

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

Jointly with the

**PLANNING & OPERATIONS COMMITTEE**

January 2, 2018, 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: Director Barbre

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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>.

**DISCUSSION ITEM**

1. RELIABILITY STUDY STATUS UPDATE AND DRAFT REVIEW OF SYSTEM (EMERGENCY) RELIABILITY WORKING ANALYSIS FOR SOUTH ORANGE COUNTY (SOC)

**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 OF ORANGE COUNTY'S CYCLIC IN-LIEU PROGRAM

### 3. 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

### 4. 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.



**DISCUSSION ITEM**

January 2, 2018

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

**FROM: Robert Hunter**  
**General Manager**

Staff Contact: Karl Seckel

**SUBJECT: Reliability Study Status Update and Draft Review of System**  
**(Emergency) Reliability Working Analysis for South Orange County**  
**(SOC)**

**STAFF RECOMMENDATION**

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Staff recommends the Planning & Operations Committee receive and file and provide comments on the report, as appropriate.

**COMMITTEE RECOMMENDATION**

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Committee recommends (To be determined at Committee Meeting)

**SUMMARY**

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Staff and MWD OC's consultant (CDM) have been working on an update of the 2016 OC Water Reliability Study. Components of the current effort include:

- Update of the Colorado River analyses for new climate change models and data option with potential implications for Metropolitan allocations under the Drought Contingency Plan
- Specific project evaluations for the major State, Regional and Orange County projects, including an additional, major Southern California reservoir
- System (emergency) reliability project analysis for Orange County.

Today's item provides an update and status report of the work in progress for the OC system reliability work; including both emergency needs and system options to meet those needs. Future reports will cover the other areas with a final phase report anticipated in Spring 2018. This work has been and will continue to be done in conjunction with the MWD OC Member Agencies.

<b>Budgeted (Y/N):</b>	Budgeted amount:	Core ____	Choice ____
<b>Action item amount:</b>	Line item:		
<b>Fiscal Impact (explain if unbudgeted):</b>			

The first phase of the reliability study concluded that the only portion of Orange County with a significant system reliability issue was South Orange County (SOC). The current supply reliability work has focused on identifying and evaluating cost-efficient project combinations to meet a range of emergency water demands in SOC. The most cost effective project combination for system reliability in SOC is a combination of the Doheny Desalination Project (23 cfs/15 mgd) supplemented by a groundwater emergency project based on the existing emergency groundwater agreement, or modified agreement as suggested in the 2016 OC Water Reliability Study, with the Orange County Water District (OCWD).

## **DETAILED REPORT**

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Staff and consultants have been working on the update of the 2016 OC Water Reliability Study. The updates include the following:

1. Review and update of the climate scenario information on both the Colorado River and the SWP supplies
2. Examination of options for the Drought Contingency Plan allocations on the Colorado River supplies
3. Evaluation of Regional MET Projects (regional & OC supply reliability)
  - a. California WaterFix
  - b. Carson IPR
4. Project evaluations impacting OCWD (supply only)
  - a. Poseidon
5. Project evaluations impacting South Orange County (SOC) (supply and system (emergency))
  - a. Poseidon
  - b. Doheny
  - c. San Juan Watershed Project
  - d. Strand Ranch (Central Valley) Drought Supplies
  - e. Cadiz
  - f. Emergency Groundwater to SOC
6. Evaluation of another major Southern California Reservoir for purposes of capturing additional wet year supplies (could provide both supply and system needs)

Staff anticipates several months to complete the update to the OC Water Reliability Study to address all of the issues above. The work has been more complex than anticipated and input regarding certain assumptions needs to be completed before release of the information.

### **Supply & System Reliability**

The concept of water reliability has been divided into two complementary components.

**SUPPLY** reliability deals with volume and delivery of the water supply over many years (out to 2040) through differing hydrologic events. It is functionally quantified as the percent of time the water supply will not meet defined supply volumes and trigger allocations (i.e., use restrictions). Examples include having to impose water use restrictions once in 20-years, or once in 10-years, or every other year. The complementary component of **SYSTEM** reliability deals with the ability of a water system to meet water demands under extreme emergency conditions such as earthquakes or power outages, and typically is on a duration interval of months.

### **System Reliability Update for SOC**

System reliability evaluations include determining the additional emergency water supply needs (over and above existing emergency supplies) to continue meeting reduced consumer demands during outages of the import system. The 2016 OC Water Reliability Study developed the target criteria of having the ability to supply reduced consumer demands for up to 60 days without the import system. This assumes a major earthquake has disrupted the import system and knocked out the Diemer Filtration Plant or supplies to or from the plant. It is assumed the Baker Treatment Plant remains in operation. System (emergency) reliability needs are typically not a concern for the OCWD basin agencies due to the magnitude of groundwater well supplies available to each agency nor for the cities of Brea or La Habra who have access to local supplies from Cal Domestic Water Company. The discussion below will focus primarily on the SOC needs for emergency supplies.

The 60-day criteria was developed in working with MET and our member agencies on potential outage situations impacting Orange County. The basis of the 60-day criteria also took into account what was deemed to be a reasonable division of emergency supply responsibilities between what the MET system can/should provide in the way of emergency storage to meet major outage needs in the event of a concurrent outage of the Colorado River Aqueduct (CRA), the State Water Project (SWP) and the Los Angeles Aqueduct (LAA) systems. MET's historical criteria was that any of these three aqueduct systems could each be disrupted for up to 6 months before flows could be restored. Based on that criteria, emergency storage in the MET system (approximately 630,000 AF) has been provided to meet emergency demands for 6-months, assuming a 25% demand reduction and assuming all local projects are kept operating (meaning groundwater supplies and other production or treatment facilities).

More recent work by MET, DWR and LA Department of Water and Power indicates that there is a likelihood of a concurrent outage of all three major aqueduct systems by way of a major rupture of the Southern Section of the San Andreas Fault from the Salton Sea all the way up north of the Tehachapi Mountains. The combined opinions of MET, DWR and the LA Department of Water and Power are that the emergency outage and recovery durations previously established need to be updated. Preliminary evaluations suggest that partial flows may be restored on the West Branch within 6-12 months. The level of uncertainty regarding potential damage and repair scenarios for the East Branch is considerably higher given the extensive length of aqueduct and higher number of facilities within close proximity to the San Andreas Fault. Preliminary evaluations suggest that repairs to restore partial flows along the East Branch may exceed 12-24 months. These are not yet hard estimates of the duration to recover the SWP and LAA although they are significantly higher than the old 6-month outage, and if implemented, would likely require additional access to emergency supplies. Additional work is proceeding at this time. Staff believes MET will be reevaluating their emergency storage criteria to account for these potentially longer outage scenarios.

This discussion has been included here to indicate that potentially longer outage durations being considered in MET's planning scenarios. These are only now beginning to emerge and will take some time (maybe years) to complete a comprehensive duration outage and recovery analysis for the SWP and Los Angeles Aqueduct facilities. MET has already completed a detailed evaluation of an outage and recovery analysis for the Colorado River Aqueduct system and believes that even under a major outage that the Colorado River

Aqueduct can be restored to 80% of capacity within 6 months. Staff believes that it is the appropriate responsibility of MET as the regional provider to plan for and provide emergency supplies to meet these more extreme outage events. Our belief is that it is much more cost-effective for MET to provide regional storage to meet emergency needs for longer durations than for each of MET's member agencies to provide for such needs. Staff also believes that that 60-day outage criteria adopted here in OC is appropriate and sufficient for Orange County's needs and likely for that of the other MET member agencies.

### **Estimated Emergency Needs for SOC**

Emergency supply needs are dependent on several primary factors:

- Level of demands to be met (emergencies can occur in the summer or winter)
- Length of time of outage
- Length of time of concurrent power outage
- Amount of water in storage reservoirs at time of outage (can be low or high)
- Level of non-potable supplies (reduces potable emergency needs)

MWDOC has worked with our agencies to standardize the emergency needs analyses on a regional basis. However, these factors can differ from agency to agency and each agency reserves the right to approach their planning needs based on their own local policies and situations. As a regional agency, MWDOC's point of view for the analysis is on a regional or sub-regional basis and not from that of a specific agency. MWDOC's most recent emergency needs analysis is provided below and provides a range of needs based on the two scenarios analyzed:

1. Uses 75% of annual normal<sup>(1)</sup> demands
2. Uses 100% of annual normal<sup>(1)</sup> demands

<sup>(1)</sup> Normal demands are based on average of 2010-11 FY to 2014-15 FY average annual usage

It should be noted that there are many demand scenarios that could be used besides the two outlined. MWDOC has examined a number of options besides the "normal" and 75% of normal demands included above; the other scenarios examined included using 2040 demands from the OC Water Reliability Study, high summer demands, low summer demands, a very wet January 2017 level of demands, summer demands from 2015 (when we were operating under the SWRCB restrictions) and the last scenario examined the SWRCB restricted demands from the recent drought. These scenarios ranged from 49% to 134% of the "100% normal demands" noted above with the SWRCB demands being 79% and the 2040 demands being 85%. With future demands hardened, it will be more difficult to achieve demand reductions during emergency situations. Staff believes the two scenarios outlined provide a reasonable range for analysis purposes, but will be seeking input from our agencies on their particular needs.

Both scenarios assume that the capacity available from the Irvine Regional Interconnection Project (i.e., the existing emergency groundwater agreement) will be reduced to 10 cfs over time. That project initially had a maximum capacity of about 25 cfs when started in 2009 but the capacity available from IRWD drops over time as their own customer demands increase. The agreement provides for the capacity to drop to zero by 2030. The available capacity not only varies between years but seasonally and is typically not available in

summer months. The portion of the year when water cannot move per the agreement expands year by year until none exists for the year 2030. In preliminary discussions with IRWD, they expect to have a long term availability of about 10 cfs to provide to SOC to assist with emergency needs if the agreement is extended, but do not believe they can commit to sharing water during the summer months. Staff is working on a technical evaluation of the ability of the IRWD system to provide water to SOC agencies over time to develop a better understanding of what amount of supply will be reliably available.

Table 1 below provides the emergency recovery needs analysis on an agency by agency basis. Scenario 1 is where staff believes most agencies would align but is subject to confirmation. Scenario 2 is very similar to what was developed in the 2016 OC Water Reliability Study.

<b>Table 1</b>		
<b>Estimated System Emergency Recovery Needs for SOC Agencies Under Two Scenarios</b>		
	<b>1</b>	<b>2</b>
<b>Agency</b>	<b>60-Day Recovery Needs Using 75% of Normal Annual Average Demands (CFS)</b>	<b>60-Day Recovery Needs Using 100% of Normal Annual Average Demands (CFS)</b>
El Toro WD	1.8	5.3
Laguna Beach CWD	0.0	0.0
Moulton Niguel WD	6.8	17.5
San Clemente	5.5	9.0
San Juan Capistrano	0.0	2.3
Santa Margarita WD	6.8	17.5
South Coast WD	6.3	6.3
Trabuco Canyon WD	0.0	0.0
<b>Total</b>	<b>27.2</b>	<b>58.0</b>
<b>Volume of water over 60 days in AF</b>	<b>3,267</b>	<b>6,960</b>
<b>(1) Normal demands based on average of 2010-11 FY to 2014-15 FY average annual usage converted to GPM</b>		

The scenarios indicate that the required volume of water for a 60-day outage would range from 3,267 AF to 6,960 AF. By way of this memo, MWDOC will seek input from all South County Agencies and try to reach a single target CFS of supply for each agency.

## **Projects to Meet Emergency System Needs**

Following are the projects identified to potentially meet the emergency needs of the SOC agencies:

- Doheny Project
- Poseidon Project
- Local Projects by agencies
- Irvine Interconnection Expansion beyond 10 cfs (previously discussed)
- Emergency Groundwater Project from OCWD

MWDOC has begun the evaluation of these projects to help understand the economics of the emergency supplies that will be available if these projects are implemented. This information will be combined with the overall update of the OC Water Reliability Study to provide recommendations from MWDOC's regional perspective. The method of analysis for the **SYSTEM** reliability analysis involves estimating the peak emergency supplies in cubic feet per second (CFS) that can be made available from any of the projects noted and then estimating the costs of providing these supplies. This analysis is fundamentally an assessment of the comparative costs to meet the emergency system reliability requirements. The initial analysis by MWDOC is focused **ONLY** on the system reliability needs and not the supply needs at this time. Staff has "extracted" the cost of providing the system (emergency) benefits in the following manner:

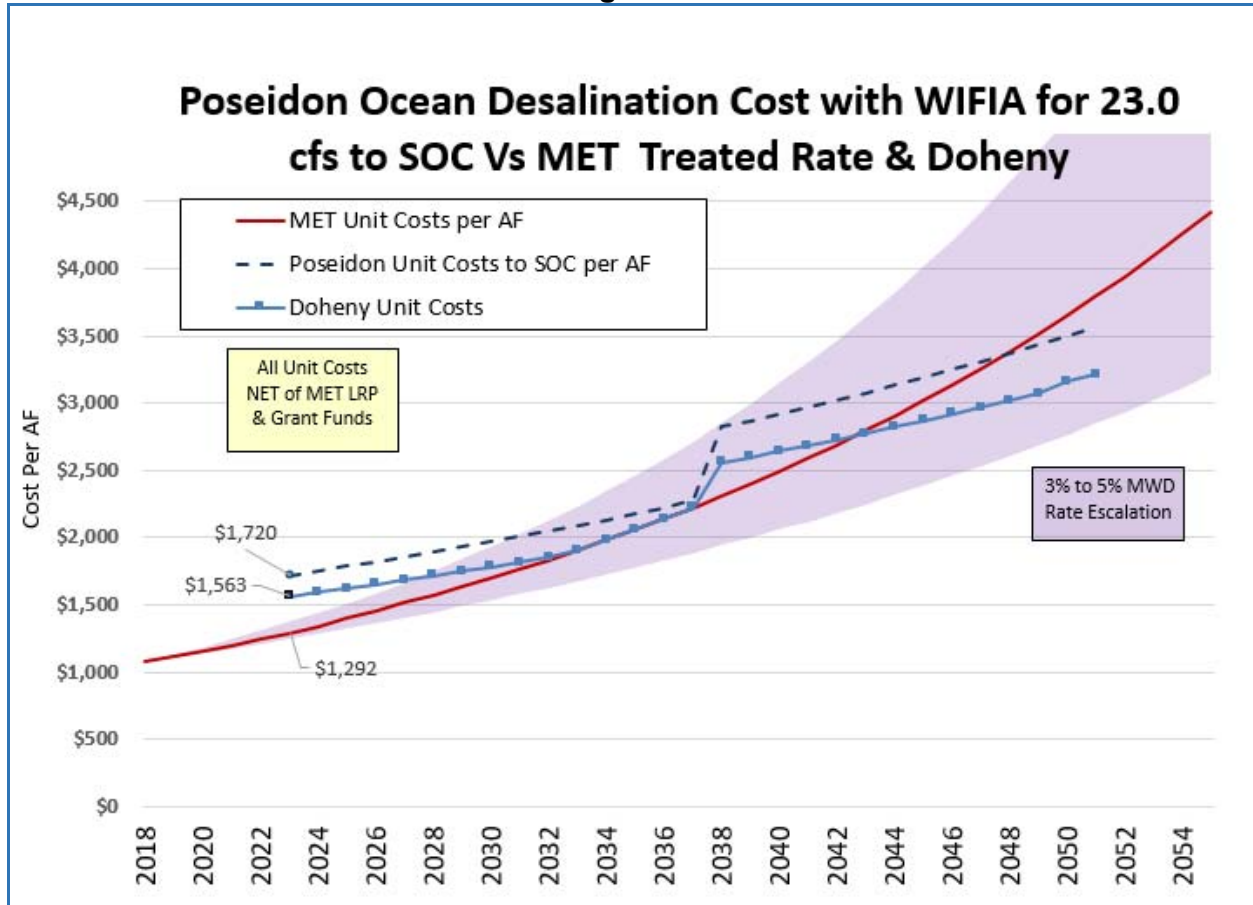
- The assumed start-up date of these projects is 2023 for purposes of discounting future dollars.
- The cost of MET water is netted out of the calculations.
  - If a supply project is developed at a unit cost above the cost of MET water, the cost of MET water is deducted from the unit cost of the Project being evaluated. The remaining costs represent the "premium" cost of the project above the cost of MET water. This premium is used as the estimated cost of the System supply on a year by year basis. This premium difference each year is discounted to 2023 dollars and summed over the next 30 years to determine the overall the Net Present Value of the costs to serve as the cost of securing the emergency supply.
  - If a supply project is developed at a unit cost lower than the cost of MET water, the emergency system capacity would essentially be provided for FREE. We do not have any projects in this category.
- For emergency only projects such as the Groundwater Emergency Supply from OCWD, the annual cost of the project is estimated for each future year and then discounted to 2023 and summed over 30 years to determine the NPV as the cost of providing groundwater emergency supplies. The analysis used for estimating the costs is consistent with the concepts outlined in the 2016 OC Water Reliability Study where a pump-in to the East Orange County Feeder No. 2 was proposed, but never negotiated. The assumed terms for the sharing of well supplies with basin agencies is as follows:



- SOC pays for 1/3 the cost of NEW wells for groundwater producers. The groundwater producers pay for 2/3rds of the cost of the wells and get to use them except during emergency situations.
- SOC pays 100% of the costs for the booster pump stations, the connections to the EOCF#2 and the cost of the chloramination (disinfection) facility.
- SOC pays for basin replacement water at the full cost of treated MET water to OCWD along with an estimated 5% loss of water and \$100 per AF incentive fee for each AF of water delivered (similar to terms from the MET Conjunctive Use Program). The volumes moved over a 60-day emergency outage range from 3,000 AF to about 7,000 AF during any one emergency as outlined in Table 1. These terms are similar, but not exact, to the current emergency groundwater agreement.
- SOC pays the energy costs to move the water, when needed.
- It was assumed that emergency water would be needed under such an arrangement 1 time every 10 years, or three times over the period analyzed. The cost of the analysis is somewhat insensitive to the assumption of how often emergency water needs to move because the capital costs of constructing the infrastructure to have the ability to move the water represents the majority of costs involved in the project.
- The emergency supplies potentially available from other NEW local supply projects under development by SOC agencies were not considered in this analysis, but can be included at a later date or can be considered in the input received back from the agencies.

A DRAFT summary graphic of the cost of Poseidon water delivered to SOC, the Doheny water delivered to SOC and the cost of MET water over time is provided below as Figure 1. In Figure 1, the difference between the cost curve for either project and the cost of MET water is the “premium cost” of the emergency portion of these supplies. Figure 1 also assumes Poseidon will be able to secure WIFIA funding which has the effect of lowering the cost of the water because of the attractive rate offered under the WIFIA program for up to 49% of the plant costs. The latter analysis included herein includes the Poseidon costs both with and without the WIFIA financing available. The costs for both projects assume they are able to secure LRP funding from MET.

Figure 1



The NPV cost for 23 cfs of supplies from each of the three projects is as follows:

- Doheny = \$5.8M
- Emergency Groundwater = \$36.0M
- Poseidon = \$73.5M to \$105.9M (the lower number assumes WIFIA financing is available)

The NPV costs should be interpreted as follows. The Doheny cost of \$5.8M means that over the 30 years of the Doheny project, the present value of the cost of water over the cost of MET water, valued in 2023 dollars (the estimated start-up of any of these projects), is \$5.8M for 23 cfs of supply.

Because the two emergency recovery needs alternatives being evaluated require more emergency supply (27 cfs and 58 cfs) than what can be provided just by Doheny (23 cfs), it requires analysis of various combinations of the projects to meet the necessary emergency needs. Table 2 below provides the various emergency options analyzed in a manner to meet the two levels of emergency supply needs.

<b>Table 2</b> <b>Summary Emergency System Options</b>			
		Range of Reliability Needs in CFS	
Option		27.2	58.0
1	Doheny	23.0	23.0
	GW	4.2	35.0
	Total	27.2	58.0
2	Poseidon	27.2	58.0
3	Doheny	23.0	23.0
	Poseidon	4.2	35.0
	Total	27.2	58.0
4	GW	27.2	58.0

Table 3 below provides the summary of the Net Present Value (NPV) analysis for all scenarios analyzed. A discount factor of 4.0% was used for all of the analyses.

<b>Table 3</b> <b>Summary Net Present Value Analysis of System Reliability Options</b>					
		Range of Reliability Needs in CFS		NET Present Value dollars (\$Millions)	
Option		27.2	58.0	27.2	58.0
1	Doheny	23.0	23.0	\$5.8	\$5.8
	GW	4.2	35.0	\$6.6	\$54.8
	Total	27.2	58.0	\$12.4	\$60.6
2	Poseidon (No Wifia)	27.2	58.0	\$119.5	\$240.0
	Poseidon (Wifia)	27.2	58.0	\$81.1	\$157.9
3	Doheny	23.0	23.0	\$5.8	\$5.8
	Poseidon (No Wifia)	4.2	35.0	\$14.1	\$151.8
	Total	27.2	58.0	\$20.0	\$157.7
	Doheny	23.0	23.0	\$5.8	\$5.8
	Poseidon (Wifia)	4.2	12.0	\$8.1	\$102.5
	Total	27.2	35.0	\$13.9	\$108.3
4	GW	27.2	58.0	\$42.6	\$90.7

The analysis summarized in Table 3 implies:

- The Doheny Project provides the least cost emergency supply to SOC up to 23 cfs. The Doheny project by itself is not able to meet the demands under the two scenarios analyzed and so other projects need to be paired with Doheny to meet the collective need.
- The second least cost emergency supplies are the Groundwater Emergency supplies. However, it should be noted that no negotiations have occurred on this option and so the analysis should be considered conceptual at this point. It should also be noted that the OCWD Groundwater Producers and OCWD Board have just recently considered examining various storage options that involve SOC (was brought up for the first time in the OCWD Water Issues Committee in December 2017). The Groundwater Producers and OCWD Board will be considering the policy implications of such programs, which will likely take 6 months or more to advance.

The storage options appear to be broader than simply providing the emergency supply needs and may involve the storage of MET or other water, providing base loaded supplies to SOC or providing dry-year supplies to SOC. Staff has requested to have the emergency needs aspect also addressed, as it appears to be considerably less controversial than storage to provide dry year needs or storage to provide “extraordinary” supplies under the MET Water Supply Allocation Plan (WSAP). Staff will keep the Board informed as these discussions proceed.

- The Poseidon costs related to emergency supplies appear to be the highest cost for supplying emergency water to SOC. Both the Poseidon and the Emergency Groundwater projects can fully meet the two scenarios being analyzed.

Other comments related to the analysis are:

- Because of the work completed by South Coast Water District, the Doheny costs have likely had more work completed on estimating the cost of the project for water delivered to SOC. The Doheny costs also include a \$50M contingency for the potential costs of integrating the capacity of the project among the neighboring agencies. The cost estimates included for the Emergency Groundwater and Poseidon should be considered to be a bit more conceptual and subject to further negotiation.
- The location of the Doheny Project, along the coast in Dana Point, requires that more and more energy costs and facility costs will be required to move the water further inland during emergency situations. For this reason, there may be an optimum point for how far inland the Doheny water is pushed to meet emergency needs when balanced with capacity in the Emergency Groundwater Project which may be able to more easily supply emergency demands further inland. Staff will be evaluating this situation.
- MWD OC Staff will continue to work with our Member Agencies to refine and finalize this information.

A presentation for the P&O Committee is attached.

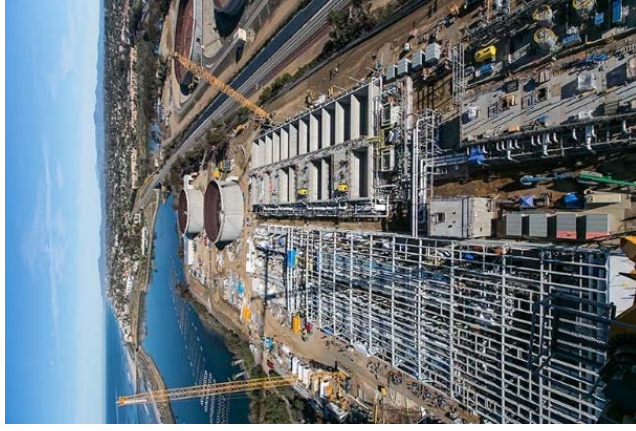
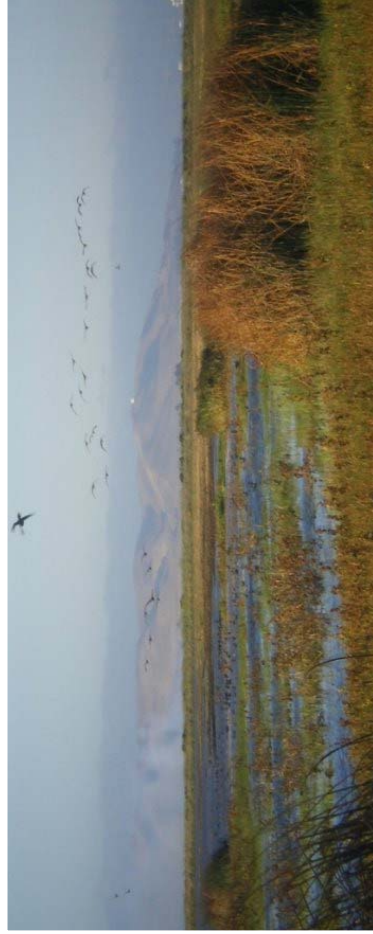




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# MWDOC P&O Committee Emergency Water System Reliability to SOC

January 2, 2018

# What is Water Reliability?

## Supply Reliability

- 💧 How often are you short water supplies and how much are you short? (Mandatory Reductions)



## System Reliability

- 💧 How reliable is your system (can demands be met) under different emergency situations?



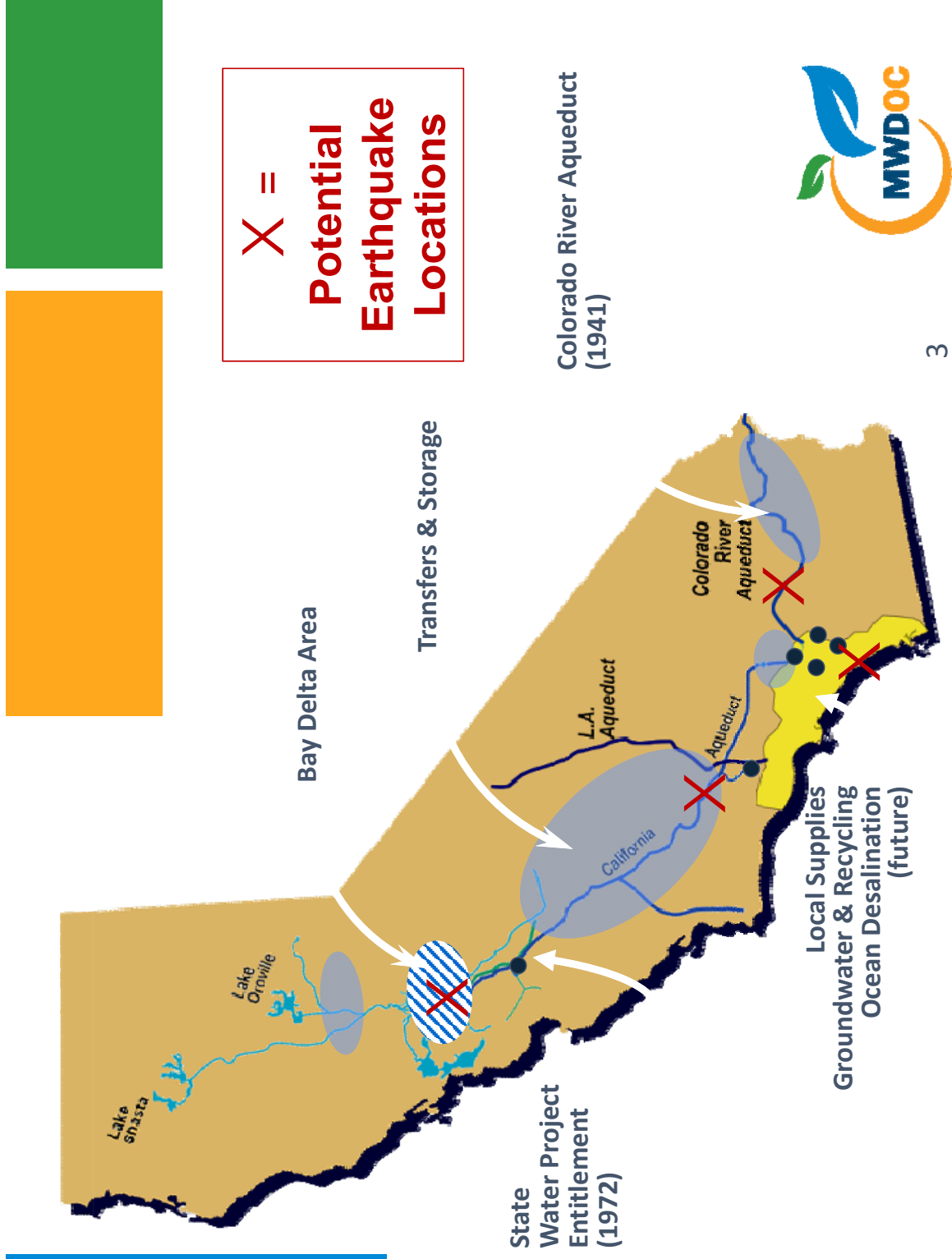


# EMERGENCY GAP Analysis (System Reliability)

## Primary Risks:

- Earthquakes
- Power Outages

Page 17 of 51



# System Reliability Assumptions Modeling

- Assumes curtailment in demands during an emergency to:
  - Average annual demands
  - 75% of annual average (similar to a winter low demand)
- Local water production continues; assumes locally produced water and water in their storage reservoirs can be moved throughout their distribution system
- Water in storage reservoirs is utilized over 60 days
- The goal of the modelling is to identify system GAPS in product water or storage to meet a reduced consumptive demand for up to 60 days without the MET system.*

*The system reliability gap is only in South Orange County*



Table 1 Estimated System Emergency Recovery Needs for SOC Agencies Under Two Scenarios		
	1	2
Agency	60-Day Recovery Needs Using 75% of Normal Annual Average Demands (CFS)	60-Day Recovery Needs Using 100% of Normal Annual Average Demands (CFS)
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Total	27.2	58.0
Volume of water over 60 days in AF	3,267	6,960
(1) Normal demands based on average of 2010-11 FY to 2014-15 FY average annual usage converted to GPM		



Other scenarios ranged from 49% to 134% of Annual Average

This assumes the IRWD Interconnection Project can provide 10 cfs beyond 2030

Need Input from the SOC Agencies based on their own evaluation of their emergency needs



# Key Project Questions

**What project or combination of projects provides the best value for South OC system (emergency reliability)?**

- ▣ **Poseidon**
- ▣ **Doheny**
- ▣ **Emergency Groundwater Project**

The following projects are being evaluated for supply reliability, but they do not provide additional emergency reliability.

- ▣ San Juan Watershed Project
- ▣ Strand Ranch (Central Valley Banking)
- ▣ Cadiz



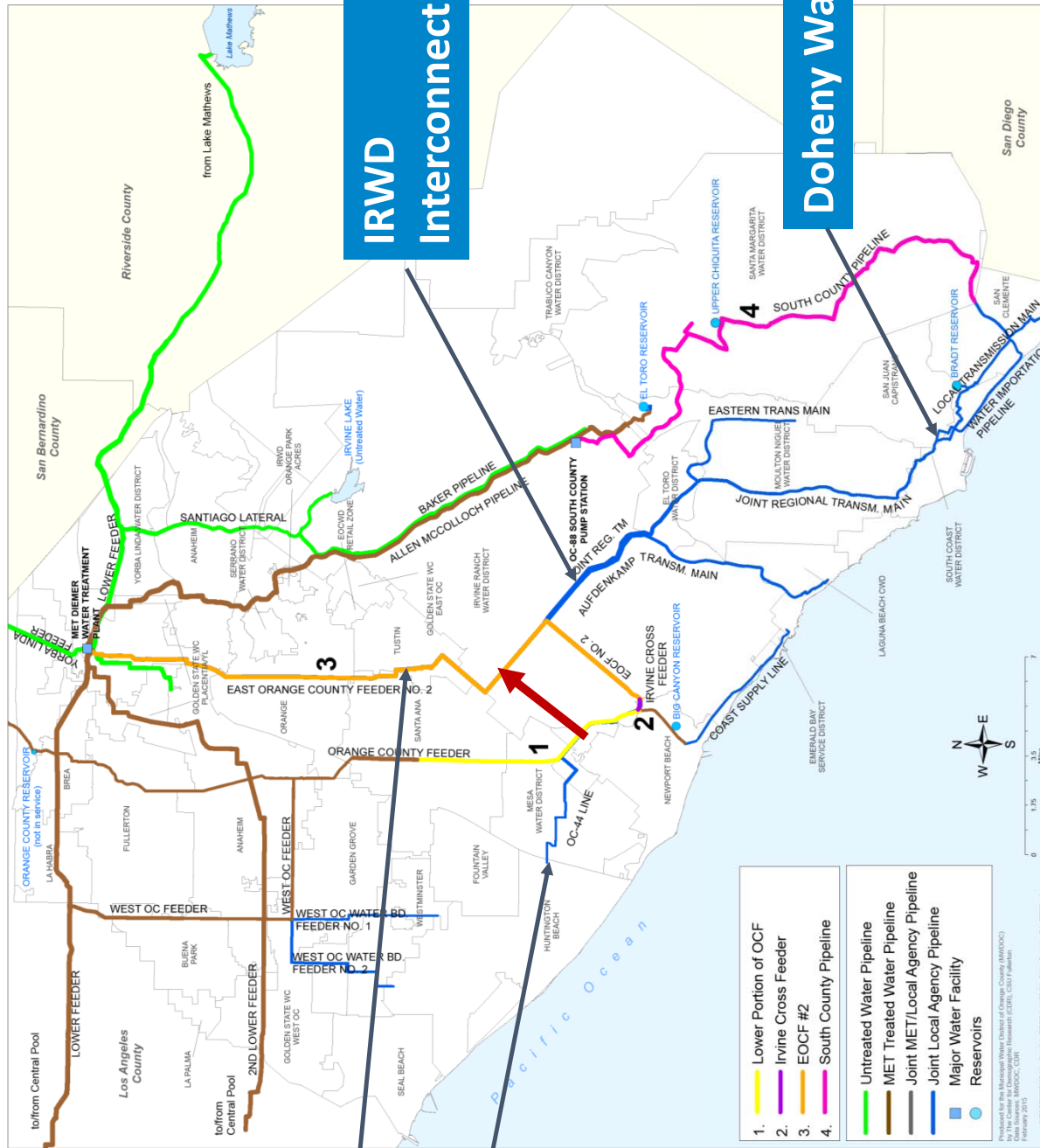
# System Reliability Projects EOCF#2

Groundwater

Poseidon Water

IRWD Interconnection

Doheny Water



# Basis of cost estimates

- Cost estimates for the three projects are from different sources and reflect different assumptions. MWD OC staff have worked to make the project scenarios as complete and compatible as possible.
- Poseidon costs are based mainly on the David Moore report published by OCWD in 2015, escalated to future dollars, combined with recent discussions with Poseidon, and integration costs developed between MWD OC and work OCWD has completed.
- Doheny costs are based on the GHD work completed for South Coast over about the past year. The following cost modifications were made (integration lift was increased, a land value was added, cost of groundwater mitigation was added and costs for securing State Parks approval were added)

The Groundwater Emergency costs were developed entirely by MWD OC and are consistent with those costs provided in the OC Water Reliability Study



## Poseidon Ocean Desalination Cost with WIFIA for 23.0 cfs to SOC Vs MET Treated Rate & Doheny

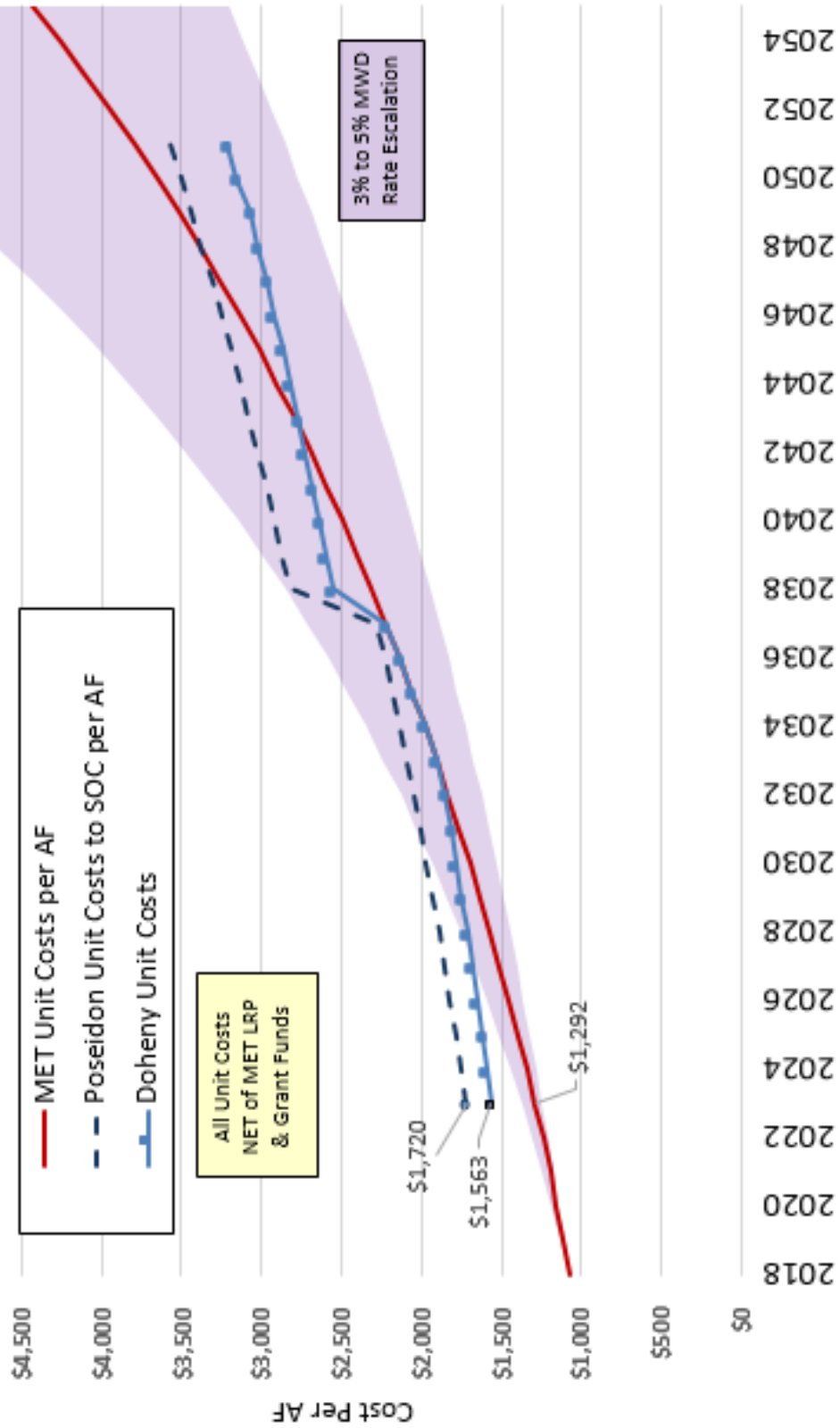


Table 3 Summary Net Present Value Analysis of System Reliability Options						
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1						
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	Total	27.2	58.0	\$12.4	\$60.6	
2						
	Poseidon (No Wifia)	27.2	58.0	\$119.5	\$240.0	
	Poseidon (Wifia)	27.2	58.0	\$81.1	\$157.9	
3						
	Doheny	23.0	23.0	\$5.8	\$5.8	
	Poseidon (No Wifia)	4.2	35.0	\$14.1	\$151.8	
	Total	27.2	58.0	\$20.0	\$157.7	
	Doheny	23.0	23.0	\$5.8	\$5.8	
	Poseidon (Wifia)	4.2	12.0	\$8.1	\$102.5	
	Total	27.2	35.0	\$13.9	\$108.3	
4						
	GW	27.2	58.0	\$42.6	\$90.7	



# Implications of Work

- ❖ Doheny has the lowest cost of providing up to 23 cfs of emergency capacity.
- ❖ The Groundwater Emergency Project has the next lowest cost:
  - ❖ Has not been negotiated
  - ❖ OCWD Board and producers are discussing options with SOC
  - ❖ Costs should be considered conceptual at this time
- ❖ Doheny costs are more firm than other projects
- ❖ Doheny and the GW Emergency storage can work together in meeting coastal and inland SOC emergency needs



# Next Steps

- Review work with member agencies and others
- Participate in emergency and other storage discussions with OCWD and SOC
- Continue with the “Supply” reliability update
- Report back in Spring 2018



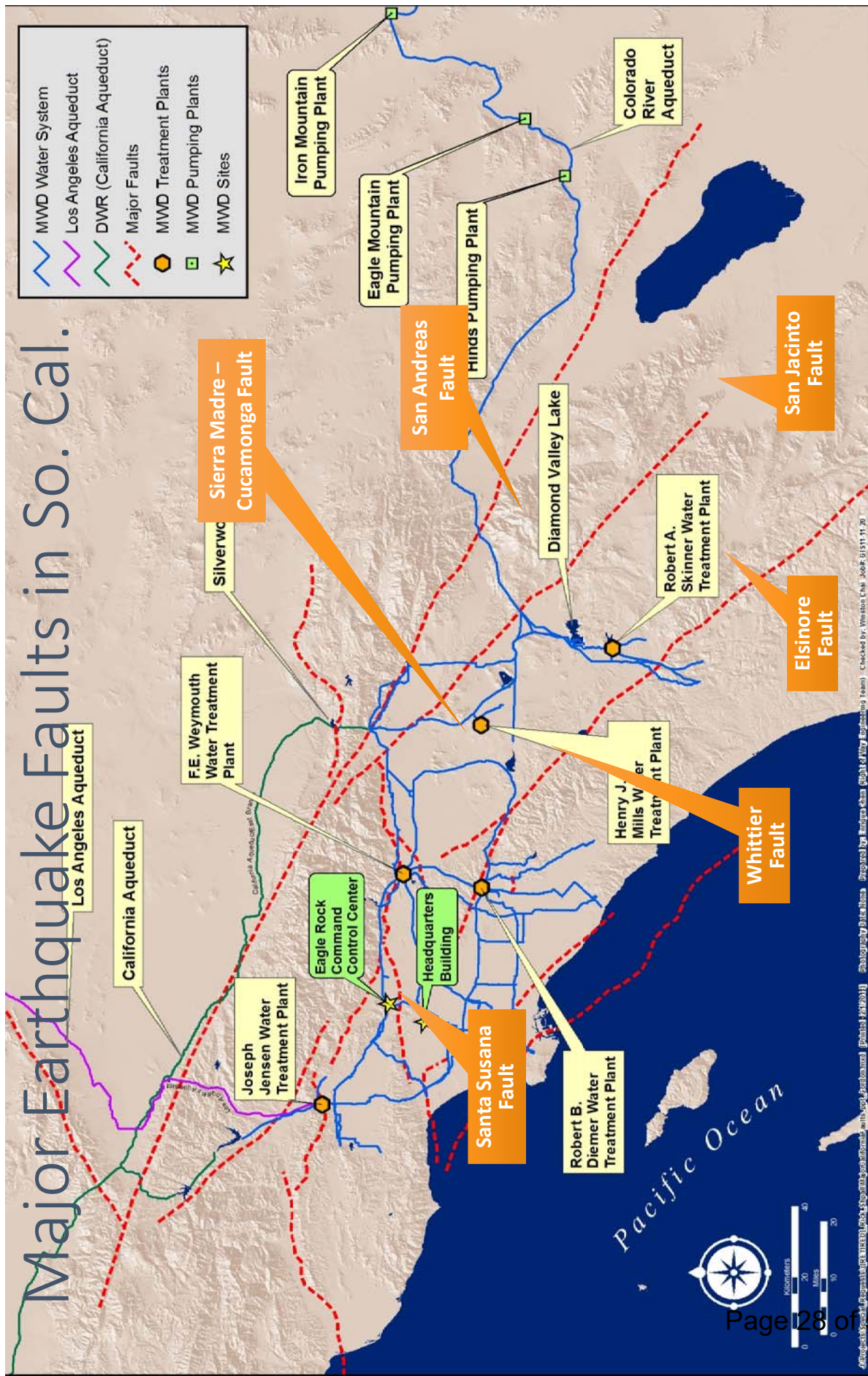


Questions???





# Major Earthquake Faults in So. Cal.





**DISCUSSION ITEM**

January 2, 2018

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

**FROM: Robert Hunter, General Manager**

Staff Contact: Harvey De La Torre and Kevin Hostert

**SUBJECT: STATUS OF ORANGE COUNTY'S CYCLIC IN-LIEU PROGRAM**

**STAFF RECOMMENDATION**

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Staff recommends the Planning & Operations Committee.

**COMMITTEE RECOMMENDATION**

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Committee recommends (To be determined at Committee Meeting)

**BACKGROUND**

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On July 19, 2017, the MWD OC Board of Directors authorized the General Manager to enter into Cyclic Agreements with the Metropolitan Water District, Orange County Water District, and the cities of Anaheim, Fullerton, and Santa Ana in the implementation of a one-time Metropolitan In-Lieu Program, as adopted by the Metropolitan Board on July 11, 2017. The purpose of this program is to replenish local groundwater storage that was severely depleted during the recent drought and optimize the storage of the excess supplies available to Metropolitan this year.

Water year (October to September) 2017 was officially the wettest year on record for Northern California, yielding record breaking runoff and a State Water Project (SWP) "Table A" allocation of 85%; and for the first time in six years, the Upper Colorado River Basin resulted in above normal runoff. Additionally, Metropolitan received approximately 124 TAF of Article 21 SWP supplies, which are surplus SWP supplies for state contractors. This will result in an estimated 2.75 MAF of available supplies for Metropolitan. With demand expected to end the year at 1.5 MAF, supplies will exceed demands by over 1.2 MAF.

Budgeted (Y/N): N/A	Budgeted amount: N/A	Core _X_	Choice __
Action item amount: None	Line item:		
Fiscal Impact (explain if unbudgeted):			

As a result of abundant supplies on the SWP and the discovery of “suspected” Quagga Mussels, at the time, in the East Branch of the California Aqueduct limiting direct replenishment deliveries (Note: Quagga Mussels were later determined not to be in the SWP East Branch), the Metropolitan Board offered a one-time In-Lieu Program to its member agencies with cyclic agreements to maximize their ability to capture excess imported water supplies. The In-Lieu program directly puts water into the Orange County Groundwater Basin by allowing groundwater producers to take additional Metropolitan treated imported water at a cost-neutral price “In-Lieu” of pumping groundwater. The Orange County Water District (OCWD) has committed to taking up to 100 TAF of In-Lieu water for the 2017-18 Fiscal Year, which will refill the Orange County Basin to 60% (Note: OCWD’s ideal basin operating range is 70% to 80% full).

In coordination with OCWD staff and the eighteen participating groundwater producers, MWDOC staff is administering the operations of the program and submitting monthly certification forms to Metropolitan. The purpose of this report is to provide the MWDOC Board with the first quarter certification update and progress toward achieving the storage goal of 100 TAF by the end of the fiscal year.

## **QUARTERLY UPDATE**

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This second quarter certification update is comprised of the imported water requested to be certified as In-Lieu by Metropolitan for the months of **October, November, and December** for MWDOC’s member agencies and the Cities of Anaheim, Fullerton, and Santa Ana. For the month of October, 15,181 AF of imported water has been requested to Metropolitan to be certified as In-Lieu water. For the month of November, we requested that 11,264 AF of imported water be certified as In-Lieu. And for the month of December, MWDOC staff is projecting between 7,000 AF and 10,000 AF of In-Lieu deliveries to be certified depending on water demands and how agencies perform. **Year-to-date In-Lieu totals are 53.5 TAF** and are tracking ahead of the original In-Lieu Operating goal for certifying 100 TAF by the end of FY 2017-18.

## **POTENTIAL DISCONTINUATION OF THE MET/MWDOC CYCLIC IN-LIEU PROGRAM**

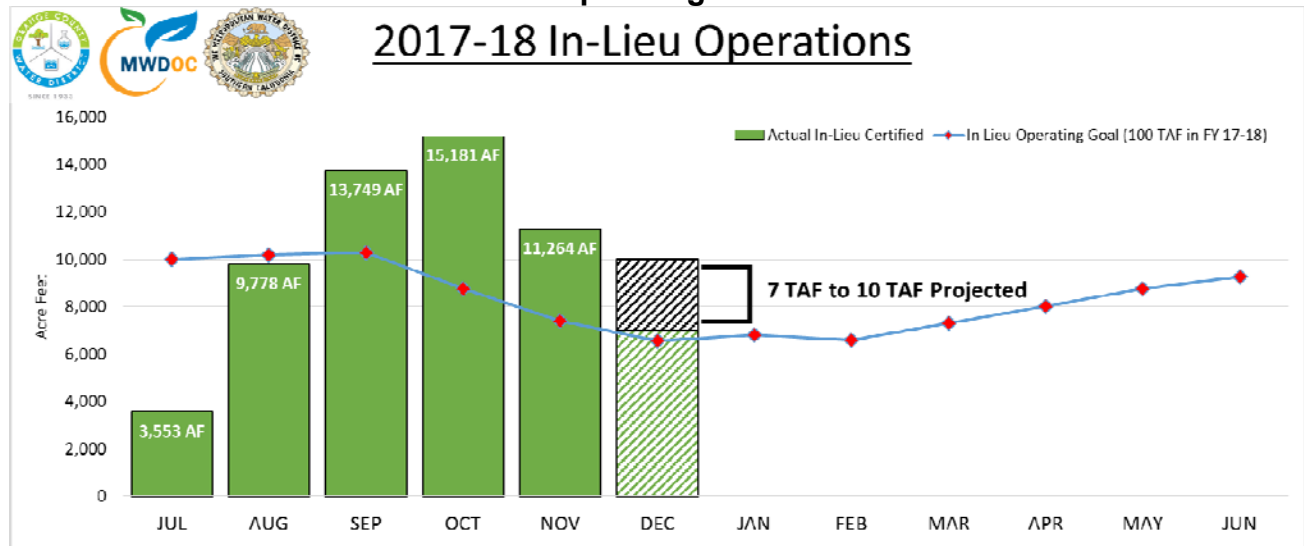
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On December 18<sup>th</sup> MWDOC staff received notification from Metropolitan staff that due to the extreme dry weather that had occur throughout the state of California in the month of December, there was a possibility Metropolitan could end the In-Lieu Program February 1<sup>st</sup> 2018. The chance of the In-Lieu program ending earlier than expected increases if the month of January sees below average snow and rainfall, which will result in a State Water Project “Table A” Allocation remaining below average. MWDOC staff has been monitoring the situation and will know more in the coming weeks whether MET will formally announce the discontinuation of the In-Lieu program.

## 2017-18 In-Lieu Deliveries by Retail Agency

Actual In-Lieu Credits (AF)	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	Total
City of Anaheim	0.0	0.0	2,963.3	3,559.6	3,421.8								9,944.7
City of Buena Park	0.0	0.0	766.9	0.0	0.0								766.9
East Orange County Water District	77.2	80.7	68.9	71.4	37.0								335.2
City of Fountain Valley	0.0	382.1	320.7	355.1	257.3								1,315.1
City of Fullerton	0.0	0.0	163.9	643.1	133.8								940.8
City of Garden Grove	66.9	391.7	351.9	211.4	432.1								1,453.9
Golden State Water Company	490.9	1,095.0	989.8	1,378.7	1,012.4								4,966.8
City of Huntington Beach	1,279.1	1,837.9	1,921.2	1,917.3	874.7								7,830.3
Irvine Ranch Water District	777.7	2,123.0	1,828.8	1,852.6	1,603.8								8,185.8
Laguna Beach County Water District	21.6	190.2	230.0	258.2	188.6								888.6
Mesa Water District	47.1	927.0	891.6	1,179.2	778.1								3,823.0
City of Newport Beach	426.9	448.3	400.1	907.8	0.0								2,183.1
City of Orange	0.0	390.0	642.1	719.8	881.2								2,633.1
City of Santa Ana	0.0	234.4	601.6	579.3	253.6								1,668.9
City of Seal Beach	37.0	62.8	92.8	215.0	267.4								675.0
City of Tustin	208.4	706.9	690.9	678.6	608.3								2,893.1
City of Westminster	95.5	277.4	277.2	104.6	92.4								847.0
Yorba Linda Water District	24.3	630.8	547.1	549.2	421.1								2,172.5
<b>Total OCWD Agencies</b>	<b>3,552.5</b>	<b>9,778.2</b>	<b>13,748.8</b>	<b>15,180.8</b>	<b>11,263.6</b>	<b>7,000.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>53,523.9</b>
<b>Total MWDOC Agencies</b>	<b>3,552.5</b>	<b>9,543.8</b>	<b>10,020.0</b>	<b>10,398.8</b>	<b>7,454.4</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>40,969.5</b>

## 2017-18 Total In-Lieu Deliveries VS. Operating Goal



<b>ENGINEERING &amp; PLANNING</b>	
<b>Doheny Ocean Desalination Project</b>	<p><b><u>UPDATED</u></b></p> <p>On December 7, 2017 South Coast Water District held a second (or Amended) Notice of Preparation &amp; Public Scoping Meeting for the Doheny Ocean Desalination Project as part of the Environment Impact Report (EIR) process. The meeting provided public notice of additional elements being added into the EIR (specifically the recent geotechnical work identifying additional potential slant well locations). The draft EIR release for public comments is anticipated in February 2018.</p>
<b>Orange County Reliability Study</b>	<p>Please see the Information Item in the packet.</p> <p>Staff and consultants have been working on an update to the 2016 OC Water Reliability Study.</p>
<b>San Juan Basin Authority</b>	<p>Charles Busslinger attended the San Juan Basin Authority (SJBA) Board meeting on December 12<sup>th</sup>. The SJBA Board authorized a new contract with Wildermuth Environmental Inc. for annual water quality monitoring of the Basin in the amount of \$424,778.</p> <p>The SJBA Board discussed the timing and content of a stakeholder workshop concerning SJBA's governance structure and mission. The Administrator will complete follow up work on a pending workshop and return to the Board at a later date.</p>
<b>North and Central O.C. Integrated Regional Watershed Management Area</b>	<p>Charles Busslinger submitted comments on the public review draft of the North &amp; Central OC Integrated Regional Watershed Management Plan (The OC Plan). The ad hoc committee will review all comments for incorporation into the final OC Plan, and a stakeholder meeting will be held in late January 2018 to announce a call for projects.</p>
<b>Scheduled Shutdowns: Lower Feeder Shutdown, Upper Feeder &amp; Lake Mathews Forebay Shutdown</b>	<p>The December 4<sup>th</sup> through December 8<sup>th</sup> shutdown of the Lower Feeder was completed as scheduled and returned to service.</p> <p>MWDOC staff participated in a conference call with MET on December 19<sup>th</sup>, to coordinate a January 6<sup>th</sup> to 19<sup>th</sup> shutdown of the Upper Feeder and concurrent January 6<sup>th</sup> – 8<sup>th</sup> Lake Mathews Forebay shutdown, which will impact the Lower Feeder (untreated). The shutdown of the Upper Feeder will allow installation of a flexible expansion joint at the Santa Ana River Bridge (the only suspension bridge in the MET system) to provide increased seismic</p>



	resilience. The Upper Feeder work requires shutdown of the Lake Mathews Forebay from January 6 <sup>th</sup> through the 8 <sup>th</sup> to limit leakage, and will impact flows into Orange County from the Lower Feeder. Our agencies have been notified of the shutdowns.
<b>Service Connection CM-1 Cost Issues with MET</b>	A meeting was held on December 18 <sup>th</sup> between staff from MWDOC, City of Newport Beach, Laguna Beach County WD, and Tom Epperson of Tetra Tech to discuss alternatives analyzed for CM-1 and the concurrent ability to deliver MET water and groundwater to LBCWD through Newport Beach's water system. MWDOC staff will next work with MET staff to explore the acceptability of the identified alternatives in an attempt to eliminate water quality issues in the MET system.
<b>Use of East Orange County Feeder No. 2 for Conveyance of Groundwater</b>	(Nothing New) MWDOC has been discussing concepts for pumping groundwater into the EOCF No. 2 for conveyance to South Orange County during an emergency event. Upcoming discussions will be held with MET.
<b>Poseidon Resources</b>	(Nothing New) 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 then consider approval of a Coastal Development Permit. OCWD is still working on the system integration concepts.
<b>San Juan Watershed Project</b>	<p>The Santa Margarita Water District (SMWD) as the Lead Agency has completed the preparation of an Environmental Impact Report (EIR) pursuant to the California Environmental Quality Act (CEQA) for the proposed San Juan Watershed Project.</p> <p>The Santa Margarita Water District (SMWD), in conjunction with South Coast Water District, proposes the San Juan Watershed Project that would develop facilities to manage surface water resources to enhance groundwater resources of the San Juan Groundwater Basin. The SMWD as the Lead Agency has prepared a Draft Program Environmental Impact Report (PEIR) pursuant to the California Environmental Quality Act (CEQA) for the proposed project. The Draft PEIR is being be circulated for a 65-day public review period, beginning December 21, 2017 and ending February 23, 2017.</p> <p>A public meeting will be held to receive comments regarding the content of the Draft PEIR. The public meetings will include a brief presentation to provide an</p>

	overview of the proposed project and the CEQA process. Written comment forms will be supplied for those who wish to submit comments in writing at the public meetings. Written comments may also be submitted anytime during the Draft PEIR review period. The public meetings will be held Tuesday, January 30, 2018 from 6:00 PM to 8:00 PM at the San Juan Capistrano Community Center, located at 25925 Camino Del Avion, San Juan Capistrano, CA 92675.
<b>Other Meetings</b>	Karl Seckel met with West Basin MWD to help develop a strategy to get DWR to release Proposition 50 retention funding they have been sitting on for almost 3 years. We believe there are 4 to 5 agencies impacted by DWR's reluctance to release the retention and are planning a joint letter to break the log jam.
	Karl Seckel attended the Santiago Aqueduct Commission meeting. The Commission has oversight for the Baker Pipeline and MWDOC represents East Orange County Water District, TIC and the County of Orange on the Commission. It appears that the County of Orange and TIC are interested in selling their capacity to IRWD. It is interesting to note that the TIC sale of capacity will result in the Commission being a public entity and will eliminate some tax assessments that now occur. The Commission also discussed changing the timing of their meetings to accommodate the MWDOC Director representative on SAC because of the conflict with MWDOC's Executive Committee, but due to the infrequency of meetings and the desire by IRWD to eliminate the Commission meetings in the future, the Commission elected to keep the same schedule. I indicated I could continue representing MWDOC at the meetings.
	Karl Seckel presented a MWDOC Proclamation and a special bottle of Big Canyon Slow & Low Old Fashioned Mix to George Murdoch, retiring Director of Operations at the City of Newport Beach.

***Status of Ongoing WEROC Projects  
December 2017***

<b><i>Description</i></b>	<b><i>Comments</i></b>
<b><i>Coordination with WEROC Member Agencies</i></b>	<p>Ongoing: WEROC, with Michal 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: Francisco Soto has been working with each agency to ensure that assignments between meetings are completed on time and the project stays on schedule. The next meeting is scheduled to take place on January 23, 2018.</p> <p>Francisco developed an After Action Report (AAR) for the series of Emergency Water Quality Sample Kits (EWQSK) trainings and exercises hosted earlier this year. The AAR provides a summary of each training and exercise conducted, a summary of the discussions during each event, and a comprehensive list of suggested planning elements for response to an Unknown Contamination Event. The final report will be distributed to member agencies, the Division of Drinking Water, OC Health Care Agency, and all other entities involved.</p> <p>Francisco is in the process of updating the WEROC Radio Systems Standard Operating Procedures. The purpose of this document is to outline the policies and procedures for the radio systems WEROC and member agencies utilizes to improve emergency response, provide reliable communications during emergencies, and coordinate resources among member agencies.</p>
<b><i>Training and Programs</i></b>	<p>WEROC hosted two Disaster Finance Workshops provided by Mike Martinet. The first training consisted of a hands-on computer workshop to assist local government agencies in evaluating their current purchasing/finance policies for compliance with Title 2 of the Code of Federal Regulations (2 CFR, Part 200). Non-compliance in RFP processes as it relates to 2 CFR Part 200 is one of the biggest reasons for agencies to have their Public Assistance Funds de-obligated. The second workshop focused on Work Process Flow &amp; Work Activity Documentation for Supervisors. This class was focused on providing processes for tracking field activities and damages, including a hands on demonstration of photo documentation. Mary Snow and Jeff Stalvey attended the first workshop and Francisco attended the second one.</p> <p>Kelly Hubbard provided a WEROC EOC Staff Training which included a discussion on recent lessons learned from the southern California fires, refresh on EOC positions and then an activity to assist everyone in learning their assigned EOC position better.</p>
<b><i>Coordination with the County of Orange</i></b>	<p>Kelly and Francisco attended the December Orange County Emergency Management Organization (OCEMO) meeting that took place in the City of</p>

	<p>Anaheim. The various sub-committees and working groups provided a status on their current planning efforts, the OA manager, Donna Boston from the Orange County Sheriff's Department Emergency Management Division (EMD) provided updates on current/future weather events, mutual aid request from the Thomas Fire, and more information on the wireless alert message that was sent out by Cal OES.</p> <p><i>Ongoing: WEROC staff participation in the OA Agreement Revision Working Group and the OCEMO Bylaws Revision Workgroup.</i> Francisco attended the OA Agreement meeting which primarily reviewed the first draft to the revisions of the Responsibilities of Signatories and Finance sections. Additionally, the group began to review the Powers and Duties of the OA Positions section which will be discussed in further detail at the next meeting. Kelly attended the Bylaws Revision Workgroup which focused on updating roles and responsibilities of officers of the OCEMO Leadership.</p> <p>Francisco and Kelly attended the AlertOC/WebEOC/Communications meeting at the OA EOC. The group discussed issues and possible improvements to all of these systems based on lessons from the most recent responses.</p>
<b><i>Coordination with Outside Agencies</i></b>	<p>Kelly has provided some coordination support to water and wastewater utilities impacted by the Thomas Fire. This has primarily been the coordination of possible generator requests and information needs.</p>
<b><i>WEROC EOC Readiness</i></b>	<p>Francisco met with an Orange County Park Ranger at the North EOC to discuss the removal of four trees on the premises. During the Canyon 2 Fire, it became apparent that the trees hindered the ability for OCFA to maneuver their fire apparatus through the property and provide structure protection. OC Parks is doing a massive tree removal and clean-up of fire impacts to Peters Canyon Regional Park which surrounds the North EOC property and offered to possibly assist with these trees if possible.</p> <p>Janine Schunk identified a vendor, Rockaway Recycling (a scrap yard out of New Jersey) to sell the old South EOC generator to. El Toro Water District (ETWD) staff have maintained this generator for WEROC for several years and was starting to have problems finding parts for the generator. The district received \$500 for the generator. Janine worked with Irvine Ranch Water District and ETWD staff to move the generator from the North EOC to the South EOC since it is considered our primary EOC. This generator is portable and can be moved site to site if needed. This generator is slightly undersized for the facility and its operations, so once improvements at the South EOC are completed, an electrical assessment will be conducted, and a new generator will be purchased in the next 3-5 years.</p>

## Status of Water Use Efficiency Projects - December 2017

Description	Lead Agency	Status % Complete	Scheduled Completion or Renewal Date	Comments
<b>Smart Timer Rebate Program</b>	MWDSC	On-going	On-going	<p>In November 2017, 184 residential and 19 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>
<b>Rotating Nozzles Rebate Program</b>	MWDSC	On-going	On-going	<p>In November 2017, 154 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>
<b>SoCal Water\$mart Residential Indoor Rebate Program</b>	MWDSC	On-going	On-going	<p>In November 2017, 398 high efficiency clothes washers and 41 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>
<b>SoCal Water\$mart Commercial Rebate Program</b>	MWDSC	On-going	On-going	<p>In November 2017, no commercial devices were installed through this program.</p> <p>For program savings and implementation information, please see MWDOC Water Use</p>

Description	Lead Agency	Status % Complete	Scheduled Completion or Renewal Date	Comments
				Efficiency Program Savings and Implementation Report.
<b>Industrial Process/ Water Savings Incentive Program (WSIP)</b>	MWDSC	30%	June 2020	<p>This program is designed for non-residential customers improving 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.</p> <p>Total water savings to date for the entire program is 582 AFY and 2,588 AF cumulatively.</p>
<b>Turf Removal Program</b>	MWDOC	On-going	On-going	<p>In November 2017, 56 rebates were paid, representing \$64,427.68 in rebates paid this month in Orange County. To date, the Turf Removal Program has removed approximately 21.2 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>
<b>Spray to Drip Conversion Program</b>	MWDOC	95%	October 2017	<p>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.</p>

**Item 3c**

<b>Description</b>	<b>Lead Agency</b>	<b>Status % Complete</b>	<b>Scheduled Completion or Renewal Date</b>	<b>Comments</b>
				To date, 208 residential sites and 54 commercial sites have completed spray to drip conversion projects.
<b>Landscape Design Assistance Program (LDAP)</b>	MWDOC	60%	April 2018	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.
<b>Landscape Design Assistance Program (LDAP) (cont.)</b>				To date, MWDOC has received and approved 79 questionnaires, and 73 site consultations have been performed. Of the 73 sites, 65 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.
<b>Recycled Water Retrofit Program</b>	MWDSC	15%	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 \$138,781.60 in funding to 17 sites irrigating over 61 acres of landscape, and MWDOC has paid a total of \$10,686.00 in grant funding to 8 of those sites irrigating 30.54 acres of landscape. The total potable water savings achieved by these projects is 142.34 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	Cumulative Water Savings[4]
High Efficiency Clothes Washer Program	2001	November-17	398	1.14	1,745	15.95	114,657	3,956
Smart Timer Program - Irrigation Timers	2004	November-17	203	1.87	1,114	60.65	21,599	7,847
Rotating Nozzles Rebate Program	2007	November-17	154	0.62	761	3.04	563,579	2,760
SoCal WaterSmart Commercial Plumbing Fixture Rebate Program	2002	November-17	0	0.00	1,996	23.95	87,275	4,752
Industrial Process/Water Savings Incentive Program (WSIP)	2006	November-17	0	0.00	0	0.00	28	582
Turf Removal Program <sup>[3]</sup>	2010	November-17	41,826	0.49	283,440	9.24	21,189,041	2,967
High Efficiency Toilet (HET) Program	2005	November-17	41	0.15	258	4.64	59,905	2,214
Water Smart Landscape Program <sup>[1]</sup>	1997						12,677	10,621
Home Water Certification Program	2013						312	7,339
Synthetic Turf Rebate Program	2007						685,438	96
Ultra-Low-Flush-Toilet Programs <sup>[2]</sup>	1992						363,926	13,452
Home Water Surveys <sup>[2]</sup>	1995						11,867	160
Showerhead Replacements <sup>[2]</sup>	1991						270,604	1,667
<b>Total Water Savings All Programs</b>			<b>4</b>	<b>289,314</b>	<b>117</b>	<b>23,380,908</b>	<b>51,081</b>	<b>421,949</b>

Page 40 of 51

<sup>(1)</sup> Water Smart Landscape Program participation is based on the number of water meters receiving monthly Irrigation Performance Reports.

<sup>(2)</sup> Cumulative Water Savings Program To Date totals are from a previous Water Use Efficiency Program Effort.

<sup>(3)</sup> Turf Removal Interventions are listed as square feet.

<sup>(4)</sup> Cumulative & annual water savings represents both active program savings and passive savings that continues to be realized due to plumbing code changes over time.

Item 3d



# **HIGH EFFICIENCY CLOTHES WASHERS 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	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	20	1,887	0.15	449.22	976
Buena Park	145	105	106	91	76	54	27	1,545	0.22	351.46	799
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	18	1,539	0.17	353.53	796
Fountain Valley	158	115	102	110	76	65	21	2,421	0.22	597.66	1,253
Garden Grove	236	190	162	165	251	127	40	3,603	0.36	845.19	1,864
Golden State WC	485	265	283	359	260	138	71	5,086	0.68	1,195.22	2,632
Huntington Beach	582	334	295	319	225	180	62	8,308	0.60	2,087.27	4,299
Invine Ranch WD	2,170	1,763	1,664	1,882	1,521	1,373	606	25,272	5.65	5,631.25	13,076
La Habra	128	82	114	87	66	53	25	1,352	0.23	307.44	700
La Palma	46	34	25	34	29	10	9	467	0.08	106.38	242
Laguna Beach CWD	57	38	37	39	32	19	9	941	0.11	228.79	487
Mesa Water	176	114	86	89	113	80	23	2,541	0.24	637.28	1,315
Moulton Niguel WD	679	442	421	790	688	575	230	10,151	2.14	2,251.88	5,252
Newport Beach	142	116	92	95	66	61	26	2,650	0.24	678.84	1,371
Orange	262	218	163	160	124	80	32	3,930	0.31	992.85	2,033
Orange Park Acres	-	-	-	-	-	-	-	12	0.00	3.76	6
San Juan Capistrano	110	76	73	92	63	33	16	1,475	0.17	351.05	763
San Clemente	206	140	94	141	75	70	41	2,661	0.41	635.87	1,377
Santa Margarita WD	679	553	662	792	466	367	136	9,652	1.18	2,197.48	4,994
Seal Beach	51	31	29	38	23	9	11	613	0.09	146.06	317
Serrano WD	20	13	10	26	8	11	3	360	0.02	90.44	186
South Coast WD	112	89	79	68	43	44	22	1,606	0.20	380.75	831
Trabuco Canyon WD	62	30	45	47	34	28	11	809	0.09	189.65	419
Tustin	97	78	59	80	66	44	21	1,633	0.18	402.10	845
Westminster	208	121	82	109	149	84	33	2,619	0.28	623.61	1,355
Yorba Linda	273	181	167	156	123	56	26	3,778	0.22	952.22	1,955
<b>MWDOC Totals</b>	<b>7,350</b>	<b>5,365</b>	<b>5,094</b>	<b>6,002</b>	<b>4,726</b>	<b>3,668</b>	<b>1,539</b>	<b>97,103</b>	<b>14.23</b>	<b>22,735.78</b>	<b>18,760</b>

Anaheim	477	331	285	295	266	213	90	10,772	0.82	2,606.24	5,574
Fullerton	270	200	186	211	165	107	48	3,743	0.42	809.26	1,937
Santa Ana	190	163	131	132	259	141	68	3,039	0.49	773.74	1,572
<b>Non-MWDOC Totals</b>	<b>937</b>	<b>694</b>	<b>602</b>	<b>638</b>	<b>690</b>	<b>461</b>	<b>206</b>	<b>17,554</b>	<b>1.72</b>	<b>4,189.24</b>	<b>3,391</b>

<b>Orange County Totals</b>	<b>8,287</b>	<b>6,059</b>	<b>5,696</b>	<b>6,640</b>	<b>5,416</b>	<b>4,129</b>	<b>1,745</b>	<b>114,657</b>	<b>15.95</b>	<b>26,925.02</b>	<b>22,151</b>
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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	18	0	149	80	521.72
Buena Park	4	19	3	0	0	0	4	10	7	4	10	7	10	3	41	44	147.67
East Orange CWD RZ	5	0	2	0	0	0	2	0	1	0	11	1	4	0	29	1	18.80
El Toro WD	26	2	7	2	11	0	8	9	9	17	33	8	14	4	129	359	2,476.50
Fountain Valley	8	2	3	2	4	0	7	10	13	1	33	12	12	0	103	40	178.65
Garden Grove	7	0	5	2	9	0	10	14	13	11	28	0	19	0	120	38	173.20
Golden State WC	13	3	9	49	9	25	39	12	35	16	56	37	45	5	270	197	812.43
Huntington Beach	15	4	18	33	20	35	19	2	42	12	88	94	31	30	303	298	1,061.60
Irvine Ranch WD	267	71	414	135	71	59	67	310	239	207	344	420	189	56	1,958	2,342	11,330.93
La Habra	3	0	4	7	2	0	4	7	3	1	12	7	4	0	40	44	203.18
La Palma	1	0	1	0	2	0	2	0	3	2	1	0	2	0	12	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	17	0	335	154	733.07
Moulton Niguel WD	179	31	51	74	40	45	46	95	163	100	236	129	156	10	1,070	811	3,577.28
Newport Beach	275	12	242	26	168	75	11	9	28	43	30	12	14	0	1,052	409	2,615.40
Orange	25	0	20	24	13	9	18	31	51	13	69	10	35	12	320	177	936.09
San Juan Capistrano	103	2	14	18	6	11	6	19	20	8	22	8	14	0	236	125	642.45
San Clemente	212	17	26	7	28	2	28	24	26	3	37	13	19	0	1,070	374	2,655.49
Santa Margarita WD	262	7	53	171	64	93	53	321	189	136	326	221	143	98	1,297	1,470	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	5	0	12	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	9	0	287	212	1,147.62
Trabuco Canyon WD	12	0	6	0	2	0	6	1	16	50	13	3	13	0	116	157	950.38
Tustin	11	0	8	4	9	1	18	14	33	8	33	23	14	1	157	81	339.47
Westminster	2	0	1	1	2	0	13	17	7	1	17	12	11	0	76	44	197.20
Yorba Linda	22	0	20	0	12	5	32	2	61	27	72	71	34	2	372	185	827.01
<b>MWDOC Totals</b>	<b>1,671</b>	<b>185</b>	<b>1,017</b>	<b>583</b>	<b>571</b>	<b>402</b>	<b>648</b>	<b>1,026</b>	<b>1,123</b>	<b>3,136</b>	<b>1,691</b>	<b>1,137</b>	<b>840</b>	<b>221</b>	<b>10,097</b>	<b>10,168</b>	<b>42,591.78</b>

Anaheim	23	60	19	10	9	26	7	52	30	34	87	10	27	0	271	457	2,606.44
Fullerton	22	51	9	29	8	0	40	26	32	12	53	7	20	0	219	199	933.90
Santa Ana	6	5	8	19	7	8	9	27	22	26	15	3	6	0	88	100	350.07
<b>Non-MWDOC Totals</b>	<b>51</b>	<b>116</b>	<b>36</b>	<b>58</b>	<b>24</b>	<b>34</b>	<b>56</b>	<b>105</b>	<b>84</b>	<b>72</b>	<b>155</b>	<b>20</b>	<b>53</b>	<b>0</b>	<b>578</b>	<b>756</b>	<b>3,890.41</b>
<b>Orange County Totals</b>	<b>1,722</b>	<b>301</b>	<b>1,053</b>	<b>641</b>	<b>595</b>	<b>436</b>	<b>704</b>	<b>1,131</b>	<b>1,207</b>	<b>3,208</b>	<b>1,846</b>	<b>1,157</b>	<b>893</b>	<b>221</b>	<b>10,675</b>	<b>10,924</b>	<b>46,482</b>

**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				
	Res	Comm.	Comm. Res	Comm.	Comm.	Comm. Res	Comm.	Comm.	Comm. Res	Comm.	Comm.	Comm. Res	Comm.	Comm.	Comm. Res	Comm.	Comm.	Comm. Res	Comm.	Comm.	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	221	0	0	30	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	0	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	73	0	0	3,521	11,316	0	242.07
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	176	0	0	47,313	94,561	2,004	4,745.18
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	36	0	0	2,066	385	343	195.29
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	45	0	0	46,723	21,413	0	1,584.28
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	2,300	0	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	30	0	0	3,401	1,058	0	120.83
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	761	0	0	193,756	278,833	14,752	16,179.24
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	761	0	0	201,545	345,693	16,341	18,322.89

**SOCAL WATER\$MART COMMERCIAL PLUMBING FIXTURES REBATE PROGRAM<sup>[1]</sup>**  
**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
<b>MWDOC Totals</b>	<b>1,966</b>	<b>1,594</b>	<b>1,172</b>	<b>2,161</b>	<b>17,275</b>	<b>13,829</b>	<b>1,350</b>	<b>64,361</b>	<b>29,594</b>
Anaheim	48	165	342	463	3,072	309	646	14,399	7,649
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
<b>Non-MWDOC Totals</b>	<b>60</b>	<b>275</b>	<b>359</b>	<b>646</b>	<b>4,841</b>	<b>1,168</b>	<b>646</b>	<b>22,914</b>	<b>14,591</b>
<b>Orange County Totals</b>	<b>2,026</b>	<b>1,869</b>	<b>1,531</b>	<b>2,807</b>	<b>22,116</b>	<b>14,997</b>	<b>1,996</b>	<b>87,275</b>	<b>44,186</b>

[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 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	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
<b>MWDOC Totals</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>9</b>	<b>5</b>	<b>0</b>	<b>27</b>	<b>571</b>
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
<b>OC Totals</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>10</b>	<b>5</b>	<b>0</b>	<b>28</b>	<b>582</b>

[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<sup>(1)</sup>

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	502	26,214	216,466	471,187	306.45
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	4,880	72,718	4,582	0	27,046	221,612	63,546	162,548	13,139	48,019	5,465	0	123,181	504,897	324.94
Fountain Valley	1,300	0	682	7,524	4,252	0	45,883	5,279	65,232	0	3,679	0	3,024	0	123,752	12,803	68.48
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
Golden State	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	506.38
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	6,375	6,032	545,247	421,737	490.54
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	40,818	22,467	1,371,391	3,186,064	2,011.17
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	2,864	1,712	4,586	226	13,647	46,850	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	284.34
Moulton Niguel	4,483	26,927	11,538	84,123	14,739	40,741	314,255	1,612,845	889,748	1,059,279	220,749	0	43,520	0	1,499,983	2,840,054	2,134.74
Newport Beach	3,454	0	3,548	2,346	894	0	33,995	65,277	76,675	375,404	2,924	0	861	6,499	122,351	449,526	256.27
Orange	12,971	0	15,951	8,723	11,244	0	120,093	281,402	289,990	106,487	12,847	2,366	5,893	0	468,989	398,978	437.74
San Clemente	21,502	0	16,062	13,165	18,471	13,908	90,349	1,137	215,249	438,963	4,267	0	18,497	0	384,397	467,173	398.06
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	26,926	25,000	823,558	1,194,453	970.36
Santiago	0	0	0	0	0	0	0	0	0	0	0	0	502	0	0	0	-
Seal Beach	0	0	3,611	0	0	0	15,178	504	17,349	15,911	1,234	0	752	0	38,124	16,415	26.23
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	9,350	2,682	321,098	460,263	419.33
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	4,272	0	330,817	47,499	172.67
Westminster	0	0	0	0	0	0	14,040	34,631	71,833	23,902	11,112	0	5,107	0	102,092	58,533	71.29
Yorba Linda	0	0	0	0	0	0	112,136	12,702	360,279	116,985	19,420	0	7,323	0	510,507	129,687	289.53
<b>MWDOC Totals</b>	<b>183,524</b>	<b>241,224</b>	<b>216,104</b>	<b>303,923</b>	<b>238,978</b>	<b>304,598</b>	<b>2,195,544</b>	<b>3,692,153</b>	<b>5,493,639</b>	<b>7,015,357</b>	<b>613,934</b>	<b>264,998</b>	<b>195,048</b>	<b>88,894</b>	<b>9,160,259</b>	<b>12,019,568</b>	<b>10,218.33</b>

Anaheim	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Fullerton	0	0	0	0	0	9,214	0	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	-
<b>Non-MWDOC Totals</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9,214</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9,214</b>	<b>6.45</b>

<b>Orange County Totals</b>	<b>183,524</b>	<b>241,224</b>	<b>216,104</b>	<b>303,923</b>	<b>238,978</b>	<b>313,812</b>	<b>2,195,544</b>	<b>3,692,153</b>	<b>5,493,639</b>	<b>7,015,357</b>	<b>613,934</b>	<b>264,998</b>	<b>195,048</b>	<b>88,894</b>	<b>9,160,259</b>	<b>12,028,782</b>	<b>10,225</b>
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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	2	452	96.82
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	8	831	243.61
Garden Grove	0	0	63	350	363	7	1	1,485	411.46
Golden State WC	80	2	142	794	512	9	10	2,800	758.66
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	141	17,050	5,295.75
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	2	1,620	581.14
Moulton Niguel WD	0	0	400	2,497	1,939	49	25	5,715	1,100.88
Newport Beach	0	0	49	168	243	11	5	730	177.34
Orange	0	1	142	978	416	17	3	2,182	515.48
San Juan Capistrano	0	0	35	140	202	3	2	525	116.91
San Clemente	0	0	72	225	246	11	1	873	218.33
Santa Margarita WD	0	0	528	997	1,152	114	26	3,335	652.39
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	4	1,510	525.18
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
<b>MWDOC Totals</b>	<b>103</b>	<b>1,651</b>	<b>3,330</b>	<b>12,038</b>	<b>11,118</b>	<b>958</b>	<b>243</b>	<b>50,949</b>	<b>13,904.35</b>

Anaheim	0	0	156	1,188	614	70	9	5,874	1,941.76
Fullerton	0	0	61	293	286	14	6	1,061	268.25
Santa Ana	0	0	33	602	293	20	0	2,021	601.53
<b>Non-MWDOC Totals</b>	<b>0</b>	<b>0</b>	<b>250</b>	<b>2,083</b>	<b>1,193</b>	<b>104</b>	<b>15</b>	<b>8,956</b>	<b>2,811.54</b>

<b>Orange County Totals</b>	<b>103</b>	<b>1,651</b>	<b>3,580</b>	<b>14,121</b>	<b>12,311</b>	<b>1,062</b>	<b>258</b>	<b>59,905</b>	<b>16,715.88</b>
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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
<b>MWDOC Totals</b>	<b>2,733</b>	<b>4,395</b>	<b>10,025</b>	<b>10,787</b>	<b>11,273</b>	<b>11,766</b>	<b>12,196</b>	<b>12,435</b>	<b>12,487</b>	<b>71,316.9</b>
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
<b>Non-MWDOC Totals</b>	<b>0</b>	<b>0</b>	<b>142</b>	<b>146</b>	<b>144</b>	<b>190</b>	<b>190</b>	<b>190</b>	<b>190</b>	<b>1,351.53</b>
<b>Orange Co. Totals</b>	<b>2,733</b>	<b>4,395</b>	<b>10,167</b>	<b>10,933</b>	<b>11,417</b>	<b>11,956</b>	<b>12,386</b>	<b>12,625</b>	<b>12,677</b>	<b>72,668.45</b>



# 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
<b>MWDOC Totals</b>	<b>78</b>	<b>0</b>	<b>164</b>	<b>1</b>	<b>52</b>	<b>0</b>	<b>294</b>	<b>1</b>	<b>14.44</b>

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
<b>Non-MWDOC Totals</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>18</b>	<b>0</b>	<b>0.82</b>
<b>Orange County Totals</b>	<b>78</b>	<b>0</b>	<b>181</b>	<b>1</b>	<b>53</b>	<b>0</b>	<b>312</b>	<b>1</b>	<b>15.266</b>

# **SYNTHETIC TURF INSTALLED BY AGENCY<sup>[1]</sup>** 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
<b>MWDOC Totals</b>	<b>132,820</b>	<b>18,033</b>	<b>181,848</b>	<b>89,642</b>	<b>97,806</b>	<b>8,624</b>	<b>20,184</b>	<b>0</b>	<b>432,658</b>	<b>116,299</b>	<b>384.83</b>

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
<b>Non-MWDOC Totals</b>	<b>9,400</b>	<b>876</b>	<b>16,282</b>	<b>20,093</b>	<b>20,303</b>	<b>65,300</b>	<b>4,227</b>	<b>0</b>	<b>50,212</b>	<b>86,269</b>	<b>83.81</b>

<b>Orange County Totals</b>	<b>142,220</b>	<b>18,909</b>	<b>198,130</b>	<b>109,735</b>	<b>118,109</b>	<b>73,924</b>	<b>24,411</b>	<b>0</b>	<b>482,870</b>	<b>202,568</b>	<b>468.63</b>
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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
<b>MWDOC Totals</b>	<b>24,256</b>	<b>12,879</b>	<b>18,778</b>	<b>20,765</b>	<b>21,136</b>	<b>30,242</b>	<b>24,918</b>	<b>27,175</b>	<b>31,827</b>	<b>27,568</b>	<b>3,654</b>	<b>3,242</b>	<b>2,031</b>	<b>861</b>	<b>4</b>	<b>249,336</b>	<b>113,878.61</b>

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
<b>Non-MWDOC Totals</b>	<b>3,011</b>	<b>4,161</b>	<b>3,687</b>	<b>7,583</b>	<b>5,207</b>	<b>18,477</b>	<b>12,133</b>	<b>19,298</b>	<b>22,636</b>	<b>15,988</b>	<b>924</b>	<b>582</b>	<b>531</b>	<b>369</b>	<b>3</b>	<b>114,590</b>	<b>48,682.70</b>

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