

MEETING OF THE BOARD OF DIRECTORS OF THE
MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

Jointly with the

PLANNING & OPERATIONS COMMITTEE

November 6, 2017, 8:30 a.m.

MWDOC Conference Room 101

P&O Committee:

Director Dick, Chair

Director Tamaribuchi

Director Yoo Schneider

Staff: R. Hunter, K. Seckel, J. Berg,

H. De La Torre, K. Davanaugh

Ex Officio Member: W. Osborne

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>.

PRESENTATION ITEM

1. PRESENTATION ON CYBER SECURITY POLICIES FOR BOARDS TO CONSIDER

DISCUSSION ITEM

2. CANYON 2 FIRE WEROC RESPONSE SUMMARY

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.)

3. NWRI CLARKE PRIZE & ANNUAL CONFERENCE ON URBAN WATER SUSTAINABILITY – MAINLY ON TREATMENT OF WASTEWATER FOR DRINKING WATER PURPOSES
4. METROPOLITAN WATER DISTRICT (MET) METER WORKGROUP
5. 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
6. 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.



PRESENTATION ITEM
November 6, 2017

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

FROM: Robert Hunter, General Manager

Staff Contact: Kelly Hubbard, WEROC Manager

SUBJECT: Presentation on Cyber Security Policies for Boards to Consider

STAFF RECOMMENDATION

Staff recommends the Planning & Operations Committee hear the presentation.

COMMITTEE RECOMMENDATION

Committee recommends (To be determined at Committee Meeting)

SUMMARY

The MWD OC Board discussed the concept of Cyber Security briefly at the September Board Meeting and requested staff to identify a speaker for a follow-up presentation. In considering the topic, staff felt it was important for the Board to hear a broad overview presentation on Cyber Security with some general information on what the threat is, what has occurred and general concepts for consideration. Additionally, staff felt it was important for the Board to hear about what policy issues they and our member agencies should be considering and discussing.

A longer program on Cyber Security with general information, threats and what has occurred to date is being developed for the December 8, 2017 program for WACO. This program has invited an expert from University of Irvine and the Los Angeles Chapter of InfraGard to speak. InfraGard is a FBI lead organization of profit, non-profit and government entities that work together to gather information and create awareness for tips, leads and protective information for the 16 critical infrastructure sectors to prevent an attack on the United States and specifically any of those sectors.

With this in mind, Staff has asked Cheryl Auger, Cyber Security Manager for the Metropolitan Water District of Southern California to speak at the P&O meeting with a focus on business risk tolerance, security frameworks, and policy.

Staff have hosted several cyber security trainings for our member agencies and continue to identify additional trainings and resources that may support their cyber security efforts.

Budgeted (Y/N): NA	Budgeted amount: NA	Core ____	Choice ____
Action item amount: \$0	Line item:		
Fiscal Impact (explain if unbudgeted):			Page 3 of 38



DISCUSSION ITEM
(November 6, 2017)

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

FROM: Robert Hunter
General Manager

Staff Contact: Kelly Hubbard, WEROC Manager

SUBJECT: Canyon 2 Fire WEROC Response Summary

STAFF RECOMMENDATION

Staff recommends the Planning & Operations Committee read the report and discuss.

COMMITTEE RECOMMENDATION

Committee recommends (To be determined at Committee Meeting)

DETAILED REPORT

The Canyon 2 Fire started Monday, October 9, 2017 at approximately 9:45 am with full containment established on October 17, 2017 at just over 9,000 acres burned. The Orange County Operational Area EOC activated at 11:37 am and was deactivated Thursday, October 12, 2017 at 5:00 pm. A total of 80 structures were deemed damaged or destroyed.

Upon notification of the fire (approximately 10:15 am), Kelly Hubbard and Francisco Soto contacted WEROC's member agencies who serve and/or have infrastructure in the area surrounding the fire to obtain an understanding of their current situation and potential impacts due to the fire. They immediately started to coordinate the protection of critical infrastructure and information sharing amongst response partners. At approximately 3:00 pm the OA EOC Policy Group requested WEROC to staff the WEROC Liaison position at the OA EOC. Kelly and Francisco continued to coordinate efforts remotely until other WEROC EOC staff were able to physically report to the OA EOC. Staff reported to the Public Works and Utilities Branch to fulfill the WEROC Liaison position for 3 Operational

Periods (12 hour shifts). WEROC EOC Staff continued to provide additional coordination and support from the MWDOC offices until October 17.

Staffing

This event provided a great training opportunity for MWDOC staff who are assigned to the WEROC EOC, but have never had the opportunity to respond to the County EOC. Staff were paired together to allow for cross-training of those individuals with and without experience at the county EOC. WEROC EOC staff pairings at the OA EOC for alternating 12 hour shifts were: Karl Seckel and Chris Lingad, Melissa Baum-Haley and Joseph Berg, Robert Hunter and Harvey De La Torre. Additionally, Charles Busslinger, Francisco Soto, Janine Schunk, and Kevin Hostert participated and had the opportunity to learn response process by providing support remotely or from the MWDOC offices.

Coordination

During this response, WEROC staff facilitated response efforts through communications with Member Agencies, MET, and other response partners. Several critical actions were facilitated by WEROC staff during this event to assist Member Agencies:

1. Protection of Critical Facilities - Staff worked with Member Agencies and MET to identify critical water facilities within the path of the fire, exact locations for each, and what the impact of losing those facilities would be. Staff were then able to use this information to work with the responding fire agencies to provide structure protection for each facility. Structure protection was provided via fire engines and with fire suppression air drops. Structures included facilities with SCADA systems, a dam keeper's house, treatment facilities with chemicals, pump stations and more.
2. Status Reports – Staff collected, updated, exchanged, and disseminated information for use in assessing the water system's status in Orange County. This information was shared with partner agencies involved in the response and our Board. Additionally, staff ensured that impacted member agencies received status reports from other agencies and the county to assist in their own response efforts.
3. Response Agency Coordination – Staff worked with member agencies and other response agencies to facilitate access to evacuated areas when safe, as well as fire suppression support for staff who needed to operate in zones that still had fire activity. Additionally staff participated in OA EOC discussions about repopulation and safety as the event started to wrap up.

Coordination included the following agencies:

- City of Anaheim – Emergency Management, Fire Department and Water Division
- City of Orange – Water Division
- City of Tustin – Emergency Management, Police Department and Water Division
- East Orange County Water District
- Golden State Water Company
- Irvine Ranch Water District
- Metropolitan Water District of Southern California – Emergency Management
- Orange County Fire Authority
- Orange County Operational Area EOC

- Serrano Water District
- Yorba Linda Water District

Impacts and Recovery

OC Public Works is the lead agency for the Operational Area for FEMA cost recovery coordination and to develop the Post Fire Debris Flow Plan. WEROC Staff will continue to assist our Member Agencies and MET through these processes.

Only one utility had minor damages to infrastructure that was reported to the County for Stafford Act Public Assistance Reimbursement consideration.

In the winter season following a fire, there is always the threat for potential debris flows due to lack of natural materials (plants) that provide slope stabilization. All water utilities that have burned landscape around their facilities have been invited to participate in meetings to write a Post Fire Debris Flow Plan. These plans include an evaluation of the threat of debris flows due to these conditions, trigger points for protective actions and response actions for each area of concern.

WEROC North EOC

The WEROC North Emergency Operations Center (EOC) was directly threatened by the fire. This property also includes Irvine Ranch Water District's newly renovated Baker Pump Station and MET's OC-70 facility. At WEROC staff's request a fire engine was positioned at the facility to provide protection of the structure. The fire burned up to the perimeter of the facility, with some burned land and singed brush and trees within the perimeter fencing. Some pictures are provided below.

In evaluating the damage at the facility and the risk posed to the facility, WEROC staff made several recommendations to MET's OC Facility staff for future protection of the property.

Those recommendations and actions to date include:

1. MET participation in the OC Post Fire Debris Flow Planning process.
 - a. MET has been invited to the planning process and the first meeting is October 26.
2. Consideration of measures to harden the facility against future fire threats as a property within the Urban-Wildland Interface. Those measures could include concepts such as fuel modification for defensible space around the facility or improvements to the buildings eaves.
 - a. WEROC Staff have sent MET facility staff materials from OCFA and Cal Fire on recommended actions to protect facilities within an Urban-Wildland Interface, and have offered to facilitate a review of the facility by OCFA Fire Prevention Staff, if desired.
3. Lastly, it appears that the fire engine protecting the facility had connected to a very small water connection. Staff have asked MET to evaluate whether a fire hydrant could be added to the property for additional fire suppression capacity in the future.

After-Action Reports

WEROC, the OA EOC and all responding agencies will host "Hot Washes" in order to develop After-Action Reports that will include information on the response, what worked well, what didn't work great, possible solutions to processes and tools (Corrective Actions), as well as assignment of responsible agencies or individuals for those Corrective Actions.

All WEROC and MWDOC staff that were involved in the response participated in an internal Hot Wash process on October 18th. Additionally WEROC staff will participate in the OA EOC Hot Wash on October 26th and facilitate a Hot Wash with impacted water utilities at the WEROC Quarterly meeting on November 7th. All of this feedback will be incorporated into a WEROC After-Action Report with Corrective Actions to improve future responses.

Pictures from WEROC North EOC

Ariel Photo of the Property (Street is Jamboree, just South of Canyon View Ave)



Singed Tree Back Side of EOC/OC70 Building



Burned land inside perimeter fence (Between Jamboree and Building)



Burned Perimeter Looking towards Peters Canyon Reservoir from EOC 2nd Floor Window



Burned Land Looking Behind Facility Across Jamboree



Small Connection Utilized by Fire Engine for Water Supply





INFORMATION ITEM

November 6, 2017

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

FROM: Robert Hunter, General Manager

Staff Contact: Karl Seckel

SUBJECT: NWRI CLARKE PRIZE & ANNUAL CONFERENCE ON URBAN WATER SUSTAINABILITY – MAINLY ON TREATMENT OF WASTEWATER FOR DRINKING WATER PURPOSES

STAFF RECOMMENDATION

Staff recommends the Planning & Operations Committee: Receive and file the report.

COMMITTEE RECOMMENDATION

Committee recommends (To be determined at Committee Meeting)

DETAILED REPORT

I attended the NWRI Clarke Prize Conference on October 20, 2017 to listen to a number of discussions regarding Urban Water Sustainability. Many of the talks discussed human risk in considering the use of treated wastewater water for Indirect or Direct Potable Reuse.

1. Charles N. Haas , Ph.D. , received the 2017 NWRI Athalie Richardson Irvine Clarke Prize for pioneering and applying methods to assess and minimize health risks caused by exposure to disease - causing microorganisms (referred to as pathogens) in water and wastewater. Hass is known as the father of QMRA - quantitative microbial risk assessment (QMRA), which involves hazard identification, dose response , exposure assessment, and risk characterization (each of these steps is a major effort) to fully understand health risks and then what to do about them. It is a methodology for measuring and evaluating the risks to humans posed by disease-causing organisms in food, water, air, and other environmental pathways. DNA sequencing is now being used in risk assessments, however, one of the problems is understanding whether the DNA from the pathogen is active (alive) or dead. Legionella bacteria is still one of the scariest bacteria out there and its occurrence has been linked to higher humidity and possibly more runoff due to climate change. Helminths and fungi issues are on the rise.

Budgeted (Y/N):	Budgeted amount:	Core __	Choice __
Action item amount:	Line item:		
Fiscal Impact (explain if unbudgeted):			

2. Dr. Joan Rose from Michigan State – She emphasized the great acceleration of events world-wide since the 1950's (economy, population growth, access to drinking water, etc.) and noted that animal manure is still the #1 source of pathogens in the world. Our world has increased cultivation acres and reduced wetlands acres. She noted that what is safe is a policy issue and judgement over the potential risks. She noted that DNA sequencers are now being tested in a hand-held size that can be used in the field.
3. The Acute Threat: Perspectives on Pathogens in Potable Reuse R. Shane Trussell, Ph.D., P.E., Trussell Technologies; Brian Pecson from Trussell actually gave the talk. He mainly talked about the required log removals of 12-10-10 for Virus, Giardia and Crypto; he noted that natural soil filtration could actually provide between 5 & 7 log removal, although this is not currently credited. He talked about safety factors in the treatment process.
4. Enhanced Source Control to Support Potable Reuse, James Colston, J.D., Orange County Sanitation District. Jim talked about what they do next door given that their charge has changed from one of being concerned about impacts to receiving water (the ocean) to one of being a source for drinking water. By way of source control, OCSD has reduced the pounds of incoming metals from over 2000 to about 20, just one indicator of the success of their source control and indicated that many smaller agencies wanting to pursue DPR or IPR will not have the ability OCSD has had due to their size, staffing, resources and a dedicated lab.
5. Pathogen Removal Mechanisms and Pathogen Credits in MBR-Based Potable Reuse Trains Ufuk Erdal, Ph.D., P.E., AECOM; he talked about the pathogen removal and log credits that could be achieved. He talked mostly about Membrane Bioreactor Processes (MBR), who currently don't receive log credits for removal, and some ways that the membrane removal can be improved by biologically or adsorption-wise essentially making the effective membrane pore sizes smaller.
6. Keynote Address: Our Future in a Warming, Water-Stressed World, Robert Glennon, Ph.D., J.D., University of Arizona School of Law; he discussed the global issues of climate change and the struggle to produce enough food, with a larger water footprint due to hotter conditions to feed the world's growth from 7 B to an ultimate 10 to 12 B people. He noted that 16 of the 17 hottest temperatures on record occurred since 2000. On the Colorado River, he noted that the average yield over the last 1000 years was about 14 MAF; the system suffers from 1.6 MAF of evaporation (I don't remember this amount being quantified), thereby leaving 12.4 MAF to meet the Upper & Lower Basin amounts and Mexico. He noted that agriculture uses 80% of the water and a 4% savings will increase M&I supplies by 50% (not sure how his math works).
7. Assessing and Mitigating Chemicals in Potable Reuse, Andrew Salveson, P.E., Carollo Engineers; Andy is an advocate for treatment without RO because of the brine disposal issues posed for inland areas and he set the stage for the use of GAC at two different points in the treatment train to reduce a variety of chemicals. He noted several plants on the road to DPR without the use of RO; he advocated for a treatment train that includes ozonation, biological activated filtration using GAC, Ultra

filtration, GAC again and then UV/AOP for a finishing process. This cannot be used in locations where salinity removal needs to occur.

8. The Relevance of Low Molecular Weight Compounds on Monitoring for Direct Potable Reuse, Jeffrey Neemann, Dr. Eng., P.E., Black & Veatch. Most drugs are low molecular weight as is NDMA and other DBP's and some forms of TOC and including volatile materials. The cutoff for RO is between 150 and 300 Daltons, which results in a removal of 40% to 90% of low molecular weight compounds. These must be removed via other methods. He discussed the operations of treatment plants, even with on-line TOC analyzers that don't detect all things, presents the problems to an operator of how safe is the water and when is intervention needed due to a treatment breakthrough. He is leading a research effort to use data analytics to help tease out "differences" that might flag an incident for an operator.
9. WE&RF's Activities to Advance Potable Reuse, Jeffrey Mosher, Water Environment & Research Foundation; Jeff talked about the road to DPR in California and that legislation requires that standards for DPR be adopted by Dec 2023.
10. Mark Sobsey provided an overview of the day's proceedings based on his Clarke Presentation from last year. He emphasized the need for taking testing into the field to provide feedback as to whether water designated for human consumption is safe.

Overall, my observations, and including talking to someone aligned with the industry and IPR for many years – there is still so much we do not yet know. Based on these discussions, pipe to pipe DPR may be 20 years off; going into a conventional water treatment plant, we will probably be there in the next 5 years, but the inability to have on-line metrics that can instantaneously measure the quality and safety of water is still many years away.



INFORMATION ITEM

November 6, 2017

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

FROM: Robert Hunter, General Manager

Staff Contacts: Karl Seckel, Charles Busslinger

SUBJECT: Metropolitan Water District (MET) Meter Workgroup

STAFF RECOMMENDATION

Staff recommends the Planning & Operations Committee receive and file the report.

COMMITTEE RECOMMENDATION

Committee recommends (To be determined at Committee Meeting)

SUMMARY

Metropolitan Water District (MET) convened a workgroup consisting of MET staff and representatives of MET Member Agencies in the spring of 2017 to review service connection meter installations and develop recommendations to modify related portions of MET's Administrative Code. The workgroup has developed a draft summary report with recommendations for Administrative Code and procedural improvements.

DETAILED REPORT

As water agencies in Southern California continue to respond to a changing operating environment (State requirements, development of local water resources, droughts, and wet years) there is a need for the import water system, and more specifically the meters used to supply water to our agencies, to have increased flexibility. Currently MET's Administrative Code is not as flexible as it could be in regards to metering flows through service connections. MET's Administrative Code defines a meter range as being between 10% and 100% of the maximum flow (this is referred to as a 10:1 turndown ratio). If flows at the

Budgeted (Y/N):	Budgeted amount:	Core __	Choice __
Action item amount:	Line item:		
Fiscal Impact (explain if unbudgeted):			

meter fall below 10% of the maximum flow, “below 10% charges” are passed on by MET. The charge assumes that the meter was flowing at the minimum (10%) flow for the entire duration when the meter indicated flows were below the meter minimum capacity (i.e. the agency pays for flows below 10% of the requested maximum flow range as if they received 10% of the meter’s flow capacity); leaving agencies to pay for water they may not have received. This last year, due to a combination of a wet year and increased local water sourcing, the single year low flow charges on one meter in Orange County (CM-12) exceeded \$100,000. Some of this inflexibility is due to technical limitations of the meters, while others are due to a conservative approach to metering which does not take into account different situations.

Over 90% of the meters MET has in its system are venturi meters. Venturi meters work extremely well, are very durable, and the 10:1 turndown works reasonably well with venturi meters. However, newer meters which electronically sense the velocity of water flowing through the pipe are known as electromagnetic flow meters or mag meters for short. Typically, these newer types of meters are coming into common use and their flow sensing abilities are much greater than venturi meters. MET currently allows mag meters to be installed and used, however, the full metering capability of the newer meters is NOT allowed to be used because MET’s Administrative Code says all meters must use a 10:1 turndown. Mag meters can allow much larger ranges to be sensed than the same sized venturi meter and are especially better at low flows. One of MWDOC’s goals in the workgroup was to get MET to allow the expanded use that are now offered by mag meters.

To address these issues, the Meter Workgroup has developed recommendations to allow more flexibility while ensuring meter accuracy is maintained.

Proposed Recommendations from the Meter Workgroup

1. MET should provide pathways for member agencies to request modifications to a service meter installations.

Three processes or ‘Options’ have been developed to provide pathways for member agencies to request changes to flow meters:

- 1.1. Existing Meter: Re-Span Flow Range

Recalibrate the meter to a different maximum and minimum flow range while maintaining a 10:1 turndown ratio.

- 1.2. Existing Meter: Increase Turndown Ratio

Increase the flow range to greater than 10:1. This option is dependent on the specifics of the service connection as to what extent this is possible.

- 1.3. New Meter; Increase Turndown Ratio and/or Reduced Straight Pipe Requirements

Covers a wide range of situations including:

- 1.1.1. Modifications to existing installations –

- (i) either replacement of an existing meter with a non-venturi meter (such as an electromagnetic flow [mag] meter) including increased Turndown Ratios, and/or
- (ii) Reduction in the length of straight pipe required upstream and downstream of the meter (i.e. less than MET’s 10 pipe diameter upstream & 5 pipe diameter downstream requirements),

1.1.2. New Service Connections – installation of non-Venturi meters

Replacement of venturi meters with mag meters could help to minimize low flow charges as mag meters have a larger flow metering range and provide increased metering accuracy at lower flow ranges than venturi meters. The downside to mag meters are that they have shorter lifecycles than venturi meters.

Under these Options the requesting agency is responsible for the cost to verify that the requested modification will meet MET's meter accuracy requirements (overall meter accuracy of 2% per Administrative Code Section 4506).

If a requested meter has a shorter lifecycle than a venturi meter, the requesting agency may also incur future meter replacement costs.

2. MET should modify the Administrative Code and internal design guidelines as necessary to accommodate the above recommended Options.
3. MET should use a lifecycle cost comparison approach when evaluating various meter types and modifications for existing and new meter installations. The details of this recommendation have not been worked out.

The workgroup is scheduled to complete a final draft report by the end of the year and to bring recommendations to the MET Board for consideration in January/February 2018.

MWDOC Comments:

MET's workgroup was initiated at the urging of MWDOC and other MET member agencies. Overall we believe the consideration provided by MET staff in allowing more flexibility in the metering process, while somewhat constrained, is a reasonable approach. We reviewed the draft report at a recent meeting with our member agencies and they were supportive of the efforts to date and they are looking forward to the implementation of the flexibility potentially afforded by the proposed changes. Issues remain with how exactly to conduct field testing to allow existing meters to be operated at different flow ranges and how the cost issue will be handled with respect to the lower life expectancy for mag meters compared to venturi meters. We are assuming MET will want to charge the owner of the metering facility whenever a mag meter needs to be repaired or replaced and we believe this would be a reasonable approach.

One other related issue came about in the metering discussions and that has to do with the implications of water quality issues that might result from lower flows occurring in the MET system. This was not necessarily discussed in detail at the meter workgroup meeting, although it appeared that MET was potentially looking at NOT allowing lower flows if water quality problems would be created in pipelines due to the water remaining in the pipes for a longer time under low flow conditions. We provided input to MET objecting to such a condition. Our agencies pointed out that a benefit of allowing lower flows at various meters could actually result in improved water quality compared to not allowing the low flow which might result in an agency turning a meter completely off. Our agencies suggested that the water quality issue from low system flows is not just a MET problem and not just a local agency problem, but should be approached collectively by both parties to examine solutions that will work. We concur with this approach and will pass it on to MET.

MWDOC will need to monitor this issue as it moves forward and turns into changes in the Administrative Code.

ENGINEERING & PLANNING

Doheny Desalination Project

UPDATED - Doheny Desal Project

MWDOC Director Megan Yoo-Schneider, Karl Seckel and Charles Busslinger attended a special South Coast WD Board meeting on October 23, 2017 on the findings and recommendations of a Water Reliability Working Group. The group was comprised of six local residents from various backgrounds who provided feedback on proposed District investments in water supply reliability with an emphasis on local sources. The group members found that the Doheny Ocean Desalination Project would provide water reliability and found value in that reliability being under the control of the District. They also found that customers would be willing to pay a ‘reasonable amount’ toward securing water reliability although there was a difference of opinion in what ‘reasonable’ meant. The group recommended that the District seek broader participation and shared financial responsibility from neighboring water districts for the desalination project. The group also recommended that the Project be designed and built from the beginning to accommodate future expansion.

A workshop will be held on October 31, 2017 to discuss the technical studies associated with the Project.

South Coast WD is continuing to move the project forward, as follows:

STATUS INFORMATION BY TASK ORDER

Task Order # 7 – Project Delivery Analysis

Project Delivery Workshop 5 is scheduled for November 15th 3-5pm.

Task Order # 8B– Environmental Impact Report

Work on the Administrative Draft EIR has continued, with additional technical studies on the Southeast Intake area wrapping up. These include:

- Air Quality/GHG
- Brine Modeling
- Updating Regional Conveyance conceptual options

Stakeholder Briefings have also been conducted with OC Public Works, City of Dana Point, and the Regional Water Board.

Future milestones are:

- Mid November, 2017: 2nd NOP Scoping Meeting to discuss revised possible slant well locations and regional project.
- Late November 2017: Submit Administrative Draft to District for Review

	<ul style="list-style-type: none"> • Late January/February: Draft EIR Released for Public Comments • Targeting June 2018 for end of NOD 30-day period <p><u>Task Order # 12 – Desal Plant Site Hydrology Study</u></p> <p>Final Report by October 31, 2017</p> <p><u>Task Order # 13 – Value for Money Analysis</u></p> <p>The VfM Board Workshop was held on March 22, 2017, and follow up meetings took place with Directors to review the Risk Register in more detail and understand additional concerns.</p> <p>Next Major Deliverable Milestones are:</p> <ol style="list-style-type: none"> 1) Customer Impact numbers to be reviewed with the Board in October 2) Final VfM Report by October 31st <p><u>Task Order # 14 – Updated Slant Well Modeling</u></p> <p>Task 1 – Additional Data Analysis has been completed. Data analysis resulted in modifications to preliminary paleochannel configuration that warrants slightly different approach for exploratory boreholes. Revised approach is to use one borehole and an onshore geophone array to refine nearshore geologic conditions.</p> <p>Next Major Deliverable Milestones are:</p> <ol style="list-style-type: none"> 1) Task 2 - Exploratory borehole work to be conducted upon receipt of Part 2 Permit from OC Parks. Permit was issued October 11th, currently scheduling drill rig 2) Task 3 – Refinement and recalibration of model has based on geophone work has been completed. 3) Task 4 – Draft modeling is complete, and Southeast Intake area modeling results may need to be updated based on results of borehole. 4) Draft Memo – Issued on October 4, 2017 5) Final Report – Estimated at October 31, 2017 <p><u>Task Order # 15 – Alternative Power Supply Analysis</u></p> <p>Final Alternative Power Supply Report issued to the District on October 13, 2017</p>
Poseidon Resources	<p>The State Lands Commission approved the lease amendment for the proposed Huntington Beach Desalination Project on October 19, 2017. The Santa Ana Regional Water Quality Control Board will next consider approval of an Ocean Discharge Permit Amendment for the project in the first half of 2018, and finally the California Coastal Commission will</p>

	then consider approval of a Coastal Development Permit. OCWD is still working on the system integration concepts.
Orange County Reliability Study	A conference call was held on October 25 th with CDM-Smith and MWDOC staff to complete follow-up work to the 2016 study. The work includes modeling of more recently available information, updating Colorado River assumptions, assessment of additional scenarios for the Huntington Beach Desalination Plant, assessment of the value of new storage and evaluation of various project options. The work is expected to be completed in the next few months.
Service Connection CM-1 Cost Issues with MET	A meeting was held with LBCWD, Newport Beach and MWDOC's consultant, Tom Epperson from Tetra Tech to discuss alternative configurations at CM-1. We are hopeful that a solution involving all three parties and MET can be developed.
North and Central O.C. Integrated Regional Watershed Management Area	Charles Busslinger continues to participate in the ad hoc committee to develop the North and Central IRWM Plan. The draft goals, objectives, and strategies were presented to stakeholders on June 27, 2017. The final draft plan is anticipated by the end of November 2017.
San Juan Basin Authority	Charles Busslinger attended the San Juan Basin Authority Board meeting on October 10 th . Santa Margarita WD continues working on the San Juan Watershed Project. Phase 1 is being designed to capture wet and dry weather runoff, with subsequent phases looking to introduce recycled water into San Juan Creek. Santa Margarita WD staff met with NOAA and National Marine Fisheries Service (NMFS) about fish passage design requirements for the project. The project must have a physical fish passage (fish passage cannot be provided through operationally raising and lowering the rubber dams). Therefore the Draft Environmental Impact Report (DEIR) must be modified to include a fish passage. The revised estimate for public review is December 2017. An overview video is available at: http://sanjuanwatershed.com/project-overview-video/
Use of East Orange County Feeder No. 2 for Conveyance of Groundwater	MWDOC has been discussing concepts for pumping groundwater into the EOCF No. 2 for conveyance to South Orange County during an emergency event. Upcoming meetings will be held with IRWD and OCWD to discuss various issues involved.
	Charles Busslinger attended the public meeting for the US Army Corps/County of Orange Aliso Creek Restoration Project Feasibility Study on October 17 th . The Draft Integrated Feasibility Report (which is a combined feasibility report and draft Environmental Impact Statement/Environmental Impact Report) is currently open for public comments through November 28, 2017. The feasibility study started back in 2004. The study looks to determine a project alternative to; restore degraded portions of Aliso Creek within Aliso and Wood

	<p>Canyons Wilderness Park, provide stream bank protection to SOCWA's Coastal Treatment Plant sludge pipelines along the east bank of Aliso Creek, and also provide protection for the Joint Transmission Main that crosses Aliso Creek downstream of Aliso Creek Road.</p> <p>The Corps' preferred alternative (prior to receiving input from the public - known as the Tentatively Selected Plan or TSP) is estimated to cost \$100 million with the Federal government looking to pay for 65%.</p>
	Karl Seckel attended a Safety Assessment Program evaluator class to be trained on the process of evaluating buildings for reentry following earthquakes.
	Karl Seckel attended the South Orange County IRWMP Management Committee meeting where the County staff provided updates on the process.
	Karl Seckel attended the annual NWRI Conference that included a number of discussions on the health risk aspects of potable reuse. Karl's summary notes are attached.
	Karl Seckel and Charles Busslinger met with Flatiron, a construction company with expertise in ocean desalination to discuss both the Doheny Desal and the Poseidon Projects.

***Status of Ongoing WEROC Projects
October 2017***

<i>Description</i>	<i>Comments</i>
Emergency Coordination	<p>The Canyon 2 Fire broke out on Monday, October 9th and WEROC was requested to respond to the Operational Area EOC to provide water coordination support. Staff went to the North EOC to evaluate any damages to the OC-70 building and the WEROC North EOC. Lastly, a hot wash was conducted with all of the staff who responded to the event and assisted. A more detailed report is provided as a separate agenda item.</p> <p>Kelly has continued to monitor the response to the Sonoma/Napa Fires, providing assistance when needed. Assistance to date has been coordination of contacts and documentation.</p>
<i>Coordination with WEROC Member Agencies</i>	<p><i>Ongoing: WEROC, with Michal Baker as the lead consultant, are facilitating 19 agencies through the process of updating the Orange County Water and Wastewater Multi-Jurisdictional Hazard Mitigation Plan.</i></p> <p>Update: Francisco Soto has been working with each agency to ensure that assignments between meetings are completed on time and the project stays on schedule. Francisco has had various virtual meetings with agencies to provide additional guidance. This month, the planning team did not meet for our scheduled planning meeting, this was done in order to allow additional time for agencies to complete their assignments.</p> <p>WEROC hosted its first exercise design meeting for the WEROC Multi-Agency Spring Exercise based on an unknown contamination of water event scenario. The meeting was to get participating agencies to consider their level of exercise participation and to work on their objectives for the exercise. This group will meet monthly until the exercise on May 15, 2018.</p>
<i>Training and Programs</i>	<p>Francisco facilitated a Drop, Cover, Hold On drill. He then provided staff with an earthquake preparedness presentation and developed a small scale search and rescue exercise to prepare staff for an extreme event. This exercise/training coincided with The Great Shake Out.</p>
<i>Coordination with the County of Orange</i>	<p>Francisco attended the October Orange County Emergency Management Organization (OCOMO) meeting that took place at the American Red Cross in the City of Santa Ana. Ms. Sue Fisher from the California State University of Fullerton shared her experience while serving as a Red Cross Volunteer in Houston during Hurricane Harvey.</p>

	<p>Francisco attended the Orange County Health Care Agency Flu Vaccination Point of Dispensing (POD) exercise on Thursday October 26, 2017 in the City of Tustin. He acted as the lead controller for the exercise, his role was to lead eight controllers and evaluators in ensuring that exercise play did not deviate and to identify gaps/areas for improvement to implement in future POD exercises. This is an annual Health Care Agency exercise in which various cities host the exercise and annual flu shots are provided to the community for free.</p> <p>Ongoing: Kelly participated in the OCCEMO Bylaws Revision workgroup. This is related to the OA Agreement revision in that OCCEMO was created by the OA Agreement and its bylaws need to be updated to reflect changes in the proposed new OA agreement and changes in actual processes. It is important for WEROC to participate as this impacts water district emergency management voting in OA matters.</p> <p>Kelly attended the Orange County Recovery Tabletop Exercise for Key Stakeholders on September 28th. The tabletop discussed short and long term recovery issues based on a large earthquake event. The focus was to get past the initial response efforts of protection of life safety, property and environment, and to move into planning for community system (utilities, housing, grocery stores, etc.) restoration and economic recovery.</p> <p>Kelly also met with representatives of the Orange County Intelligence Assessment Center (OCIAAC) to discuss ongoing coordination with OCIAAC, WEROC and water utilities. The discussion included joint collaboration on response and training, the sharing of maps and contacts, as well as notification protocols.</p> <p>Francisco and Kelly attended the County-Wide Terrorism Functional Exercise as the WEROC Liaison to the County Operation Area EOC. The exercise was based on multiple terrorist events occurring within the county on the same date, but at various times and locations. The exercise received FEMA grant funding that allowed for additional enhancements and realism for the exercise, like simulated press briefings, news clips and social media feed. This exercise has been planned for almost a year and was developed prior to the Vegas Shooting on October 1, 2017.</p>
<p>Coordination with Outside Agencies</p>	<p>Kelly and Francisco attended the California Emergency Services Association (CESA) Annual Training and Conference in Fish Camp (Yosemite), CA. The conference is the only conference targeted to Emergency Management Professionals within CA. Additionally, Kelly was the Conference Chair and had been working on this conference for the past year. It was one of the highest attendance conferences ever for the association.</p>

	<p>Kelly attended the Cal OES Mutual Aid Regional Agency Coordination (MARAC) meeting in Alhambra. Anna Cave, retired Emergency Manager from the City of Brea, was the primary speaker. She shared lessons learned from Hurricane Harvey (Texas) based on her observations as a new resident and accomplished emergency manager. Additional topics included updates on state-wide planning, grants, mutual aid, and coordination efforts.</p>
WEROC EOC Readiness	<p>Janine Schunk researched and found a recycling company to purchase and take away WEROC's old generator. El Toro Water District provided maintenance of this generator for years for WEROC, but was starting to have trouble finding parts for continued upkeep.</p> <p>Francisco and Kelly met with OC Sheriff's Department Communications staff to discuss the project's progress, clean-up our tracking sheets and keep the project moving.</p> <p>Francisco participated in the MARS monthly radio test and Janine participated in the OA Radio test.</p>

Status of Water Use Efficiency Projects

October 2017

Description	Lead Agency	Status % Complete	Scheduled Completion or Renewal Date	Comments
Smart Timer Rebate Program	MWDSC	On-going	On-going	<p>In September 2017, 51 residential and 41 commercial smart timers were installed in Orange County.</p> <p>For program water savings and implementation information, see MWDOC Water Use Efficiency Program Savings and Implementation Report.</p>
Rotating Nozzles Rebate Program	MWDSC	On-going	On-going	<p>In September 2017, 112 rotating nozzles were installed in Orange County.</p> <p>For program savings and implementation information, please see MWDOC Water Use Efficiency Program Savings and Implementation Report.</p>
SoCal Water\$mart Residential Indoor Rebate Program	MWDSC	On-going	On-going	<p>In September 2017, 195 high efficiency clothes washers and 29 premium high efficiency toilets were installed through this program.</p> <p>For program savings and implementation information, please see MWDOC Water Use Efficiency Program Savings and Implementation Report.</p>
SoCal Water\$mart Commercial Rebate Program	MWDSC	On-going	On-going	<p>In September 2017, 361 premium high efficiency toilets were installed through this program.</p> <p>For program savings and implementation information, please see MWDOC Water Use Efficiency Program Savings and Implementation Report.</p>

Description	Lead Agency	Status % Complete	Scheduled Completion or Renewal Date	Comments
Industrial Process Water Use Reduction Program	MWDOC	5%	June 2020	A total of 41 Focused Surveys and 19 Comprehensive Surveys have been completed or are in progress. To date, 15 companies have signed Incentive Agreements. Updated discharger lists have been obtained, and outreach is continuing to sites with feasible water savings potential. As a result of this program, 582 AFY of water savings is being achieved.
Turf Removal Program	MWDOC	On-going	On-going	<p>In September 2017, 62 rebates were paid, representing \$63,442.87 in rebates paid this month in Orange County. To date, the Turf Removal Program has removed approximately 21.0 million square feet of turf.</p> <p>For program savings and implementation information, please see MWDOC Water Use Efficiency Program Savings and Implementation Report.</p>
California Sprinkler Adjustment Notification System – Base Irrigation Schedule Calculator	MWDOC	On-going	On-going	<p>The California Sprinkler Adjustment Notification System (CSANS) sends an e-mail or “push” an irrigation index to assist property owners with making global irrigation scheduling adjustments. Participants voluntarily register to receive this e-mail at www.csans.net and can unsubscribe at any time.</p> <p>An annual support contract with Enterprise Information Systems, the original developer of CSANS, was recently executed. Support will include annual web hosting, technical support, functional refinements, and ongoing application health and maintenance.</p>
Spray to Drip Conversion Program	MWDOC	85%	October 2017	This is a rebate program designed to encourage residential and commercial sites to convert their existing conventional spray heads to low-

Description	Lead Agency	Status % Complete	Scheduled Completion or Renewal Date	Comments
				<p>volume, low-precipitation drip technology.</p> <p>To date, 205 residential sites and 52 commercial sites have completed spray to drip conversion projects.</p>
Landscape Design Assistance Program (LDAP)	MWDOC	55%	April 2018	<p>This is a pilot program designed to offer free front yard landscape design assistance to customers who are participating in MWDOC's Turf Removal Rebate Program.</p> <p>To date, MWDOC has received and approved 68 questionnaires, and 58 site consultations have been performed. Of the 58 sites, 43 have received their custom designs and have been sent their Letters To Proceed to begin their projects. MWDOC will be visiting these sites to take photos once each project is complete. Photos will also be taken at six and twelve months after installation.</p>

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	September-17	195	0.56	1,057	7.07	113,969	3,932	26,899
Smart Timer Program - Irrigation Timers	2004	September-17	92	2.43	742	30.78	21,227	7,812	46,482
Rotating Nozzles Rebate Program	2007	September-17	112	0.45	499	2.00	563,317	2,759	18,322
SoCal WaterSmart Commercial Plumbing Fixture Rebate Program	2002	September-17	361	1.11	1,757	11.82	87,036	4,743	44,177
Industrial Process Water Use Reduction Program	2006	September-17	0	0.00	0	0.00	28	582	2,470
Turf Removal Program ^[3]	2010	September-17	45,761	0.53	137,847	19	21,043,448	2,947	10,204
High Efficiency Toilet (HET) Program	2005	September-17	29	0.10	177	1.88	59,824	2,211	16,709
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				5	142,079	73	23,233,673	50,989	421,769

^[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 11/12	FY 12/13	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	Total	Current FY Water Savings Ac/Ft (Cumulative)	Cumulative Water Savings across all Fiscal Years	15 yr. Lifecycle Savings Ac/Ft
Brea	144	93	115	114	76	57	10	1,877	0.05	448.87	971
Buena Park	145	105	106	91	76	54	13	1,531	0.10	350.98	792
East Orange CWD RZ	10	10	8	8	8	3	-	192	0.00	48.55	99
El Toro WD	112	134	121	111	65	47	10	1,531	0.07	353.25	792
Fountain Valley	158	115	102	110	76	65	16	2,416	0.11	597.49	1,250
Garden Grove	236	190	162	165	251	127	22	3,585	0.17	844.57	1,855
Golden State WC	485	265	283	359	260	138	48	5,063	0.30	1,194.43	2,620
Huntington Beach	582	334	295	319	225	180	41	8,287	0.27	2,086.55	4,288
Invine Ranch WD	2,170	1,763	1,664	1,882	1,521	1,373	377	25,043	2.53	5,623.35	12,958
La Habra	128	82	114	87	66	53	13	1,340	0.11	307.02	693
La Palma	46	34	25	34	29	10	5	463	0.03	106.24	240
Laguna Beach CWD	57	38	37	39	32	19	7	939	0.06	228.73	486
Mesa Water	176	114	86	89	113	80	16	2,534	0.11	637.03	1,311
Moulton Niguel WD	679	442	421	790	688	575	140	10,061	0.96	2,248.78	5,206
Newport Beach	142	116	92	95	66	61	17	2,641	0.10	678.53	1,367
Orange	262	218	163	160	124	80	20	3,918	0.15	992.44	2,027
Orange Park Acres	-	-	-	-	-	-	-	12	0.00	3.76	6
San Juan Capistrano	110	76	73	92	63	33	11	1,470	0.08	350.88	761
San Clemente	206	140	94	141	75	70	28	2,648	0.19	635.42	1,370
Santa Margarita WD	679	553	662	792	466	367	79	9,595	0.50	2,195.52	4,965
Seal Beach	51	31	29	38	23	9	5	607	0.03	145.85	314
Serrano WD	20	13	10	26	8	11	1	358	0.01	90.37	185
South Coast WD	112	89	79	68	43	44	12	1,596	0.09	380.40	826
Trabuco Canyon WD	62	30	45	47	34	28	6	804	0.04	189.48	416
Tustin	97	78	59	80	66	44	10	1,622	0.07	401.72	839
Westminster	208	121	82	109	149	84	17	2,603	0.12	623.06	1,347
Yorba Linda	273	181	167	156	123	56	13	3,765	0.09	951.77	1,948
MWDOC Totals	7,350	5,365	5,094	6,002	4,726	3,668	937	96,501	6.35	22,715.01	18,644

Anaheim	477	331	285	295	266	213	58	10,740	0.36	2,605.62	5,557
Fullerton	270	200	186	211	165	107	30	3,725	0.18	808.02	1,927
Santa Ana	190	163	131	132	259	141	32	3,003	0.19	770.77	1,554
Non-MWDOC Totals	937	694	602	638	690	461	120	17,468	0.72	4,184.41	3,375

Orange County Totals	8,287	6,059	5,696	6,640	5,416	4,129	1,057	113,969	7.07	26,899.42	22,018
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SMART TIMERS INSTALLED BY AGENCY

through MWDOC and Local Agency Conservation Programs

Agency	FY 11/12		FY 12/13		FY 13/14		FY 14/15		FY 15/16		FY 16/17		FY 17/18		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	8	0	9	8	4	0	43	6	20	4	31	4	8	0	139	80	521.72
Buena Park	4	19	3	0	0	0	4	10	7	4	10	7	8	1	39	42	147.67
East Orange CWD RZ	5	0	2	0	0	0	2	0	1	0	11	1	2	0	27	1	18.80
El Toro WD	26	2	7	2	11	0	8	9	9	17	33	8	10	0	125	355	2,476.50
Fountain Valley	8	2	3	2	4	0	7	10	13	1	33	12	8	0	99	40	178.65
Garden Grove	7	0	5	2	9	0	10	14	13	11	28	0	13	0	114	38	173.20
Golden State WC	13	3	9	49	9	25	39	12	35	16	56	37	25	5	250	197	812.43
Huntington Beach	15	4	18	33	20	35	19	2	42	12	88	94	25	30	297	298	1,061.60
Irvine Ranch WD	267	71	414	135	71	59	67	310	239	207	344	420	102	48	1,871	2,334	11,330.93
La Habra	3	0	4	7	2	0	4	7	3	1	12	7	3	0	39	44	203.18
La Palma	1	0	1	0	2	0	2	0	3	2	1	0	0	0	10	2	5.98
Laguna Beach CWD	109	2	76	2	71	0	86	0	86	1	27	0	5	0	502	20	235.04
Mesa Water	21	0	10	2	15	2	17	28	36	12	149	41	13	0	331	154	733.07
Moulton Niguel WD	179	31	51	74	40	45	46	95	163	100	236	129	108	9	1,022	810	3,577.28
Newport Beach	275	12	242	26	168	75	11	9	28	43	30	12	11	0	1,049	409	2,615.40
Orange	25	0	20	24	13	9	18	31	51	13	69	10	22	12	307	177	936.09
San Juan Capistrano	103	2	14	18	6	11	6	19	20	8	22	8	8	0	230	125	642.45
San Clemente	212	17	26	7	28	2	28	24	26	3	37	13	10	0	1,061	374	2,655.49
Santa Margarita WD	262	7	53	171	64	93	53	321	189	136	326	221	80	85	1,234	1,457	5,671.10
Santiago CWD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Seal Beach	0	3	1	0	1	36	1	12	2	2,446	2	4	4	0	11	2,502	5,119.58
Serrano WD	3	0	1	0	0	0	4	0	11	2	4	0	3	0	41	2	13.96
South Coast WD	78	10	13	16	8	4	104	73	9	11	7	0	6	0	284	212	1,147.62
Trabuco Canyon WD	12	0	6	0	2	0	6	1	16	50	13	3	7	0	110	157	950.38
Tustin	11	0	8	4	9	1	18	14	33	8	33	23	10	1	153	81	339.47
Westminster	2	0	1	1	2	0	13	17	7	1	17	12	7	0	72	44	197.20
Yorba Linda	22	0	20	0	12	5	32	2	61	27	72	71	25	2	363	185	827.01
MWDOC Totals	1,671	185	1,017	583	571	402	648	1,026	1,123	3,136	1,691	1,137	523	193	9,780	10,140	42,591.78

Anaheim	23	60	19	10	9	26	7	52	30	34	87	10	11	0	255	457	2,606.44
Fullerton	22	51	9	29	8	0	40	26	32	12	53	7	12	0	211	199	933.90
Santa Ana	6	5	8	19	7	8	9	27	22	26	15	3	3	0	85	100	350.07
Non-MWDOC Totals	51	116	36	58	24	34	56	105	84	72	155	20	26	0	551	756	3,890.41
Orange County Totals	1,722	301	1,053	641	595	436	704	1,131	1,207	3,208	1,846	1,157	549	193	10,331	10,896	46,482

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

Agency	FY 11/12			FY 12/13			FY 13/14			FY 14/15			FY 15/16			FY 16/17			FY 17/18			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	Comm.		
	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Comm.			
Brea	130	0	0	65	120	0	84	0	0	157	45	0	74	2,484	0	0	0	0	0	0	0	572	2,749	0	49.46	
Buena Park	32	0	0	65	0	0	53	0	0	248	0	0	45	98	0	0	0	0	0	0	0	509	173	2,535	813.11	
East Orange	340	0	0	55	0	0	30	0	0	221	0	0	0	0	0	0	0	0	30	0	0	781	0	0	19.29	
El Toro	357	76	0	23	6,281	0	56	3,288	0	1,741	28,714	0	730	4,457	0	55	242	0	0	0	0	3,369	46,222	890	1,191.53	
Fountain Valley	108	0	0	35	0	0	80	0	0	107	0	0	222	0	0	0	0	0	0	0	0	710	0	0	17.21	
Garden Grove	119	0	0	95	0	0	80	0	0	88	50	0	110	0	0	55	98	0	0	0	0	933	299	0	32.52	
Golden State	294	0	0	257	2,595	0	192	0	0	583	1,741	0	1,088	0	0	207	6,008	0	0	0	0	3,448	11,316	0	241.78	
Huntington Beach	458	0	0	270	0	0	120	0	0	798	1,419	0	1,345	2,836	0	149	3,362	0	0	0	0	3,797	12,526	2,681	1,310.95	
Irvine Ranch	1,715	4,255	0	25,018	1,014	0	11,010	4,257	0	1,421	632	0	1,989	5,047	0	335	9,511	0	98	0	0	47,235	94,561	2,004	4,744.87	
La Habra	33	90	0	0	0	0	15	0	0	109	338	0	300	0	0	0	0	0	0	0	0	481	1,236	900	365.97	
La Palma	0	0	0	0	0	0	0	0	0	0	0	0	46	505	0	0	2,385	0	0	0	0	56	2,890	0	26.08	
Laguna Beach	763	0	0	3,596	0	0	2,948	878	0	2,879	1,971	0	1,390	0	0	0	0	0	0	0	0	12,139	2,896	0	301.19	
Mesa Water	297	277	0	270	0	0	361	0	0	229	0	0	166	0	0	113	0	0	0	0	0	2,030	385	343	195.15	
Moulton Niguel	1,225	0	0	512	1,385	0	361	227	0	1,596	4,587	0	5,492	1,441	0	153	5,872	0	185	0	0	12,059	20,515	2,945	1,689.15	
Newport Beach	640	3,273	0	25,365	50	0	19,349	6,835	0	460	3,857	0	348	670	0	0	0	0	0	0	0	46,678	21,413	0	1,584.10	
Orange	343	0	0	264	0	0	245	120	0	304	668	0	631	91	0	0	0	0	0	0	0	3,170	1,072	0	109.25	
San Juan Capistrano	949	0	0	684	30	0	370	0	0	495	737	0	310	593	0	75	123	0	0	0	0	5,495	8,852	0	445.50	
San Clemente	4,266	117	1,343	631	172	0	415	5,074	0	326	0	0	426	0	0	0	0	0	82	0	0	10,071	7,538	1,343	799.92	
Santa Margarita	4,817	0	0	983	0	0	389	0	0	1,207	1,513	0	1,820	837	0	15	0	0	104	0	0	16,269	6,921	611	824.37	
Seal Beach	0	0	0	0	0	0	0	0	0	40	5,261	0	0	2,300	0	0	0	0	0	0	0	155	7,852	0	127.44	
Serrano	58	0	0	190	0	0	105	0	0	377	0	0	695	0	0	0	0	0	0	0	0	3,405	0	0	93.29	
South Coast	688	359	0	435	0	0	70	0	0	4,993	13,717	0	1,421	2,889	0	16	0	0	0	0	0	8,130	18,870	0	472.75	
Trabuco Canyon	379	0	0	34	0	0	0	0	0	56	0	0	130	0	0	0	4,339	0	0	0	0	2,086	5,130	0	131.59	
Tustin	476	1,013	0	378	0	0	329	0	0	408	0	0	317	386	0	65	-341	0	0	0	0	3,371	1,058	0	120.71	
Westminster	26	0	0	15	0	0	0	0	0	54	0	0	73	0	0	105	0	0	0	0	0	464	0	0	10.98	
Yorba Linda	559	0	0	730	0	0	40	990	0	921	0	0	1,715	0	0	213	0	0	0	0	0	6,081	4,359	500	460.06	
MWDOC Totals	19,072	9,460	1,343	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	499	0	0	193,494	278,833	14,752	16,178.19	
Anaheim	742	38,554	0	459	813	0	338	0	0	498	712	0	794	5,221	0	147	3,953	0	0	0	0	4,020	49,799	105	1,350.45	
Fullerton	409	0	0	119	0	0	107	0	0	684	1,196	0	521	7,015	0	65	3,034	0	0	0	0	2,910	11,309	1,484	668.74	
Santa Ana	22	65	0	99	0	0	86	2,533	0	310	0	0	0	1,420	0	0	1,106	0	0	0	0	859	5,752	0	124.46	
Non-MWDOC Totals	1,173	38,619	0	677	813	0	531	2,533	0	1,492	1,908	0	1,315	13,656	0	212	8,093	0	0	0	0	7,789	66,860	1,589	2,143.65	
Orange County Totals	20,245	48,079	1,343	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	499	0	0	201,283	345,693	16,341	18,321.84	

SOCAL WATER\$MART COMMERCIAL PLUMBING FIXTURES REBATE PROGRAM^[1]
INSTALLED BY AGENCY
 through MWDOC and Local Agency Conservation Programs

Agency	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	Totals	Cumulative Water Savings across all Fiscal Years
Brea	1	234	0	10	91	734	0	1,365	494
Buena Park	290	5	23	56	591	133	0	2,489	1,217
East Orange CWD RZ	0	0	0	0	0	0	0	0	0
El Toro WD	137	0	212	6	268	35	0	1,062	655
Fountain Valley	314	0	0	1	249	0	357	1,229	657
Garden Grove	0	4	1	167	676	410	0	2,451	1,644
Golden State WC	135	0	1	0	1,008	53	0	2,865	2,083
Huntington Beach	156	104	144	7	783	641	0	2,954	1,753
Irvine Ranch WD	646	1,090	451	725	11,100	5,958	993	28,859	8,538
La Habra	0	0	0	0	340	42	0	925	605
La Palma	0	0	0	0	0	509	0	675	131
Laguna Beach CWD	0	0	27	0	0	0	0	446	342
Mesa Water	41	6	0	79	661	782	0	4,254	2,307
Moulton Niguel WD	0	0	0	3	413	281	0	1,277	908
Newport Beach	35	0	0	0	566	0	0	1,834	1,414
Orange	73	1	271	81	275	2,851	0	5,030	2,035
San Juan Capistrano	0	0	14	0	0	0	0	260	427
San Clemente	19	0	0	1	0	0	0	432	412
Santa Margarita WD	0	0	0	2	90	743	0	950	283
Santiago CWD	0	0	0	0	0	0	0	0	0
Seal Beach	0	0	0	0	0	184	0	538	471
Serrano WD	0	0	0	0	0	0	0	0	0
South Coast WD	84	148	0	382	0	0	0	1,320	577
Trabuco Canyon WD	0	0	0	0	0	0	0	11	16
Tustin	0	0	0	75	358	212	0	1,402	913
Westminster	35	1	28	0	146	177	0	1,138	1,093
Yorba Linda	0	1	0	0	226	84	0	595	616
MWDOC Totals	1,966	1,594	1,172	2,161	17,275	13,829	1,350	64,361	29,594
Anaheim	48	165	342	463	3,072	309	407	14,160	7,641
Fullerton	0	94	0	178	476	621	0	2,778	1,811
Santa Ana	12	16	17	5	1,293	238	0	5,737	5,131
Non-MWDOC Totals	60	275	359	646	4,841	1,168	407	22,675	14,583
Orange County Totals	2,026	1,869	1,531	2,807	22,116	14,997	1,757	87,036	44,177

[1] Retrofit devices include UL+ Iolets and Urinals, High Efficiency Iolets and Urinals, Multi-Family and Multi-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 USE REDUCTION PROGRAM

Number of Process Changes by Agency

Agency	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	Overall Program Interventions	Annual Water Savings[1]
Brea	0	0	0	0	0	0	0	0	0
Buena Park	0	0	0	0	1	0	0	2	54
East Orange	0	0	0	0	0	0	0	0	0
El Toro	0	0	0	0	0	0	0	0	0
Fountain Valley	0	0	0	0	0	1	0	1	23
Garden Grove	0	0	0	0	1	0	0	1	0
Golden State	0	0	0	0	0	0	0	1	3
Huntington Beach	0	2	0	1	2	0	0	5	132
Irvine Ranch	1	1	1	0	2	1	0	9	115
La Habra	0	0	0	0	1	0	0	1	0
La Palma	0	0	0	0	0	0	0	0	0
Laguna Beach	0	0	0	0	0	0	0	0	0
Mesa Water	0	0	0	0	0	0	0	0	0
Moulton Niguel	0	0	0	0	0	0	0	0	0
Newport Beach	0	0	0	1	0	0	0	1	21
Orange	0	0	0	0	1	2	0	4	88
San Juan Capistrano	0	0	0	0	0	0	0	0	0
San Clemente	0	0	0	0	0	0	0	0	0
Santa Margarita	0	0	0	0	0	0	0	0	0
Seal Beach	0	0	0	0	0	0	0	0	0
Serrano	0	0	0	0	0	0	0	0	0
South Coast	0	0	0	0	1	1	0	2	134
Trabuco Canyon	0	0	0	0	0	0	0	0	0
Tustin	0	0	0	0	0	0	0	0	0
Westminster	0	0	0	0	0	0	0	0	0
Yorba Linda	0	0	0	0	0	0	0	0	0
MWDOC Totals	1	3	1	2	9	5	0	27	571
Anaheim	0	0	0	0	0	0	0	0	0
Fullerton	0	0	0	0	0	0	0	0	0
Santa Ana	0	0	0	0	1	0	0	1	11
OC Totals	1	3	1	2	10	5	0	28	582

[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 11/12		FY 12/13		FY 13/14		FY 14/15		FY 15/16		FY 16/17		FY 17/18		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	3,397	9,466	7,605	0	5,697	0	71,981	30,617	118,930	404,411	8,354	479	0	0	215,964	444,973	302,71
Buena Park	0	0	0	0	0	0	11,670	1,626	77,127	16,490	3,741	0	2,996	0	95,534	18,116	48,23
East Orange	0	0	0	0	1,964	0	18,312	0	27,844	0	0	0	0	0	48,120	0	23,32
El Toro	4,723	0	4,680	72,718	4,582	0	27,046	221,612	63,546	162,548	13,139	48,019	4,089	0	121,805	504,897	324,75
Fountain Valley	1,300	0	682	7,524	4,252	0	45,583	5,279	65,232	0	3,679	0	2,297	0	123,025	12,803	68,37
Garden Grove	14,013	0	4,534	0	8,274	0	67,701	22,000	177,408	49,226	11,504	0	4,487	0	287,921	117,403	224,31
Huntington Beach	42,593	30,973	31,813	3,200	32,725	8,424	164,507	190,738	310,264	112,937	0	0	0	0	581,902	346,272	506,98
Huntington Beach	27,630	48,838	9,219	12,437	20,642	0	165,600	58,942	305,420	270,303	9,560	21,534	3,110	0	541,982	415,705	489,24
Irvine Ranch	6,450	1,666	32,884	32,384	36,584	76,400	234,905	317,999	782,844	2,675,629	231,483	46,725	22,650	22,467	1,353,223	3,186,064	2,008,63
La Habra	0	8,262	0	0	0	0	14,014	1,818	49,691	72,164	0	0	1,450	0	65,155	90,019	77,05
La Palma	0	0	0	0	0	0	4,884	0	10,257	59,760	0	0	0	0	15,141	59,760	32,14
Laguna Beach	2,533	0	2,664	1,712	4,586	226	13,647	48,850	47,614	0	3,059	0	220	0	75,301	48,788	65,38
Mesa Water	6,777	0	10,667	0	22,246	0	131,675	33,620	220,815	106,896	4,173	77,033	5,940	0	402,293	217,549	284,94
Moulton Niguel	4,483	26,927	11,538	84,123	14,739	40,741	314,250	1,612,845	889,748	1,059,279	220,749	0	25,029	0	1,481,492	2,840,054	2,132,15
Newport Beach	3,454	0	3,548	2,346	894	0	33,995	65,277	76,675	375,404	2,924	0	0	0	121,490	443,027	255,24
Orange	12,971	0	15,951	8,723	11,244	0	120,093	281,402	289,990	108,487	12,847	2,366	4,414	0	467,510	398,978	437,53
San Clemente	21,502	0	16,062	13,165	18,471	13,908	90,349	1,137	215,249	438,963	4,267	0	11,595	0	377,495	467,173	397,10
San Juan Capistrano	22,656	103,692	29,544	27,156	12,106	0	101,195	32,366	197,290	143,315	2,624	40,748	0	0	365,415	347,277	409,91
Santa Margarita	1,964	11,400	10,151	11,600	17,778	48,180	211,198	514,198	534,048	550,420	17,010	28,094	13,653	0	810,285	1,169,453	965,01
Santiago	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Seal Beach	0	0	3,611	0	0	0	15,178	504	17,349	15,911	1,234	0	0	0	37,372	16,415	26,13
Serrano	0	0	0	0	2,971	0	41,247	0	127,877	4,403	5,450	0	0	0	177,545	4,403	82,26
South Coast	6,806	0	9,429	4,395	15,162	116,719	84,282	191,853	181,102	128,290	14,967	0	3,941	574	315,689	458,155	418,28
Trabuco Canyon	272	0	1,542	22,440	2,651	0	14,771	0	42,510	88,272	1,465	0	768	0	63,979	110,712	85,98
Tustin	0	0	9,980	0	1,410	0	71,285	14,137	232,697	33,362	11,173	0	0	0	326,545	47,499	172,08
Westminster	0	0	0	0	0	0	14,040	34,631	71,833	23,902	11,112	0	3,844	0	100,829	58,533	71,11
Yorba Linda	0	0	0	0	0	0	112,136	12,702	360,279	116,985	19,420	0	4,323	0	507,507	129,687	289,11
MWDOC Totals	183,524	241,224	216,104	303,923	238,978	304,598	2,195,544	3,692,153	5,493,639	7,015,357	613,934	264,998	114,806	23,041	9,080,519	11,953,715	10,197,94

Anaheim	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Fullerton	0	0	0	0	0	0	9,214	0	0	0	0	0	0	0	0	9,214	6,45
Santa Ana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Non-MWDOC Totals	0	0	0	0	0	9,214	0	0	0	0	0	0	0	0	0	9,214	6.45

Orange County Totals	183,524	241,224	216,104	303,923	238,978	313,812	2,195,544	3,692,153	5,493,639	7,015,357	613,934	264,998	114,806	23,041	9,080,519	11,962,929	10,204
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[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 11-12	FY 12-13	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18	Total	Cumulative Water Savings across all Fiscal Years
Brea	0	0	38	146	154	4	0	450	96.65
Buena Park	0	0	96	153	112	13	0	684	185.90
East Orange CWD RZ	0	0	13	26	24	0	0	86	20.43
El Toro WD	0	133	218	869	264	12	1	2,038	524.33
Fountain Valley	0	0	41	132	220	7	3	826	243.18
Garden Grove	0	0	63	350	363	7	1	1,485	411.46
Golden State WC	80	2	142	794	512	9	6	2,796	758.32
Huntington Beach	0	0	163	1,190	628	4	3	2,904	698.52
Irvine Ranch WD	0	1,449	810	1,777	2,798	638	99	17,008	5,292.18
Laguna Beach CWD	0	0	45	112	81	1	0	388	101.25
La Habra	0	0	37	94	83	5	1	591	190.75
La Palma	0	0	21	59	52	4	0	222	56.39
Mesa Water	0	0	147	162	162	7	0	1,618	580.97
Moulton Niguel WD	0	0	400	2,497	1,939	49	20	5,710	1,100.45
Newport Beach	0	0	49	168	243	11	4	729	177.26
Orange	0	1	142	978	416	17	1	2,180	515.31
San Juan Capistrano	0	0	35	140	202	3	2	525	116.91
San Clemente	0	0	72	225	246	11	0	872	218.24
Santa Margarita WD	0	0	528	997	1,152	114	15	3,324	651.45
Seal Beach	0	2	17	50	69	-1	0	857	385.24
Serrano WD	0	0	2	40	55	3	0	121	23.54
South Coast WD	23	64	102	398	235	11	3	1,024	222.75
Trabuco Canyon WD	0	0	10	108	169	2	0	339	62.73
Tustin	0	0	64	132	201	12	2	1,508	525.01
Westminster	0	0	35	161	359	3	1	1,332	403.46
Yorba Linda WD	0	0	40	280	379	12	4	1,255	335.11
MWDOC Totals	103	1,651	3,330	12,038	11,118	958	166	50,872	13,897.79

Anaheim	0	0	156	1,188	614	70	6	5,871	1,941.76
Fullerton	0	0	61	293	286	14	5	1,060	268.25
Santa Ana	0	0	33	602	293	20	0	2,021	601.53
Non-MWDOC Totals	0	0	250	2,083	1,193	104	11	8,952	2,811.54

Orange County Totals	103	1,651	3,580	14,121	12,311	1,062	177	59,824	16,709.33
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Water Smart Landscape Program

Total Number of Meters
in Program by Agency

Agency	FY 07-08	FY 08-09	FY 09-10	FY 10-11	FY 11-12	FY 12-13	FY 13-14	FY 14-15	FY 15-16	Overall Water Savings To Date (AF)
Brea	0	0	0	0	22	22	22	22	22	64.37
Buena Park	0	0	17	103	101	101	101	101	101	462.69
East Orange CWD RZ	0	0	0	0	0	0	0	0	0	0.00
El Toro WD	352	384	371	820	810	812	812	812	812	4,856.93
Fountain Valley	0	0	0	0	0	0	0	0	0	0.00
Garden Grove	0	0	0	0	0	0	0	0	0	0.00
Golden State WC	14	34	32	34	32	32	32	32	32	200.59
Huntington Beach	0	0	31	33	31	31	31	31	31	148.43
Irvine Ranch WD	708	1,008	6,297	6,347	6,368	6,795	6,797	6,769	6,780	38,304.89
Laguna Beach CWD	0	57	141	143	141	124	124	124	124	733.07
La Habra	0	23	22	24	22	22	22	22	22	136.72
La Palma	0	0	0	0	0	0	0	0	0	0.00
Mesa Water	165	286	285	288	450	504	511	514	515	2,943.57
Moulton Niguel WD	180	473	571	595	643	640	675	673	661	4,120.71
Newport Beach	58	142	171	191	226	262	300	300	300	1,501.19
Orange	0	0	0	0	0	0	0	0	0	0.00
San Clemente	227	233	247	271	269	269	299	407	459	2,368.77
San Juan Capistrano	0	0	0	0	0	0	0	0	0	0.00
Santa Margarita WD	945	1,571	1,666	1,746	1,962	1,956	2,274	2,386	2,386	14,178.10
Seal Beach	0	0	0	0	0	0	0	0	0	0.00
Serrano WD	0	0	0	0	0	0	0	0	0	0.00
South Coast WD	62	117	108	110	118	118	118	164	164	829.91
Trabuco Canyon WD	12	49	48	62	60	60	60	60	60	350.52
Tustin	0	0	0	0	0	0	0	0	0	0.00
Westminster	10	18	18	20	18	18	18	18	18	116.46
Yorba Linda WD	0	0	0	0	0	0	0	0	0	0.00
MWDOC Totals	2,733	4,395	10,025	10,787	11,273	11,766	12,196	12,435	12,487	71,316.9
Anaheim	0	0	142	146	144	190	190	190	190	1,351.53
Fullerton	0	0	0	0	0	0	0	0	0	0.00
Santa Ana	0	0	0	0	0	0	0	0	0	0.00
Non-MWDOC Totals	0	0	142	146	144	190	190	190	190	1,351.53
Orange Co. Totals	2,733	4,395	10,167	10,933	11,417	11,956	12,386	12,625	12,677	72,668.45

HOME WATER SURVEYS PERFORMED BY AGENCY

through MWDOC and Local Agency Conservation Programs

Agency	FY 13/14		FY 14/15		FY 15/16		Total		Cumulative Water Savings
	Surveys	Cert Homes	Surveys	Cert Homes	Surveys	Cert Homes	Surveys	Cert Homes	
Brea	1	0	2	0	0	0	3	0	0.16
Buena Park	0	0	1	0	0	0	1	0	0.05
East Orange	19	0	1	0	0	0	20	0	1.39
El Toro	0	0	3	0	0	0	3	0	0.14
Fountain Valley	3	0	4	0	1	0	8	0	0.42
Garden Grove	0	0	6	0	1	0	7	0	0.31
Golden State	0	0	0	0	0	0	0	0	0.00
Huntington Beach	2	0	5	0	2	0	9	0	0.42
Irvine Ranch	1	0	3	0	6	0	10	0	0.35
La Habra	0	0	1	0	0	0	1	0	0.05
La Palma	0	0	0	0	0	0	0	0	0.00
Laguna Beach	4	0	8	0	1	0	13	0	0.68
Mesa Water	0	0	0	0	0	0	0	0	0.00
Moulton Niguel	4	0	4	0	0	0	8	0	0.47
Newport Beach	2	0	8	0	6	0	16	0	0.66
Orange	2	0	18	0	1	0	21	0	1.01
San Clemente	15	0	13	0	0	0	28	0	1.67
San Juan Capistrano	4	0	13	0	2	0	19	0	0.94
Santa Margarita	15	0	40	1	14	0	69	1	3.27
Seal Beach	0	0	1	0	2	0	3	0	0.09
Serrano	0	0	2	0	0	0	2	0	0.09
South Coast	6	0	4	0	1	0	11	0	0.64
Trabuco Canyon	0	0	4	0	0	0	4	0	0.19
Tustin	0	0	10	0	5	0	15	0	0.59
Westminster	0	0	0	0	0	0	0	0	0.00
Yorba Linda	0	0	13	0	10	0	23	0	0.85
MWDOC Totals	78	0	164	1	52	0	294	1	14.44

Anaheim	0	0	0	0	0	0	0	0	0.00
Fullerton	0	0	17	0	1	0	18	0	0.82
Santa Ana	0	0	0	0	0	0	0	0	0.00
Non-MWDOC Totals	0	0	17	0	1	0	18	0	0.82

Orange County Totals	78	0	181	1	53	0	312	1	15.266
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SYNTHETIC TURF INSTALLED BY AGENCY^[1] through MWDOC and Local Agency Conservation Programs

Agency	FY 07/08		FY 08/09		FY 09/10		FY 10/11		Total Program		Cumulative Water Savings across all Fiscal Years
	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	
Brea	0	0	2,153	2,160	500	0	0	0	2,653	2,160	3.30
Buena Park	0	0	1,566	5,850	0	0	0	0	1,566	5,850	5.19
East Orange	0	0	0	0	983	0	0	0	983	0	0.55
El Toro	3,183	0	2,974	0	3,308	0	895	0	10,360	0	6.98
Fountain Valley	11,674	0	1,163	0	2,767	0	684	0	16,288	0	12.46
Garden Grove	1,860	0	0	0	3,197	0	274	0	5,331	0	3.47
Golden State	6,786	0	13,990	0	15,215	0	2,056	0	38,047	0	24.88
Huntington Beach	15,192	591	12,512	0	4,343	1,504	0	0	32,047	2,095	25.29
Irvine Ranch	11,009	876	13,669	0	2,585	0	0	0	27,263	876	21.00
La Habra	0	0	0	0	0	0	0	0	0	0	-
La Palma	429	0	0	0	0	0	0	0	429	0	0.36
Laguna Beach	3,950	0	3,026	0	725	0	0	0	7,701	0	5.84
Mesa Water	4,114	0	3,005	78,118	4,106	0	2,198	0	13,423	78,118	63.46
Moulton Niguel	14,151	0	25,635	2,420	7,432	0	0	0	47,218	2,420	35.69
Newport Beach	2,530	0	6,628	0	270	0	0	0	9,428	0	6.92
Orange	4,169	0	7,191	0	635	0	0	0	11,995	0	8.89
San Clemente	9,328	0	11,250	455	2,514	1,285	500	0	23,592	1,740	18.37
San Juan Capistrano	0	0	7,297	639	2,730	0	4,607	0	14,634	639	9.02
Santa Margarita	12,922	0	26,069	0	21,875	0	7,926	0	68,792	0	44.68
Seal Beach	0	0	817	0	0	0	0	0	817	0	0.57
Serrano	7,347	0	1,145	0	0	0	0	0	8,492	0	6.97
South Coast	2,311	0	6,316	0	17,200	0	1,044	0	26,871	0	16.43
Trabuco Canyon	1,202	0	9,827	0	0	0	0	0	11,029	0	7.89
Tustin	6,123	0	4,717	0	2,190	0	0	0	13,030	0	9.67
Westminster	2,748	16,566	8,215	0	890	0	0	0	11,853	16,566	22.47
Yorba Linda	11,792	0	12,683	0	4,341	5,835	0	0	28,816	5,835	24.48
MWDOC Totals	132,820	18,033	181,848	89,642	97,806	8,624	20,184	0	432,658	116,299	384.83

Anaheim	4,535	0	7,735	20,093	13,555	65,300	4,122	0	29,947	85,393	69.18
Fullerton	4,865	876	5,727	0	6,223	0	105	0	16,920	876	12.36
Santa Ana	0	0	2,820	0	525	0	0	0	3,345	0	2.27
Non-MWDOC Totals	9,400	876	16,282	20,093	20,303	65,300	4,227	0	50,212	86,269	83.81

Orange County Totals	142,220	18,909	198,130	109,735	118,109	73,924	24,411	0	482,870	202,568	468.63
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[1] Installed device numbers are calculated in square feet

ULF TOILETS INSTALLED BY AGENCY
through MWDOC and Local Agency Conservation Programs

Agency	Previous Years	FY 95-96	FY 96-97	FY 97-98	FY 98-99	FY 99-00	FY 00-01	FY 01-02	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	Total	Cumulative Water Savings across all Fiscal Years
Brea	378	189	299	299	122	144	867	585	341	401	26	48	17	4	0	3,720	1,692.64
Buena Park	361	147	331	802	520	469	524	1,229	2,325	1,522	50	40	18	9	0	8,347	3,498.37
East Orange CWD RZ	2	0	33	63	15	17	15	50	41	44	19	18	13	2	0	332	138.23
El Toro WD	1,169	511	678	889	711	171	310	564	472	324	176	205	61	40	0	6,281	3,091.16
Fountain Valley	638	454	635	858	1,289	2,355	1,697	1,406	1,400	802	176	111	58	32	0	11,911	5,383.10
Garden Grove	1,563	1,871	1,956	2,620	2,801	3,556	2,423	3,855	3,148	2,117	176	106	67	39	0	26,298	12,155.41
Golden State WC	3,535	1,396	3,141	1,113	3,024	2,957	1,379	2,143	3,222	1,870	167	116	501	43	0	24,607	11,731.47
Huntington Beach	3,963	1,779	2,600	2,522	2,319	3,492	3,281	2,698	3,752	1,901	367	308	143	121	0	29,246	13,854.70
Irvine Ranch WD	4,016	841	1,674	1,726	1,089	3,256	1,534	1,902	2,263	6,741	593	626	310	129	0	26,700	11,849.23
Laguna Beach CWD	283	93	118	74	149	306	220	85	271	118	32	26	29	6	0	1,810	845.69
La Habra	594	146	254	775	703	105	582	645	1,697	1,225	12	31	6	7	0	6,782	2,957.73
La Palma	65	180	222	125	44	132	518	173	343	193	31	27	20	17	0	2,090	927.52
Mesa Water	1,610	851	1,052	2,046	2,114	1,956	1,393	1,505	2,387	988	192	124	56	14	0	16,288	7,654.27
Moulton Niguel WD	744	309	761	698	523	475	716	891	728	684	410	381	187	100	0	7,607	3,371.14
Newport Beach	369	293	390	571	912	1,223	438	463	396	1,883	153	76	36	16	0	7,219	3,166.77
Orange	683	1,252	1,155	1,355	533	2,263	1,778	2,444	2,682	1,899	193	218	88	53	4	16,600	7,347.93
San Juan Capistrano	1,234	284	193	168	323	1,319	347	152	201	151	85	125	42	39	0	4,663	2,324.42
San Clemente	225	113	191	65	158	198	667	483	201	547	91	66	37	34	0	3,076	1,314.64
Santa Margarita WD	577	324	553	843	345	456	1,258	790	664	260	179	143	101	29	0	6,522	3,001.01
Seal Beach	74	66	312	609	47	155	132	81	134	729	29	10	6	12	0	2,396	1,073.80
Serrano WD	81	56	68	41	19	52	95	73	123	98	20	15	14	2	0	757	338.66
South Coast WD	110	176	177	114	182	181	133	358	191	469	88	72	32	22	0	2,305	990.05
Trabuco Canyon WD	10	78	42	42	25	21	40	181	102	30	17	20	12	14	0	634	273.02
Tustin	968	668	557	824	429	1,292	1,508	1,206	1,096	827	69	89	26	12	0	9,571	4,423.88
Westminster	747	493	969	1,066	2,336	2,291	2,304	1,523	2,492	1,118	145	105	70	24	0	15,683	7,064.28
Yorba Linda WD	257	309	417	457	404	1,400	759	1,690	1,155	627	158	136	81	41	0	7,891	3,409.49
MWDOC Totals	24,256	12,879	18,778	20,765	21,136	30,242	24,918	27,175	31,827	27,568	3,654	3,242	2,031	861	4	249,336	113,878.61

Anaheim	447	1,054	1,788	3,661	1,755	7,551	4,593	6,346	9,707	5,075	473	371	462	341	1	43,625	18,359.52
Fullerton	1,453	1,143	694	1,193	1,364	2,138	1,926	2,130	2,213	1,749	172	77	44	23	2	16,321	7,435.23
Santa Ana	1,111	1,964	1,205	2,729	2,088	8,788	5,614	10,822	10,716	9,164	279	134	25	5	0	54,644	22,887.95
Non-MWDOC Totals	3,011	4,161	3,687	7,583	5,207	18,477	12,133	19,298	22,636	15,988	924	582	531	369	3	114,590	48,682.70

Orange County Totals	27,267	17,040	22,465	28,348	26,343	48,719	37,051	46,473	54,463	43,556	4,578	3,824	2,562	1,230	7	363,926	162,561.30
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