MEETING OF THE BOARD OF DIRECTORS OF THE
MUNICIPAL WATER DISTRICT OF ORANGE COUNTY
Jointly with the
PLANNING & OPERATIONS COMMITTEE
February 4, 2019, 8:30 a.m.
Conference Room 101

P&O Committee:
Director Yoo Schneider, Chair
Director Tamaribuchi
Director Dick

Staff: R. Hunter, K. Seckel, J. Berg, H. De La Torre, K. Davanaugh

Ex Officio Member: Director Barbre

MWDOC Committee meetings are noticed and held as joint meetings of the Committee and the entire Board of Directors and all members of the Board of Directors may attend and participate in the discussion. Each Committee has designated Committee members, and other members of the Board are designated alternate committee members. If less than a quorum of the full Board is in attendance, the Board meeting will be adjourned for lack of a quorum and the meeting will proceed as a meeting of the Committee with those Committee members and alternate members in attendance acting as the Committee.

PUBLIC COMMENTS - Public comments on agenda items and items under the jurisdiction of the Committee should be made at this time.

ITEMS RECEIVED TOO LATE TO BE AGENDIZED - Determine there is a need to take immediate action on item(s) and that the need for action came to the attention of the District subsequent to the posting of the Agenda. (Requires a unanimous vote of the Committee)

ITEMS DISTRIBUTED TO THE BOARD LESS THAN 72 HOURS PRIOR TO MEETING -- Pursuant to Government Code section 54957.5, non-exempt public records that relate to open session agenda items and are distributed to a majority of the Board less than seventy-two (72) hours prior to the meeting will be available for public inspection in the lobby of the District's business office located at 18700 Ward Street, Fountain Valley, California 92708, during regular business hours. When practical, these public records will also be made available on the District's Internet Web site, accessible at http://www.mwdoc.com.

ACTION ITEM

1. WATER USE EFFICIENCY RESEARCH PROJECTS

INFORMATION ITEMS (The following items are for informational purposes only – background information is included in the packet. Discussion is not necessary unless a Director requests.)

2. STATUS REPORTS

   a. Ongoing MWDOC Reliability and Engineering/Planning Projects
   b. WEROC
   c. Water Use Efficiency Projects
   d. Water Use Efficiency Programs Savings and Implementation Report

3. REVIEW OF ISSUES RELATED TO CONSTRUCTION PROGRAMS, WATER USE EFFICIENCY, FACILITY AND EQUIPMENT MAINTENANCE, WATER STORAGE, WATER QUALITY, CONJUNCTIVE USE PROGRAMS, EDUCATION, DISTRICT FACILITIES, and MEMBER-AGENCY RELATIONS

ADJOURNMENT

NOTE: At the discretion of the Committee, all items appearing on this agenda, whether or not expressly listed for action, may be deliberated, and may be subject to action by the Committee. On those items designated for Board action, the Committee reviews the items and makes a recommendation for final action to the full Board of Directors; final action will be taken by the Board of Directors. Agendas for Committee and Board meetings may be obtained from the District Secretary. Members of the public are advised that the Board consideration process includes consideration of each agenda item by one or more Committees indicated on the Board Action Sheet. Attendance at Committee meetings and the Board meeting considering an item consequently is advised.

Accommodations for the Disabled. Any person may make a request for a disability-related modification or accommodation needed for that person to be able to participate in the public meeting by telephoning Maribeth Goldsby, District Secretary, at (714) 963-3058, or writing to Municipal Water District of Orange County at P.O. Box 20895, Fountain Valley, CA 92728. Requests must specify the nature of the disability and the type of accommodation requested. A telephone number or other contact information should be included so that District staff may discuss appropriate arrangements. Persons requesting a disability-related accommodation should make the request with adequate time before the meeting for the District to provide the requested accommodation.

Item No. 1

ACTION ITEM
February 20, 2019

TO: Board of Directors

FROM: **Planning & Operations Committee**
(Directors Yoo Schneider, Dick, Tamaribuchi)

Robert Hunter, General Manager
Staff Contact: J. Berg, Director of Water Use Efficiency

SUBJECT: **Water Use Efficiency Research Projects**

STAFF RECOMMENDATION

Staff recommends the Board of Directors approve implementation of research projects as detailed below including:

1. A contribution of $15,000 to the California Water Efficiency Partnership for the development of Water Use Efficiency Standards Compliance and Water Conservation Tracking Tools,
2. A professional services contract with Water Systems Optimization, Inc. to:
    a. Conduct Water Balance Validation Research and staff training in an amount not to exceed $56,000
    b. Conduct Leak Detection Research and staff training in an amount not to exceed $100,000

COMMITTEE RECOMMENDATION

Committee recommends (To be determined at Committee Meeting)

SUMMARY

Staff has identified the following four research projects for Board consideration this fiscal year:

- Water Use Efficiency Standards Compliance and Water Conservation Tracking Tools
- Water Balance Validation Research
- Leak Detection Research, and
- Pressure Regulating Valve Replacement Pilot Program and Water Savings Evaluation

Budgeted (Y/N): Yes	Budgeted amount: $96,000	Core _X_	Choice __
Action item amount: $96,000	Line item: 35-7040		
Fiscal Impact (explain if unbudgeted):			

All four research projects are designed to assist agencies in complying with new water use efficiency standards included in Senate Bills 555 and 606, and Assembly Bill 1668.

The total cost for these research activities is $353,500. Staff proposes to use a combination of budgeted research funds ($75,000) and budgeted but repurposed landscape education funds ($21,000) for a total of $96,000 or 25 percent for MWDOC's contribution to the research. Repurposed landscape education funding is available because very favorable pricing was secured near the end of FY 2017-18 for the Qualified Water Efficient Landscaper Program instructor. MWDOC funds will leverage an additional $265,500 or 75 percent from other funding sources such as Metropolitan, water suppliers from throughout the state, and the US Bureau of Reclamation.

DETAILED REPORT

The following provides descriptions of the four research projects including goals, funding partners, budget, etc.

Water Use Efficiency Standards Compliance and Water Conservation Tracking Tool

The California Water Efficiency Partnership (CalWEP), in conjunction with the Alliance for Water Efficiency, is seeking funds to develop tools to assist members with compliance with California's new water use efficiency mandates contained in Assembly Bill 1668 and Senate Bill 606. Two tools are targeted for development including:

1. A California Water Use Efficiency Standards Compliance Tool - This tool will allow an urban water supplier to calculate their water use objective and compare the objective to their actual water use. The water use objective will include volumes of water for indoor, outdoor, and water loss standards. Actual water use from billing data will be entered into the tool for comparison to the supplier's water use objective. The compliance tool will be developed in a way that will allow for the tool to be refined over time in response to the evolution of the standards. CalWEP will engage with the Department of Water Resources during the development process to ensure the tool is consistent with the new standards.

2. An Updated California-Specific Water Conservation Tracking Tool - This tool will allow an urban supplier to track the costs and water savings of water use efficiency program implementation over time. It also allows agencies to optimize program implementation by evaluating the costs and savings of customized water use efficiency program portfolios to meet a water savings goal. This tool was used to develop MWDOC's Water Use Efficiency Master Plan in 2013. The updated tool will include water conservation programs specific to California, such as:

    - Modular functionality that separates compliance detection and conservation planning to ensure compliance;
    - Improved indoor and outdoor water use accounting and GPCD target tracking;
    - New functionality to evaluate costs and benefits of CII mixed-use meter conversion;

- New functionality to assess water savings and cost-effectiveness of CII water use audits and management reports for different types and sizes of commercial and industrial water users;
- New functionality for tracking costs and water savings of water loss auditing, reporting, pressure management, and leak detection and repair activities;
- Updates to the Tracking Tool Library to incorporate the most current information on implementation costs and water savings for conservation activities aimed at reducing residential indoor, landscape, and CII water uses; and
- Updates to the Tracking Tool Library to incorporate the most current information on implementation costs and water savings for utility leak detection and repair activities including pressure management.

The proposal for the development of the tools is from M.Cubed and A&N Technical Services, Inc. and is provided as Attachment A. CalWEP is soliciting funding support from water agencies throughout the state to develop these tools. The cost for both tools is $205,500. While the funding drive began this month, to date the following funding commitments have been made:

• Inland Empire Utilities Agency	$15,000
• Municipal Water District of Orange County	$15,000 (proposed)
• Regional Water Authority	$20,000
• Solano County Water Agency	$20,000
• Sonoma County Water Agency	$10,000
• Western Municipal Water District	$10,000
	$90,000 (44%)

It is anticipated the funding drive will conclude this summer, at which time development of the tools will begin. The tools will be completed within 8 to 11 months including testing and user training. Staff requests board authorization for MWDOC to contribute $15,000 toward the development of the tools. This represents less than eight percent of the cost of the tools, but leverages full access to the tools and shares the cost with water agencies throughout the state.

Water Balance Validation Research

On March 9, 2018, State Water Resources Control Board (Water Board) staff began a stakeholder process to develop rules requiring urban retail water suppliers to meet performance standards for the volume of water loss. This was the first of four stakeholder meetings the Water Board plans to hold. At this meeting, Water Board staff revealed they will base these performance standards on as little as two years of validated water loss audit data. This represents a significant area of concern for MWDOC staff. Not only is the Water Board planning to set the standards on a very limited data set (two years), but they are also planning to use two different validation processes. The 2017 validation process was funded by the Water Board and utilized two consultants working very closely to validate water audit reports for all urban water suppliers in the state. This provided a common validation approach and, therefore, a very consistent state-wide data set. In 2018, validations were done by a broader group of validators, including consultants and water agency staff who completed the Cal-Nev AWWA Water Audit Validator Certification. As a result, the

variability of water balance validations will increase significantly from 2017 to present and may result in the standard being set based upon poor quality data.

With this in mind, in 2018 the MWDOC Board authorized staff to utilize Water System Optimization, Inc. (WSO) to perform water balance validations for all member agencies in order to have a third consecutive year of consistently validated water balances. The results of the three-year dataset are provided in Figure 1. This dataset show moderate to significant variability from year to year for most agencies (64%) and minimal variability for others (36%). In addition, there is significant variability from agency to agency. Staff presented these results to the Water Board staff leading the process to set the water loss volume standard.

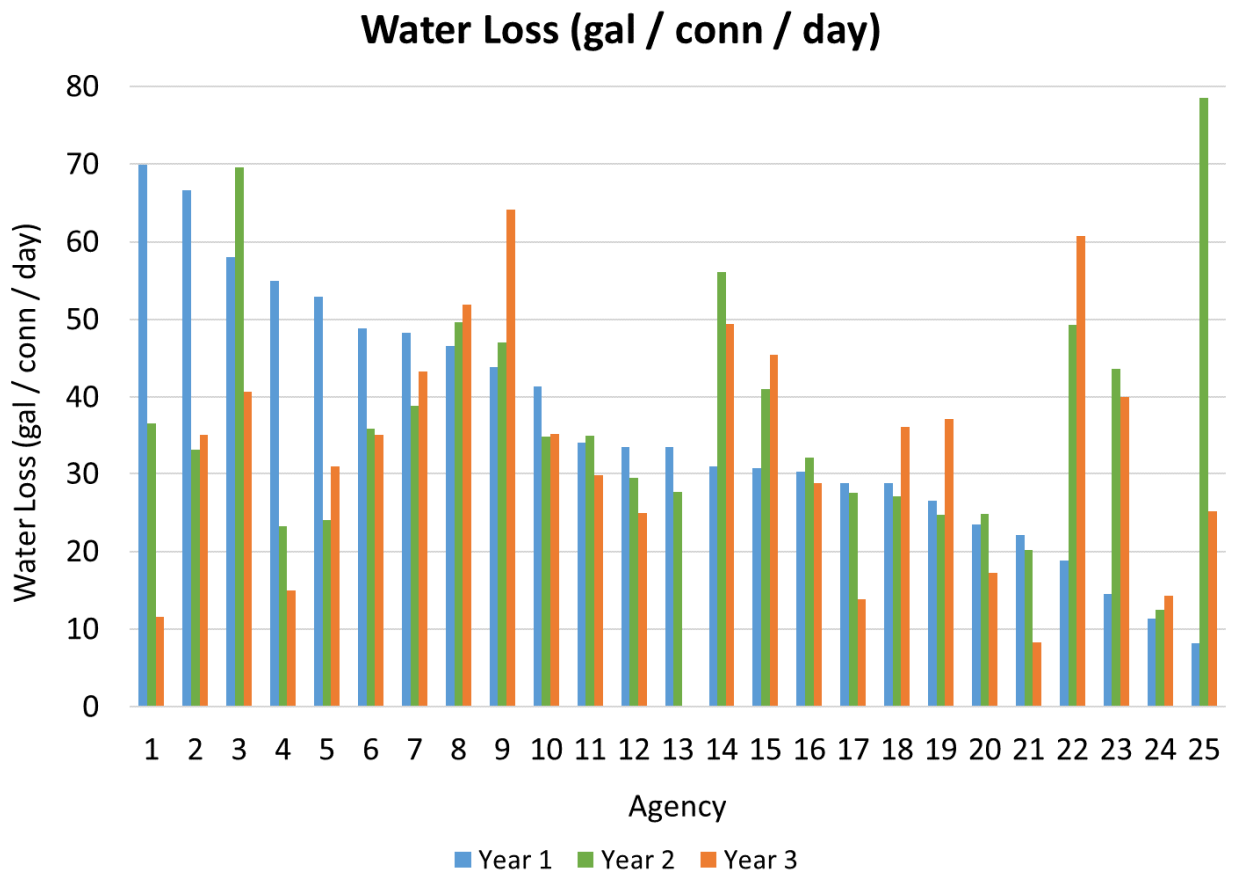

Figure 1

Both staff and WSO believe a five-year data set would be more appropriate for setting the performance standard for a volume of water losses, with an emphasis placed on the last two to three years of data in the five-year dataset. Staff is advocating that the Water Board adopt a two-step process for adopting the volume standard for water loss. The first step would extend the water loss audit reporting to five years before setting water loss standards. This will allow for agencies to continually improve the data used to compile the audit, thus improving the confidence in the water balance results. The second step would use the bigger and more consistent data set to set the volumetric standard for water loss.

Staff is proposing to extend our water loss audit report validation for 2019 to all member agencies as a Core program using MWDOC budgeted research funds. This project has two goals:

Goal 1: Complete water balance validations for all MWDOC member agencies to establish a fourth consecutive year of consistently validated water balances.

Goal 2: Provide hands on water balance validation training for MWDOC's Water Loss Control Programs Supervisor.

This will allow Orange County's data to be validated consistently for a fourth consecutive year. The results of this four-year data set will be shared with Water Board staff with the intent to use this data to better inform the standards setting process.

In addition, this validation process will serve as a training opportunity for MWDOC's new Water Loss Control Program Supervisor. One-on-one training will be provided by WSO using our member agencies as case studies. Once completed, the Supervisor will be ready to take the California-Nevada American Water Works Association Water Audit Validator Certification Course and Exam.

Staff discussed this research and training effort with WSO and negotiated a discounted cost of $2,000 per agency[1]. The total cost for this effort would be $56,000 for 28 water balance validations. WSO was amenable to the discounted rate because they will work with a larger number of agencies, and the data will have value to the Water Board's standard setting process.

Staff recommends the Board of Directors authorize the General Manager to sign a professional services contract with Water Systems Optimization, Inc. to conduct Water Balance Validation Research in an amount not to exceed $56,000

Leak Detection Research

Staff proposes to conduct a Leak Detection Research project in partnership with the Metropolitan Water District of Southern California, US Bureau of Reclamation, and member agencies. This project has two goals:

Goal 1: Conduct leak detection and repair to evaluate water savings and feasibility of a standardized Conservation Credits Program incentive from Metropolitan.

Goal 2: Hands on leak detection training for MWDOC's Leak Detection Technician.

Staff proposes to use our existing leak detection contractor, WSO to perform leak detection on 230 miles of distribution system while simultaneously training MWDOC Shared Services staff. Up to six retail water agencies with varying levels of water loss and pipe materials will be included in the research. WSO and MWDOC staff will document all leaks, track repairs, and quantify water savings. Leak detection results will also be used to corroborate estimates of real water loss calculated in annual water balances required by SB 555. All

[1] MWDOC technical assistance program includes water loss audit validation by WSO at a fixed cost of $2,500 per retail agency.

information will be reported to Metropolitan to evaluate water savings and feasibility of a standardized Conservation Credits Program incentive from Metropolitan.

As summarized in Table 1, the budget for this research effort is $100,000 and is proposed to be funded by MWDOC, Metropolitan, US Bureau of Reclamation, and in-kind support from participating member agencies. WSO will perform the leak detection while simultaneously training MWDOC's Leak Detection Technician. WSO will also establish data collection procedures, aggregate and analyze results, document results including recommendations and presents results to project partners. Data collection procedures will then be used by MWDOC staff administering water loss control shared services.

Table 1
Leak Detection Research Funding Partnership

Funding Partner	Leak Detection and Training	Evaluation	Total
MWDOC		$25,000	$25,000
Metropolitan	$30,000		$30,000
US Bureau of Reclamation	$45,000		$45,000
Total:	**$75,000**	**$25,000**	**$100,000**

Staff recommends the Board of Directors approve a professional services contract with Water Systems Optimization, Inc. to conduct Leak Detection Research and MWDOC staff training in an amount not to exceed $100,000

Pressure Regulating Valve Replacement Pilot Program and Water Savings Evaluation

The California Plumbing Code requires homes and businesses to have a pressure regulating valve (PRV) when the water supply pressure or street pressure is 80 psi or greater.

According to the Uniform Plumbing Code Illustrated Training Manual:

> *"[a] limit of 80 psi (551.6 kPa) is the maximum static pressure of any water supply system. The reason for this is to reduce water hammer, unnecessary use of water, splashing, excessive discharge of pressure relief valves and to protect appliance and fixture valves and mechanisms from pressure that exceeds their design limits. Any installation with pressures above 80 psi will require a pressure regulating valve to limit the pressure to 80 psi or below.*

PRVs appear to have a useful life of 10 – 12 years. When they fail, they usually fail in the open position, therefore increasing indoor water pressure to street pressure. As a result, all plumbing fixtures, appliances, and leaks are likely flowing at higher rates, resulting in increased water use. Staff is proposing implementation of a study, in partnership with host member agencies, to evaluate the viability of a PRV replacement program to save water. The study will rely on a plumber(s) to canvas targeted neighborhoods known to have high pressure. With homeowner permission, the plumber will test the PRV. If the test results in a failed PRV, the plumber will offer to replace it with a new one. Pre and post retrofit water use will be collected and analyzed by MWDOC staff to quantify water savings.

The study will be implemented using a combination of funding from MWDOC and Metropolitan. Staff is in the process of conducting a Request for Proposals (RFP) process to hire a plumber(s) to perform the field work. Staff will return to the Board this spring with a detailed proposal once the RFP process has been completed. If this research results in a significant amount of indoor water savings, PRVs could be added to the regional rebate program as a new water saving opportunity to assist agencies in meeting indoor water use standards contained in SB 606 and AB 1668.

Summary

In summary, these research efforts are designed to assist agencies to comply with new water use efficiency standards contained in Senate Bills 555 and 606, and Assembly Bill 1668. This research will provide quality data to better inform water loss standards, assist agencies in complying with standards, and train MWDOC water loss control shared services staff who will implement water loss programs to comply with standards.

As shown in Table 2, the total cost for these research activities is $353,500. Staff proposes to use a combination of budgeted research funds ($75,000) and budgeted but repurposed landscape education funds ($21,000) for a total of $96,000 or 25 percent for MWDOC's contribution to the research. Repurposed landscape education funding is available because very favorable pricing was secured near the end of FY 2017-18 for the Qualified Water Efficient Landscaper Program instructor. MWDOC funds will leverage an additional $265,500 or 75 percent from other funding sources such as Metropolitan, water suppliers from throughout the state, and the US Bureau of Reclamation.

Table 2
Summary of Research Projects

Research Project	MWDOC Contribution	Metropolitan or Other Contributions	Total:
Water Use Efficiency Standards Compliance and Water Conservation Tracking Tools	$15,000	Other = $190,500	$205,500
Water Balance Validation Research	$56,000	$0.00	$56,000
Leak Detection Research	$25,000	Metropolitan = $30,000 USBR = $45,000	$100,000
Pressure Regulating Valve Replacement Water Savings Evaluation	To Be Determined		
Total:	**$96,000**	**$265,500**	**$353,500**

POLICY ANALYSIS
FOR THE
PUBLIC AND PRIVATE
SECTORS
M.CUBED

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DATE: December 3, 2018
TO: Joe Berg, California Water Efficiency Partnership Board
Mary Ann Dickenson, California Water Efficiency Partnership
FR: David Mitchell (M.Cubed) and Tom Chesnutt (A&N Technical Services)
RE: Proposal to develop Tools for New State Urban Water Use Standards

Introduction

This letter proposal sets forth development of two independent but related tools:

1. A California WUE Standards Compliance Tool (CalWEP Tool) and
2. An updated California-specific version of the AWE Water Conservation Tracking Tool (AWE Tool)

The first tool would be used to determine compliance with new State Urban Water Use Standards. The second would be used to attain or ensure compliance through planned design of intentional WUE programs. Members of CalWEP and AWE would have access to these planning (AWE tool) and California WUE Standards compliance (CalWEP tool) tools. The CalWEP tool would necessarily be a work in progress as the Standards are being finalized. The AWE Water Conservation Tracking Tool is an Excel-based planning model that water suppliers can use to evaluate the water savings, costs, and benefits of conservation (WUE) programs. Using information entered into the Tracking Tool from a utility's system, it provides a standardized methodology for water savings and benefit-cost accounting, and includes a library of pre-defined conservation activities from which users can build conservation programs.

The Tracking Tool is used widely across the nation. Many utilities in California rely on it for conservation planning. Different versions of the Tracking Tool have been developed for unique state regulatory environments. For example, one version is specific to the plumbing codes, appliance standards, and landscape requirements in California. However, California is currently in the process of making significant changes to these regulations. Helping water utilities plan for compliance with these regulatory changes is one of the main purposes of the Tracking Tool.

This proposal describes the pending changes to California urban water conservation regulations and proposes modifications to the Tracking Tool to help California urban water suppliers plan their water conservation programs to comply with the new state requirements. The proposal sets out a modular approach that separates (1) California state compliance from (2) the task of conservation program planning to ensure compliance. This modular approach will allow urban water suppliers to use alternative approaches to compliance determination or conservation planning at their choice. The modular approach would also allow use of the California-specific tools for cross-checking and validation of alternative approaches.

Changing State Urban Water Conservation Regulations

A major change on California's urban water management horizon is the implementation of Executive Order B-37-16. The stated goal of the order is to "help Californians *adopt permanent changes* to use water more wisely".[1] Specifically, the Executive Order states:

> *The Department of Water Resources (Department) shall work with the Water Board to develop new water use targets as part of a permanent framework for urban water agencies. These new water use targets shall build upon the existing state law requirements that the state achieve a 20% reduction in urban water usage by 2020 ... These water use targets shall be customized to the unique conditions of each water agency, shall generate more statewide water conservation than existing requirements, and shall be based on strengthened standards for:*
>
> *a. Indoor residential per capita water use;*
> *b. Outdoor irrigation, in a manner that incorporates landscape area, local climate, and new satellite imagery data;*
> *c. Commercial, industrial, and institutional water use; and*
> *d. Water lost through leaks.*

New Per Capita Water Use Targets for Indoor and Outdoor Water Use

Key to the Executive Order is the requirement that urban water suppliers meet new water use targets that will replace the 20x2020 targets set under Senate Bill X7-7 passed in 2009. Importantly, the new targets must result in greater statewide water savings than the 20x2020 targets they are replacing.

The state is developing new standards and targets for indoor residential water use and outdoor residential and non-residential landscape water use. Current law (AB 1668 and SB 606) sets an initial indoor residential target of 55 gpcd. The target would be reduced to 52.5 gpcd in 2025 and to 50 gpcd in 2030, if studies of residential indoor water use support lowering the targets. Currently, indoor residential water use is thought to average about 58 gpcd[2], which is about 14% greater than the target being proposed for 2030.

The outdoor component of the target will be based on estimated landscape area multiplied by a fraction of a measure of evapotranspiration using the principles of the Model Water Efficient Landscape Ordinance. While the fraction of measured evapotranspiration that will determine the outdoor water, allowance has not been settled, it is likely to be somewhere in the range of 0.45 to 0.8.[3]

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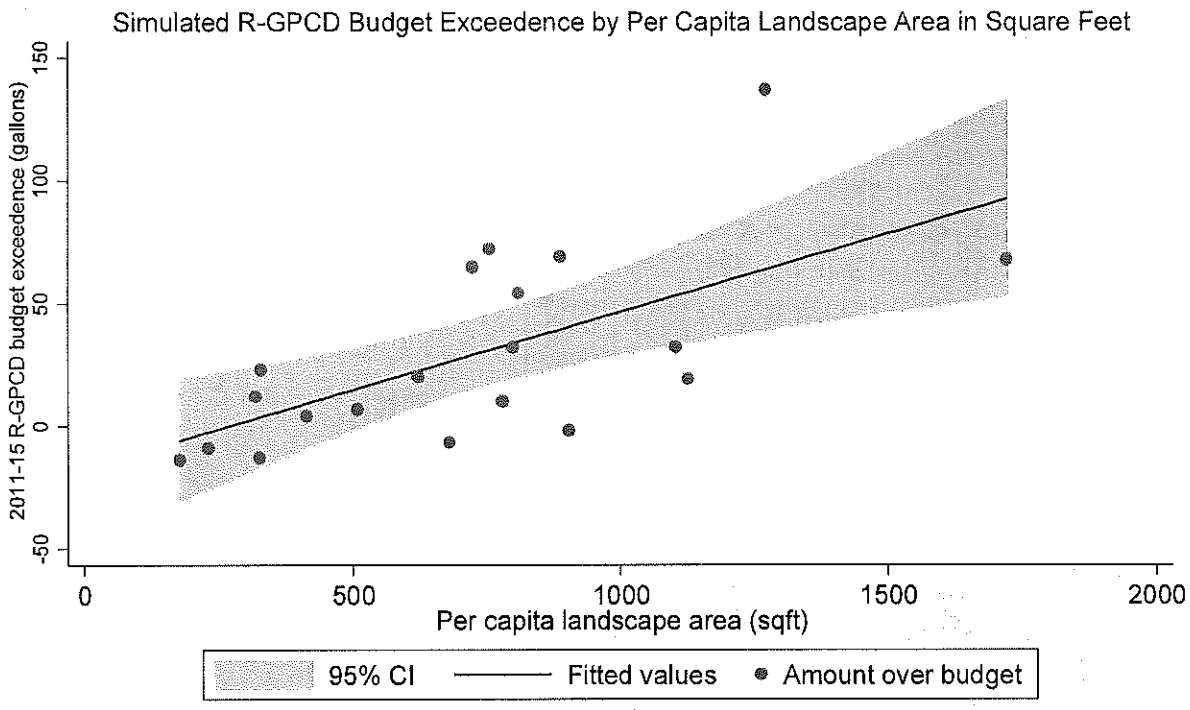
[1] State of California. 2017. Making Water Conservation a California Water of Life: Implementing Executive Order B-37-16. Prepared by California Department of Water Resources, State Water Resources Control Board, California Public Utilities Commission, California Department of Food and Agriculture, California Energy Commission.

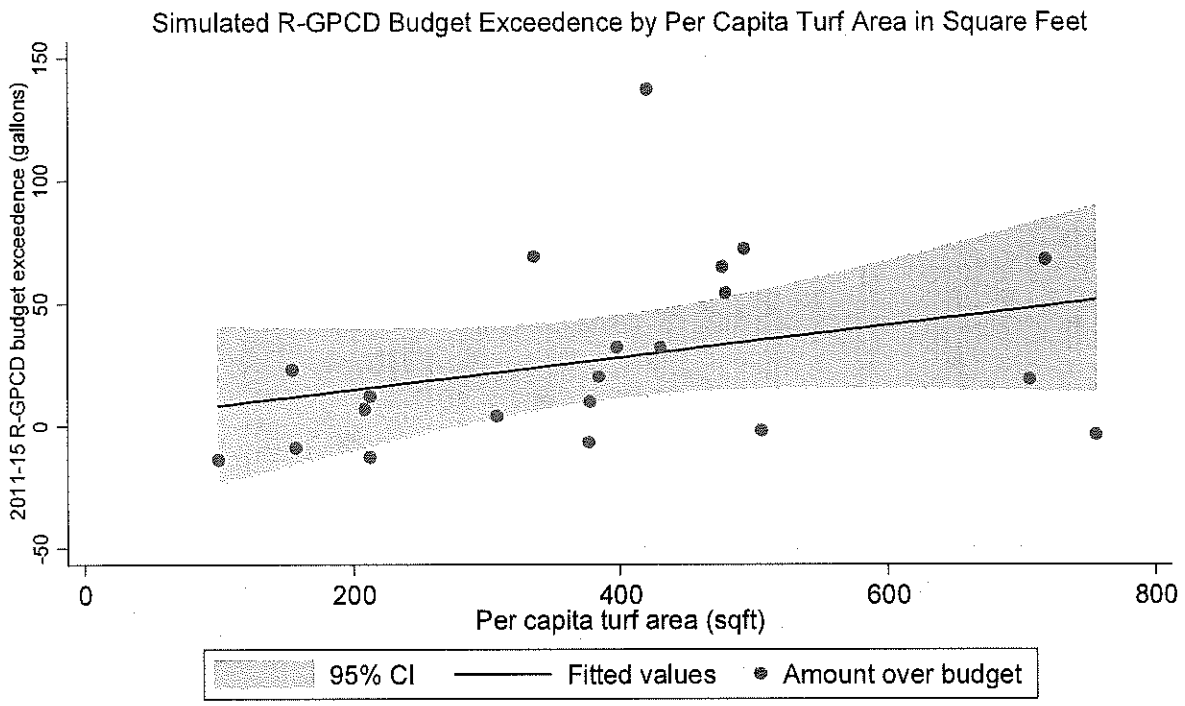
[2] M.Cubed. 2016. Projected Statewide and County-Level Effects of Plumbing Codes and Appliance Standards on Indoor GPCD. Prepared for the California Department of Water Resources.

[3] This is based on changes DWR is proposing to make to the maximum applied water allowance (MAWA) in the Model Water Efficient Landscape Ordinance (MWELO) which would serve as the benchmark for setting the outdoor urban water use targets. The pre-2015 MAWA was 0.7 of ETo. The current MWELO (effective Feb. 2016) lowered the MAWA to 0.55 for residential landscape projects and to 0.45 for non-residential projects. See https://www.water.ca.gov/LegacyFiles/wateruseefficiency/landscapeordinance/docs/2015%20MWELO%20Guidance%20for%20Local%20Agencies.pdf

Analysis of recent historical residential water use and landscape area for a statewide sample of 20 water suppliers indicates that regions with significant landscape and turf area per capita may be challenged to meet the new outdoor standards. For example, the following two charts show the results of a simulation examining the extent to which 2011-15 average R-GPCD for the sampled suppliers would exceed a hypothetical residential water target.[4] Simulation results are sorted by landscape and turf area per capita. The charts show a strongly positive correlation between the magnitude of per capita landscape and turf area and the magnitude of exceedance of the simulated target for the sampled districts. Moreover, budget exceedence in the simulation is commonplace even though residential demand was lower than normal in 2014 and 2015 due to drought water use restrictions.



[4] The simulated monthly outdoor budgets were set to measured residential landscape area multiplied by max(average monthly ETo x 0.55 – 0.3 x average monthly precipitation, 0). The annual budget is the sum of the monthly budgets. Indoor budgets were set to 55 gpcd. The budgets were compared to each supplier's average R-GPCD for 2011-2015.



The new indoor and outdoor targets will put new urgency on accurate assessments of the water savings potential and cost-effectiveness of conservation programs targeted to reduce residential and landscape water use. Modifications to the Tracking Tool are needed to better support indoor and outdoor water use accounting and to ensure that the Tracking Tool Library's indoor and landscape water conservation program specifications accurately incorporate the best available information on water savings and program implementation costs.

CII Performance Standards

The state is also proposing new performance measures for CII water use, including (1) classification of all CII accounts using the North American Industry Classification System (NAICS) and where feasible development of CII subsector water use benchmarks for identification of CII accounts with potential for water use efficiency improvements; (2) completion of water use audits or water management plans for CII accounts over a specified size, volume, or percentage threshold; and (3) conversion of all landscapes over a specified size threshold that are served by a mixed-use meter CII account to dedicated irrigation accounts.

It is not yet known what the threshold will be for completing water use audits or water management plans for CII accounts. The state indicated in its Making Conservation a California Way of Life report that it will develop regulations and guidelines by October 1, 2021 (CWC 10609.10(a)), though this may change under future legislation. It stands to reason that water suppliers with a high fraction of

commercial and industrial water use are likely to bear most of the burden of the new requirements. As a general rule, the top 10% of CII water users account for 70 to 80% of all CII water uses.[5]

Completing water use audits and management reports for these large CII customers will be a complex and expensive task which may require use of consultants with specialized knowledge in industrial process water use. Commercial and industrial audits and management plans can be highly technical and expensive to complete. Based on data compiled in 2005 by the California Urban Water Conservation Council, CII water use surveys and management reports were shown to have a median cost range of $1,000 to $30,000 and a mean cost range of $4,000 to $100,000 per intervention.[6] The wide cost ranges are primarily driven by the complexity of the water end uses under investigation – completing a water use survey for a large industrial refinery, for example, requires much more effort and time than completing one for a small commercial laundry or kitchen.

Currently, the Tracking Tool's program library does not include default entries for CII water use audits and management reports. It will be important to add new program specifications for these activities to the library in anticipation of the state requirements.

CII Mixed Meter Conversion

The state has also proposed that urban water suppliers convert all landscapes above a certain size served by mix-use CII meters to dedicated irrigation meters. While the landscape size threshold has not yet been determined, it is conceivable that individual water suppliers may have to convert hundreds if not thousands of acres of landscape from mixed-use to dedicated irrigation meters. This represents a potentially significant task and cost for urban water suppliers. Large landscaped areas often are served by more than one meter and determining which meter is serving which parts of a landscape can be complicated and often can only be accomplished through trial and error.

Whether this requirement will yield cost-effective water savings is an unsettled question. Modifications to the Tracking Tool are needed to help water suppliers accurately assess the expected costs and benefits of CII mixed-use meter conversion.

System Water Loss Reporting and Reduction

Executive Order B-37-16 places significant emphasis on accelerating data collection and reporting on system water loss and taking actions to minimize leaks. Specifically, it states:

> *The Water Board and the Department [of Water Resources] shall direct actions to minimize water system leaks that waste large amounts of water. The Water Board, after funding projects to address health and safety, shall use loans from the Drinking Water State Revolving Fund to prioritize local projects that reduce leaks and other water system losses. The Water Board and the Department [of Water Resources] shall direct urban and*

[5] Mitchell, David and Thomas Chesnutt. 2017. CII Water Use and Drought Response: Case Study of California Water Service. Prepared for California Water Service, Department of Water Resources, and State Water Resources Control Board.

[6] California Urban Water Conservation Council. 2005. BMP Costs & Savings Study: A Guide to the Data and Methods for Cost Effectiveness Analysis of Urban Water Conservation Best Management Practices. California Urban Water Conservation Council. Sacramento.

> *agricultural water suppliers to accelerate their data collection, improve water system management, and prioritize capital projects to reduce water waste. The California Public Utilities Commission shall order investor-owned water utilities to accelerate work to minimize leaks.*

Senate Bill 555, passed in 2015, requires the Water Board to develop water loss performance standards for urban retail water suppliers between January 2019 and July 2020. These standards are expected to be incorporated into the new water use targets (SB 606 & AB 1668) the state is developing for urban water suppliers.

Modifications to the Tracking Tool are needed so that users can accurately account for the costs of state water loss auditing and reporting requirements, the costs of leak detection and minimization actions, and the expected water savings from these actions over time. (Note: SB 555 requires life-cycle cost analysis, and the state will need to apply and interpret this requirement.) This will require updating the Tracking Tool Library to include new water loss management activities. It may also require the development a new Tracking Tool module specifically designed for water loss accounting and tracking of water savings from leak minimization activities.

Summary of Needed Updates and Modifications to Tracking Tool

In light of the above, necessary updates and modifications to the Tracking Tool include:

- Modular functionality that separates compliance detection and conservation planning to ensure compliance
- Improved indoor and outdoor water use accounting and GPCD target tracking;
- New functionality to evaluate costs and benefits of CII mixed-use meter conversion;
- New functionality to assess water savings and cost-effectiveness of CII water use audits and management reports for different types and sizes of commercial and industrial water users;
- New functionality for tracking costs and water savings of water loss auditing, reporting, pressure management, and leak detection and repair activities;
- Updates to the Tracking Tool Library to incorporate the most current information on implementation costs and water savings for conservation activities aimed at reducing residential indoor, landscape, and CII water uses;
- Updates to the Tracking Tool Library to incorporate the most current information on implementation costs and water savings for utility leak detection and repair activities including pressure management.

Proposed Scope of Work

The Scope of Work follows the standard software development paradigm, breaking work tasks into the following five categories:

1. Requirements Analysis
2. Design
3. Development
4. Testing
5. Rollout

Requirements Analysis

The requirements analysis is arguably the most important step since it will guide everything that follows. The purpose of the requirements analysis is to determine the changes that need to be made to the Tracking Tool from the perspective of the user.

Task 1 – Formation of Project Advisory Committee. The first step in completing the requirements analysis will be formation of a Project Advisory Committee (PAC) comprised of California Water Efficiency Partnership members and staff. In addition to general project oversight, the PAC will provide a forum for the identification and prioritization of Tracking Tool modifications. This will be done over the course of several meetings with the PAC early in the project.

Task 2 – User Interviews. Up to 10 interviews will be conducted with Tracking Tool users and state agency staff. These users will be queried about how they currently use the Tracking Tool for conservation planning, whether and how they intend to use it in their planning for compliance with future state water use regulations, and what changes to the Tracking Tool would best facilitate this planning. Interview results will be compiled and summarized in a Technical Memorandum that will be distributed to the PAC.

Task 3 – Documented Requirements Analysis

Upon completion of the user interviews and initial PAC meetings, we will prepare a draft Technical Memorandum documenting the requirements analysis and describing in detail the proposed updates to the Tracking Tool and its Program Library in terms of its functionality, design, and data structure. Following review and comment by the PAC, the requirements analysis memorandum will be finalized.

Design

Task 4 – Preliminary Re-Design. A preliminary re-design of the Tracking Tool will be prepared based on the results of the requirements analysis. This preliminary re-design will be presented to the PAC for review and input. The re-design will consist of mock-ups of the user interface and output worksheets of the Tracking Tool.

Task 5 – Final Re-Design. Based on PAC feedback on the preliminary re-design, a final re-design of the Tracking Tool will be developed and presented to the PAC for approval.

Development

Task 6 Compliance Module Coding. This stand-alone module can be used independently of the AWE tracking tool. The module will allow an agency to enter service area specific data (population, landscape area, Et, etc.) into state performance metrics to determine compliance with its potential urban water use objective. The module will allow an agency to choose different levels of indoor water use, MAWA and water loss, through user-friendly pull downs to calculate its urban water use objective. It will also require the user to enter water use by customer class to compare to the objective. Additional state efficiency standards for CII non-outdoor use, efficient water loss levels, and estimated use for approved variances will also be included to complete the calculation of the agency's urban water use objective.

It is of course true that ultimate compliance with California state regulations for "Conservation as a California Way of Life" cannot be specified with certainty until the California state regulations have been

finalized. Ultimately, the state may provide a tool to assist in compliance determination. That said, a reasonable forecast can now be made on where state regulations will end up. California water utilities need to be able to reduce the current state of uncertainty surrounding their compliance. This task will develop an urban water use objective calculator to fill this void in the interim. Should the state quickly provide a compliance tool, this task can be scaled back.

Task 7 – Tracking Tool Coding. Coding of the Tracking Tool will commence following PAC approval of the re-design. This will entail updating existing Tracking Tool worksheets, adding new worksheets (including inputs from the Compliance Module), updating the navigation system, and updating or creating new back-end Visual Basic code.

Task 8 – Update Tracking Tool Library. This task will update the Tracking Tool's library of conservation program activities to incorporate the most current information on implementation costs and water savings for conservation activities aimed at reducing residential indoor, landscape, and CII water uses. David Pekelney (A&N) will lead this activity. This task will also develop and add new water loss accounting, leak detection and repair, and pressure management activities to the library. We are currently checking with subject matter experts to add an additional team member to assist in defining water loss life cycle costs.

Task 9 – Update User Guide. Following completion of Tasks 6 and 7, the Tracking Tool's User Guide will be updated to reflect the changes to the Tracking Tool's design, functionality, and library.

Testing

Task 10 – Alpha Testing. Once the coding and library updating tasks are finished, the Tracking Tool will be tested for bugs and design flaws by the consultant team and CalWEP/AWE staff. Identified software bugs and design issues will be catalogued and fixes will be documented.

Task 11 – PAC Demonstration. Upon completion of alpha testing, the PAC will be given a demonstration of the updated Tracking Tool. This will be scheduled to align with one of the regular meetings of the California Water Efficiency Partnership, or will be done remotely via the internet to spare the PAC unnecessary travel and time away from work.

Task 12 – Beta Testing. Upon completion of alpha testing the Tracking Tool will be distributed to PAC members for additional testing and feedback. Again, any identified software bugs and design issues will be catalogued and fixes will be documented.

Rollout

Task 13 – Rollout Webinar. When the Tracking Tool is ready for public release, AWE will schedule a rollout webinar for California Water Efficiency Partnership members. The webinar will present the revised functionality of the Tracking Tool and illustrate ways it may be used to evaluate and plan for the new state water use regulations.

Development Team

The development team consists of staff from M.Cubed, A&N Technical Services, and AWE. David Mitchell of M.Cubed will serve as the project manager and will also be the lead on the requirements analysis, design and development tasks. Tom Chesnutt and David Pekelney of A&N Technical Services

will lead the library update and testing tasks. Bill Christiansen of AWE will support the requirements analysis and testing tasks and also will support the rollout tasks. Mary Ann Dickinson will provide general oversight and will be the primary liaison between the development team and the California Water Efficiency Partnership.

Schedule

Completion of the Scope of Work is expected to require 8 to 11 months from the project kick-off:

- Requirements Analysis – 2 months
- Design – 1 to 2 months
- Development – 3 to 4 months
- Testing – 1 to 2 months
- Rollout – 1 month

It is understood that initiation of the project as well as possible changes to the proposed schedule will be governed by the timing and content of state legislation and related regulations establishing the new urban water targets and reporting requirements.

Budget

Task budgets are provided in the following table. The total project cost is $205,500.

Budget to Update AWE Water Conservation Tracking Tool for New State Urban Water Use Standards

Requirements Analysis	**Task Cost**
Task 1 PAC meetings	$7,500
Task 2 User Interviews	$10,000
Task 3 Documented Requirements Analysis	$10,000
Design	
Task 4 Preliminary Re-Design	$15,000
Task 5 Final Re-Design	$10,000
Development	
Task 6 Compliance Module Coding	$25,000
Task 7 Tracking Tool Coding	$45,000
Task 8 Update Tracking Tool Library	$40,000
Task 9 Update User Guide	$10,000
Testing	
Task 10 Alpha Testing	$10,000
Task 11 PAC Demonstration	$5,000
Task 12 Beta Testing	$10,000
Rollout	
Task 13 Rollout Webinar	$5,000
Travel and Project Incidentals	$3,000
Total Project Cost	$205,500

ENGINEERING & PLANNING	
Orange County Reliability Study	Spin off work from the Reliability Study to further analyze the Strand Ranch Extraordinary Water Supply program is now in progress.
South Orange County Emergency Service Program	Dudek continues to assist MWDOC and IRWD to determine if the existing IRWD South Orange County Interconnection capacity for providing emergency water to South Orange County can be expanded and/or extended beyond its current time horizon of 2030. Staff from MWDOC, IRWD, OCWD and Dudek met on January 24, 2019 to review the hydraulic modeling of the IRWD system. Dudek is currently incorporating comments into the technical memorandum and the next step is to share the information with the SOC agencies in February.
Strand Ranch Project	MWDOC is using the modeling from the Orange County Reliability Study to evaluate how "extraordinary supplies" from the Strand Ranch Project can be utilized by the MWDOC agencies to provide drought protection over the next 7 to 11 years or longer. The analysis is currently in progress.
MET Evaluation of Regional Storage Portfolio (ERSP)	MET Evaluation of Regional Storage Portfolio (ERSP). Metropolitan's emergency water storage objective is based on the potential for major earthquake damage to the State Water Project and Colorado River aqueducts that transport imported water supplies to Southern California (following the San Andreas M7.8 'Great ShakeOut' scenario developed by the US Geological Survey). MET has established a Member Agency Workgroup to consider updates to MET's emergency storage objective, including: 1. Updating emergency criteria, 2. Revising the framework for determining emergency storage volume. The new framework would shift from a traditional single equation for determining emergency storage volume, to an updated evaluation that considers various combinations of criteria to determine a storage amount that provides an envelope of alternatives for MET's emergency storage that could provide reliability during the outage period. 3. Proposed periodic re-evaluation of emergency storage volume to coincide with completion of each new IRP (every 5 years). MET released a White Paper on October 29, 2018 to member agencies for their review and feedback. The paper discusses a methodology for review and update of emergency criteria and re-evaluation of Metropolitan's emergency storage. Included in the proposed outage period criteria is: A. Recognition that an outage on the SWP could exceed previous estimates of six months (now one to two years), and B. Incorporation of increased operational flexibility of the MET system which was demonstrated during the last drought. Some areas in the MET's service area that normally receive SWP water from the East

	Branch could be served by delivering DVL water to Mills through the Inland Feeder/Lakeview Pipeline intertie. These changes modify the Emergency Outage Criteria from a minimum/ maximum outage criteria to an 'effective outage' duration which better represents conditions. A third Workgroup meeting was held November 1, 2018 which continued the discussion on updating emergency storage criteria and re-evaluation of Metropolitan's Emergency Storage Requirements. Based on these discussions, it appears as if MET staff will only be making marginal changes in the existing emergency storage recommendations.
Poseidon Resources	(Nothing new to report) Poseidon continues working with the Santa Ana Regional Water Quality Control Board (SARWQCB) to renew and update its existing National Pollution Discharge Elimination System permit and expects to be in front of the Regional Board in 2019.
SMWD Rubber Dams Project	(Nothing New to Report) SMWD continues to work on additional technical studies to complete the response to comments on the Draft Environmental Impact Report (DEIR).
Doheny Ocean Desalination Project	(Nothing New to Report) South Coast WD released the Doheny Ocean Desalination Project Draft Environmental Impact Report (EIR) on May 17, 2018. A Public Meeting for the EIR was held on June 26, 2018, and the EIR public comment period closed on August 6, 2018. Consultant GHD is currently working on an updated Coastal Hazard Technical Study to address comments received. A Request for Qualifications (RFQ) for a 3rd party legal firm to assist with Design-Build-Operate (DBO) contract development was released and interviews with 5 respondents were held August 22, 2018. The South Coast WD Board is currently in negotiations and anticipates awarding the contract in the near future. South Coast WD staff also submitted a grant application for up to $20 million for project construction through Bureau of Reclamation 'Water SMART: Desalination Construction Projects under the WIIN Act'. The Bureau of Reclamation expects to contact potential award recipients and unsuccessful applications toward the end of 2018.
Meetings	
	Charles Busslinger has been participating in conference calls hosted by CalDesal in anticipation of the January 2019 Public Scoping Meetings for the Triennial Review of the California Ocean Plan. The review is required by the US EPA. The State Water Board is using the public meetings to develop a list of 'projects' or tasks the State Water Board will address over the next two years. Three scoping meetings were held throughout the State in January 2019 including a January 14th meeting held in Costa Mesa. Charles attended the Costa Mesa meeting along with representatives with South Coast WD, Mesa WD, and West Basin MWD.

	Numerous comments were received concerning revisions to the Desalination Amendment implementation provisions of the Ocean Plan. Members of the environmental community advocated to add ocean acidification, hypoxia (deprivation of adequate oxygen supply) and 'the newest science available' to the Plan. Those currently trying to secure the first desalination permit since the Ocean Plan Amendments were adopted 3-½ years ago, advocated for clearer guidance on interpretations of the Amendments (the rules); as some interpretations are not supported by the Ocean Plan Amendments and are making the permit process exceedingly lengthy. The timeline for the triennial review is: Release of Draft Staff Report & Proposed List of Projects — May 2019 Formal Written Comments — June 2019 Public Hearing — June 2019 Response to Comments — Sept. 2019 State Water Board Adoption — Oct. 2019 Submittal to U.S. EPA — Nov. 2019
	Charles Busslinger participated in the South OC IRWM Project Review Ad Hoc Committee meeting on January 23, 2019. The committee reviewed the 13 projects submitted in response to the November 2018 Call for Projects for Prop 1 IRWM grant funding. $2.33 million is available to South OC for this funding round with a 2nd round anticipated in 2022. Applicants are currently being afforded the opportunity to make changes to their applications based upon feedback from the Ad Hoc committee prior to final scoring.
	Charles Busslinger and Karl Seckel participated in a January 24, 2019 meeting to review Dudek's hydraulic study of IRWD's system in regards to the South OC Emergency Service Program. See above for details.
	Karl Seckel attended the OCBC Infrastructure Committee where Bill Hasencamp from MET provided an overview of the Colorado River Drought Contingency Plan issues. The presentation was extremely well received.
	Karl Seckel and MWDOC Director Sat Tamaribuchi met with UCI Professor and Founder of the Center for Hydrometeorology and Remote Sensing, Soroosh Sorooshian, to discuss the work they have been doing on hydrology and runoff based on satellite data since 1983 (that is the year the satellite data had a good enough resolution to complete the work they do). They are involved in real-time global precipitation statistics for anywhere in the world based on the daily satellite data.

Status of Ongoing WEROC Projects
January 2019

Description	Comments
Coordination with WEROC Member Agencies	*Ongoing: WEROC, with Michael Baker as the lead consultant, is facilitating 19 agencies through the process of updating the Orange County Water and Wastewater Multi-Jurisdictional Hazard Mitigation Plan.* Update: CalOES has completed their review of the Hazard Mitigation Plan and requested a few minor revisions. Francisco Soto is working with the participating agencies and the consultant to address the revisions and re-submit the plan to CalOES and FEMA by February 1, 2019. Kelly Hubbard presented to the South Orange County Wastewater Authority (SOCWA) Board on Thursday, January 10 regarding Emergency Fuel Planning. She provided information on what planning has occurred at the state, regional and county level, as well as recommendations on what all local agencies should do for emergency fuel planning and supply. Kelly presented the Draft WEROC Budget to the three Cities and OCWD. She presents the draft numbers annually, along with a summary of projects expected to be completed this fiscal year and expectations for the next fiscal year. It's an opportunity for the funding agencies to ask questions about the budget and suggest any needed programming support. Kelly and Karl Seckel will meet with the other two WEROC funding agencies (Orange County Sanitation District and SOCWA) separately next month.
Training and Programs	Francisco attended the Design Network for Emergency Management workshop at Chapman University. The organizers are graphic artists who have merged emergency management concepts into design in order to develop visually effective emergency information. Workshop topics included Visual Thinking/Visual Language, Iconography, Cognition and Emergency Information, and Technology and User Interface. WEROC is exploring the possibility to work with the organizers to develop visually effective and informative water emergency communication signs.
Coordination with the County of Orange	Kelly attended the January OCEMO meeting at the Operational Area EOC. Director Donna Boston from the Emergency Management Division (EMD) provided an overview of the Emergency Management Division projects and goals for 2019. Other presentation topics included OA Managers Report, Grant Updates, CalOES report, and Sub-committee updates. Kelly attended the Countywide exercise final planning meeting at the City of Newport Beach Emergency Operations Center. The meeting focused on finalizing the details for the January 30th exercise. Francisco attended the Emergency Alert System (EAS) Quarterly Meeting at the Orange County Transportation Authority in the City of Orange. Topics included last

	quarter EAS activations, EAS plan updates, the integration of BLU Alert Codes, and reports from each of the EAS members. Francisco participated in various conference calls for the possible activation of the Holy Fire Debris Flow Plan and the Canyon 2 Debris Flow Plan due to the rain event from January 14-16. The calls detail the current rain forecast and each agency's response actions and concerns for possible debris flows. Trabuco Canyon Water District (TCWD) has infrastructure that can be impacted by the Holy Fire Debris Flow area. TCWD participates in the calls and WEROC staff are aware of their concerns and possible need to coordination should a debris flow occur. There were no significant impacts to water utilities.
Coordination with Outside Agencies	Kelly attended the California Public Utilities Commission (PUC) Hearing titled, "Workshop on Impacts from De-Energization: Focus on First Responders and Local Government" in Calabasas. This was one of two workshops held in the state by the PUC to hear from the local agencies on their concerns with impacts from Public Safety Power Shutoff plans. The Public Safety Power Shutoff (PSPS) Plans give power utilities the ability to proactively shut off power in high fire risk areas when extreme weather conditions present a clear and imminent threat to powerlines. The concern with this planning is potential impacts to emergency notification systems, critical infrastructure, vulnerable populations, and water services. Staff has written a letter to the PUC outlining water utility concerns and recommendations. We are asking for all OC water and wastewater utilities to sign onto the letter. It will be mailed to the PUC by the end of the month.
EOC Readiness	Kelly provided the WEROC EOC Logistics Section Training. Training topics included Roles and Responsibilities, Mutual Aid, Resource Request Process, and general discussion. Francisco & Kelly provided training to the EOC Director (Rob Hunter) and Plans & Intelligence Section Chief (Joe Berg). Training topics included Exercise Overview, Roles and Responsibilities, review of the exercise Situational Summary and Action Plan, and general discussion items. Janine Schunk, Francisco and Kelly have spent several days at the South EOC preparing the facility for the January 30 exercise. Due to the nature of the scenario preparation for this exercise includes pre-developing some messaging, forms, and content on the whiteboards and within WebEOC. This is a great learning tool in itself, as staff continues to refine our processes and procedures throughout the preparation process. Janine successfully participated in the OA and MET Radio Test and WebEOC tests for the month. Janine facilitated the monthly test of the WEROC Radio System. Janine met with an AT&T technician at the South EOC to repair internet connections and to evaluate our bandwidth needs.

Status of Water Use Efficiency Projects

February 2019

Description	Lead Agency	Status % Complete	Scheduled Completion or Renewal Date	Comments
Smart Timer Rebate Program	MWDSC	Ongoing	Ongoing	In December 2018, 152 residential and 14 commercial smart timers were installed in Orange County. For program water savings and implementation information, see MWDOC Water Use Efficiency Program Savings and Implementation Report.
Rotating Nozzles Rebate Program	MWDSC	Ongoing	Ongoing	In December 2018, 114 rotating nozzles were installed in Orange County. For program savings and implementation information, please see MWDOC Water Use Efficiency Program Savings and Implementation Report.
SoCal Water$mart Residential Indoor Rebate Program	MWDSC	Ongoing	Ongoing	In December 2018, 257 high efficiency clothes washers and 19 premium high efficiency toilets were installed through this program. For program savings and implementation information, please see MWDOC Water Use Efficiency Program Savings and Implementation Report.
SoCal Water$mart Commercial Rebate Program	MWDSC	Ongoing	Ongoing	In December 2018, 325 commercial premium high efficiency toilets and 1104 residential premium high efficiency toilets were installed through this program. For program savings and implementation information, please see MWDOC Water Use Efficiency Program Savings and Implementation Report.
Industrial Process/ Water Savings Incentive Program (WSIP)	MWDSC	75%	July 2020	This program is designed for non-residential customers to improve their water efficiency through upgraded equipment or services that do not qualify for standard rebates. Incentives are based on the amount of water customers save and allows for customers to implement custom water-saving projects. This fiscal year, two projects have been completed, which will save over 28 AFY. Total water savings to date for the entire program is 673 AFY and 3,414 AF cumulatively.

Description	Lead Agency	Status % Complete	Scheduled Completion or Renewal Date	Comments
Turf Removal Program	MWDOC	Ongoing	Ongoing	In January 2019, 42 rebates were paid, representing $154,566 in rebates paid this month in Orange County. To date, the Turf Removal Program has removed approximately 22 million square feet of turf. For program savings and implementation information, please see MWDOC Water Use Efficiency Program Savings and Implementation Report.
Spray to Drip Conversion Program	MWDOC	Ongoing	Ongoing	This is a rebate program designed to encourage residential and commercial sites to convert their existing conventional spray heads to low-volume, low-precipitation drip technology. To date, 241 residential sites and 63 commercial sites have completed spray to drip conversion projects.
Recycled Water Retrofit Program	MWDSC	100%	September 2018	This program provides incentives for commercial sites to convert dedicated irrigation meters to recycled water. To date, Metropolitan has provided a total of $545,868.18 in funding to 33 sites irrigating 113 acres of landscape, and MWDOC has paid a total of $56,950.00 in grant funding to 20 of those sites. The total potable water savings achieved by these projects is 331 AFY.

Orange County

Water Use Efficiency Programs Savings
and
Implementation Report

Retrofits and Acre-Feet Water Savings for Program Activity

Program	Program Start Date	Retrofits Installed in	Month Indicated		Current Fiscal Year		Overall Program		
			Interventions	Water Savings	Interventions	Water Savings	Interventions	Annual Water Savings[4]	Cumulative Water Savings[4]
High Efficiency Clothes Washer Program	2001	December-18	257	0.74	1,474	14.35	118,019	4,072	30,418
Smart Timer Program - Irrigation Timers	2004	December-18	166	1.45	1,601	109.26	24,325	8,370	55,160
Rotating Nozzles Rebate Program	2007	December-18	114	0.46	2,965	35.56	567,272	2,760	22,276
Commercial Plumbing Fixture Rebate Program	2002	December-18	1,429	4.40	7,172	40.58	100,945	5,153	49,516
Industrial Process/Water Savings Incentive Program (WSIP)	2006	December-18	0	0.00	2	7.31	33	673	3,414
Turf Removal Program[3]	2010	January-19	77,358	0.90	501,131	21.49	22,096,209	3,094	13,375
High Efficiency Toilet (HET) Program	2005	December-18	19	0.07	153	6.51	60,256	2,227	19,279
Water Smart Landscape Program [1]	1997						12,677	10,621	72,668
Home Water Certification Program	2013						312	7.339	15.266
Synthetic Turf Rebate Program	2007						685,438	96	469
Ultra-Low-Flush-Toilet Programs [2]	1992						363,926	13,452	162,561
Home Water Surveys [2]	1995						11,867	160	1,708
Showerhead Replacements [2]	1991						270,604	1,667	19,083
Total Water Savings All Programs				**8**	**514,498**	**235**	**24,311,883**	**52,353**	**449,942**

[1] Water Smart Landscape Program participation is based on the number of water meters receiving monthly Irrigation Performance Reports.
[2] Cumulative Water Savings Program To Date totals are from a previous Water Use Efficiency Program Effort.
[3] Turf Removal Interventions are listed as square feet.
[4] Cumulative & annual water savings represents both active program savings and passive savings that continues to be realized due to plumbing code changes over time.

HIGH EFFICIENCY CLOTHES WASHERS INSTALLED BY AGENCY

through MWDOC and Local Agency Conservation Programs

Agency	FY 12/13	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	FY18/19	Total	Current FY Water Savings Ac/Ft (Cumulative)	Cumulative Water Savings across all Fiscal Years	15 yr. Lifecycle Savings Ac/Ft
Brea	93	115	114	76	57	56	29	1,952	0.28	503.63	1,010
Buena Park	105	106	91	76	54	50	23	1,591	0.17	397.58	823
East Orange CWD RZ	10	8	8	8	3	1	3	196	0.02	53.82	101
El Toro WD	134	121	111	65	47	50	20	1,591	0.19	399.14	823
Fountain Valley	115	102	110	76	65	49	19	2,468	0.17	664.99	1,277
Garden Grove	190	162	165	251	127	87	41	3,691	0.36	948.56	1,910
Golden State WC	265	283	359	260	138	156	59	5,230	0.59	1,344.64	2,706
Huntington Beach	334	295	319	225	180	141	47	8,434	0.48	2,312.06	4,364
Irvine Ranch WD	1,763	1,664	1,882	1,521	1,373	1,203	483	26,352	4.51	6,420.06	13,635
La Habra	82	114	87	66	53	48	23	1,398	0.23	348.12	723
La Palma	34	25	34	29	10	14	4	476	0.04	120.42	246
Laguna Beach CWD	38	37	39	32	19	20	12	964	0.11	253.85	499
Mesa Water	114	86	89	113	80	54	21	2,593	0.23	708.35	1,342
Moulton Niguel WD	442	421	790	688	575	527	191	10,639	1.97	2,556.94	5,505
Newport Beach	116	92	95	66	61	51	26	2,701	0.27	750.36	1,398
Orange	218	163	160	124	80	74	32	4,004	0.33	1,101.76	2,072
Orange Park Acres					-	-	-	12	0.00	4.09	6
San Juan Capistrano	76	73	92	63	33	33	10	1,502	0.09	392.33	777
San Clemente	140	94	141	75	70	85	38	2,743	0.34	710.95	1,419
Santa Margarita WD	553	662	792	466	367	274	115	9,905	1.21	2,477.48	5,125
Seal Beach	31	29	38	23	9	17	5	624	0.04	163.10	323
Serrano WD	13	10	26	8	11	8	-	365	0.00	100.05	189
South Coast WD	89	79	68	43	44	36	18	1,638	0.16	424.08	848
Trabuco Canyon WD	30	45	47	34	28	22	3	823	0.02	212.00	426
Tustin	78	59	80	66	44	49	17	1,678	0.16	448.25	868
Westminster	121	82	109	149	84	65	22	2,673	0.20	696.53	1,383
Yorba Linda	181	167	156	123	56	67	22	3,841	0.24	1,056.30	1,987
MWDOC Totals	5,365	5,094	6,002	4,726	3,668	3,237	1,283	100,084	12.41	25,569.43	19,336
Anaheim	331	285	295	266	213	173	63	10,918	0.63	3,039.61	5,649
Fullerton	200	186	211	165	107	99	72	3,866	0.72	1,000.91	2,000
Santa Ana	163	131	132	259	141	124	56	3,151	0.59	808.11	1,630
Non-MWDOC Totals	694	602	638	690	461	396	191	17,935	1.94	4,848.63	3,465
Orange County Totals	6,059	5,696	6,640	5,416	4,129	3,633	1,474	118,019	14.35	30,418.06	22,801

SMART TIMERS INSTALLED BY AGENCY

through MWDOC and Local Agency Conservation Programs

Agency	FY 12/13		FY 13/14		FY 14/15		FY 15/16		FY16/17		FY17/18		FY18/19		FY19/20		FY20/21		Total Program		Cumulative Water Savings across all Fiscal Years
	Res	Comm	Res	Comm	Res	Comm	Res	Comm	Res	Comm	Res	Comm	Res	Comm	Res	Comm	Res	Comm	Res	Comm.	
Brea	9	8	4	0	43	6	20	4	31	4	32	0	20	0	0	0	0	0	183	80	585.16
Buena Park	3	0	0	0	4	10	7	4	10	7	15	3	13	4	0	0	0	0	59	48	184.56
East Orange CWD RZ	2	0	0	0	2	0	1	0	11	1	6	0	1	0	0	0	0	0	32	1	26.86
El Toro WD	7	2	11	0	8	9	9	17	33	8	29	4	20	0	0	0	0	0	164	359	2,729.47
Fountain Valley	3	2	4	0	7	10	13	1	33	12	28	12	22	1	0	0	0	0	141	53	229.97
Garden Grove	5	2	9	0	10	14	13	11	28	0	27	2	24	0	0	0	0	0	152	40	209.31
Golden State WC	9	49	9	25	39	12	35	16	56	37	88	6	48	14	0	0	0	0	361	212	979.10
Huntington Beach	18	33	20	35	19	2	42	12	88	94	70	30	71	59	0	0	0	0	413	357	1,343.55
Irvine Ranch WD	414	135	71	59	67	310	239	207	344	420	416	78	230	82	0	0	0	0	2,415	2,446	13,143.92
La Habra	4	7	2	0	4	7	3	1	12	7	8	0	12	3	0	0	0	0	56	47	237.63
La Palma	1	0	2	0	2	0	3	2	1	0	5	0	2	0	0	0	0	0	17	2	8.34
Laguna Beach CWD	76	2	71	0	86	0	86	1	27	0	11	0	3	0	0	0	0	0	511	20	272.50
Mesa Water	10	2	15	2	17	28	36	12	149	41	49	0	22	55	0	0	0	0	389	209	893.73
Moulton Niguel WD	51	74	40	45	46	95	163	100	236	129	284	33	181	55	0	0	0	0	1,379	889	4,271.85
Newport Beach	242	26	168	75	11	9	28	43	30	12	24	0	15	0	0	0	0	0	1,077	409	2,941.28
Orange	20	24	13	9	18	31	51	13	69	10	61	13	58	26	0	0	0	0	404	204	1,094.84
San Juan Capistrano	14	18	6	11	6	19	20	8	22	8	23	5	14	0	0	0	0	0	259	130	746.15
San Clemente	26	7	28	2	28	24	26	3	37	13	38	41	21	0	0	0	0	0	1,110	415	3,015.21
Santa Margarita WD	53	171	64	93	53	321	189	136	326	221	273	220	142	19	0	0	0	0	1,569	1,611	6,934.81
Santiago CWD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Seal Beach	1	0	1	36	1	12	2	2,446	2	4	5	0	2	0	0	0	0	0	14	2,502	6,804.43
Serrano WD	1	0	0	0	4	0	11	2	4	0	8	0	10	0	0	0	0	0	56	2	18.26
South Coast WD	13	16	8	4	104	73	9	11	7	0	15	2	5	7	0	0	0	0	298	221	1,312.12
Trabuco Canyon WD	6	0	2	0	6	1	16	50	13	3	20	0	19	0	0	0	0	0	142	157	1,063.40
Tustin	8	4	9	1	18	14	33	8	33	23	27	1	25	0	0	0	0	0	195	81	404.49
Westminster	1	1	2	0	13	17	7	1	17	12	22	0	18	0	0	0	0	0	105	44	232.45
Yorba Linda	20	0	12	5	32	2	61	27	72	71	68	10	47	3	0	0	0	0	453	196	989.06
MWDOC Totals	1,017	583	571	402	648	1,026	1,123	3,136	1,691	1,137	1,652	460	1,045	328	0	0	0	0	11,954	10,735	50,672.42
Anaheim	19	10	9	26	7	52	30	34	87	10	66	0	90	68	0	0	0	0	400	525	2,980.95
Fullerton	9	29	8	0	40	26	32	12	53	7	45	0	52	0	0	0	0	0	296	199	1,083.22
Santa Ana	8	19	7	8	9	27	22	26	15	3	16	0	18	0	0	0	0	0	116	100	423.47
Non-MWDOC Totals	36	58	24	34	56	105	84	72	155	20	127	0	160	68	0	0	0	0	812	824	4,487.64
Orange County Totals	1,053	641	595	436	704	1,131	1,207	3,208	1,846	1,157	1,779	460	1,205	396	-	-	-	-	12,766	11,559	55,160

ROTATING NOZZLES INSTALLED BY AGENCY
through MWDOC and Local Agency Conservation Programs

Agency	FY 12/13			FY 13/14			FY 14/15			FY 15/16			FY 16/17			FY 17/18			FY 18/19			Total Program			Cumulative Water Savings across all Fiscal Years
	Small		Large	Small		Large	Small		Large	Small		Large	Small		Large	Small		Large	Small		Large	Small		Large	
	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	
Brea	65	120	0	84	0	0	157	45	0	74	2,484	0	0	0	0	0	0	0	0	0	0	572	2,749	0	85.79
Buena Park	65	0	0	53	0	0	248	0	0	45	98	0	0	0	0	0	0	0	0	0	0	509	173	2,535	819.21
East Orange	55	0	0	30	0	0	221	0	0	0	0	0	0	0	0	30	0	0	0	0	0	781	0	0	23.32
El Toro	23	6,281	0	56	3,288	0	1,741	28,714	0	730	4,457	0	55	242	0	36	0	0	0	0	0	3,260	43,348	890	1,738.92
Fountain Valley	35	0	0	0	0	0	107	0	0	222	0	0	0	0	0	85	0	0	0	283	0	919	3,157	0	26.33
Garden Grove	95	0	0	80	0	0	88	50	0	110	0	0	55	98	0	52	0	0	0	0	0	855	254	0	40.26
Golden State	257	2,595	0	192	0	0	583	1,741	0	1,088	0	0	207	6,008	0	161	-495	0	35	259	0	3,515	11,096	0	391.95
Huntington Beach	270	0	0	120	0	0	798	1,419	0	1,345	2,836	0	149	3,362	0	-37	0	0	0	0	0	4,001	9,135	2,681	1,433.89
Irvine Ranch	25,018	1,014	0	11,010	4,257	0	1,421	632	0	1,989	5,047	0	335	9,511	0	356	-215	0	0	0	0	46,498	43,325	2,004	5,469.24
La Habra	0	0	0	15	0	0	109	338	0	300	0	0	0	0	0	0	0	0	0	0	0	1,515	55,404	900	375.11
La Palma	0	0	0	0	0	0	0	0	0	46	505	0	0	2,385	0	33	0	0	0	0	0	89	3,163	0	61.83
Laguna Beach	3,596	0	0	2,948	878	0	2,879	1,971	0	1,390	0	0	0	0	0	0	0	0	0	0	0	11,948	2,896	0	465.06
Mesa Water	270	0	0	361	0	0	229	0	0	166	0	0	113	0	0	36	0	0	0	0	0	2,062	302	343	209.38
Moulton Niguel	512	1,385	0	361	227	0	1,596	4,587	0	5,492	1,441	0	153	5,872	0	893	0	0	647	38	0	13,375	20,636	2,945	1,970.31
Newport Beach	25,365	50	0	19,349	6,835	0	460	3,857	0	348	670	0	0	0	0	45	0	0	0	0	0	46,865	16,632	0	2,267.73
Orange	264	0	0	245	120	0	304	668	0	631	91	0	0	0	0	0	0	0	0	0	0	3,133	5,853	0	137.11
San Juan Capistrano	684	30	0	370	0	0	495	737	0	310	593	0	75	123	0	59	0	0	40	1,400	0	5,067	4,543	0	504.70
San Clemente	631	172	0	415	5,074	0	326	0	0	426	0	0	0	0	0	146	0	0	0	0	0	10,062	11,948	1,343	886.42
Santa Margarita	983	0	0	389	0	0	1,207	1,513	0	1,820	837	0	15	0	0	224	0	0	0	0	0	15,387	7,283	611	908.67
Seal Beach	0	0	0	0	0	0	40	5,261	0	0	2,300	0	0	0	0	0	0	0	0	0	0	155	7,561	0	218.61
Serrano	190	0	0	105	0	0	377	0	0	695	0	0	0	0	0	0	0	0	0	0	0	1,907	291	0	109.69
South Coast	435	0	0	70	0	0	4,993	13,717	0	1,421	2,889	0	16	0	0	0	0	0	0	0	0	9,628	18,870	0	755.13
Trabuco Canyon	34	0	0	0	0	0	56	0	0	130	0	0	0	4,339	0	0	0	0	0	0	0	729	4,339	0	186.27
Tustin	378	0	0	329	0	0	408	0	0	317	386	0	65	-341	0	30	0	0	47	0	0	4,491	1,849	0	140.25
Westminster	15	0	0	0	0	0	54	0	0	73	0	0	105	0	0	50	0	0	42	0	0	790	0	0	15.25
Yorba Linda	730	0	0	40	990	0	921	0	0	1,715	0	0	213	0	0	0	0	0	34	0	0	5,824	1,103	500	515.75
MWDOC Totals	59,970	11,647	0	36,622	21,669	0	19,818	65,250	0	20,883	24,634	0	1,556	31,599	0	2,199	-710	0	845	1,980	0	195,668	276,847	14,752	19,756.19
Anaheim	459	813	0	338	0	0	498	712	0	794	5,221	0	147	3,953	0	0	0	0	0	0	0	4,020	49,799	105	1,505.60
Fullerton	119	0	0	107	0	0	684	1,196	0	521	7,015	0	65	3,034	0	0	0	0	140	0	0	2,910	11,309	1,484	823.24
Santa Ana	99	0	0	86	2,533	0	310	0	0	0	1,420	0	0	1,106	0	0	0	0	0	0	0	859	5,752	0	191.08
Non-MWDOC Totals	677	813	0	531	2,533	0	1,492	1,908	0	1,315	13,656	0	212	8,093	0	0	0	0	140	0	0	7,789	66,860	1,589	2,519.93
Orange County Totals	60,647	12,460	0	37,153	24,202	0	21,310	67,158	0	22,198	38,290	0	1,768	39,692	0	2,199	-710	0	985	1,980	0	203,457	343,707	16,341	22,276.11

COMMERCIAL PLUMBING FIXTURES REBATE PROGRAM[1]
INSTALLED BY AGENCY
through MWDOC and Local Agency Conservation Programs

Agency	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	Totals	Cumulative Water Savings across all Fiscal Years
Brea	234	0	10	91	734	242	0	**1,607**	**586**
Buena Park	5	23	56	591	133	49	0	**2,538**	**1,363**
East Orange CWD RZ	0	0	0	0	0	0	0	**0**	**0**
El Toro WD	0	212	6	268	35	737	717	**2,516**	**750**
Fountain Valley	0	0	1	249	0	895	0	**1,767**	**755**
Garden Grove	4	1	167	676	410	0	0	**2,451**	**1,805**
Golden State WC	0	1	0	1,008	53	93	0	**2,958**	**2,278**
Huntington Beach	104	144	7	783	641	10	0	**2,964**	**1,942**
Irvine Ranch WD	1,090	451	725	11,100	5,958	1,599	993	**30,458**	**9,816**
La Habra	0	0	0	340	42	0	0	**925**	**664**
La Palma	0	0	0	0	509	0	0	**675**	**159**
Laguna Beach CWD	0	27	0	0	0	0	0	**446**	**373**
Mesa Water	6	0	79	661	782	0	0	**4,254**	**2,545**
Moulton Niguel WD	0	0	3	413	281	506	3,434	**5,217**	**1,159**
Newport Beach	0	0	566	0	0	0	0	**1,834**	**1,550**
Orange	1	271	81	275	2,851	458	512	**6,000**	**2,284**
San Juan Capistrano	0	14	0	0	0	0	0	**260**	**457**
San Clemente	0	0	1	0	0	0	0	**432**	**444**
Santa Margarita WD	0	0	2	90	743	598	506	**2,054**	**368**
Santiago CWD	0	0	0	0	0	0	0	**0**	**0**
Seal Beach	0	0	0	0	184	278	0	**816**	**519**
Serrano WD	0	0	0	0	0	0	0	**0**	**0**
South Coast WD	148	0	382	0	0	0	0	**1,320**	**646**
Trabuco Canyon WD	0	0	0	0	0	0	0	**11**	**18**
Tustin	0	0	75	358	212	2	284	**1,688**	**1,015**
Westminster	1	28	0	146	177	25	0	**1,163**	**1,191**
Yorba Linda	1	0	0	226	84	338	0	**933**	**684**
MWDOC Totals	**1,594**	**1,172**	**2,161**	**17,275**	**13,829**	**5,830**	**6,446**	**75,287**	**33,368**
Anaheim	165	342	463	3,072	309	1,808	361	**15,922**	**8,482**
Fullerton	94	0	178	476	621	274	365	**3,417**	**2,028**
Santa Ana	16	17	5	1,293	238	582	0	**6,319**	**5,637**
Non-MWDOC Totals	**275**	**359**	**646**	**4,841**	**1,168**	**2,664**	**726**	**25,658**	**16,147**
Orange County Totals	**1,869**	**1,531**	**2,807**	**22,116**	**14,997**	**8,494**	**7,172**	**100,945**	**49,516**

Family 4-Liter HETs, Zero Water Urinals, High Efficiency Clothes Washers, Cooling Tower Conductivity Controllers, Ph Cooling Tower Conductivity Controllers, Flush Valve Retrofit Kits, Pre-rinse Spray heads, Hospital X-Ray Processor Recirculating Systems, Steam Sterilizers, Food Steamers, Water Pressurized Brooms, Laminar Flow Restrictors, and Ice Making Machines.

INDUSTRIAL PROCESS/WATER SAVINGS INCENTIVE PROGRAM

Number of Projects by Agency

Agency	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	Overall Program Interventions	Annual Water Savings[1]	Cumulative Water Savings across all Fiscal Years[1]
Brea	0	0	0	0	0	0	0	0	0	0	0
Buena Park	0	0	0	0	1	0	0	0	2	54	541
East Orange	0	0	0	0	0	0	0	0	0	0	0
El Toro	0	0	0	0	0	0	0	1	1	9	3
Fountain Valley	0	0	0	0	0	1	0	0	1	23	42
Garden Grove	0	0	0	0	1	0	0	0	1	0	1
Golden State	0	0	0	0	0	0	0	0	1	3	32
Huntington Beach	0	2	0	1	2	0	1	0	6	180	701
Irvine Ranch	1	1	1	0	2	1	1	0	10	119	722
La Habra	0	0	0	0	1	0	0	0	1	0	1
La Palma	0	0	0	0	0	0	0	0	0	0	0
Laguna Beach	0	0	0	0	0	0	0	0	0	0	0
Mesa Water	0	0	0	0	0	0	0	0	0	0	0
Moulton Niguel	0	0	0	0	0	0	0	0	0	0	0
Newport Beach	0	0	0	1	0	0	0	0	1	21	86
Orange	0	0	0	0	1	2	1	0	5	97	569
San Juan Capistrano	0	0	0	0	0	0	0	0	0	0	0
San Clemente	0	0	0	0	0	0	0	0	0	0	0
Santa Margarita	0	0	0	0	0	0	0	0	0	0	0
Seal Beach	0	0	0	0	0	0	0	0	0	0	0
Serrano	0	0	0	0	0	0	0	0	0	0	0
South Coast	0	0	0	0	1	1	0	0	2	134	247
Trabuco Canyon	0	0	0	0	0	0	0	0	0	0	0
Tustin	0	0	0	0	0	0	0	0	0	0	0
Westminster	0	0	0	0	0	0	0	0	0	0	0
Yorba Linda	0	0	0	0	0	0	0	1	1	20	7
MWDOC Totals	1	3	1	2	9	5	3	2	32	662	2952
Anaheim	0	0	0	0	0	0	0	0	0	0	0
Fullerton	0	0	0	0	0	0	0	0	0	0	0
Santa Ana	0	0	0	0	1	0	0	0	1	11	462
OC Totals	1	3	1	2	10	5	3	2	33	673	3414

[1] Acre feet of savings determined during a one year monitoring period.

If monitoring data is not available, the savings estimated in agreement is used.

TURF REMOVAL BY AGENCY[1]

through MWDOC and Local Agency Conservation Programs

Agency	FY 12/13		FY 13/14		FY 14/15		FY 15/16		FY 16/17		FY 17/18		FY 18/19		Total Program		Cumulative Water Savings across all Fiscal Years
	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	
Brea	7,605	0	5,697	0	71,981	30,617	118,930	404,411	8,354	479	9,853	27,234	3,180	17,790	228,997	489,997	**408.56**
Buena Park	0	0	0	0	11,670	1,626	77,127	16,490	3,741	0	4,586	0	1,230	0	98,354	18,116	**64.76**
East Orange	0	0	1,964	0	18,312	0	27,844	0	0	0	0	0	0	0	48,120	0	**30.06**
El Toro	4,680	72,718	4,582	0	27,046	221,612	63,546	162,548	13,139	48,019	7,273	42,510	7,437	9,895	132,426	557,302	**427.70**
Fountain Valley	682	7,524	4,252	0	45,583	5,279	65,232	0	3,679	0	8,631	0	2,849	27,679	132,208	40,482	**93.44**
Garden Grove	4,534	0	8,274	0	67,701	22,000	177,408	49,226	11,504	0	4,487	0	0	0	287,921	117,403	**281.06**
Golden State	31,813	3,200	32,725	8,424	164,507	190,738	310,264	112,937	0	0	0	0	0	0	581,902	346,272	**636.92**
Huntington Beach	9,219	12,437	20,642	0	165,600	58,942	305,420	270,303	9,560	21,534	14,236	6,032	7,937	36,267	561,045	458,004	**634.31**
Irvine Ranch	32,884	32,384	36,584	76,400	234,905	317,999	782,844	2,675,629	231,483	46,725	86,893	61,037	38,440	130,708	1,455,906	3,355,342	**2,696.58**
La Habra	0	0	0	0	14,014	1,818	49,691	72,164	0	0	3,003	0	1,504	0	68,212	90,019	**99.42**
La Palma	0	0	0	0	4,884	0	10,257	59,760	0	0	0	0	0	0	15,141	59,760	**42.63**
Laguna Beach	2,664	1,712	4,586	226	13,647	46,850	47,614	0	3,059	0	589	0	0	0	75,670	48,788	**82.86**
Mesa Water	10,667	0	22,246	0	131,675	33,620	220,815	106,896	4,173	77,033	17,373	77,785	1,360	0	415,086	295,334	**396.89**
Moulton Niguel	11,538	84,123	14,739	40,741	314,250	1,612,845	889,748	1,059,279	220,749	0	98,271	0	73,579	0	1,628,313	2,840,054	**2,767.96**
Newport Beach	3,548	2,346	894	0	33,995	65,277	76,675	375,404	2,924	0	5,938	6,499	0	35,480	127,428	485,006	**342.72**
Orange	15,951	8,723	11,244	0	120,093	281,402	289,990	106,487	12,847	2,366	11,956	0	10,320	1,798	485,372	400,776	**562.65**
San Clemente	16,062	13,165	18,471	13,908	90,349	1,137	215,249	438,963	4,267	0	33,083	7,098	6,500	0	405,483	474,271	**524.26**
San Juan Capistrano	29,544	27,156	12,106	0	101,195	32,366	197,290	143,315	2,624	40,748	0	0	0	0	365,415	347,277	**509.68**
Santa Margarita	10,151	11,600	17,778	48,180	211,198	514,198	534,048	550,420	17,010	28,094	62,706	25,000	22,302	23,198	881,640	1,217,651	**1,269.27**
Santiago	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**-**
Seal Beach	3,611	0	0	0	15,178	504	17,349	15,911	1,234	0	752	0	0	0	38,124	16,415	**33.87**
Serrano	0	0	2,971	0	41,247	0	127,877	4,403	5,450	0	555	0	4,000	0	182,100	4,403	**108.45**
South Coast	9,429	4,395	15,162	116,719	84,282	191,853	181,102	128,290	14,967	0	13,319	7,806	5,990	0	331,057	465,387	**532.10**
Trabuco Canyon	1,542	22,440	2,651	0	14,771	0	42,510	88,272	1,465	0	4,788	0	1,536	0	69,535	110,712	**111.78**
Tustin	9,980	0	1,410	0	71,285	14,137	232,697	33,362	11,173	0	16,926	0	5,941	6,894	349,412	54,393	**230.98**
Westminster	0	0	0	0	14,040	34,631	71,833	23,902	11,112	0	10,033	0	5,461	0	112,479	58,533	**95.92**
Yorba Linda	0	0	0	0	112,136	12,702	360,279	116,985	19,420	0	9,529	3,696	11,856	0	524,569	133,383	**382.47**
MWDOC Totals	**216,104**	**303,923**	**238,978**	**304,598**	**2,195,544**	**3,692,153**	**5,493,639**	**7,015,357**	**613,934**	**264,998**	**424,780**	**264,697**	**211,422**	**289,709**	**9,601,915**	**12,485,080**	**13,367.28**
Anaheim	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**-**
Fullerton	0	0	0	9,214	0	0	0	0	0	0	0	0	0	0	0	9,214	**7.74**
Santa Ana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**-**
Non-MWDOC Totals	**0**	**0**	**0**	**9,214**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9,214**	**7.74**
Orange County Totals	**216,104**	**303,923**	**238,978**	**313,812**	**2,195,544**	**3,692,153**	**5,493,639**	**7,015,357**	**613,934**	**264,998**	**424,780**	**264,697**	**211,422**	**289,709**	**9,601,915**	**12,494,294**	**13,375**

[1]Installed device numbers are listed as square feet

HIGH EFFICIENCY TOILETS (HETs) INSTALLED BY AGENCY

through MWDOC and Local Agency Conservation Programs

Agency	FY 12-13	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19	Total	Cumulative Water Savings across all Fiscal Years
Brea	0	38	146	154	4	6	0	**456**	**116.31**
Buena Park	0	96	153	112	13	3	0	**687**	**215.26**
East Orange CWD RZ	0	13	26	24	0	0	0	**86**	**24.09**
El Toro WD	133	218	869	264	12	6	6	**2,049**	**611.70**
Fountain Valley	0	41	132	220	7	9	1	**833**	**278.76**
Garden Grove	0	63	350	363	7	4	0	**1,488**	**474.87**
Golden State WC	2	142	794	512	9	11	2	**2,803**	**877.57**
Huntington Beach	0	163	1,190	628	4	3	0	**2,904**	**821.99**
Irvine Ranch WD	1,449	810	1,777	2,798	638	239	96	**17,244**	**6,027.81**
Laguna Beach CWD	0	45	112	81	1	4	0	**392**	**118.10**
La Habra	0	37	94	83	5	1	0	**591**	**215.86**
La Palma	0	21	59	52	4	2	3	**227**	**66.14**
Mesa Water	0	147	162	162	7	3	3	**1,624**	**650.22**
Moulton Niguel WD	0	400	2,497	1,939	49	40	11	**5,741**	**1,344.78**
Newport Beach	0	49	168	243	11	6	0	**731**	**208.28**
Orange	1	142	978	416	17	10	3	**2,192**	**608.94**
San Juan Capistrano	0	35	140	202	3	9	2	**534**	**139.85**
San Clemente	0	72	225	246	11	6	7	**885**	**256.16**
Santa Margarita WD	0	528	997	1,152	114	34	2	**3,345**	**793.98**
Seal Beach	2	17	50	69	-1	0	0	**857**	**421.72**
Serrano WD	0	2	40	55	3	0	0	**121**	**28.68**
South Coast WD	64	102	398	235	11	7	0	**1,028**	**266.55**
Trabuco Canyon WD	0	10	108	169	2	3	2	**344**	**77.50**
Tustin	0	64	132	201	12	10	4	**1,520**	**589.95**
Westminster	0	35	161	359	3	4	0	**1,335**	**460.36**
Yorba Linda WD	0	40	280	379	12	8	2	**1,261**	**388.78**
MWDOC Totals	1,651	3,330	12,038	11,118	958	428	144	**51,278**	**16,084.22**
Anaheim	0	156	1,188	614	70	19	5	**5,889**	**2,193.20**
Fullerton	0	61	293	286	14	9	4	**1,068**	**314.09**
Santa Ana	0	33	602	293	20	0	0	**2,021**	**687.54**
Non-MWDOC Totals	0	250	2,083	1,193	104	28	9	**8,978**	**3,194.82**
Orange County Totals	**1,651**	**3,580**	**14,121**	**12,311**	**1,062**	**456**	**153**	**60,256**	**19,279.04**