and high efficiency nozzles. The Program is funded through Metropolitan standard device incentives and a grant MWDOC received from USBR.

MWDOC is currently conducting outreach to determine if banks would be willing to provide higher loan amounts for certified upgrades and if the real estate industry would recognize and promote this program.

There are two ways for single family customers to participate. First, they can request a home water survey from MWDOC or their water agency. Second, once customer has purchased and installed their smart controllers and high efficiency nozzles and submitted their rebate application, they are provided an on-site audit. MWDOC’s vendor, *Mission Resources Conservation District* visits the site to verify the installation and conduct an indoor and outdoor audit. Through the audit, remaining water savings opportunities are presented to the customer along with available rebates. The site is then given a score. If the score meets the program threshold efficiency, the site is certified as a Water Smart home. The customer is given a public recognition plaque for their commitment to water use efficiency.

Following is a list of the measures offered to the customer under the program. The measures are paid and tracked through the SoCal Water\$mart Program, therefore the annual activity and associated savings is credited to the SoCal Water\$mart Program.

| MEASURES | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p style="margin-left: 20px;">Smart Controllers (Weather-Based Irrigation Controllers)</p> | <p><u>Enhanced Residential Incentive:</u> Additional \$300 per controller</p> <p><u>Per Unit Residential Savings:</u></p> <p>37 gallons per day</p> <p>10 year useful life</p> <p>0.41 acre-feet lifetime savings</p> <p><u>Market Description:</u></p> <p>All single family homes with irrigation systems in MWDOC’s service territory</p> |

| | |
|-----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>High Efficiency Sprinkler Nozzles (HENS)</p> | <p><u>Incentive:</u> \$4 per nozzle for residential, commercial and irrigation customers</p> <p><u>Per Unit Savings:</u></p> <p>3.6 gallons per day per nozzle</p> <p>5 year useful life</p> <p>0.02 acre-feet lifetime savings</p> <p><u>Market Description:</u></p> <p>All single family homes with irrigation</p> |
|-----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Annual activity is provided under the SoCal Water\$mart Program.

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| <p>MARKETING/OUTREACH</p> | |
| <p>Local retail agencies send out bill inserts. The program is also promoted on the MWDOC and agency websites.</p> | |
| <p>RECOMMENDED LOCAL AGENCY SUPPORT AND REQUIRED REPORTING</p> <p>Promote the program through bill inserts, websites and other outreach methods targeted at single family customers.</p> | |
| <p>PROGRAM INTERCONNECTIVITY</p> <p>Stormwater, MS4, and Southern California Edison are potentially interconnected. The program incentives are paid through Metropolitan’s SoCal Water\$mart Program.</p> | |
| <p>MEASUREMENT AND VERIFICATION</p> <p>All installations are inspected during the verification and audit site visit.</p> | <p>MWDOC PRIMARY CONTACT</p> <p>Steve Hedges</p> |
| <p>FUNDING SOURCES</p> <p>The program is currently funded through Metropolitan for standard incentives.</p> <p>Grants obtained by MWDOC from USBR provide for home surveys and enhanced incentive funding.</p> | <p>WATER SAVINGS PROJECTIONS</p> <p>Water savings are accounted for under the SoCal Water\$mart Program.</p> |

Turf Removal Incentive Program


Program Sectors: Landscape

The MWDOC Turf Removal Incentive Program encourages customers to remove high water consuming turf and replace it with alternative solutions such as low water using indigenous California friendly plants and surfaces that allow for ground water infiltration and reduce runoff.

Through this Program, residential and commercial customers of participating retail water agencies are eligible to receive an incentive of \$0.30 (or more) per square foot of turf removed for qualifying projects. Several retail agencies provide supplementary funds above the \$0.30 per square foot.

Customers download a program application and guidelines from the MWDOC website. Customers submit their application and plan designs to MWDOC. Preliminary site inspections are conducted by MWDOC program staff, prior to turf modifications, in order to confirm customer eligibility and verify square footage. Exposed soil, where turf has been removed, must be covered with mulch, rock, synthetic turf, or approved low water use plant material. When the landscape renovation is finished, a final inspection will be conducted by MWDOC staff. Upon final approval a rebate check is generated and sent to the customer.

MWDOC has implemented the program since 2010 with funding from Metropolitan, DWR and USBR. Through the program 1.2 million square feet of turf has been replaced and 100% of the grant funds have been exhausted. Currently MWDOC continues to offer the incentive with a base amount of \$0.30 per square foot provided by Metropolitan through its Agency Administered Program funds. Metropolitan’s program refinement committee is currently recommending to increase the incentive to \$1.00 per square foot.

| MEASURES | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p style="text-align: center;">Turf Removal (California Friendly)</p> | <p><u>Incentive:</u></p> <p>Previously, \$0.30 per square foot from Metropolitan and local funding if available</p> <p>Metropolitan is now expected to recommend an increase in the incentive to \$1.00 per square foot</p> <p><u>Savings:</u></p> <p>.125 gallons per day</p> <p>10 year useful life</p> <p>.0014 acre-feet lifetime savings</p> <p><u>Market Description:</u> Removing turf and planting California Friendly plants is a long term market transformation activity. There are millions of</p> |



| | |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>acres of turf in MWDOC’s territory. Turf removal is a gateway into other improvements such as drip irrigation and smart timers.</p> <p><u>Cost per Acre-foot:</u></p> <p>Previous Incentive: \$316 per acre-foot Expected Incentive: \$884 per acre-foot</p> |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Measure | Annual Activity | | | | |
|--------------|-----------------|------------|------------|------------|------------|
| | FY 13/14 | FY 14/15 | FY 15/16 | FY 16/17 | FY 17/18 |
| Turf Removal | 400,000 sf | 400,000 sf | 400,000 sf | 400,000 sf | 400,000 sf |

| | |
|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| MARKETING/OUTREACH | |
| Local agencies conduct outreach to their customers through standard methods including websites, bill inserts, newsletters, and direct mail. | |
| RECOMMENDED LOCAL AGENCY SUPPORT AND REQUIRED REPORTING | |
| Target customers with non-functional and hard to irrigate areas. | |
| PROGRAM INTERCONNECTIVITY | |
| The program can be promoted through all MWDOC programs specifically all landscape programs. | |
| MEASUREMENT AND VERIFICATION | MWDOC PRIMARY CONTACT |
| All projects are inspected prior to and after implementation. | Melissa Baum-Haley |
| FUNDING SOURCES | WATER SAVINGS PROJECTIONS |
| The program is currently funded through Metropolitan Agency Administered Funds | <u>Lifetime Savings</u> 2,800 Acre-Feet |

Restaurant and Hospital Technical Assistance and Enhanced Assistance

Understanding how effective technical assistance (through audits) and enhanced incentives works for most customers MWDOC will continue to pursue funding for specific market sectors. The next two targets are: restaurants and hospitals. These two sectors were chosen because of the number of facilities within MWDOC’s territory and available technologies within each sector.



Education Based Programs

California Sprinkler Adjustment Notification System

The California Sprinkler Adjustment Notification System is a program designed to help customers to easily adjust their sprinklers to match local weather and landscape changes throughout the year.

The CSANS program provides a monthly or weekly email to participants that contain the water index for that time period. It is a free program for which customers can subscribe. The CSANS also provides a public information conduit to promote other programs, classes or information from the water agency to their customer. The program is provided by the agency and developed cooperatively with MWDOC, DWR, and MWD.

The Watering Index is a percentage of water needed at the site based upon the local weather and a landscape's need for water. The initial index is normally 100 percent for the hottest time of the year in Southern California - much of July and August. Over the course of the year the Watering Index changes to reflect the landscape's changing need for water as the weather changes.

The Watering Index reports three percentages:

Weekly: based on average conditions over the previous 7 days

Monthly: based on average conditions over the previous 30 days

CSANS builds from MWD's water index. Rather than having customers pull the data from MWD's website, CSANS pushes the index via email. CSANS utilizes the percent adjust feature on most existing controllers. If a controller does not have this function a WaterDex can be used in conjunction with CSANS

CSANS is funded through a partnership including MWDOC, USBR, DWR, MWDCS, IRWD and LADWP.

WaterSmart Software

An interactive web-based software tool (or standard mail delivery format) that collects information from customers and compares their usage against like customers in the database, referred to as a "social comparison". This persuades the customer to engage in evaluating their water usage and opportunities to saving or be more in link with their comparative customers. It creates a two way communication with the water agency and the customer giving the opportunity for the retail agency to educate the customer and link them with programs.

The program allows for personalized water savings opportunities. In addition, water agencies can target messages and programs to specific customers. A few of MWDOC's retail agencies are implementing the program. Others have shown interest and MWDOC is in talks with the company to obtain economies of scale pricing and is considering a grant application to support implementation.



California Friendly Landscape Training

The California Friendly Landscape Training Program is sponsored by the Metropolitan Water District of Southern California and is offered through a partnership with the Municipal Water District of Orange County. This program features a variety of landscape related classes that are available online or in a classroom setting. Information regarding course content is listed below.

Residential Homeowner Course Description

This program was developed with the residential homeowner in mind. It covers the basics of landscape design and maintenance, and is offered as a four-hour class.

The presentations cover the following topics:

- Basic Landscape Design
- Landscape Plants
- Landscape Sprinkler Systems
- Landscape Watering and Fertilizing

MWDOC is working with MWD to bring back large landscape training. Training components for large landscape will also be included in the WaterSmart Landscape Program. Efforts will be made to utilize California Landscape Contractors Association as an outreach and training partner for this customer segment.

Pilots and Studies

Spray to Drip Pilot

The Spray to Drip Pilot's goal is to quantify the average savings of drip or low precipitation irrigation systems. MWDOC received a grant from USBR to study the savings. The project will provide customer incentives of up to \$0.50 per square foot to replace their existing spray irrigation system with a drip system. The installation site will be inspected before and after the installation to verify the size of the retrofitted irrigated area and to confirm a low precipitation irrigation system is installed. The savings will be quantified for each site. Then a statistically valid average savings will be calculated. These savings numbers will assist MWDOC and Metropolitan to set a standard rebate for the regional rebate program.

Quantify Savings Differential Between Traditional and California Friendly Landscapes

MWDOC will study the water usage disparity between traditional landscapes and California Friendly plantings that are better suited to Orange County's mild winters and warm, dry summers. Existing efforts such as the Irvine Field Station Study will and Santa Monica Garden-Garden demonstration be reviewed initially. Further study may include a review of existing homes with and without California Friendly landscaping to better understand the water savings opportunity of California Friendly landscapes.



Home Pressure Regulation Pilot

MWDOC will evaluate the water savings potential of pressure regulation for residential customers.

Device Retention Analysis

MWDOC will evaluate the retention of conservation devices over time to assess the lifetime of effective savings.

Utility Operations

MWDOC will continue to provide support services for member water retailers. Services include the following:

1. Water Audit Software – MWDOC provides consultant assistance to retail agencies that use the water audit tool to conduct distribution audits and leak repairs.
2. Promotion of Budget Based Billing – MWDOC provides technical and financial assistance to retail agencies evaluating water budget based billing.
3. Dedicated Irrigation Meter - MWDOC will be attempting to find funds to analyze the cost and savings of splitting mixed use meters to separately track indoor usage versus irrigation.

School Education

MWDOC fully supports school education programs. This includes the following:

1. Water Education Assemblies
2. Orange County Water Hero
3. Poster and Slogan Campaign

Public Information

MWDOC is charged with responsibility to increase the public perception of the value of water, as well as the WUE customer programs. MWDOC will pilot a public information campaign called Water Works for You. The goal of the campaign is to build trust, credibility, and value between Orange County water agencies and customers. The campaign will be initiated through Pinterest, MWDOC's eCurrents 2.0 Newsletter, and the open government website.

Some communication vehicles include:

1. eCurrents Newsletter
2. O.C. Water Summit
3. Water Policy Forum & Dinners
4. Social Media
5. Community Events
6. Inspection Trip Program



7. Water: Do More with Less



Chapter 7: IMPLEMENTATION PLAN

Over the next five years, MWDOC will take responsibility for a number of program oversight functions and provide valuable support services to member agencies.

A key part of that role is to act as liaison between MWD, grantors such as USBR, and MWDOC member agencies. Since Metropolitan and grant funding is limited, MWDOC will position itself aggressively with Metropolitan and grantors to secure funding each year or funding cycle. MWDOC will administer all of the grants and regional programs. This role will encompass several duties including:

- Securing outside funding through local, state and federal grants.
- Obtaining outside vendors when necessary.
- Developing operation plans, procedures and schedules for each program.
- Implementing regional marketing and outreach efforts.
- Providing technical assistance to customers and retail agencies.
- Monitoring start up and on-going activities for each program.
- Tracking and reporting production and progress towards goals for each program.

MWDOC will also work to advance WUE within the industry and transform landscape and commercial markets. This includes the following duties:

- Research and evaluate new technologies.
- Evaluate savings potential and duration of those savings.
- Develop best field delivery mechanisms.
- Create and promote local, state and national policies that further WUE and eliminate excessive water waste.
- Develop strategic partnerships that offer opportunities for collaboration, message dissemination and funding.

Figure 7-1 is an overview of the MWDOC staffing organizational structure and the key areas of responsibility for each staff person.

MWDOC WUE Organizational Chart

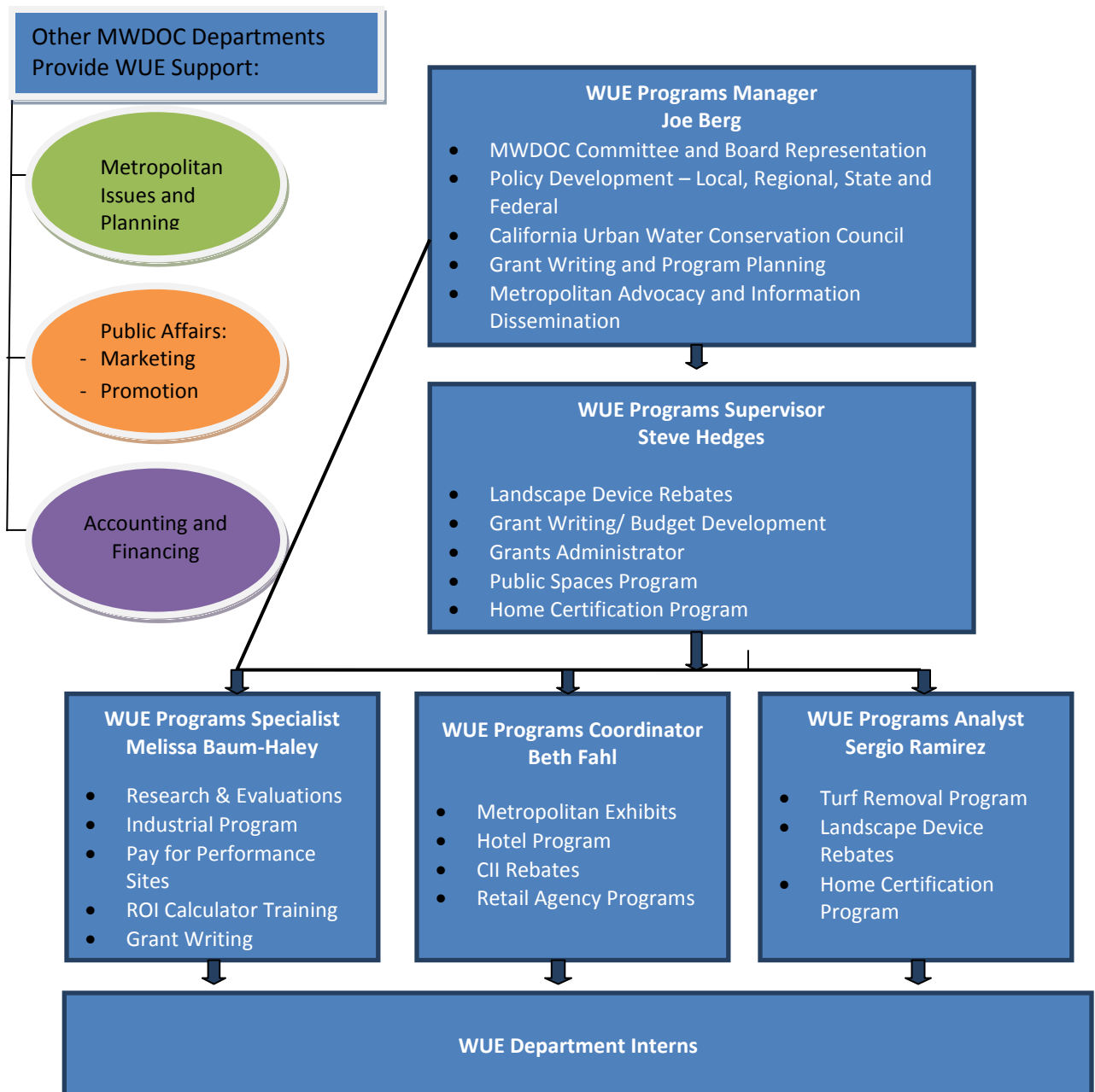


Figure 7-1 MWDOC WUE Staffing Organizational Chart

Retail Agency Role

To bolster success of the plan, retail agencies need to take a proactive, hands-on approach in regards to the programs offered to their customers. This includes development of local marketing campaigns and maintenance of current website content. Retailers should print literature and promote the program vigorously.



One of the key tasks is development of lists of customers for outreach and ongoing direct marketing to increase participation. Throughout the duration of the programs, retailers will need to supplement MWDOC’s general message to customers about the value of water.

Program Implementation Strategy

Implementation details for each program are detailed in Chapter 6: Recommended Programs and they include program descriptions, measure(s) offered, target customer segments, marketing methods, production numbers, measurement of savings and economic evaluation results.

The programs listed in Table 7-1 are outsourced to other agencies and industry vendors due to specific expertise required for certain programs, staffing limitations, and the ability leverage Metropolitan administration of programs. Also referenced in the chart is the MWDOC lead.

| Program | Implementation Vendor | MWDOC Lead |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| HOA WaterSmart Landscape | ConserVision. | Joe Berg |
| Large Landscape Pay for Performance Incentives | Metropolitan staff processes agreements and incentives | Melissa Baum-Haley |
| Public Spaces Program | MWDOC staff | Steve Hedges |
| MWDOC Turf Removal Incentive Program | MWDOC staff | Melissa Baum-Haley |
| SoCal Water\$mart Rebate Program | Metropolitan’s SoCal Water\$mart vendor, EGIA | Landscape Rebates – Steve Hedges, Sergio Ramirez CII Rebates – Beth Fahl Residential Rebates – Beth Fahl |
| Home Certification Program | Mission Resources Conservation District and Retail Water Agencies conducts verification inspections and performs audits. | Steve Hedges Sergio Ramirez |
| California Sprinkler Adjustment Notification System | Implemented through MWDOC | Melissa Baum-Haley |
| Industrial Process Pay for Performance Program | URS Corporation conducts audits and provides technical assistance | Melissa Baum-Haley |
| Hotel Program | WaterWise Consulting, Inc. | Beth Fahl |

Table 7-1 Program Implementation Strategies



Program Activity Implemented by Year

The projected number of activities to be implemented on average, per year as well as over the program term, is shown in Table 7-2. Please note that many of the 10 selected programs consist of multiple activities. For example the SoCal WaterSmart Residential Rebate Program includes both high efficiency clothes washers and high efficiency toilets.

Implementation volumes for each program will be adjusted over time if, and when, circumstances change. Adjustments could occur due to customer response issues, funding changes, technology issues, or other unforeseeable factors.

| <i>Program</i> | <i>Years of Implementation</i> | <i>Average Number of Activities per Year</i> |
|------------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Landscape Programs | | |
| HOA WaterSmart Landscape | 5 Years FY 13/14 – 17/18 | Additional 500 meters per year |
| Large Landscape Pay for Performance Incentives | 5 Years FY 13/14 – 17/18 | 35 acres per year |
| Public Spaces Program | 4 Years FY 13/14 – 16/17 | 152,460 square feet per year |
| SoCal WaterSmart Landscape Incentives | 5 Years FY 13/14 – 17/18 | Residential WBIC Controllers – 465 Residential Soil Moisture Sensor Controllers -35 Commercial Controllers – 7,500 Central Control - 150 High Efficiency Nozzles – 2,200 |
| Home Certification Program | 2 Years FY 13/14 – 14/15 | Through SoCal WaterSmart |
| California Sprinkler Adjustment Notification System | 5 Years FY 13/14 – 17/18 | TBD |
| MWDOC Turf Removal Incentive Program | 5 Years FY 13/14 – 17/18 | 400,000 square feet per year |
| Commercial, Industrial and Institutional Programs | | |
| Industrial Process Pay for Performance Program | 2 Years FY 13/14 – 17/18 | 0.2 completed project per year |



| <i>Program</i> | <i>Years of Implementation</i> | <i>Average Number of Activities per Year</i> |
|------------------------------------------------------------|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SoCal Water\$mart Commercial Device Incentives | 5 Years FY 13/14 – 17/18 | High Efficiency Toilets – 2,625 ULV Urinals – 250 Connectionless Food Steamers – 7 Air Cooled Ice Machines – 3 Cooling Tower pH Controllers – 8 Cooling Tower Conductivity Controllers -8 |
| Hotel Program | 5 Years FY 13/14 – 17/18 | Part of SoCal Water \$mart Program |
| Residential Indoor Programs | | |
| SoCal Water\$mart Residential Device Rebate Program | 5 Years FY 13/14 – 17/18 | High Efficiency Toilets – 1,000 for FY 13/14 High Efficiency Washers – 8,750 |

Table 7-2 Program Annual Activity

Marketing

The core goal of marketing, under the WUE Master Plan, is to increase public perception of the value of water. Once customers comprehend its value, they will be much more inclined to take action and increase their level of WUE at their homes and places of business. To accomplish this feat, the value of water will be a message that is threaded through all marketing initiatives.

MWDOC’s marketing and outreach strategies are to:

- Increase participation in rebate and incentive programs through regional marketing efforts.
- Develop marketing tools that will allow member agencies to promote rebate/incentive and awareness programs at the local level.
- Work collaboratively with Metropolitan and its member agencies to develop regional messages, coordinate outreach tools, and market transformation initiatives.
- Build strategic partnerships with industry organizations, non-profits, and other organizations.
- Utilize water awareness programs to educate the public about the value of water.

One of MWDOC’s key marketing strengths lies in the extensiveness of partnerships and collaborations. This includes close ties with cities, Metropolitan and MWDOC member agencies, Orange County storm water agencies, grant funding agencies, non-profits, trade organizations, and a variety of different stakeholders. These networks provide strategic opportunities to cross-market, gain funding, and collaborate.



Program messaging and promotion will be launched through an array of communication channels and partnerships. For instance, SoCal Water\$mart rebates will cross market the program through the Orange County Stormwater Program as well as at community events, landscape events and partner promotions.

Promotion will be initiated through print media and digital medium such as websites, custom landing pages, email marketing, e-newsletters, social media, and QR codes.

Marketing activities specific for each program are outlined in the Program Detail Sheets included in Chapter 6: Recommended Program Details. Marketing campaigns will be modified, as needed, to either ramp up participation or announce a program change.

MWDOC has already created a 40+ page comprehensive WUE Marketing Plan. The plan covers messaging, goals, strategies, and tactics on both a broad-based and program-specific level. Public education and school programs are addressed in the plan, as well as outreach to local, state and national networks in order to identify opportunities for collaboration and cross marketing.

The marketing plan will provide comprehensive support for access by interested agencies. As the local “face” to the customer, the retail agency is the primary access point for program marketing. Understanding this, MWDOC will work to appropriately integrate marketing services with individual agency’s own marketing plans as desired by each agency. MWDOC provides support through such means as template marketing materials that can be customized per agency.

Implementation Schedule

Figure 7-2 is the 5 year implementation chart depicting each program, its roll out schedule, and funding mechanism:

| Program Name | FY 13/14 | FY 14/15 | FY 15/16 | FY 16/17 | FY 17/18 |
|---------------------------------------------------|---------------------------------------------------------------------------|----------|----------------------------------|----------|----------|
| Industrial Pay for Performance | Grant Funding | | Transition to P4P Program | | |
| So Cal Water\$mart | Ongoing | | | | |
| Hotel Program | Grant Funding | | Transition to So Cal Water\$mart | | |
| Residential Care & Dormitory | Grant Funding | | Transition to So Cal Water\$mart | | |
| Restaurant Tech. Assistance & Enhanced Incentives | Incentives thru So Cal Water\$mart. Tech. Assistance when Grants approved | | | | |



| Program Name | FY 13/14 | FY 14/15 | FY 15/16 | FY 16/17 | FY 17/18 |
|--------------------------------------------------------------------|--------------------------------------------------------------------------|----------|----------|----------|------------|
| Hospital Tech. Assistance & Enhanced Incentives | Incentives thru So Cal WaterSmart. Tech. Assistance when Grants approved | | | | |
| Landscape Pay for Performance | Ongoing | | | | |
| HOA WaterSmart Landscape | Ongoing | | | | |
| Public Spaces Program | Grant Funding | | | | Transition |
| California Friendly Landscape Program | Ongoing | | | | |
| Soil Moisture Sensor Systems | Transition | Ongoing | | | |
| SF Quantify Savings Differential between Traditional & CA Friendly | Phase 1 | Phase 2 | | | |
| Sprinkler Nozzle Performance Testing Protocol | Metropolitan Conduct | | | | |
| Spray to Drip Conversion | MWDOC Pilot | | | | |
| Water Smart Software | Ongoing | | | | |
| Turf Removal Incentive Program | Ongoing | | | | |
| Home Pressure Regulation Valves- PRVs (Indoor & Irr.) | MWDOC Pilot | | | | |
| Device Retention Rates | MWDOC Study | | | | |
| Water Loss Control | Ongoing | | | | |

Figure 7-2 Program Implementation Plan



Water Reduction Goals

The selected programs provide WUE programs for all customers but with focused aim on the highest opportunity customer segments and niche markets.

MWDOC will implement 11 active programs. The programs will deliver water savings through the 2015 and 2020 target years and beyond due to the long life for several of the measures being offered. Table 7-3 is an overview of the lifetime water savings for each of the programs:

Lifetime Water Savings by WUE Programs

| Water Use Efficiency Program | Estimated Lifetime Water Savings (AF) |
|------------------------------------------------------|---------------------------------------|
| SoCal Water\$mart Residential Rebates | 13,804 |
| SoCal Water\$mart Commercial Rebates | 13,578 |
| SoCal Water\$mart Landscape Rebates | 6,989 |
| HOA WaterSmart Landscape Program | 3,436 |
| MWDOC Turf Removal Incentive Program | 2,800 |
| Landscape Pay for Performance Incentives | 2,049 |
| Public Spaces Program | 854 |
| Industrial Pay for Performance Incentives | 60 |
| Hotel Water Reduction Program | Included in SoCal Water\$mart Savings |
| Home Certification Program | Included in SoCal Water\$mart Savings |
| California Sprinkler Adjustment Notification Program | Not quantified |
| Total | 43,570 |

Table 7-3 Program Water Savings

It is important to understand the assumptions behind calculations for some of the selected programs:

- In the chart above, landscape measures reflect a conservative life of 10 years. Most likely many of these measures will continue to save water even longer, but since some of these devices are relatively new to market useful savings life is uncertain.
- Although marketed for a number of years, high efficiency clothes washers still offer a



significant potential and are projected to deliver significant activity over the next five years.

- Please note that the Industrial Process Pay for Performance Program budgets reflect low production. A conservative participation estimate is plugged into the budget although MWDOC expects to see a higher number of projects implemented. Additionally, the projection covers a two year period only, due to the grant end date. Metropolitan’s Water Savings Incentive Program is expected to continue through all five years and production for Industrial Process Pay for Performance program may be routed through this.

The programs selected will deliver the following collective results shown in Table 7-4. Overall, the WUE Master Plan is estimated to save 43,570 acre-feet of water over the lifetime of the measures, at an expected cost of \$415 per acre foot. Program costs are expected to be \$14,653,915 in present value terms over the 5-year implementation period (\$16,118,246 in nominal terms). Direct economic benefits of the Plan are expected to be \$47,297,495 (present value).

Plan Overview

| | |
|--------------------------------------|---------------------|
| Lifetime Water Savings | 43,570 Acre-feet |
| Overall Cost per Acre-foot | \$415 per Acre-foot |
| Program Costs (Present Value) | \$14,653,915 |
| Avoided Costs (Present Value) | \$47,297,495 |

Table 7-4 Plan Overview

Table 7-5 is an overview of each of the program measures showing the respective activity levels, lifetime water savings, cost per Acre-foot, the avoided supply costs and benefit to cost ratio per measure.

Program Measures Snapshot



| Measure | Total Estimated Activity Over 5 Year Plan | Lifetime Water Savings (AF) | Cost per Acre-foot | Avoided Supply Costs | Benefit to Cost Ratio |
|------------------------------------------------------------------------------------|-------------------------------------------|-----------------------------|--------------------|----------------------|-----------------------|
| Industrial Pay for Performance | 0.4 projects | 60 | \$364 | \$58,572 | 3.09 |
| SoCal WaterSmart Commercial HETs – Standard Incentive | 14,375 | 8,523 | \$106 | \$9,438,286 | 13.87 |
| SoCal WaterSmart Commercial HETs- Enhanced Incentive | 2,500 | 1,482 | \$214 | \$1,641,441 | 6.86 |
| SoCal WaterSmart Commercial HETs- Enhanced Incentive and Verified Existing 3.5 gpf | 1,250 | 741 | \$424 | \$820,720 | 3.45 |
| SoCal WaterSmart Commercial ULV Urinals | 1,250 | 2,140 | \$149 | \$2,369,468 | 9.83 |
| SoCal WaterSmart Commercial Cooling Tower Conductivity Controllers | 40 | 129 | \$226 | \$126,629 | 4.88 |
| SoCal WaterSmart Commercial Cooling Tower pH Controllers – Standard Incentive | 30 | 292 | \$209 | \$286,683 | 5.28 |
| SoCal WaterSmart Commercial Cooling Tower pH Controllers – Enhanced Incentive | 10 | 97 | \$405 | \$95,561 | 2.72 |
| SoCal WaterSmart Commercial Dry Vacuum Pumps | 10 | 6 | \$235 | \$6,348 | 4.85 |
| SoCal WaterSmart Commercial Connectionless Food Steamers – Standard Incentive | 25 | 63 | \$242 | \$63,329 | 5.03 |
| SoCal WaterSmart Commercial Connectionless Food Steamers – Enhanced Incentive | 10 | 25 | \$287 | \$25,332 | 4.24 |
| SoCal WaterSmart Commercial Air Cooled Ice Machines – Standard Incentive | 10 | 15 | \$809 | \$15,604 | 1.51 |
| SoCal WaterSmart Commercial Air Cooled Ice Machines – | 5 | 8 | \$993 | \$7,802 | 1.23 |



| Measure | Total Estimated Activity Over 5 Year Plan | Lifetime Water Savings (AF) | Cost per Acre-foot | Avoided Supply Costs | Benefit to Cost Ratio |
|-----------------------------------------------------------------------------------|-------------------------------------------|-----------------------------|--------------------|----------------------|-----------------------|
| Enhanced Incentive | | | | | |
| SoCal WaterSmart Commercial Laminar Flow Restrictors | 1,000 | 58 | \$185 | \$56,571 | 5.96 |
| HOA WaterSmart Landscape | 2,500 meters | 3,436 | \$38 | \$3,586,332 | 30.75 |
| Large Landscape Pay for Performance | 35 projects | 2,049 | \$176 | \$2,270,693 | 7.57 |
| Public Spaces Program | 609,840 sq. ft. | 854 | \$1,865 | \$926,221 | 0.69 |
| SoCal WaterSmart Landscape Central Irrigation Controller | 750 | 97 | \$232 | \$107,218 | 5.74 |
| SoCal WaterSmart Landscape High Efficiency Nozzles | 11,000 | 220 | \$288 | \$234,074 | 4.15 |
| SoCal WaterSmart Landscape Large Rotary Nozzles | 600 sets | 108 | \$85 | \$119,685 | 15.73 |
| SoCal WaterSmart Landscape Commercial Smart Controllers | 37,500 stations | 4,838 | \$555 | \$5,360,903 | 2.40 |
| SoCal WaterSmart Landscape Residential Smart Controllers – Enhanced Incentives | 2,325 controllers | 964 | \$1,408 | \$1,067,861 | .95 |
| SoCal WaterSmart Landscape Soil Moisture Sensors | 175 | 80 | \$1,280 | \$88,414 | 1.04 |
| SoCal WaterSmart Landscape Soil Moisture Sensor Add-Ons | 1,500 | 684 | \$1,106 | \$765,748 | 1.23 |
| SoCal WaterSmart Residential High Efficiency Clothes Washers – Standard Incentive | 37,500 | 11,324 | \$360 | \$12,015,516 | 3.63 |
| SoCal WaterSmart Residential High Efficiency Clothes Washers – Enhanced Incentive | 6,250 | 1,887 | \$1,129 | \$2,200,586 | 1.16 |
| SoCal WaterSmart Residential | 1,000 | 593 | \$119 | \$636,945 | 11.27 |



| Measure | Total Estimated Activity Over 5 Year Plan | Lifetime Water Savings (AF) | Cost per Acre-foot | Avoided Supply Costs | Benefit to Cost Ratio |
|-------------------------|-------------------------------------------|-----------------------------|--------------------|----------------------|-----------------------|
| High Efficiency Toilets | | | | | |
| Turf Removal Incentive | 2,000,000 | 2,800 | \$884 | \$3,102,952 | 1.51 |

Table 7-5 Programs Snapshot - Activity, Savings, Cost Avoided Supply and B/C Ratio

Program Budgets

Annual budgets for each program, showing quantified water savings, are documented in Table 7-6. The budget amounts shown reflect the financial commitment of all funding agencies including MWDOC, MWD, USBR, DWR and any other grantors. The budgets do not include local agency contributions.

The Choice Budget provides MWDOC services that are budgeted, described and priced in a manner that is intended to allow individual member agencies to decide whether to receive such services. The MWDOC programs in this WUE Master Plan will continue to be offered as are existing programs for member agencies.

Please note that the Industrial Process Pay for Performance Program budgets is low. The amounts represent a conservative estimate on participation although MWDOC expects to see a higher number of projects implemented. Also the projection is for two years only due to the grant end date. MWD's Water Savings Incentive Program is expected to continue through all five years and production may be routed through that program.

Program Budgets

| Program | FY 13/14 | FY 14/15 | FY 15/16 | FY 16/17 | FY 17/18 |
|------------------------------------------------|-----------|-----------|-----------|-----------|-----------|
| HOA WaterSmart Landscape | \$24,700 | \$25,194 | \$25,698 | \$26,212 | \$26,736 |
| Large Landscape Pay for Performance Incentives | \$63,491 | \$64,761 | \$66,056 | \$67,377 | \$68,725 |
| Public Spaces Program | \$350,658 | \$357,671 | \$364,825 | \$372,121 | \$0 |
| SoCal WaterSmart Landscape Incentives | \$801,017 | \$898,568 | \$944,260 | \$963,146 | \$982,409 |
| MWDOC Turf Removal Incentive Program | \$436,000 | \$444,720 | \$453,614 | \$462,687 | \$471,940 |



| Program | FY 13/14 | FY 14/15 | FY 15/16 | FY 16/17 | FY 17/18 |
|----------------------------------------------------|-------------------------------------|-------------|-------------|-------------|-------------|
| Home Certification Program | Included in SoCal WaterSmart Budget | | | | |
| Industrial Process Pay for Performance Program | \$9,620 | \$9,812 | \$0 | \$0 | \$0 |
| SoCal WaterSmart Commercial Device Incentives | \$330,336 | \$336,943 | \$343,682 | \$350,555 | \$357,566 |
| Hotel Program | Included in SoCal WaterSmart Budget | | | | |
| SoCal WaterSmart Residential Device Rebate Program | \$1,125,049 | \$1,089,889 | \$1,111,687 | \$1,133,921 | \$1,156,599 |
| Total | \$3,140,871 | \$3,227,559 | \$3,309,822 | \$3,376,019 | \$3,063,975 |

Table 7-6 Program Budgets

Evaluation, Measurement and Verification

MWDOC believes that WUE programs and technologies must be validated through a rigorous evaluation, measurement and verification (EM &V) protocol. In conducting the evaluation, measurement and verification of water use efficiency programs there are four major evaluation targets. These are:

1. **Technology Savings Verification (research and pilot tests)** -Under the WUE Master Plan, the technology savings verification would be done prior to full scale implementation to ascertain the average savings and identify product issues or installation problems before the device is disseminated on a wide scale.
2. **Impact Evaluation (savings measurement and installation verification)**- The impact evaluation estimates the net changes in water usage by implementing the activity or installing the measure, and it estimates the rate of installation and retention.
3. **Program Evaluation (process evaluation and implementation effectiveness)** -The program evaluation assesses the effectiveness and efficiency of a given program or delivery mechanism in terms of level of customer participation, implementation effectiveness, and cost.
4. **Market Assessment (potential opportunity and measure saturation)**-The market assessment estimates the potential savings opportunity for region-wide implementation of a given activity, the device saturation, and remaining potential. The assessment should include not only technical savings potential, but also a



measure of feasible and cost-effective level savings.

All programs implemented by MWDOC have an evaluation, measurement and verification component. Some activities and technologies, typically those newer-to-market, require more aggressive evaluation and measurement scrutiny in order to provide strong documentation of actual performance in MWDOC territory. Table 7-7 is a snapshot of MWDOC planned activities. The measurement and verification activities are also described in the recommended program details provided in *Chapter 6*.

Evaluation, Measurement and Verification Snapshot

| | |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Installation Verification Inspections</p> | <ul style="list-style-type: none"> • 80 percent of Landscape Smart Controllers and 100 percent of Turf Removal Verified through Site Inspection by Mission Resource Conservation District and Retail Agencies • 5% of All Other Devices Verified by MWD |
| <p>Testing Protocol</p> | <ul style="list-style-type: none"> • One Technology will be selected each year. • Testing protocol will be developed • Manufacturers’ products will be tested against a protocol and an approved list of models will be developed for funding of incentives. • Start with sprinkler nozzles through Metropolitan’s study to be conducted in FY 13/14. |
| <p>Device Retention Analysis</p> | <ul style="list-style-type: none"> • Conduct analysis of how long devices stay installed once funded. |
| <p>Pilot and Research Projects</p> | <ul style="list-style-type: none"> • Study and Validate the Savings Differential between Traditional and CA Friendly Landscapes • Study and Validate Savings from Converting Spray to Drip Irrigation Systems |

Table 7-7 Evaluation, Measurement and Verification Snapshot

New Tools and Performance Tracking

As a part of the planning process, a number of valuable tools and resources were developed for MWDOC and its agencies (Figure 7-3).

Newly Created Tools and Resources

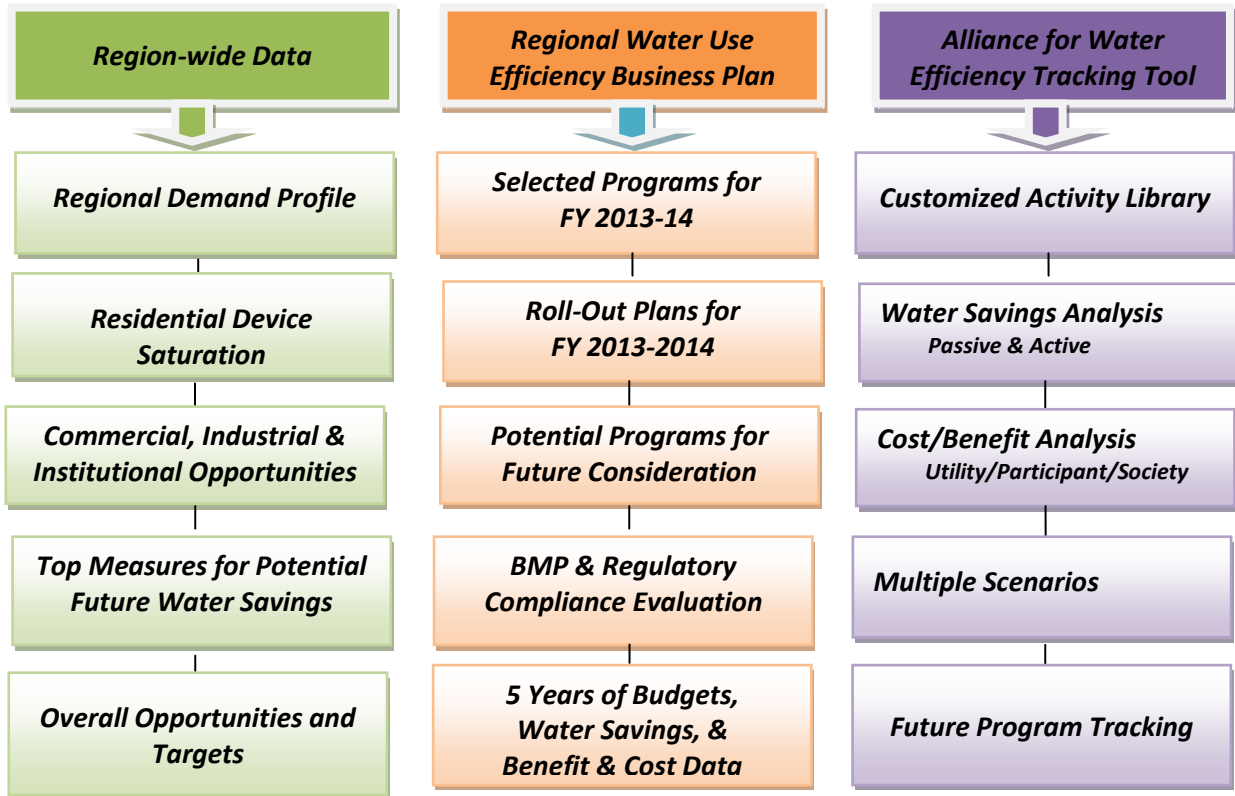


Figure 7-3 New Tools and Resources

The MWDOC Data Elements, Water Use Efficiency Master Plan and Tracking Tool software are working tools to be used to guide MWDOC and member agencies well into the future.

They are designed as flexible resources that adapt to changing circumstances. As budgets and grant funding fluctuate over time, MWDOC and its member agencies will be able to enter the new parameters into the software tool and analyze the impact of the new variables. The Tracking Tool will help MWDOC and its member agencies evaluate options and track results. If, for example, tracking against SBx7-7 targets is below target then WUE programs constitute an adaptable investment alternative for attaining targets. The Tracking Tool will be used to record program and economic performance as the programs are rolled out and can be used to ensure that incremental milestones are being met on schedule.

Plan Updates

The WUE Master Plan is a working document and, as such, must be modified and updated as changes occur and program years roll out. MWDOC and the member agencies will need to regularly review the plan and make adjustments accordingly.

More generally, the plan should be adapted to conditions and opportunities over time. In this way, MWDOC and the member agencies can assure they will meet the regional IRP goals as well as SBx7-7. Programs with large remaining potential such as those identified in this plan can be expanded or enhanced. Furthermore, the research and pilot programs will result in additional possible sources of conservation savings ready for implementation.



Changes and/or reviews of the plan should take place in line with the following conditions:

- When programs are added, subtracted or modified.
- As grants are received, put on hold or denied.
- On a yearly basis in order to meet the annual reporting requirements.
- Every five years with the purpose of meeting the Urban Water Management Plan report cycle.



Appendix A: Avoided Costs

Based on the assumptions provided by MWDOC, the accompanying AWE Water Conservation Tracking Tool includes an estimated forecast of MWDOC avoided costs. The rolled up avoided costs, expressed in both nominal and constant 2013 dollars, are on the Total Direct Utility Avoided Costs worksheet.

In addition to that sheet, the following are key assumptions:

Common Assumptions

- Avoided costs are estimated through 2050.
- All costs provided by MWDOC are assumed to be the costs in 2013 expressed in 2013 dollars.
- The system lost and unaccounted for water rate is 6.1%.
- Peak season is assumed be the months of May through September.
- The interest rate (and discount rate used to calculate the long-run avoided costs) is 2.7%.
- The assumed annual inflation rate is 3%.

Variable Operating Costs

The variable operating cost that is avoided as a result of conservation throughout the year is the forecasted Metropolitan Tier 1 treated water rate. This sheet converts the series in the file Mets Past and Projected Rates.xlsx to a form that the model can digest. It is assumed that, after 2020, the Tier 1 rate increases at a 2% real annual rate, which is the average increase over the 2013-2020 period.

Planned Additions

This sheet shows the three capital projects that are used for comparison purposes to the portfolio of water use efficiency programs contained in the Master Plan:

- South Orange Coastal Ocean Desalination Project (SOCOD). The capital and fixed O&M costs are per Economic Model Draft Version 1 6_12 3 12.xlsx.
- Poseidon. The capital and fixed O&M costs are the GWRS Phase 2 costs scaled up by a factor of (56,000/30,000), the respective annual production of the two projects. GWRS Phase 2 costs are per email correspondence (Warren Greco, April 25, 2013); fixed O&M costs exclude power and chemicals.
- Ground Water Replenishment System (GWRS) Phase 3. The capital and fixed O&M costs are assumed to be equal to the GWRS Phase 2 costs since the expected annual productions of the two projects are almost identical.

The financing term is 20 years. The debt is assumed to be paid off over that period.

SOCOD and Poseidon are assumed to be reflected only in peak-season avoided costs, while GWRS Phase 3 is reflected in both peak and off-peak season avoided costs.

The above assumptions yield the avoided costs shown below graphically in Figure A-1 and on the Total Direct Utility Avoided Costs worksheet as shown in Tables A-1 and A-2.

Total Direct Avoided Costs: Real Dollars

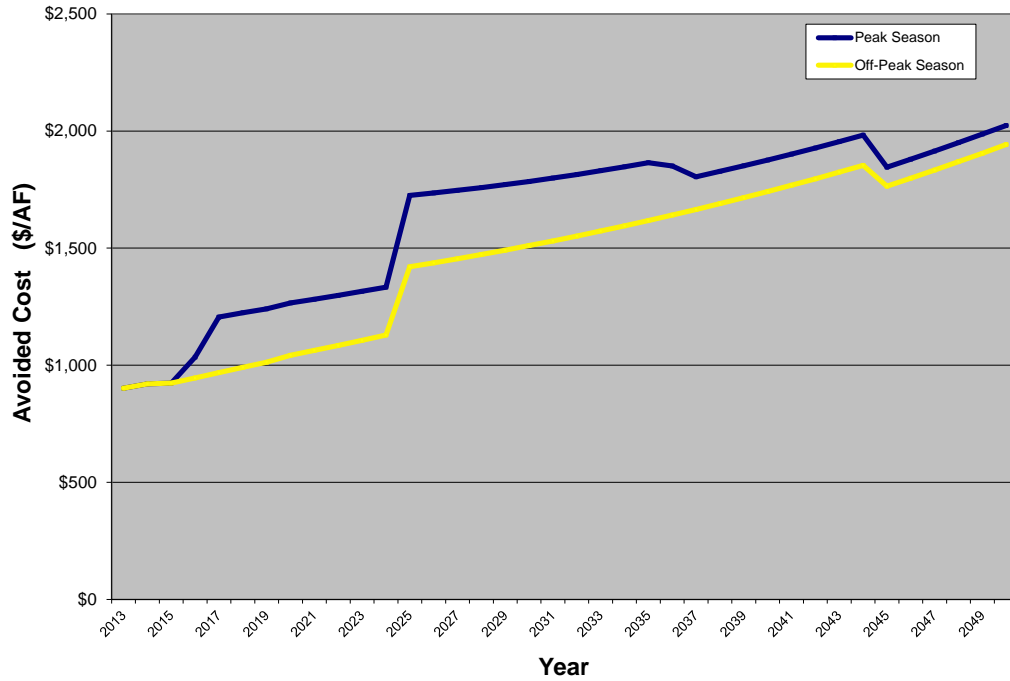


Figure A-1 Total Direct Avoided Costs: Real Dollars



| Total Direct Utility Avoided Costs: Nominal Dollars | | | | | | |
|------------------------------------------------------------|--------------------|-----------------|----------------|------------------------|-----------------|----------------|
| (\$/AF) | | | | | | |
| Year | Peak Season | | | Off-Peak Season | | |
| | Short-Run | Long-Run | Total | Short-Run | Long-Run | Total |
| 2013 | \$902 | \$0 | \$902 | \$902 | \$0 | \$902 |
| 2014 | \$948 | \$0 | \$948 | \$948 | \$0 | \$948 |
| 2015 | \$980 | \$0 | \$980 | \$980 | \$0 | \$980 |
| 2016 | \$1,033 | \$98 | \$1,131 | \$1,033 | \$0 | \$1,033 |
| 2017 | \$1,089 | \$268 | \$1,357 | \$1,089 | \$0 | \$1,089 |
| 2018 | \$1,149 | \$270 | \$1,419 | \$1,149 | \$0 | \$1,149 |
| 2019 | \$1,210 | \$272 | \$1,482 | \$1,210 | \$0 | \$1,210 |
| 2020 | \$1,282 | \$274 | \$1,556 | \$1,282 | \$0 | \$1,282 |
| 2021 | \$1,347 | \$276 | \$1,624 | \$1,347 | \$0 | \$1,347 |
| 2022 | \$1,415 | \$279 | \$1,694 | \$1,415 | \$0 | \$1,415 |
| 2023 | \$1,487 | \$281 | \$1,768 | \$1,487 | \$0 | \$1,487 |
| 2024 | \$1,562 | \$284 | \$1,846 | \$1,562 | \$0 | \$1,562 |
| 2025 | \$1,641 | \$819 | \$2,460 | \$1,641 | \$384 | \$2,026 |
| 2026 | \$1,724 | \$825 | \$2,549 | \$1,724 | \$387 | \$2,111 |
| 2027 | \$1,811 | \$831 | \$2,642 | \$1,811 | \$389 | \$2,201 |
| 2028 | \$1,903 | \$837 | \$2,740 | \$1,903 | \$392 | \$2,295 |
| 2029 | \$1,999 | \$843 | \$2,842 | \$1,999 | \$394 | \$2,393 |
| 2030 | \$2,101 | \$849 | \$2,950 | \$2,101 | \$397 | \$2,497 |
| 2031 | \$2,207 | \$856 | \$3,063 | \$2,207 | \$399 | \$2,606 |
| 2032 | \$2,319 | \$863 | \$3,182 | \$2,319 | \$402 | \$2,721 |
| 2033 | \$2,436 | \$870 | \$3,306 | \$2,436 | \$405 | \$2,841 |
| 2034 | \$2,559 | \$878 | \$3,437 | \$2,559 | \$408 | \$2,967 |
| 2035 | \$2,689 | \$885 | \$3,574 | \$2,689 | \$411 | \$3,099 |
| 2036 | \$2,825 | \$829 | \$3,653 | \$2,825 | \$414 | \$3,238 |
| 2037 | \$2,968 | \$701 | \$3,669 | \$2,968 | \$417 | \$3,385 |
| 2038 | \$3,118 | \$710 | \$3,827 | \$3,118 | \$420 | \$3,538 |
| 2039 | \$3,275 | \$718 | \$3,994 | \$3,275 | \$424 | \$3,699 |
| 2040 | \$3,441 | \$727 | \$4,168 | \$3,441 | \$427 | \$3,868 |
| 2041 | \$3,615 | \$736 | \$4,351 | \$3,615 | \$431 | \$4,046 |
| 2042 | \$3,798 | \$745 | \$4,543 | \$3,798 | \$434 | \$4,233 |
| 2043 | \$3,990 | \$755 | \$4,745 | \$3,990 | \$438 | \$4,429 |
| 2044 | \$4,192 | \$764 | \$4,957 | \$4,192 | \$442 | \$4,634 |
| 2045 | \$4,404 | \$348 | \$4,752 | \$4,404 | \$138 | \$4,543 |
| 2046 | \$4,627 | \$358 | \$4,986 | \$4,627 | \$142 | \$4,770 |
| 2047 | \$4,862 | \$369 | \$5,231 | \$4,862 | \$147 | \$5,008 |
| 2048 | \$5,107 | \$380 | \$5,488 | \$5,107 | \$151 | \$5,258 |
| 2049 | \$5,366 | \$392 | \$5,757 | \$5,366 | \$155 | \$5,521 |
| 2050 | \$5,637 | \$403 | \$6,041 | \$5,637 | \$160 | \$5,798 |

Table A-1 Total Direct Utility Avoided Costs: Nominal Dollars



| Total Direct Utility Avoided Costs: 2013 Dollars | | | | | | |
|---------------------------------------------------------|--------------------|-----------------|----------------|------------------------|-----------------|----------------|
| (\$/AF) | | | | | | |
| Year | Peak Season | | | Off-Peak Season | | |
| | Short-Run | Long-Run | Total | Short-Run | Long-Run | Total |
| 2013 | \$902 | \$0 | \$902 | \$902 | \$0 | \$902 |
| 2014 | \$920 | \$0 | \$920 | \$920 | \$0 | \$920 |
| 2015 | \$924 | \$0 | \$924 | \$924 | \$0 | \$924 |
| 2016 | \$945 | \$89 | \$1,035 | \$945 | \$0 | \$945 |
| 2017 | \$968 | \$238 | \$1,206 | \$968 | \$0 | \$968 |
| 2018 | \$991 | \$233 | \$1,224 | \$991 | \$0 | \$991 |
| 2019 | \$1,013 | \$228 | \$1,241 | \$1,013 | \$0 | \$1,013 |
| 2020 | \$1,043 | \$223 | \$1,266 | \$1,043 | \$0 | \$1,043 |
| 2021 | \$1,063 | \$218 | \$1,282 | \$1,063 | \$0 | \$1,063 |
| 2022 | \$1,085 | \$214 | \$1,298 | \$1,085 | \$0 | \$1,085 |
| 2023 | \$1,106 | \$209 | \$1,316 | \$1,106 | \$0 | \$1,106 |
| 2024 | \$1,128 | \$205 | \$1,333 | \$1,128 | \$0 | \$1,128 |
| 2025 | \$1,151 | \$574 | \$1,725 | \$1,151 | \$270 | \$1,421 |
| 2026 | \$1,174 | \$562 | \$1,736 | \$1,174 | \$263 | \$1,437 |
| 2027 | \$1,198 | \$549 | \$1,747 | \$1,198 | \$257 | \$1,455 |
| 2028 | \$1,222 | \$537 | \$1,759 | \$1,222 | \$251 | \$1,473 |
| 2029 | \$1,246 | \$525 | \$1,771 | \$1,246 | \$246 | \$1,492 |
| 2030 | \$1,271 | \$514 | \$1,785 | \$1,271 | \$240 | \$1,511 |
| 2031 | \$1,296 | \$503 | \$1,799 | \$1,296 | \$235 | \$1,531 |
| 2032 | \$1,322 | \$492 | \$1,814 | \$1,322 | \$229 | \$1,551 |
| 2033 | \$1,349 | \$482 | \$1,830 | \$1,349 | \$224 | \$1,573 |
| 2034 | \$1,376 | \$472 | \$1,847 | \$1,376 | \$219 | \$1,595 |
| 2035 | \$1,403 | \$462 | \$1,865 | \$1,403 | \$214 | \$1,618 |
| 2036 | \$1,431 | \$420 | \$1,851 | \$1,431 | \$210 | \$1,641 |
| 2037 | \$1,460 | \$345 | \$1,805 | \$1,460 | \$205 | \$1,665 |
| 2038 | \$1,489 | \$339 | \$1,828 | \$1,489 | \$201 | \$1,690 |
| 2039 | \$1,519 | \$333 | \$1,852 | \$1,519 | \$196 | \$1,715 |
| 2040 | \$1,549 | \$327 | \$1,876 | \$1,549 | \$192 | \$1,741 |
| 2041 | \$1,580 | \$322 | \$1,902 | \$1,580 | \$188 | \$1,768 |
| 2042 | \$1,612 | \$316 | \$1,928 | \$1,612 | \$184 | \$1,796 |
| 2043 | \$1,644 | \$311 | \$1,955 | \$1,644 | \$181 | \$1,825 |
| 2044 | \$1,677 | \$306 | \$1,983 | \$1,677 | \$177 | \$1,854 |
| 2045 | \$1,710 | \$135 | \$1,846 | \$1,710 | \$54 | \$1,764 |
| 2046 | \$1,745 | \$135 | \$1,880 | \$1,745 | \$54 | \$1,798 |
| 2047 | \$1,780 | \$135 | \$1,915 | \$1,780 | \$54 | \$1,833 |
| 2048 | \$1,815 | \$135 | \$1,950 | \$1,815 | \$54 | \$1,869 |
| 2049 | \$1,851 | \$135 | \$1,987 | \$1,851 | \$54 | \$1,905 |
| 2050 | \$1,888 | \$135 | \$2,024 | \$1,888 | \$54 | \$1,942 |

Table A-2 Total Direct Utility Avoided Costs: 2013 Dollars



Appendix B: Economic Analysis – Costs, Benefits, and Cost Effectiveness

The economic analysis of MWDOC WUE Programs was conducted using the Alliance for Water Efficiency Water Conservation Tracking Tool.

This appendix summarizes the results of the cost effectiveness analysis of a set of existing and potentially new WUE programs. These WUE programs came out of the Stakeholder Workshops for the MWDOC's WUE Master Plan. Program cost-effectiveness is assessed from:

1. A Regional Water Agency Perspective to determine if the programs make sense for water agencies to implement for the region. This perspective includes all program costs to water agencies (MWDOC's costs plus outside funding) compared to the water savings. Programs not regionally cost effective were generally excluded from further analysis
2. An Orange County Perspective to determine attractiveness from the viewpoint of alternative program funding partners. This perspective includes only the program costs from different program funding partners, including MWDOC and its retailers.

This appendix provides the summary of results of the cost-effectiveness analysis. The results are summarized in the following four tables/figures:

Table B-1: Savings and Cost Assumptions

Table B-2: WUE Program Benefits

Table B-3: Activity Ranking by Benefit-to-Cost Ratio for MWDOC



Table B-1 Savings and Cost Assumptions

| Activity Name | Market Sector | Primary Customer Class | Delivery Mechanism | Unit | Savings, Per Unit (\$/yr) | Source of Unit Savings Estimate | Savings, Useful Life (yrs) | PAP Incentive Input (\$/Unit) | Average Units/Rebate | Program Admin/Staff Cost (\$/Unit) | Program Marketing Cost (\$/Unit) | MWDOC Rebate Admin (\$/Unit) | Program Installation, Distribution, or Survey Cost (\$/Unit) | Customer Incentive or Product Cost (\$/Unit) | All Agency Costs (\$/Unit) | MWDOC Rebate Funding (\$/Unit) | MWDOC Admin. Funding (\$/Unit) | MWDOC Member Agency Allocation (\$/Unit) | MWDOC Grant Funding (DWR, USBR, etc.) (\$/Unit) | Local Agency Rebate (\$/Unit) | Net MWDOC Cost (\$/Unit) | |
|----------------------------------------------------------------|---------------|------------------------|--------------------|----------------|-------------------------------------|---------------------------------|------------------------------------|-------------------------------|----------------------|------------------------------------|----------------------------------|------------------------------|--------------------------------------------------------------|----------------------------------------------|----------------------------|--------------------------------|--------------------------------|------------------------------------------|-------------------------------------------------|-------------------------------|--------------------------|----------|
| Industrial Program (P4P) | E | CI | Commercial | Incentive | Site | 4,887,765 | MWDOC analysis for grant applic | 10 | \$ 150.00 | \$ - | \$ 5,600.00 | \$ - | \$ 20,000.00 | \$ 22,500.00 | \$ 48,100.00 | \$ 11,250.00 | \$ - | \$ - | \$ 36,850.00 | \$ - | \$ - | |
| Rebate, HET (Tank-Type) | E | CI | Commercial | Rebate | Toilet | 13,849 | MWDOC Save a Buck =.0425 AFY | 20 | 50 | \$ 0.04 | \$ - | \$ 0.10 | \$ - | \$ 50.00 | \$ 50.13 | \$ 50.00 | \$ 0.10 | \$ - | \$ - | \$ - | \$ 0.04 | |
| Rebate, HET (Flushometer) | E | CI | Commercial | Rebate | Toilet | 13,849 | MWDOC Save a Buck =.0425 AFY | 20 | 50 | \$ 0.04 | \$ - | \$ 0.19 | \$ - | \$ 100.00 | \$ 100.23 | \$ 100.00 | \$ 0.19 | \$ - | \$ - | \$ - | \$ 0.04 | |
| Rebate, UL or Zero Water Urinal (Replace 1.5+ gpf) | E | CI | Commercial | Rebate | Urinal | 39,982 | MWDOC Save a Buck =.1227 AFY | 20 | 5 | \$ 0.36 | \$ - | \$ 3.80 | \$ - | \$ 200.00 | \$ 204.16 | \$ 200.00 | \$ 3.80 | \$ - | \$ - | \$ - | \$ 0.36 | |
| Rebate, Cooling Tower pH Controller | E | CI | Commercial | Rebate | Controller | 633,465 | MWDOC Save a Buck =1.9440 AFY | 5 | 1 | \$ 1.78 | \$ - | \$ 166.25 | \$ - | \$ 1,750.00 | \$ 1,918.03 | \$ 1,750.00 | \$ 166.25 | \$ - | \$ - | \$ - | \$ 1.78 | |
| Rebate, Cooling Tower Conductivity Controller | E | CI | Commercial | Rebate | Controller | 209,848 | MWDOC Save a Buck =.6440 AFY | 5 | 1 | \$ 1.78 | \$ - | \$ 59.38 | \$ - | \$ 625.00 | \$ 686.16 | \$ 625.00 | \$ 59.38 | \$ - | \$ - | \$ - | \$ 1.78 | |
| Rebate, Dry-Vacuum Pumps | E | CI | Commercial | Rebate | Rebate_5 hp | 29,848 | MWDOC Save a Buck =.0916 AFY | 7 | 1 | \$ 1.78 | \$ - | \$ 11.88 | \$ - | \$ 125.00 | \$ 138.66 | \$ 125.00 | \$ 11.88 | \$ - | \$ - | \$ - | \$ 1.78 | |
| Rebate, Connectionless Food Steamer (per Compartment) | E | CI | Commercial | Rebate | Compartment | 81,463 | MWDOC Save a Buck =.2500 AFY | 10 | 1 | \$ 1.78 | \$ - | \$ 46.08 | \$ - | \$ 485.00 | \$ 532.86 | \$ 485.00 | \$ 46.08 | \$ - | \$ - | \$ - | \$ 1.78 | |
| Rebate, Air Cooled Ice Machines | E | CI | Commercial | Rebate | Ice Machine | 50,181 | MWDOC Save a Buck =.1540 AFY | 10 | 1 | \$ 1.78 | \$ - | \$ 95.00 | \$ - | \$ 1,000.00 | \$ 1,096.78 | \$ 1,000.00 | \$ 95.00 | \$ - | \$ - | \$ - | \$ 1.78 | |
| Rebate, Laminar Flow Restrictors | E | CI | Commercial | Rebate | Flow Restrictor | 3,750 | MWDOC Web Site "up to 7500gpd | 5 | 50 | \$ 0.04 | \$ - | \$ 0.02 | \$ - | \$ 10.00 | \$ 10.05 | \$ 10.00 | \$ 0.02 | \$ - | \$ - | \$ - | \$ 0.04 | |
| Enhanced Rebate, HET (Tank-Type) | E | CI | Commercial | Rebate | Toilet | 13,849 | MWDOC Save a Buck =.0425 AFY | 20 | 5 | \$ 0.36 | \$ - | \$ 0.95 | \$ - | \$ 100.00 | \$ 101.31 | \$ 50.00 | \$ 0.95 | \$ - | \$ 50.00 | \$ - | \$ 0.36 | |
| Enhanced Rebate, HET (Tank-Type, verified replace 3.5+ gpf) | E | CI | Commercial | Rebate | Toilet | 13,849 | MWDOC Save a Buck =.0425 AFY | 20 | 5 | \$ 0.36 | \$ - | \$ 0.95 | \$ - | \$ 200.00 | \$ 201.31 | \$ 50.00 | \$ 0.95 | \$ - | \$ 150.00 | \$ - | \$ 0.36 | |
| Enhanced Rebate, HET (Flushometer) | E | CI | Commercial | Rebate | Toilet | 13,849 | MWDOC Save a Buck =.0425 AFY | 20 | 5 | \$ 0.36 | \$ - | \$ 1.90 | \$ - | \$ 150.00 | \$ 152.26 | \$ 100.00 | \$ 1.90 | \$ - | \$ 50.00 | \$ - | \$ 0.36 | |
| Enhanced Rebate, HET (Flushometer, verified replace 3.5+ gpf) | E | CI | Commercial | Rebate | Toilet | 13,849 | MWDOC Save a Buck =.0425 AFY | 20 | 5 | \$ 0.36 | \$ - | \$ 1.90 | \$ - | \$ 250.00 | \$ 252.26 | \$ 100.00 | \$ 1.90 | \$ - | \$ 150.00 | \$ - | \$ 0.36 | |
| Enhanced Rebate, UL or Zero Water Urinal (Retrofit) | E | CI | Commercial | Rebate | Urinal | 39,982 | MWDOC Save a Buck =.1227 AFY | 20 | 5 | \$ 0.36 | \$ - | \$ 3.80 | \$ - | \$ 300.00 | \$ 304.16 | \$ 200.00 | \$ 3.80 | \$ - | \$ 100.00 | \$ - | \$ 0.36 | |
| Enhanced Rebate, Cooling Tower pH Controller | E | CI | Commercial | Rebate | Controller | 633,465 | MWDOC Save a Buck =1.9440 AFY | 5 | 1 | \$ 1.78 | \$ - | \$ 166.25 | \$ - | \$ 3,550.00 | \$ 3,718.03 | \$ 1,750.00 | \$ 166.25 | \$ - | \$ 1,800.00 | \$ - | \$ 1.78 | |
| Enhanced Rebate, Cooling Tower Conductivity Controller | E | CI | Commercial | Rebate | Controller | 209,848 | MWDOC Save a Buck =.6440 AFY | 5 | 1 | \$ 1.78 | \$ - | \$ 59.38 | \$ - | \$ 625.00 | \$ 686.16 | \$ 625.00 | \$ 59.38 | \$ - | \$ - | \$ - | \$ 1.78 | |
| Enhanced Rebate, Connectionless Food Steamer (per Compartment) | E | CI | Commercial | Rebate | Compartment | 81,463 | MWDOC Save a Buck =.2500 AFY | 10 | 1 | \$ 1.78 | \$ - | \$ 46.08 | \$ - | \$ 585.00 | \$ 632.86 | \$ 485.00 | \$ 46.08 | \$ - | \$ 100.00 | \$ - | \$ 1.78 | |
| Enhanced Rebate, Air Cooled Ice Machines | E | CI | Commercial | Rebate | Ice Machine | 50,181 | MWDOC Save a Buck =.1540 AFY | 10 | 1 | \$ 1.78 | \$ - | \$ 95.00 | \$ - | \$ 1,250.00 | \$ 1,346.78 | \$ 1,000.00 | \$ 95.00 | \$ - | \$ 250.00 | \$ - | \$ 1.78 | |
| Urinal Valve Retrofit Program | P | CI | Commercial | Direct Install | Valve | 12,994 | MWDOC Save a Buck =.1227 AFY | 10 | 20 | \$ - | \$ 10.00 | \$ - | \$ 100.00 | \$ 100.00 | \$ 210.00 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 210.00 | |
| HOA Watersmart Landscape | E | Landscape | Irrigation | Budget | Meters | 133,225 | A&N Study, assume average savi | 5 | \$ - | \$ - | \$ - | \$ - | \$ 49.40 | \$ - | \$ 49.40 | \$ 4.70 | \$ - | \$ - | \$ - | \$ - | \$ 24.70 | |
| Large Landscape Customized Incentive (P4P) | E | Landscape | Irrigation | Incentive | Acres | 1,907,625 | Grant estimated savings per acre | 10 | \$ 150.00 | \$ - | \$ - | \$ - | \$ 288.75 | \$ 8,781.43 | \$ 9,070.18 | \$ 24,390.71 | \$ - | \$ - | \$ 4,679.46 | \$ - | \$ - | |
| Public Spaces Program, CI | E | Landscape | Irrigation | Rebate | Sq Ft | 46 | MWDOC Save a Buck =.00014 AFY | 10 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 2.30 | \$ 2.30 | \$ - | \$ - | \$ 0.30 | \$ 2.00 | \$ - | \$ - | |
| Rebate, CCIC | E | Landscape | Irrigation | Rebate | CCIC | 4,203 | MWDOC Save a Buck =.0129 per S | 10 | 34 | \$ 1.31 | \$ - | \$ 0.07 | \$ - | \$ 25.00 | \$ 26.38 | \$ 25.00 | \$ 0.07 | \$ - | \$ - | \$ - | \$ 1.31 | |
| Rebate, Commercial Rotating Nozzle | E | Landscape | Commercial | Rebate | Nozzle | 1,303 | MWDOC So Cal Water Smart =.004 | 5 | 25 | \$ 0.19 | \$ - | \$ 0.02 | \$ 1.23 | \$ 4.00 | \$ 5.44 | \$ 4.00 | \$ 0.02 | \$ - | \$ - | \$ - | \$ 1.42 | |
| Rebate, Commercial Large Rotary Nozzles (Set of 2) | E | Landscape | Irrigation | Rebate | Nozzle Set of 2 | 5,865 | MWDOC Save a Buck =.0180 AFY | 10 | 25 | \$ 0.38 | \$ - | \$ 0.05 | \$ - | \$ 13.00 | \$ 13.43 | \$ 13.00 | \$ 0.05 | \$ - | \$ - | \$ - | \$ 0.38 | |
| Rebate, Residential Rotating Nozzle | E | Landscape | Single Family | Rebate | Nozzle | 1,303 | MWDOC So Cal Water Smart =.004 | 5 | 25 | \$ 0.19 | \$ - | \$ 0.02 | \$ 1.23 | \$ 4.00 | \$ 5.44 | \$ 4.00 | \$ 0.02 | \$ - | \$ - | \$ - | \$ 1.42 | |
| Rebate, Commercial In-Stem Flow Regulator | E | Landscape | Commercial | Rebate | Rebate | 500 | MWDOC Web Site "up to 1000gpd | 5 | 25 | \$ 1.78 | \$ - | \$ 0.00 | \$ - | \$ 1.00 | \$ 2.78 | \$ 1.00 | \$ 0.00 | \$ - | \$ - | \$ - | \$ 1.78 | |
| Rebate, Turf Removal | E | Landscape | Single Family | Rebate | Sq Ft | 46 | MWDOC Save a Buck =.00014 AFY | 10 | 1000 | \$ 0.06 | \$ - | \$ 0.03 | \$ 0.30 | \$ 0.30 | \$ 0.30 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 0.09 | |
| Rebate, Residential Smart Timers | E | Landscape | Irrigation | Rebate | Stations | 4,203 | MWDOC Save a Buck =.0129 per S | 10 | 24 | \$ 1.89 | \$ - | \$ 0.10 | \$ 36.10 | \$ 25.00 | \$ 63.09 | \$ 25.00 | \$ 0.10 | \$ - | \$ - | \$ - | \$ 37.99 | |
| Rebate, Residential Smart Timers | E | Landscape | Single Family | Rebate | WBIC | 13,505 | MWD Under an Acre 37gpd So Cal | 10 | 1 | \$ 44.00 | \$ - | \$ 7.60 | \$ 82.47 | \$ 80.00 | \$ 214.07 | \$ 80.00 | \$ 7.60 | \$ - | \$ - | \$ - | \$ 126.47 | |
| Enhanced Rebate, Commercial Smart Timers | E | Landscape | Irrigation | Rebate | Stations | 4,203 | MWDOC Save a Buck =.0129 per S | 10 | 24 | \$ 1.89 | \$ - | \$ 0.10 | \$ 36.10 | \$ 50.00 | \$ 88.09 | \$ 25.00 | \$ 0.10 | \$ - | \$ 61.10 | \$ - | \$ 1.89 | |
| Enhanced Rebate, Residential Smart Timers | E | Landscape | Single Family | Rebate | WBIC | 13,505 | MWD Under an Acre 37gpd So Cal | 10 | 1 | \$ 44.00 | \$ - | \$ 7.60 | \$ 82.47 | \$ 380.00 | \$ 514.07 | \$ 80.00 | \$ 7.60 | \$ - | \$ 307.47 | \$ 75.00 | \$ 44.00 | |
| Enhanced Rebate, Turf Removal | E | Landscape | Single Family | Rebate | Sq Ft | 46 | MWDOC Save a Buck =.00014 AFY | 10 | 1000 | \$ 0.06 | \$ - | \$ 0.03 | \$ 0.03 | \$ 1.00 | \$ 1.09 | \$ 1.00 | \$ - | \$ - | \$ - | \$ - | \$ 0.09 | |
| Direct Install, Commercial Smart Timers | P | Landscape | Irrigation | Direct Install | Stations | 4,203 | MWDOC Save a Buck =.0129 per S | 10 | 24 | \$ 1.89 | \$ - | \$ 0.10 | \$ 36.10 | \$ 50.00 | \$ 88.09 | \$ 25.00 | \$ 0.10 | \$ - | \$ - | \$ 61.10 | \$ - | \$ 1.89 |
| Direct Install, Residential Smart Timers | P | Landscape | Single Family | Direct Install | WBIC | 13,505 | MWD Under an Acre 37gpd So Cal | 10 | 1 | \$ 44.00 | \$ - | \$ 7.60 | \$ 82.47 | \$ 380.00 | \$ 514.07 | \$ 80.00 | \$ 7.60 | \$ - | \$ - | \$ 307.47 | \$ 75.00 | \$ 44.00 |
| Soil Moisture Sensor Systems, Commercial | P | Landscape | Commercial | Rebate | Stations w Sensor | 4,624 | Assume 10% more than ...MWD | 10 | 24 | \$ 1.89 | \$ - | \$ 0.10 | \$ 36.10 | \$ 50.00 | \$ 88.09 | \$ 25.00 | \$ 0.10 | \$ - | \$ - | \$ 61.10 | \$ - | \$ 1.89 |
| Soil Moisture Sensor Systems, Residential | P | Landscape | Single Family | Rebate | Controller w Sensor | 14,856 | Assume 10% more than ...MWD | 10 | 1 | \$ 44.00 | \$ - | \$ 7.60 | \$ 82.47 | \$ 380.00 | \$ 514.07 | \$ 80.00 | \$ 7.60 | \$ - | \$ - | \$ 307.47 | \$ 75.00 | \$ 44.00 |
| Rain Shut-off Devices (Distribution), Commercial | P | Landscape | Commercial | Distribution | Add On to Controller w/o Shut Off D | 40,353 | Assume 24 stations, savings 40% | 5 | 24 | \$ - | \$ - | \$ - | \$ - | \$ 360.00 | \$ 360.00 | \$ - | \$ - | \$ 360.00 | \$ - | \$ - | | |
| Rain Shut-off Devices (Distribution), Residential | P | Landscape | Single Family | Distribution | Add On to Controller w/o Shut Off D | 5,402 | Assume 40% of ...MWD Under al | 5 | 1 | \$ - | \$ - | \$ - | \$ - | \$ 15.00 | \$ 15.00 | \$ - | \$ - | \$ 15.00 | \$ - | \$ - | | |
| FreeSprinklerNozzle.com Voucher Program | P | Landscape | Single Family | Voucher | Nozzle | 1,303 | MWDOC So Cal Water Smart =.004 | 5 | \$ - | \$ 0.15 | \$ - | \$ - | \$ - | \$ 3.00 | \$ 3.15 | \$ - | \$ - | \$ 3.00 | \$ - | \$ - | \$ 0.15 | |
| California Sprinkler Adjustment Notification System | P | Landscape | Single Family | Notification | Participating Controller | 14,235 | IRWD Water Dex Study | 5 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 80.00 | \$ 80.00 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 80.00 | |
| Rebate, Artificial Turf | P | Landscape | Commercial | Rebate | Sq Ft | 46 | MWDOC Save a Buck =.00014 AFY | 10 | 1000 | \$ 0.06 | \$ - | \$ 0.03 | \$ 0.03 | \$ 3.00 | \$ 3.09 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 3.09 | |
| Landscape Potable to Recycled Conversions | P | Landscape | Commercial | Incentive | AF Saved | 32,585 | Pay for AF of savings, which is sp | 10 | \$ - | \$ - | \$ - | \$ - | \$ 150.00 | \$ 150.00 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 150.00 | |
| Rainwater Capture (Rain Barrel) Co-Pay | P | Landscape | Single Family | Co-Pay | Rain Barrel | 300 | Assume you get 5 usable fills @ 6 | 5 | \$ - | \$ 5.00 | \$ - | \$ - | \$ - | \$ - | \$ 5.00 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 5.00 | |
| Soil Moisture Sensor Systems Add On, SF | P | Landscape | Single Family | Research | Sensor Add-On to Dumb Timer | 14,856 | Assume 10% more than ...MWD | 10 | 1 | \$ 44.00 | \$ - | \$ 7.60 | \$ 82.47 | \$ 310.00 | \$ 444.07 | \$ 80.00 | \$ 7.60 | \$ - | \$ 237.47 | \$ 75.00 | \$ 44.00 | |
| SoCal WaterSmart HE Clothes Washer, Res | E | Residential | Single Family | Device Rebate | Washer | 11,250 | MWD So Cal Water Smart (WF 4) | 15 | 1 | \$ 0.47 | \$ - | \$ 8.08 | \$ - | \$ 85.00 | \$ 93.55 | \$ 85.00 | \$ 8.08 | \$ - | \$ - | \$ - | \$ 0.47 | |
| SoCal WaterSmart HET Rebates, Residential | E | Residential | Single Family | Device Rebate | Toilet | 13,849 | MWDOC Save a Buck =.0425 AFY | 20 | 1 | \$ 1.78 | \$ - | \$ 4.75 | \$ - | \$ 50.00 | \$ 56.53 | \$ 50.00 | \$ 4.75 | \$ - | \$ - | \$ - | \$ 1.78 | |
| Enhanced SoCal WaterSmart HE Clothes Washer, Res | E | Residential | Single Family | Device Rebate | Washer | 11,250 | MWD So Cal Water Smart (WF 4) | 15 | 1 | \$ 0.47 | \$ - | \$ 8.08 | \$ - | \$ 285.00 | \$ 293.55 | \$ 85.00 | \$ 8.08 | \$ - | \$ - | \$ 200.00 | \$ - | \$ 0.47 |
| MWDOC Turf Removal Incentives Program | E | Landscape | Single Family | Rebate | Sq Ft | 46 | MWDOC Save a Buck =.00014 AFY | 10 | 1000 | \$ 0.06 | \$ - | \$ 0.03 | \$ 0.03 | \$ 1.00 | \$ 1.09 | \$ - | \$ - | \$ 1.00 | \$ - | \$ - | \$ 0.09 | |

Table B-1 Savings and Cost Assumptions



Table B-2: WUE Program Benefits

| Conservation Benefit Analysis (2013 Dollars) | | | | |
|----------------------------------------------|----------------------------------------------------------------|----------------------|----------------------|----------------------|
| Class | Activity Name | Unit Benefit (\$/AF) | PV Benefit | Avoided Supply |
| Commercial | Industrial Program (P4P) | \$ 1,124 | \$ 58,572 | \$ 58,572 |
| Commercial | Rebate, HET (Tank-Type) | \$ 1,466 | \$ 9,438,286 | \$ 9,438,286 |
| Commercial | Rebate, UL or Zero Water Urinal (Replace 1.5+ gpf) | \$ 1,466 | \$ 2,369,468 | \$ 2,369,468 |
| Commercial | Rebate, Cooling Tower pH Controller | \$ 1,102 | \$ 286,683 | \$ 286,683 |
| Commercial | Rebate, Cooling Tower Conductivity Controller | \$ 1,102 | \$ 79,143 | \$ 79,143 |
| Commercial | Rebate, Dry-Vacuum Pumps | \$ 1,142 | \$ 6,348 | \$ 6,348 |
| Commercial | Rebate, Connectionless Food Steamer (per Compartment) | \$ 1,218 | \$ 63,329 | \$ 63,329 |
| Commercial | Rebate, Air Cooled Ice Machines | \$ 1,218 | \$ 15,604 | \$ 15,604 |
| Commercial | Rebate, Laminar Flow Restrictors | \$ 1,102 | \$ 56,571 | \$ 56,571 |
| Commercial | Enhanced Rebate, HET (Tank-Type) | \$ 1,466 | \$ 1,641,441 | \$ 1,641,441 |
| Commercial | Enhanced Rebate, HET (Tank-Type, verified replace 3.5+ gpf) | \$ 1,466 | \$ 820,720 | \$ 820,720 |
| Commercial | Enhanced Rebate, Cooling Tower pH Controller | \$ 1,102 | \$ 95,561 | \$ 95,561 |
| Commercial | Enhanced Rebate, Cooling Tower Conductivity Controller | \$ 1,102 | \$ 47,486 | \$ 47,486 |
| Commercial | Enhanced Rebate, Connectionless Food Steamer (per Compartment) | \$ 1,218 | \$ 25,332 | \$ 25,332 |
| Commercial | Enhanced Rebate, Air Cooled Ice Machines | \$ 1,218 | \$ 7,802 | \$ 7,802 |
| Irrigation | HOA Watersmart Landscape | \$ 1,155 | \$ 3,586,332 | \$ 3,586,332 |
| Irrigation | Large Landscape Customized Incentive (P4P) | \$ 1,332 | \$ 2,270,693 | \$ 2,270,693 |
| Irrigation | Public Spaces Program, CII | \$ 1,286 | \$ 926,221 | \$ 926,221 |
| Irrigation | Rebate, CCIC | \$ 1,332 | \$ 107,218 | \$ 107,218 |
| Commercial | Rebate, Commercial Rotating Nozzle | \$ 1,193 | \$ 106,397 | \$ 106,397 |
| Irrigation | Rebate, Commercial Large Rotary Nozzles (Set of 2) | \$ 1,332 | \$ 119,685 | \$ 119,685 |
| Single Family | Rebate, Residential Rotating Nozzle | \$ 1,193 | \$ 127,677 | \$ 127,677 |
| Irrigation | Rebate, Commercial Smart Timers | \$ 1,332 | \$ 5,360,903 | \$ 5,360,903 |
| Single Family | Enhanced Rebate, Residential Smart Timers | \$ 1,332 | \$ 1,067,861 | \$ 1,067,861 |
| Single Family | Soil Moisture Sensor Systems, Residential | \$ 1,332 | \$ 88,414 | \$ 88,414 |
| Single Family | Soil Moisture Sensor Systems Add On, SF | \$ 1,360 | \$ 765,748 | \$ 765,748 |
| Single Family | SoCal WaterSmart HE Clothes Washer, Res | \$ 1,305 | \$ 12,015,516 | \$ 12,015,516 |
| Single Family | SoCal WaterSmart HET Rebates, Residential | \$ 1,343 | \$ 636,945 | \$ 636,945 |
| Single Family | Enhanced SoCal WaterSmart HE Clothes Washer, Res | \$ 1,305 | \$ 2,002,586 | \$ 2,002,586 |
| Single Family | MWDOC Turf Removal Program | \$ 1,332 | \$ 3,102,952 | \$ 3,102,952 |
| Total | | \$ 1,340 | \$ 47,297,495 | \$ 47,297,495 |

Table B-2 WUE Program Benefits



Table B-3 WUE Program Ranking by Benefit-to-Cost Ratio

| Utility Conservation Program NPV and B/C Ratio (2013 Dollars) | | | |
|----------------------------------------------------------------------|----------------------------------------------------------------|----------------------|------------------|
| Class | Activity Name | NPV (\$) | B/C Ratio |
| Commercial | Industrial Program (P4P) | \$ 39,606 | 3.09 |
| Commercial | Rebate, HET (Tank-Type) | \$ 8,757,677 | 13.87 |
| Commercial | Rebate, UL or Zero Water Urinal (Replace 1.5+ gpf) | \$ 2,128,445 | 9.83 |
| Commercial | Rebate, Cooling Tower pH Controller | \$ 232,337 | 5.28 |
| Commercial | Rebate, Cooling Tower Conductivity Controller | \$ 62,941 | 4.88 |
| Commercial | Rebate, Dry-Vacuum Pumps | \$ 5,039 | 4.85 |
| Commercial | Rebate, Connectionless Food Steamer (per Compartment) | \$ 50,748 | 5.03 |
| Commercial | Rebate, Air Cooled Ice Machines | \$ 5,246 | 1.51 |
| Commercial | Rebate, Laminar Flow Restrictors | \$ 47,075 | 5.96 |
| Commercial | Enhanced Rebate, HET (Tank-Type) | \$ 1,402,241 | 6.86 |
| Commercial | Enhanced Rebate, HET (Tank-Type, verified replace 3.5+ gpf) | \$ 583,062 | 3.45 |
| Commercial | Enhanced Rebate, Cooling Tower pH Controller | \$ 60,445 | 2.72 |
| Commercial | Enhanced Rebate, Cooling Tower Conductivity Controller | \$ 37,765 | 4.88 |
| Commercial | Enhanced Rebate, Connectionless Food Steamer (per Compartment) | \$ 19,355 | 4.24 |
| Commercial | Enhanced Rebate, Air Cooled Ice Machines | \$ 1,442 | 1.23 |
| Irrigation | HOA Watersmart Landscape | \$ 3,469,690 | 30.75 |
| Irrigation | Large Landscape Customized Incentive (P4P) | \$ 1,970,866 | 7.57 |
| Irrigation | Public Spaces Program, CII | \$ (417,435) | 0.69 |
| Irrigation | Rebate, CCIC | \$ 88,532 | 5.74 |
| Commercial | Rebate, Commercial Rotating Nozzle | \$ 80,730 | 4.15 |
| Irrigation | Rebate, Commercial Large Rotary Nozzles (Set of 2) | \$ 112,075 | 15.73 |
| Single Family | Rebate, Residential Rotating Nozzle | \$ 96,876 | 4.15 |
| Irrigation | Rebate, Commercial Smart Timers | \$ 3,126,449 | 2.40 |
| Single Family | Enhanced Rebate, Residential Smart Timers | \$ (60,977) | 0.95 |
| Single Family | Soil Moisture Sensor Systems, Residential | \$ 3,448 | 1.04 |
| Single Family | Soil Moisture Sensor Systems Add On, SF | \$ 143,271 | 1.23 |
| Single Family | SoCal WaterSmart HE Clothes Washer, Res | \$ 8,702,386 | 3.63 |
| Single Family | SoCal WaterSmart HET Rebates, Residential | \$ 580,415 | 11.27 |
| Single Family | Enhanced SoCal WaterSmart HE Clothes Washer, Res | \$ 269,814 | 1.16 |
| Single Family | MWDOC Turf Removal Program | \$ 1,044,015 | 1.51 |
| Subtotal Conservation Activities | | \$ 32,643,581 | 3.23 |
| Total With Overhead & Public Information | | \$ 32,643,581 | 3.23 |

Table B-3 WUE Program Ranking by Benefit-to-Cost Ratio