MEETING OF THE
BOARD OF DIRECTORS OF THE
MUNICIPAL WATER DISTRICT OF ORANGE COUNTY
Jointly with the
PLANNING & OPERATIONS COMMITTEE
January 5, 2015, 8:30 a.m.
MWDOC Conference Room 101

P&O Committee:
Director Osborne, Chair
Director Barbre
Director Hinman

Staff: R. Hunter, K. Seckel, R. Bell, H. De La Torre, P. Meszaros, J. Berg

Ex Officio Member: L. Dick

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

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

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

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

ACTION ITEMS

1. INCREASE AUTHORIZATION FOR CDM-SMITH FOR THE ORANGE COUNTY WATER RELIABILITY STUDY

2. DOHENY OCEAN DESALINATION PROJECT BASELINE ENVIRONMENTAL MONITORING AGREEMENT WITH SCWD/LBCWD

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. STATUS OF REVIEWING AND REVISING MWDOC'S WATER SUPPLY ALLOCATION PLAN

4. 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

5. 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.

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

Item No. 1

ACTION ITEM
January 21, 2015

TO: Board of Directors

FROM: **Planning & Operations Committee**
(Directors Osborne, Barbre, Hinman)

Robert Hunter
General Manager

Staff Contact: Karl Seckel/Richard Bell

SUBJECT: **Increase Authorization for CDM-Smith for the Orange County Water Reliability Study**

STAFF RECOMMENDATION

Staff recommends the Board of Directors authorizes staff to supplement the cost authorization for the OC Water Reliability Study by $24,000, increasing the total consultant scope of work for CDM-Smith to $221,240.

COMMITTEE RECOMMENDATION

Committee recommends (To be determined at Committee Meeting)

SUMMARY

In October, the Board authorized the General Manager to enter into a consulting agreement with CDM-Smith to provide technical assistance for the OC Water Reliability Study at a cost not to exceed $197,240. The scope of work had a pre-negotiated add-on for modeling work in the event MET was not able to share their updated IRP modeling with our consultant (this was considered to be a reasonable possibility and that is why the scope addition was pre-negotiated). Based on recent meetings with MET, we found out that MET has not yet completed their updated IRP modeling and that the official work will not be released until the summer or fall of this year. MET is not willing to conduct specific modeling at our request under our assumptions and therefore, additional work will be required of our consultant. MET did indicate they will be willing to share their modeling output at such time as they

Budgeted (Y/N): Yes	Budgeted amount: $340,000	Core X	Choice __
Action item amount: $24,000	Line item: 21-7010 $12,000 and 23-7010 $12,000		
Fiscal Impact (explain if unbudgeted): Sufficient funds were budgeted to accommodate the increase. With this approval, the total authorization will increase to $221,240 for CDM-Smith.			

complete the work and issue an "official update". MET also indicated they would be willing to work with us on their demand forecasts for Orange County based on updated work they are completing at this time in working towards their IRP update.

Based on the outcome of the meeting, CDM-Smith has noted that additional work will be required on their part to fill in the missing work by MET. The work they will be doing will, in effect, mimic the MET IRP modeling and allow us to test various assumptions for input into the Orange County work. The additional fee requested to complete the work is $24,000 and was included as an option in the original fee negotiation. There is sufficient budget to cover the additional work. The requirement for the additional work and the proposed fee adjustment was discussed at the December Workgroup meeting and there did not appear to be any questions from the group.

Status Update on OC Water Reliability Study

A number of kick off meetings have been held, data collection is underway and two full Workgroup meetings have been held.

Attached are the Powerpoints from the November and December Workgroup meetings. Provided below is the anticipated schedule of Future Workgroup meetings by topic.

Future Reliability Study Workgroup Meetings

Meeting No.	Anticipated Date	Proposed Meeting Topics
2	Jan	Review Draft Water Demand Analysis and Method for Forecasting
3	Feb	Review Reliability Scenarios and Possible Impacts
4	Mar	Present Demand Forecast with Sensitivity
5	Apr	Present Local Agency New/Potential Projects
6	May	Present and Discuss MET and OC Policies to Improve Reliability
7	Jun	Present Supply and System Gap Analysis
8	Jul	Present Example Portfolios of New/Potential Projects
9	Aug	Demonstrate that New/Potential Projects Improve Reliability
10	Oct	Review Draft Report

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

Draft, Subject to Changes based on Data Availability from MET and Local Agencies

27

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

OC Reliability Study Workgroup

Orange County Water Reliability Study

Meeting # 1: Project Kick-Off

November 20, 2014

Meeting Agenda

1. Review Study Objectives and Scope Tasks
2. Discuss Water Demand Issues and Present Example
3. Discuss Definition of Reliability and Present Example
4. Duration of Drought and Seismic/Catastrophic Events
5. Information Needed from Local Agencies
6. Review Technical Meetings
7. Review Study Workgroup Meetings and Topics

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

2

Study Purpose

Project Purpose:

To inform OC water agencies on water supply and system needs, and summarize local agency projects and programs to improve reliability to provide a consistent assessment. This information will be important to inform decision-makers as to the relative value and timing of moving ahead with key projects, such as Poseidon desalination.

Key Attributes:

- Improved methodology for water demands
- Agreed-upon definition and evaluation of supply and system reliability
- Summary of local agency supply and system improvement projects, using consistent data
- Decision making remains with local utilities

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

3

Project Scope Tasks

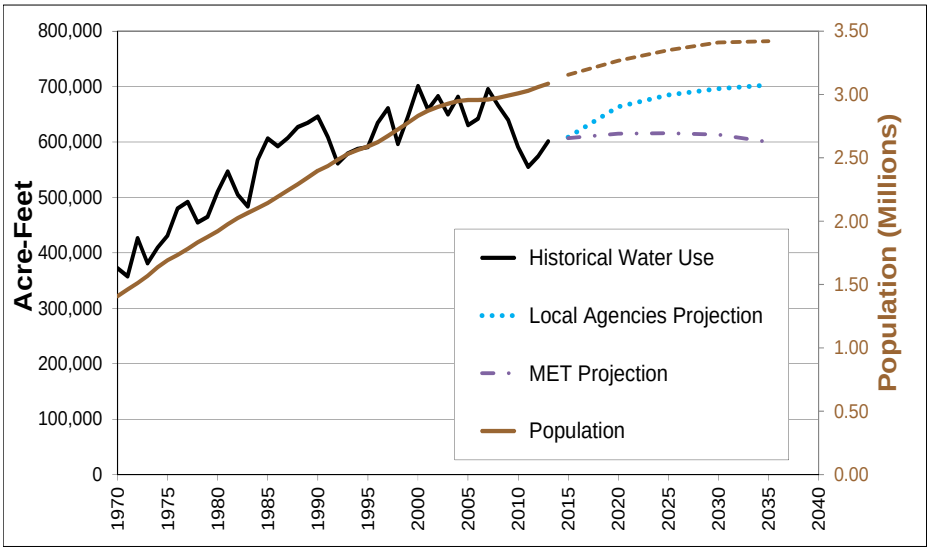
1. Project Management
2. Projection of Demands
3. Existing Local Supplies
4. Imported Supplies Under Various Scenarios
5. Supply GAP
6. System GAP
7. Options for NEW Supplies
8. MET and OC Policy Issues

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

4

Water Demand Issue: Reconciling Projections

- Will demands bounce back from current lows?
- What is the reason between difference in MET vs local agency projections?
- Can we get these projections to be closer/more aligned?



MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

5

Changes in Water Use for MNWD

Variable	Calendar Year			
	2007	2010	2011	2012
Water Use (AFY)	44,613	34,387	34,275	35,696
Population	162,108	163,725	165,282	167,000
Unemployment Rate (%)	3.9	9.5	8.8	7.6
Drought Restrictions	No	Yes	Yes	No
Precipitation (inches)	6.5	23.2	7.7	8.6
Single-family Monthly Water Bill ($2000)	$18	$20	$25	$38

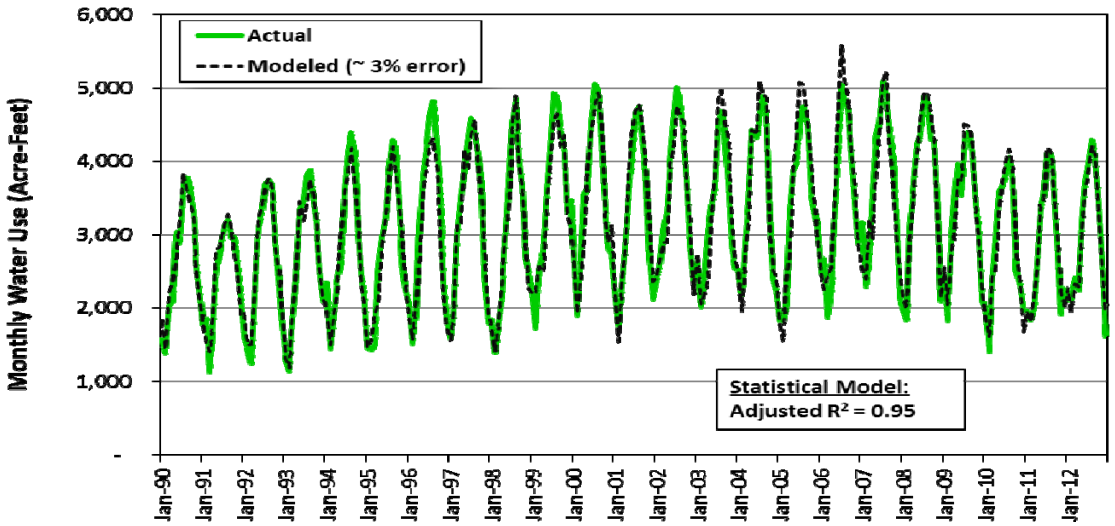
6

MNWD Water Demand Model

- Statistical model of monthly water use from 1990-2012
- Explanatory variables include:
  - Population
  - Weather (temperature and precipitation)
  - Economy (unemployment rate)
  - Drought restrictions
  - Price of water
  - Plumbing code (passive conservation)

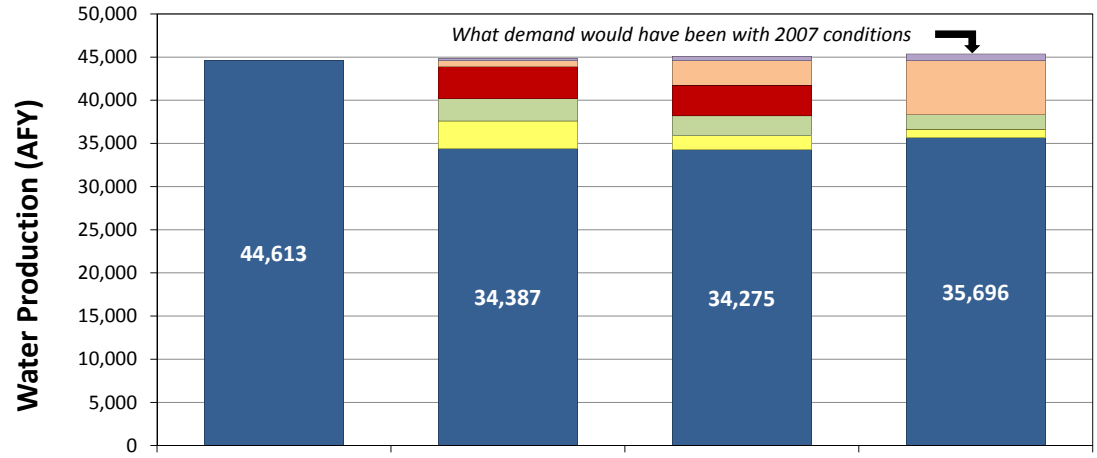
7

MNWD Water Demand Model Performance



8

Water Demand Model Explains Variations in Water Use



Factors Reducing Demand (AFY)	2007	2010	2011	2012
Code Savings*		223 (0.5%)	491 (1.1%)	758 (1.7%)
Price of Water		734 (1.6%)	2,887 (6.4%)	6,265 (13.1%)
Drought		3,691 (8.2%)	3,532 (7.8%)	0 (0.0%)
Economy		2,590 (5.8%)	2,252 (5.0%)	1,698 (3.7%)
Weather		3,211 (7.2%)	1,668 (3.7%)	955 (2.1%)
Total		10,449 (23.3%)	10,829 (24.0%)	9,676 (21.3%)

9

** Includes efficiencies in water use from state plumbing codes and landscape ordinances since 2007*

MNWD Demand Forecast Methodology

Base Demand Sector Water Unit Use X **Socio-Economic Adjustment** X **Demographic Driver** = **Demand Sector Water Use**

For each sector (e.g., single-family), historical water sales are divided by a historical driver (e.g., homes). This represents a non-drought, normal economy, normal weather unit use.

A adjustment factor is estimated based on econometric studies that modifies the base unit use overtime:

- Price of Water unit use ↓
- Income unit use ↑
- Density unit use ↓
- Family Size unit use ↑

Future projections of demographics (single-family homes, multifamily homes, and total employment) that are provide by SCAG for MNWD's service area.

10

Base Water Unit Use (normal conditions)

Single-Family Residential *
= 420 gallons/day per home

Multifamily Residential *
= 390 gallons/day per home

Commercial *
= 125 gallons/day per employee

* MNWD's irrigation and recycled water accounts are rolled up into each of these categories based on billing data

11

Socioeconomic Assumptions

Family Size: Increases from 2.66 to 2.73 by 2035
Results in 1.4% increase in residential water unit use

Housing Density: Increases 6% by 2035
Results in 3% decrease in residential water unit use

Household Income: Increases 1% per year (4% nominal)
Results in 7% increase in residential water unit use

Water Rate Structure Change: Budget Based
Results in 8% decrease in residential & commercial water unit use

Price of Water: Increases 2% per year (5% nominal)
Results in 3% decrease in residential & commercial water unit use

12

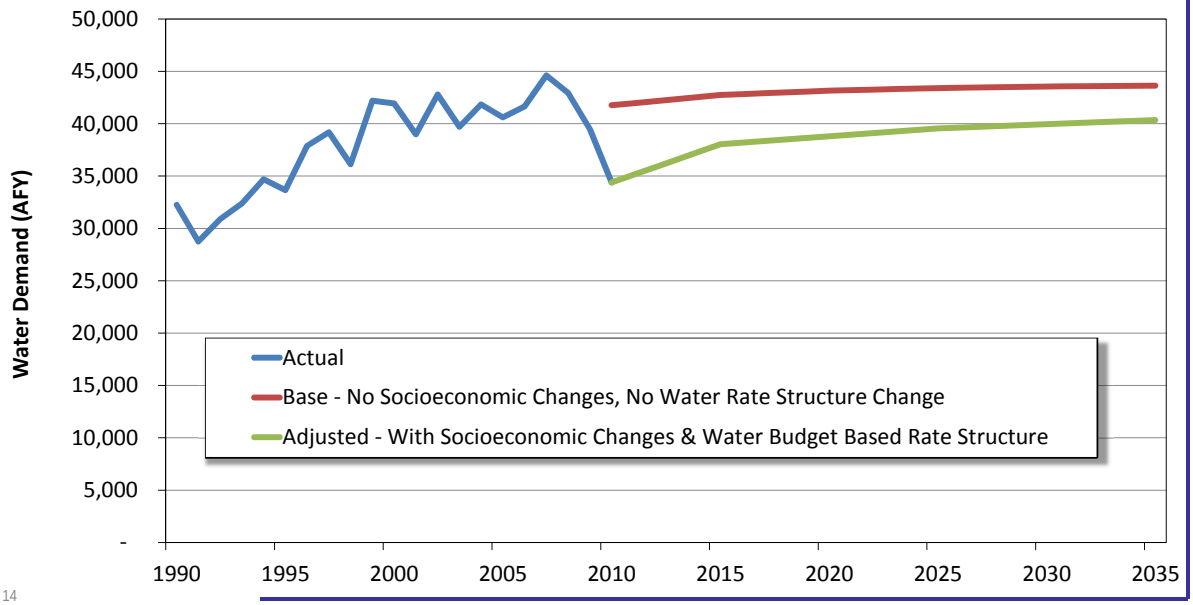
Projected Demographics for MNWD

Calendar Year	Population	Single-Family Households	Multifamily Households	Total Employment
2010	164,755	46,800	15,022	67,470
2015	167,260	47,121	15,517	69,499
2020	167,892	47,185	15,568	71,138
2025	169,571	47,249	15,586	72,105
2030	171,250	47,255	15,881	72,378
2035	172,929	47,273	15,967	72,629
Growth	**5.0%**	**1.0%**	**6.3%**	**7.6%**

Projected by SCAG (RTP Series 12) for MNWD's service area

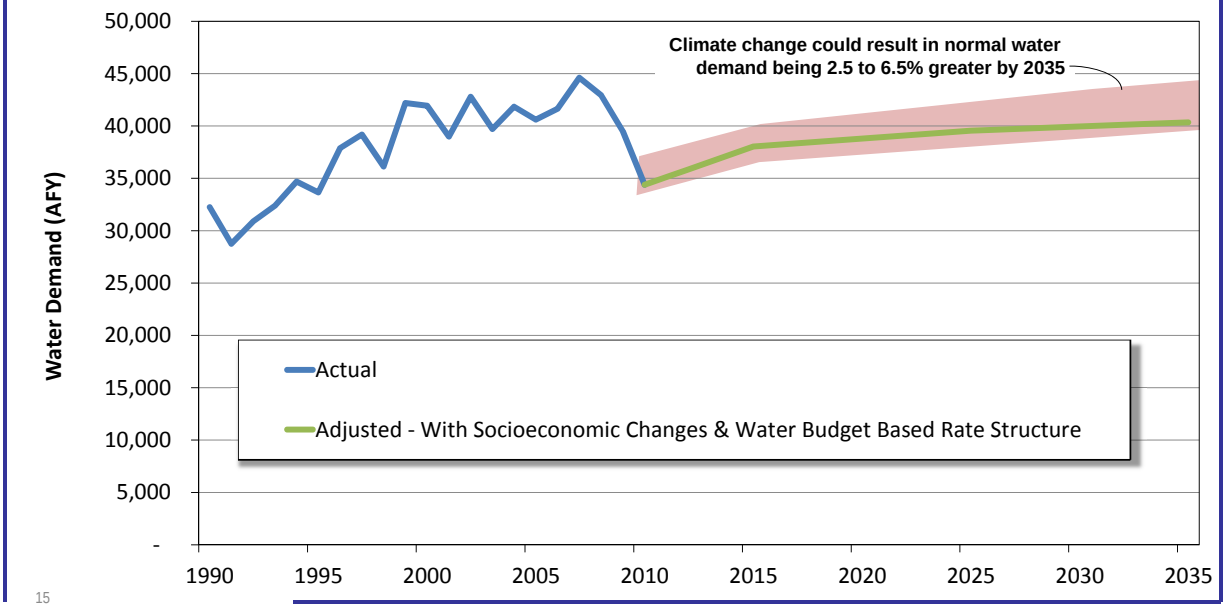
13

MNWD Water Demand Forecast



14

MNWD Water Demand Forecast



15

Definition of Reliability

	Supply Reliability	System Reliability
Definition	Availability of water supply under different hydrologic conditions, typically measured in terms of frequency, duration and magnitude of shortages.	Ability to deliver imported water under outages of key facilities, caused by seismic events, facility failures, or other catastrophic events.
Factors Impacting	• BDCP implementation (SWP) • Oversubscribed Colorado River (CRA) • Climate change (SWP, CRA, local supplies) • Success of conservation and local supply development	• Seismic risks to MET's Diemer WTP • Seismic risks to So. OC imported water pipelines • Seismic and storm risk to Delta levees • Seismic risks to Edmonston Pumps
Implications to Orange County	Portions of OC are better off than others because of OC Basin. There is a potential that prolonged droughts (esp. under climate change) can result in shortages to both basin and non-basin areas.	So. OC is extremely vulnerable to local seismic risks due to single point of delivery for treated imported water. All of OC vulnerable for Delta and Edmonston risks.

Duration of Supply/System Reliability Events

Reliability Event	Duration
Droughts	One to 5 Years (historic hydrology) One to 10? Years (climate change?)
So. OC Imported Pipeline Failures	7 to 14 Days
Diemer WTP Failure	30 to 60 Days
Delta Levee Failure	1 to 2 Years
Edmonston Pumping Plant	TBD

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

17

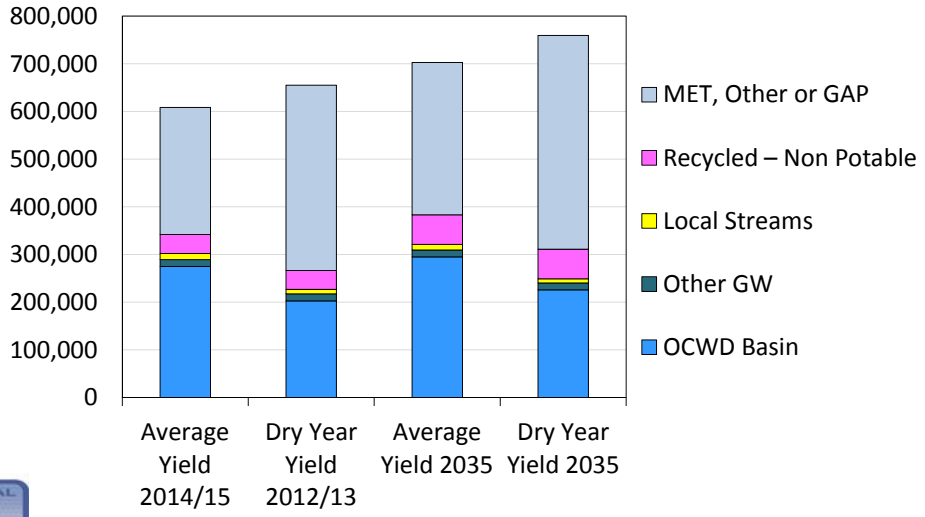
Local Agency Data Needs

1. CY and FY 2013/14 Water Demands by Sector (needed for 2015 UWMP)
2. Demand and Supply Projections through 2035 (also needed for 2015 UWMP)
3. Response to MWDOC survey on Generators, Fueling and Operations during emergency events
4. Local Agency New/Potential Projects (project form will be sent in a few weeks)

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

18

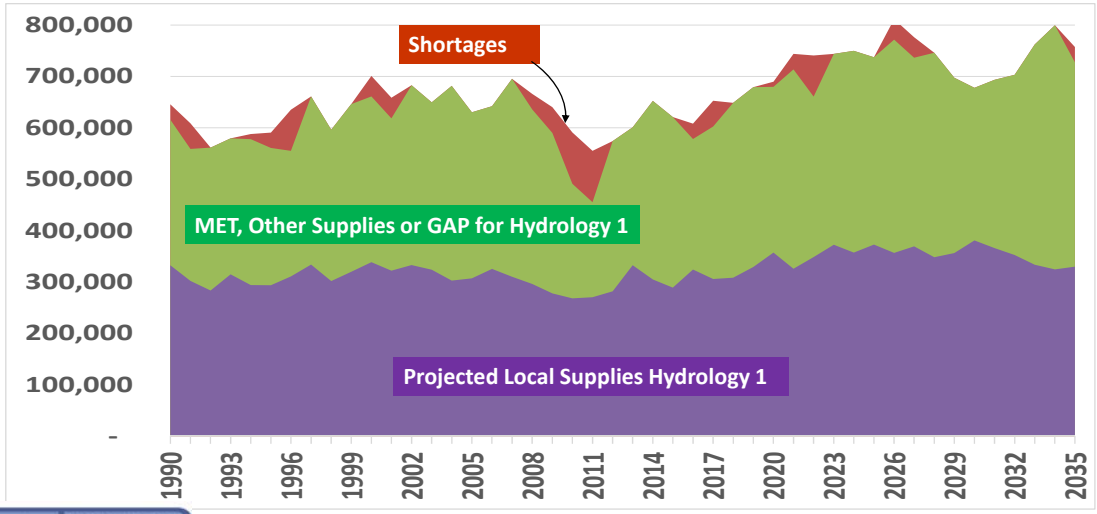
OC Water Demands & Supplies



MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

19

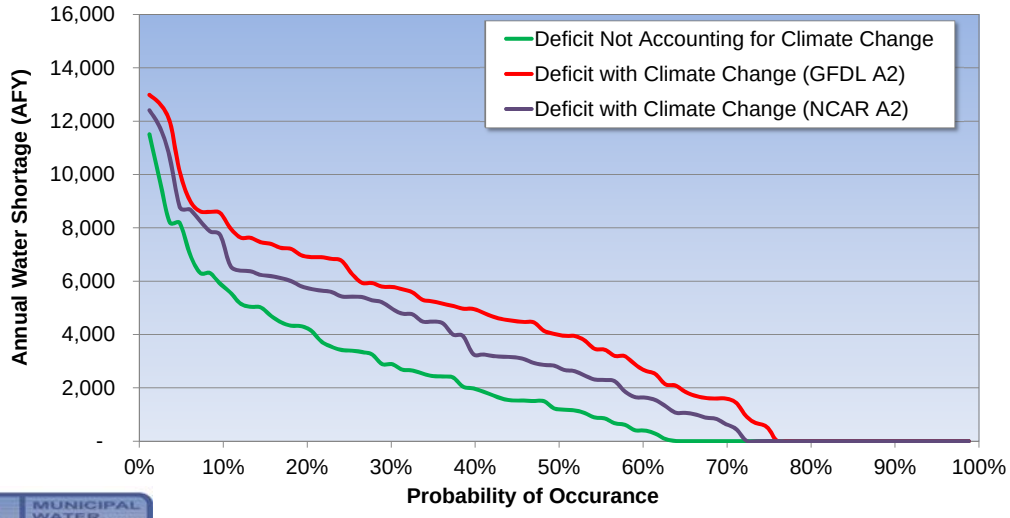
Illustrative Example of Supply Reliability



MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

20

MNWD's Supply Reliability Analysis in 2035



MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

21

MNWD's System Reliability Scenarios

Delta Levee Risk

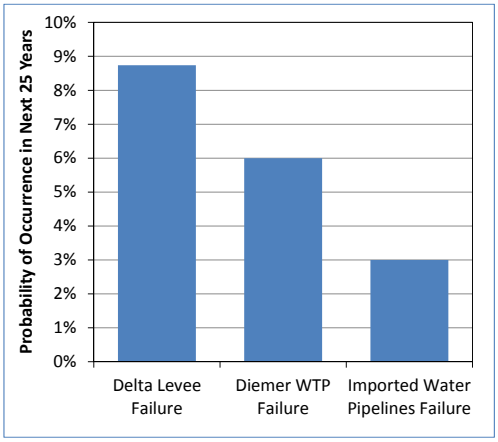
- The risk of deliveries being disrupted more than 6 months (MWD has storage for 6 month outage)

Diemer Water Treatment Plant

- The risk of a complete shut-down of plant for 30-60 days

Imported Water Pipelines

- The risk of both regional treated water pipelines breaking for 7-14 days

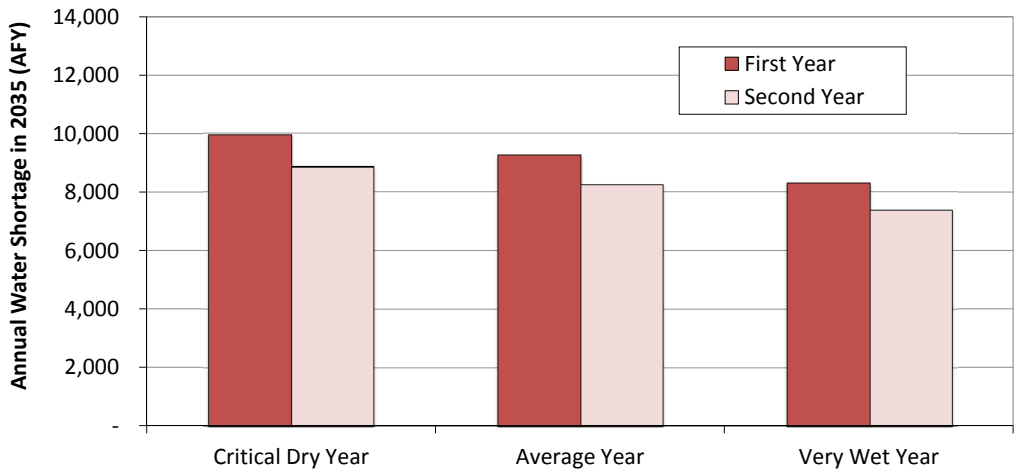


Source: California DWR and CDM Smith's use of EZ-FRISK earthquake ground motion software

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

22

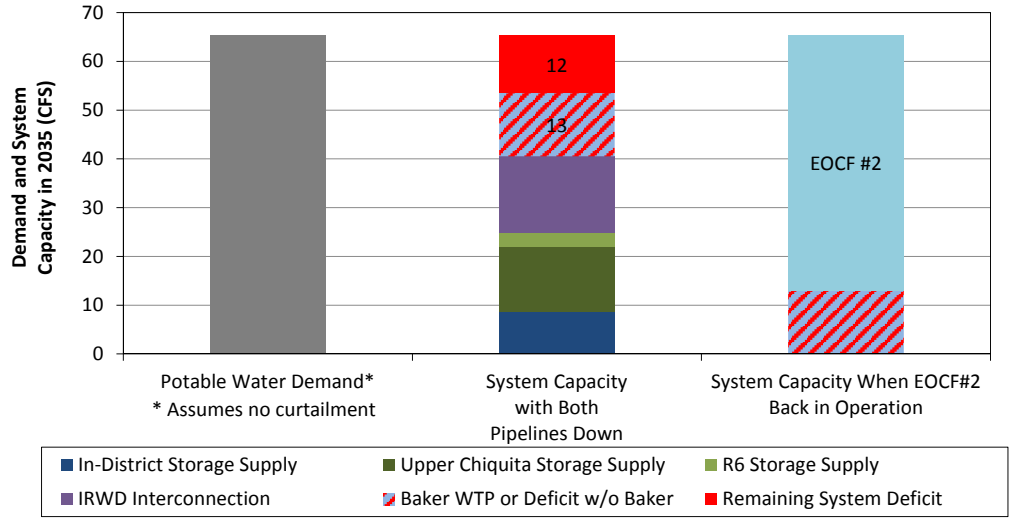
MNWD's Projected Shortages Under Delta Levee Failure



Based on California DWR Report: Delta Risk Management Strategy (2009)

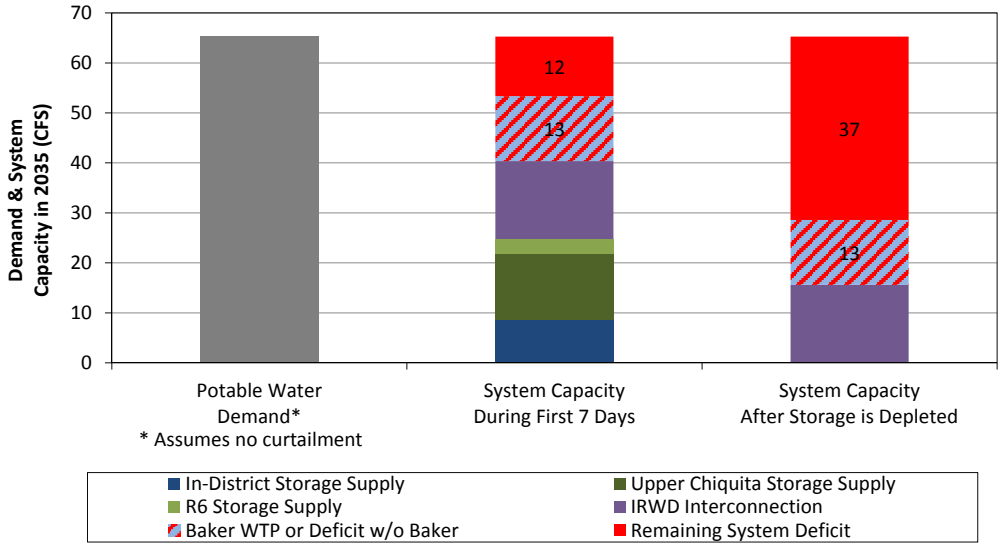
23

MNWD's Projected System Reliability in 2035



24

MNWD's Projected System Reliability in 2035



25

Summary of Technical Meetings

1. MWDOC staff kick-off (already held)
2. OCWD/MWDOC staff kick-off (already held)
3. MET meeting on supply reliability (scheduled on Nov 26)
4. SMWD for SJBA, Cadiz and South County Recycling
5. IRWD for expansion of the Regional Interconnections and for Strand Ranch
6. OCSD for update on availability of wastewater
7. Cal Domestic Water Company to discuss groundwater in Brea and La Habra areas
8. Others, as needed

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

26

Future Reliability Study Workgroup Meetings

Meeting No.	Anticipated Date	Proposed Meeting Topics
2	Jan	Review Draft Water Demand Analysis and Method for Forecasting
3	Feb	Review Reliability Scenarios and Possible Impacts
4	Mar	Present Demand Forecast with Sensitivity
5	Apr	Present Local Agency New/Potential Projects
6	May	Present and Discuss MET and OC Policies to Improve Reliability
7	Jun	Present Supply and System Gap Analysis
8	Jul	Present Example Portfolios of New/Potential Projects
9	Aug	Demonstrate that New/Potential Projects Improve Reliability
10	Oct	Review Draft Report

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

Draft, Subject to Changes based on Data Availability from MET and Local Agencies

27

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

OC Reliability Study Workgroup

Orange County Water Reliability Study

Meeting # 1: Project Kick-Off

November 20, 2014

OC Water Reliability Study Workgroup Meeting #2 Policy Issues

December 18, 2014

Municipal Water District of Orange County

1

Agenda

- Presentations from Local Agencies on Demand Forecasts and Trends
- Information Updates from Local Agencies
- Summary of Recent Meetings with MET
- Request for Scope Augmentation for CDM Smith to Develop "Shadow" MET IRP Model
- Start Discussions on Policy Issues
- Next Steps

2

Local Agency Demand Forecasts

- Presentations by Anaheim and IRWD on recent work on updating demand projections
  - Methodology
  - Forecast of impact of WUE efforts
  - Trends identified

3

Information from Agencies

- MWDOC (Kevin Hostert) Agency Surveys
  - 2013-14 Billing Data by Sector
  - 5 and 25 Year Projections, including Existing Projects Production Forecast
  - NEW Project Survey
  - Generator and Operating Information for Agencies during emergency situations

Would like information in by December 31;
if you have questions or need help,
call or email Kevin Hostert
714-593-5034 or khostert@mwdoc.com

4

Recent Meetings with MET

- Summary of Recent Meetings with MET
  - MET IRP Modeling – not available until summer 2015 or later
  - DWR SWP & Climate modeling
    - 2013 Water Reliability Forecast for SWP coming out soon – based on Wanger & Climate Change
    - 2015 Water Reliability Forecast for SWP coming out in April 2015 – will include impacts of Biops & Climate Change
  - MET Demand forecasts
    - Not available until summer 2015 or later
    - MET will work with us to calibrate OC demands for our study purposes
- Request for Scope Augmentation for CDM to prepare shadow MET IRP Model
  - Allows us to test scenarios other than those used by MET

5

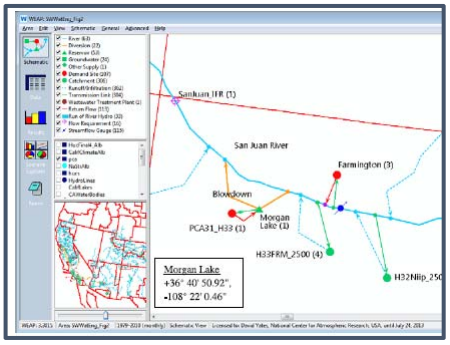
MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

Scope Augmentation: Prepare Shadow IRP Model

- Use Calibrated WEAP-SW model, developed by Dr. David Yates, for Water-Energy Study of Southwest U.S. to derive Delta exports and Colorado River Deliveries to MET under current and climate changed-conditions
- Develop a MET-OC WEAP to add MET's storage and transfer programs, and allocate supplies to OC
- Model supply GAP for OC based on imported water availability, SAR supplies, and other local water supplies

Scope Augmentation Fee = $24,000

6

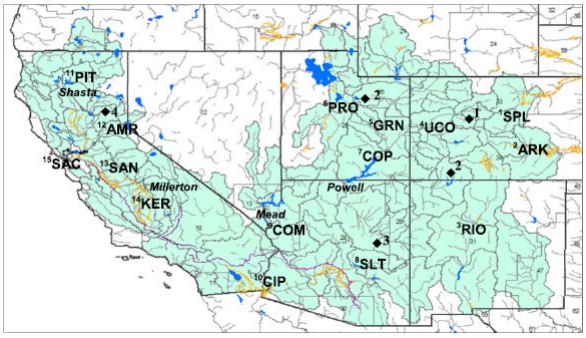


Water Evaluation and Planning (WEAP) is a water planning model developed by SEI and has been used by CA DWR, MWD, and others to simulate water supply operations and reliability. It can be customized to represent local, state and multi-state regions.

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

WEAP-SW Model

- Represents the water supply and demands of more than 60 major river basins throughout Arizona, California, Colorado, Nevada, New Mexico, Wyoming, and Utah.
- Spatially based, capable of calculating changes in the hydrologic cycle, including changes in climate conditions and human interventions such as reservoirs, canals and tunnels, irrigation systems, urban water system, and hydropower facilities.
- Can incorporate scenarios of extended droughts (both observed as well as synthetic) on supply reliability
- Models Delta exports and Colorado River supplies to MET system



7

Policies Issues (start dialogue)

- Policy Issues from the Scope of Work
  - Identifying and valuing benefits of Local Projects
    - Supply
    - System
    - Extraordinary Supply
    - Regional Benefits vs Local Benefits
    - Carry-Over Storage for Droughts
  - Water Supply and Drought Management Plan and how NEW Projects are accounted for during drought allocations
    - Preferential Rights
    - Share the Pain Model
    - Others
  - MWD as the regional provider (they build large local projects)
  - Level and Extent of MWD Storage for Managing Supplies

8

Policy Issues (start dialogue)

- Incentives provided by MWD
- Extended Drought Planning Criteria
- Contingency Targets for Planning Purposes
- Sharing of supplies within OC
- SAR water policy issues
- Storage of MWD water by Member Agencies outside of MWD
- Introduction of Local water into the MET system
- Availability of water for groundwater replenishment
- Others???

9

Today's Policy Discussion

- Benefits of Local Projects using two examples just for illustration purposes
  - Ocean Desal Project
  - Central Valley Transfer

10

Types of Benefits of a Local Project

- Supply Benefit
- System Benefit
- Extraordinary Supply Benefit
- Carry-Over Storage – provides extra water in storage for future use
- Others???
- To Whom do these benefits accrue?

11

Example - Ocean Desalination Project

- Supply Benefit = Annual production out of facility 10 years out of 10 years to local area; lowers annual demand on MET, resulting in higher reliability for MET service area every year
- System Benefit = Peak capacity out of facility when needed for emergency response; diversifies location of OC supply sources - may improve resiliency
- Extraordinary Supply Benefit = NEW supply when we are under a water supply allocation plan by MET – would only occur if the plant comes on line after the base years used for allocation purposes
- Extra water in storage – lower demand on MET allows more water to be placed in MET storage accounts
- Water Quality, others???

12

Example – Central Valley Water Transfer

- Supply Benefit = Occurs only in years when water is utilized/needed
- System Benefit = NONE
- Extraordinary Supply Benefit = YES, when we are under a water supply allocation plan by MET
- Extra water in storage – NONE
- Water quality, others???
- The benefits accrue directly to the user of the water

13

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

Normal & Drought Year Ops

Supply Sources	Case 1 Before Projects	Case 2 With Base Loaded Ocean Desal	Case 3 Drought Year with CV Transfer	Case 4 Drought Year with Ocean Desal & CV Transfer
	Normal	Normal	Drought	Drought
MET	5,000	4,000	4,000	3,000
Normal Local	5,000	5,000	5,000	5,000
Ocean Desal	na	1,000	na	1,000
CV Transfer	na	na	1,000	1,000
Total Demands	10,000	10,000	10,000	10,000

Comments
Reduced demand on MET increases reliability to MET service area
Ability for MET to store 1,000 to 2,000 AF of water per year compared to Case 1
Reduced Sale by MET impacts their finances
Local Benefit of increased supply - MET service area neutral

14

Upcoming Next Steps

- Collect and Compile Data from Agencies Survey
- Upcoming Meetings to Collect Data:
  - Cal Domestic, Brea and La Habra Groundwater
  - SMWD, Cadiz and SJBA
  - IRWD, Strand Ranch
- Develop OC Statistical Model of Water Production
- Work with MET on Demand Forecasts
- Identify and Value Benefits of Local Projects
- Preparation of MET IRP Shadow Model for GAP

15

16

ACTION ITEM
January 21, 2015

TO: **Planning and Operations Committee**
(Directors Osborne, Barbre, Hinman)

FROM: **Robert Hunter, General Manager**

Staff Contact: K. Seckel/R.Bell

SUBJECT: **Doheny Ocean Desalination Project Baseline Environmental Monitoring Agreement with SCWD/LBCWD**

STAFF RECOMMENDATION

Staff recommends that the Board of Directors authorize the General Manager to enter into an updated professional service agreement with Chambers Group, in association with Merkel & Associates in an amount of $153,346 and enter into a reimbursement agreement with South Coast Water District to fully fund this work, including MWDOC staff time estimated at $6,000. Last year we entered into an agreement with SCWD/LBCWD for the MET Foundational Action Funding Program work on "Application of Slant Well Technology" and would use a similar agreement for this work.

SCWD will be the project manager and MWDOC will provide contract administration, oversight and project support. This work was previously considered and awarded by the Board on April 20, 2011 upon concurrence of the Project Participants Committee, however, the work under this prior award was not initiated at that time due to funding considerations in the Phase 3 work. The Chambers Group/Merkel Associates updated proposal is attached.

COMMITTEE RECOMMENDATION

To be determined at the Committee meeting . . . .

Budgeted (Y/N): N	Budgeted amount: n/a
Action item amount: $160,000	Line item:
Fiscal Impact (explain if unbudgeted): No fiscal impact on MWDOC. Work to be fully funded by South Coast Water District including staff time. South Coast and LBCWD are discussing joint participation for this work.	

SUMMARY

SCWD/LBCWD are proceeding with implementation of the 5 MGD Doheny Demonstration Ocean Desalination Project. In the interest of time, SCWD has requested MWDOC to contract for these services since a formal procurement process and award had been previously conducted by MWDOC and the Doheny Project Participants. SCWD will fund all work under this agreement, will serve as the project manager, and will fund MWDOC staff time to provide contract administration, oversight and project support. An agreement between MWDOC and SCWD would be entered into that would be similar to the approach taken with the MET Foundational Action Funding Program work. An estimated cost for this work is $160,000 which includes MWDOC staff time.

Chambers Group and Merkel & Associates have provided an updated proposal which is attached. Dr. Noel Davis is the project manager as before. The baseline environmental monitoring work for lower San Juan Creek and the seasonal coastal lagoon, is on the critical path for project implementation and is necessary to support the environmental documentation and permit applications for the Doheny Ocean Desalination Project.

SCWD/LBCWD are currently working on the MET Foundational Action Funding Program "Application of Slant Well Technology" and the baseline environmental monitoring work will be conducted concurrently to provide the following:

- Needed data and information for assessment of the coastal lagoon habitat for project impact evaluation for CEQA (and possibly NEPA) processing to be started later next year by SCWD/LBCWD and to support project permit applications.

- An improved understanding of the environmental issues relative to the project and groundwater production out of San Juan Basin.

The overall purpose of the recommended work is to (1) finalize the scope of work working with the resource agency personnel, some of whom have changed and (2) to collect baseline environmental information for lower San Juan Creek and its seasonal coastal lagoon to support the project CEQA impact evaluation and documentation and project permit applications.

The work will help to address several questions related to potential groundwater drawdown impacts on the lower reaches of San Juan Creek and its seasonal coastal lagoon from the proposed project and upstream groundwater development and management programs. It will also help to subsequently recommend a monitoring program to assess conditions and potential project impacts and any necessary project mitigation measures as well as assess habitat conditions for southern Steelhead and other species.

Staff previously worked on this effort during 2010 and 2011 and completed an updated and revised scope of work in 2013, working with the San Juan Basin Authority, Project Participants, City of Dana Point, State Parks, Trout Unlimited, National Marine Fishery Service, California Department of Fish and Wildlife, and US Fish and Wildlife Service,

State Parks, San Diego Regional Water Quality Control Board, Orange County Watersheds, U.S. EPA, and with the U.S. Bureau of Reclamation fishery staff to help outline and review the work elements. Since that time, some staff have changed and it is necessary to review the proposed scope of investigation with these agencies for their comments and concurrence to the scope. Opportunities for timely support funding from these agencies will be explored.

NWRI may be tasked to form an independent science advisory panel to review the consultants work as is being done under the MET Foundational Action Funding Program work. No budget is provided for NWRI at this time.

To solicit consultants for this work, staff previously prepared and issued a Request for Proposals (RFP). In preparation of the RFP scope of work, staff coordinated and received comments from National Marine Fishery Services, Trout Unlimited, State Parks and Orange County Watersheds. This information was incorporated into the draft RFP. Staff then circulated the draft RFP and received comments from staff from the San Juan Basin Authority (SJBA), the Project Participants, and the U.S. Bureau of Reclamation. The final RFP was issued on December 17, 2010 to 16 firms who specialized in this field. This list was based on an effort to include qualified firms known to MWDOC, the Project Participants, SJBA, Orange County Watersheds, State Parks, and others who might have an interest and qualifications in this specialized field.

The RFP and related project background was subsequently forwarded to the resource/regulatory agencies (National Oceanic and Atmospheric Association (NOAA), National Marine Fisheries Service (NMFS), United States Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG) and State/Regional Water Boards), inviting their participation and potential funding support for this baseline environmental monitoring effort. Comments were received but no additional funding source was identified at that time.

MWDOC received six excellent written proposals on January 28, 2011. Staff from the Project Participants, SJBA, City of Dana Point, Orange County Watersheds, State Parks, the U.S. Bureau of Reclamation and George Sutherland representing Trout Unlimited, participated in the selection process. Proposals were received from six firms/teams: AECOM, Chambers Group, Coastal Environments, Michael Brandman Associates, MBC Applied Environmental, and Westin Solutions. The selection panel interviewed three teams: Chambers Group, MBC Applied Environmental and Westin Solutions. The interviews were held on March 10, 2011 and the panel recommended the selection and award of the contract to Chambers Group, in association with Merkel and Associates, in the amount of $140,694. The Project Participants Committee concurred with staff's recommendation to award the project and the MWDOC Board on April 20, 2011 awarded the contract to Chambers Group/Merkel & Associates.

One of the initial and key tasks to be performed after entering into the contract with Chambers Group/Merkel & Associates will be to meet with the regulatory agencies to discuss and refine the scope of work as appropriate and to determine their interest in potential funding and staff participation. Since the fisheries and environmental issues go beyond the Doheny Ocean Desalination Project, the work to be conducted under SCWD funding is focused on the project. However, there can be economies of scale in

undertaking baseline environmental monitoring and assessment work for the same area. Staff has been coordinating with George Sutherland, representative of Trout Unlimited over the past several years regarding southern Steelhead recovery planning for San Juan Creek. Trout Unlimited has been working with the resource agencies on the design and implementation of fish passages on Arroyo Trabuco and on habitat improvement for the seasonal coastal lagoon to improve the area for southern Steelhead refugia. To support staff in this baseline environmental monitoring effort and to facilitate coordination with the resource and regulatory agencies, the Board previously authorized staff to enter into an agreement with George Sutherland, representing Trout Unlimited in the amount of $10,000. This agreement was not entered into due to the deferred monitoring work and is NOT part of this award at this time.

It should be noted that South Coast WD and Laguna Beach CWD are discussing joint participation for this work; depending on how quickly those arrangements can be made, the funding agreement may be drafted to include LBCWD.

December 22, 2014

Mr. Richard Bell, P. E.
Municipal Water District of Orange County
18700 Ward Street
Fountain Valley, CA 92708

SUBJECT: LOWER SAN JUAN CREEK AND SEASONAL COASTAL LAGOON - BASELINE ENVIRONMENTAL MONITORING FOR DOHENY OCEAN DESALINATION PROJECT ENVIRONMENTAL ASSESSMENT

Dear Mr. Bell:

Based on input from the involved agencies and steelhead and lagoon experts, Chambers Group has updated the scope and costs for the Lower San Juan Creek and Seasonal Coastal Lagoon Baseline Environmental Monitoring Program. The scope and costs are presented below. This revised scope will be circulated to the resource agencies for comment.

SCOPE OF WORK

Task 1 Literature Review and Collection of Relevant Data from Other Investigations

During this task, relevant existing literature on habitat conditions in San Juan Creek Lagoon and Lower San Juan Creek will be compiled into an electronic database, reviewed, and summarized in a technical memorandum. Chambers Group has reviewed much of the available literature as part of its previous work on the Doheny Ocean Desalination Project. The available literature includes studies of the San Juan Creek watershed (San Juan and Trabuco Creeks Watershed Steelhead Recovery Plan by CDM for Trout Unlimited and the California Department of Fish and Wildlife and the U.S. Army Corps of Engineers San Juan Creek Watershed Management Plans. These documents provide an overview of the watershed with some information specific to Lower San Juan Creek and San Juan Creek Lagoon. In addition, a limited amount of biological and/or water and sediment quality sampling events in Lower San Juan Creek and San Juan Creek Lagoon provide specific information on parameters relevant to establishing an environmental baseline for the Doheny Ocean Desalination Project. For example, these studies include a tidewater goby survey in San Juan Creek Lagoon that included enumeration of all fish species collected and water quality measurements (Baskin, J.N. and T.R. Haglund 2006 Tidewater Goby Protocol Survey in San Juan Capistrano Creek Lagoon, Dana Point, Orange County, California), the Southern California Coastal Water Research Project (SCCWRP) Surface Water Ambient Monitoring Program (SWAMP) Report on the San Juan Hydrologic Unit (Mazor, R.D. and K. Schiff 2007) included a station in Lower San Juan Creek that was sampled for water chemistry, water toxicity, benthic invertebrates, and physical habitat assessment. In addition, Chambers Group mapped the vegetation in San Juan Creek Lagoon as part of the studies for the SOCOD project. The literature review will include the recent beach monitoring work by SCCWRP.

This task will also include development of criteria for San Juan Creek Lagoon to provide a rearing environment for juvenile steelhead. Studies on the restoration of the southern steelhead population in Topanga Creek (for example Dagit, R., K. Reagan and V. Tobias 2007 Topanga Creek Southern Steelhead Habitat Suitability and

Monitoring Study) will be used as a reference. In general, steelhead require relatively cool, unpolluted, well oxygenated water; refuge from predators; and an adequate source of food. The Resource Conservation District of the Santa Monica Mountains has developed a Habitat Suitability Index for Topanga Creek. Those parameters will be reviewed and discussed with NOAA Fisheries, Trout Unlimited, Rosi Dagit of the Resource Conservation District of the Santa Monica Mountains, and other knowledgeable parties to develop specific criteria that would need to be met for San Juan Creek Lagoon to provide good habitat for juvenile steelhead rearing in San Juan Creek Lagoon.

The deliverable from this task will be a Technical Memorandum that summarizes the existing literature on Lower San Juan Creek and San Juan Creek Lagoon and evaluates the current condition of the habitat based on this information. The Technical Memorandum also will review the literature on habitat needs for juvenile steelhead and will suggest specific criteria for San Juan Creek Lagoon to support summer rearing of juvenile steelhead.

Cost for Literature Review and Technical Memorandum $9,862

Personnel Noel Davis of Chambers Group

Schedule Technical Memorandum within 6 weeks of Notice to Proceed

2. Baseline Environmental Monitoring Monitoring

2 A. Characterization of the Physical Environment

Characterization of the physical environment will be done by Merkel & Associates, who recently performed a similar analysis for San Mateo Creek. Development of a firm understanding of the physical environment of the Lower San Juan Creek and lagoon system is critical to understanding the relationship between natural variability and project effects on biotic systems. To develop this understanding, the project team proposes a year-long field sampling program that is comprised of various point sampling events and continuous monitoring efforts. The program examines changes in the system over time using a combination of historic record reviews (photographic records, channel design plans, past topographic surveys), and direct measurements and observations (sediment characterization, water levels, sediment surface profiles, and water quality conditions).

If manifested as a surficial effect, the proposed groundwater extraction may result in reduction in surface water levels or changes in surface water salinity. These same physical conditions vary both naturally within the creek and lagoon and are affected by upstream basin extraction, diversions, return flows and management planning. It is important to develop a natural baseline before it is possible to explore potential effects of pumping, measured as deviations from the baseline. Understanding the baseline physical environment and its connection to the biological systems is also critical to understanding when a system is susceptible to potential stress and how that stress may be manifested. With this information, it will be possible to begin to consider potential need for and form of operational triggers that may affect extraction practices, timing, or volume.

It is expected that many of the present ongoing groundwater flow modeling investigations will aid in determining if and when coupling with surface water occurs as a result of extraction pumping. The

program proposed below is intended to supplement this macro-scale understanding of the basin and extraction area hydrology with a refined understanding of the baseline hydrologic and geomorphic interface to the reliant ecological communities.

Task 2A1: GIS Review and Analysis of Historic Aerial Photographs

Prior to initiation of field investigations, a review of historic data and aerial photographs collected for the Lower San Juan Creek and and its seasonal coastal lagoon will be performed. Aerial photographs, in particular, can provide a powerful tool for analysis of change in fluvial and geomorphic conditions. The project team is currently completing a similar effort for the Trestles Wetlands Natural Preserve. GIS analysis of aerial photographs has illustrated not only changes in the morphology and character of the San Mateo Creek Lagoon, but has illustrated the southerly migration and reduction in prominence of the point at Lowers surf break over time.

For the proposed work effort, the project team would collect available true vertical aerial images of San Juan Creek and Lagoon. Compiled photos will be scanned and imported into ESRI ArcGIS© software and georeferenced using stationary control points. A qualified GIS specialist will then delineate the lagoon boundaries, the extent of the lagoon sand bar, and other geomorphic features such as bars, channels, and holes within the project area. Using these data, it is possible to roughly quantify and compare changes in geomorphology over space and time.

Cost for GIS Review of Aerial Photographs $5,013

Personnel Merkel and Associates

Schedule Technical Memorandum within 2 months of Notice to Proceed

Task 2A2: Beach and Lagoon Profiling

The Lower San Juan Creek and Lagoon represents a dynamic system in which sediment transport, channel depth and location, and sand berm development are driven by seasonal and interannual variation in rainfall, air temperatures, and tidal cycles. In order to characterize an annual pattern of sediment accretion and erosion and channel movement, the study area would be surveyed two times during the study period: once in early spring immediately following winter storms and prior to rebuilding of a summer berm condition and once prior to the winter storm season.

The survey will be conducted from a fixed station and will include an axial survey of the creek from Stonehill Drive into the shallow surf zone. Stationing from Stonehill Drive downstream would be used, and elevations will be taken every 100 feet of channel length over the approximately 1 mile reach. Within the creek, the survey would follow the thalweg (flow line) of the channel. This process will provide horizontal and vertical positioning for the creek. In addition to the creek profile, two additional profiles would be added in the lagoon and across the beach berm (the berm typically forms and moves upstream over the summer) to better characterize this segment of the system. In addition to the axial surveys, several channel sections would be surveyed to characterize the elevations and variability within segments of the creek and lagoon. The same survey profiles and sections would be surveyed during both events in order to evaluate changes in surface morphology following the winter storm season.

A GIS grid model would be used to subtract the surveyed surfaces to compare change in the bottom elevations between survey events. This process will allow evaluation of accretion or erosion and sedimentation patterns. Data would be presented in reports both graphically and through summary statistics such as rates of accretion or erosion at the lagoon mouth and within the Lower San Juan Creek adjacent to Pacific Coast Highway (PCH). Storm flows periodically scour out the lower San Juan Creek channel below PCH. The depth of scour is tied to tide, depth of sediment, flow rate/duration and sediment load.

Because ground surface elevation and water surface elevation interact to determine depth of water in an aquatic environment, the results of the topographic survey investigations would be coupled for analyses with a continuous water level monitoring program (described below).

Cost for Beach and Lagoon Profiling $15,315

Personnel Merkel and Associates

Schedule Late April or Early May 2015

Task 2A3: Water Level, Ponded Area, and Water Quality Conditions

Task 2A3.1 Water Level

Water level monitoring is fundamental to understanding the factors influencing physical and biological structure of the lower San Juan Creek and its seasonal coastal lagoon. As an estuarine system with freshwater input and annually variable ocean influence, stream flows and, to a lesser extent, tides are the principal forces driving the hydrodynamics within the lagoon area. The accretion and erosion of the sand berm at the mouth of the lagoon has the greatest impact on oceanic influence, and seasonal rainfall patterns drive freshwater input and wash out of the berm. Water level monitoring provides a means of tracking these influences.

Water level would be measured continuously with self-contained, logging water level gauges deployed at three stations within the study area: Station 1 will be located within the lagoon along the main channel, Station 2 will be located just east of PCH, and Station 3 will be located between PCH and Stonehill Drive. A fourth station would be located within Dana Point Harbor to provide a tide control for the gauges within San Juan Creek and Lagoon. The stations would be positioned away from structures (such as bridges) that will cause localized hydraulic jumps during high creek flows or tidal intrusion. Final station locations may be adjusted based on security and ease of retrieval. A perforated PVC pipe with a locking cover cap would be installed below the normal water level at each station. Highly accurate well loggers would be deployed at the four stations, and a barometric pressure logger would be deployed nearby at a secure above-water location and used to correct the submerged pressure gauges for atmospheric pressure. The location and elevation of each monitoring station would be established by land survey at the time of completion of beach and lagoon profiling (described above). Data would be collected continuously at six-minute intervals for the entire year-long study period. Pressure gauges would be downloaded, serviced, calibrated, and reprogrammed every two months at a minimum; and an effort would be made to service units concurrently with other field monitoring work. At times of visits to the pressure gauges observations will be made of the extent of ponded water in the lagoon. Changes in water depth at each station over the study period would then be analyzed and charted.

Cost for Water Level Monitoring $16,313

Personnel Merkel and Associates

Schedule Data collected for one-year from Notice to Proceed

Task 2A3.2 Water Quality

Multiprobe water quality instruments (YSI or Hydrolab) would be deployed quarterly at water level monitoring stations within the study area. Units would be calibrated in accordance with manufacturer specifications and programmed to log temperature (°C), dissolved oxygen (DO)(mg/L), turbidity (NTU), salinity (ppt), and pH at 30-minute intervals for 30 days. The units would be mounted near water level pressure gauges.

At the time of deployment and retrieval, water quality readings would be collected with a separate, tended instrument next to the deployed unit for quality control purposes. In addition, at this time, the independent unit would be utilized to collect depth profile water quality data at each station. The unit would be lowered to 1 foot off the lagoon or channel bottom and collect temperature (°C), dissolved oxygen (DO)(mg/L), turbidity (NTU), and salinity (ppt) for 2 minutes. Then the unit would be raised in 1-foot increments with coincident data collected until it reaches the surface. This will provide water quality and, in particular, a salinity profile with depth. In most instances it is anticipated that the shallow nature of the water body will limit both the profile depth and variability of the water body; however, it is possible that a marine water pool will be found below freshwaters in the lagoon and, potentially, the lower creek areas.

Following data collection, the retrieved units would be placed in calibration solutions and rechecked for accuracy. A technician would download and transfer data to the project database for review and analysis. The data would be reviewed to detect and remove spurious data points that may have resulted from algal fouling of probes, signal decay from sediment loading or biotic activities, or that are out of the range of the capability of the unit. Accepted data would be plotted graphically, numerically analyzed, and reviewed to generate summary statistics.

Cost for Water Quality Monitoring $19,395

Personnel Merkel and Associates

Schedule Mid-May , August, November, February

Task 2B. Surface Water and Seasonal Coastal Lagoon Habitat Assessment

The project area for the surface water and habitat assessment will be the lower San Juan Creek and its seasonal coastal lagoon below the PCH Bridge and lower San Juan Creek just above the bridge to Stonehill Drive. Chambers Group proposes to do the surface water and seasonal coastal lagoon habitat assessments twice – once in the spring after the end of the winter high flow period and once in the late summer/early fall at the end of the dry season. These sampling periods will capture the conditions during the reproductive period for many species and during the period when the lagoon and lower creek are most likely to be stressed by high temperatures and low creek flows.

Task 2B1: Bank and Riparian Vegetation

Bank and riparian vegetation surveys will be done in the spring to assess the reproductive condition of the vegetation and in the early fall to assess the condition of the vegetation following the stressful period of high temperatures and no rainfall. A minimum of three 25-meter-long permanent transects will be established within the potential impact area in lower San Juan Creek and its seasonal coastal lagoon, and three transects will be established upstream above Stonehill Drive beyond the area of potential impact. This area is impacted to a far greater degree by SCWD Groundwater recovery plant well pumping. The point intercept method will be used to document percent cover of each species on the transect. Reproductive state and general condition of the vegetation will be documented with field notes and photographs.

Cost for Vegetation Monitoring $6,260

Personnel Heather Clayton of Chambers Group

Schedule Late- April or Early Man and September or Early October

Task 2B2: Essential Fish Habitat Assessment

Task2B.2.1. Habitat Assessment

An assessment of the physical suitability of the habitat of lower San Juan Creek and its seasonal coastal lagoon to support fish will be done in the late spring and early fall survey periods during the fish surveys. The project team will use a modified version of the physical habitat quality assessment protocol that is part of the California Department of Fish and Wildlife (CDFW) Stream Bioassessment Procedures. The physical habitat quality assessment scores a series of parameters that contribute to stream quality for fishes on a scale of 1 to 20, with 20 being optimal habitat and 0 being extremely poor. Some of the parameters (such as characteristics of riffles) in the CDFW Stream Bioassessment Procedures' physical habitat quality assessment apply primarily to upper watershed riffle/run habitat used for salmonid spawning. The physical habitat quality assessment for the lower San Juan Creek and its seasonal coastal lagoon monitoring will focus on parameters important to support juvenile steelhead rearing in the seasonal coastal lagoon and that are appropriate for the lagoon and lower creek. These parameters will include water depth, vegetation canopy cover, woody debris, boulders, number and depth of pools, and algae. Habitat will be assessed at three locations across the width of the estuary downstream from the bridge.

Task 2B. 2.2. Fish Sampling

Rosi Dagit will amend her Section 10 permit for endangered species take to include San Juan Creek and up to 3 people from Chambers Group. Fish will be sampled during the spring and fall survey periods using a minnow seine. Up to six sites will be sampled, depending on the amount of water in the estuary during the sampling. All fish collected will be identified, measured, and weighed. A voucher sample will be collected for each species identified so that identifications can be verified. The data will be checked in the field at the end of each day. Field data will be transferred to Excel spreadsheets. The analysis will include a table of the number of each species of fish collected at each station with size range and total weight.

Cost for Fish Survey and Habitat Assessment $24,444

Personnel **Rosi Daggitt, and Noel Davis, Paul Morrissey, and Lisa Louie of Chambers Group**

Schedule Late April to mid-May and Late September to Early October

Task 2B3: Nutrient Analysis

Water samples will be collected during the fish survey at each fish sampling site and analyzed for nutrients (Nitrate-N, Nitrite-N, Ammonia-N, orthophosphate) and turbidity.

Cost for Nutrient Analysis **$1,668**

Personnel Rosi Daggitt

Schedule **Late April to mid-May and Late September to Early October**

Task 2B4: Water Column Invertebrate Sampling

Invertebrates provide the base of the food chain for higher trophic levels such as fish and birds. In many cases, the benthic community also serves as an indication of sediment quality. Because of the variation in flows and salinity within San Juan Creek estuary, the benthic invertebrate community would be expected to respond to the seasonal variation in flows rather than sediment quality. Furthermore, steelhead smolts do not eat sediment-dwelling invertebrates. Therefore, water column and epibenthic invertebrates, the main food source for outmigrating smolts, will be sampled.

To characterize the pelagic and epibenthic invertebrate communities within Lower San Juan Creek and Lagoon, three stations will be established within the study area: Station 1 will be located within the lagoon along the main channel, Station 2 will be located just east of PCH, and Station 3 will be located between PCH and Stonehill Drive. These stations are the same as those proposed for the water quality monitoring program discussed above. Pelagic and epibenthic invertebrates would be sampled at each station twice during the study period: once in early spring following winter storm events, and once in later summer before the next seasonal rains.

At Station 1, within the lagoon, a minimum of three transects would be placed parallel to and within the dominant stream flow (for the lagoon this would be along the main channel). Two biologists would tow a plankton or hoop net with attached bridle along each transect for a determined length. Each replicate would include a surface water tow and a bottom substrate tow in order to capture any vertical stratification of organisms. At Stations 2 and 3, further upstream, a kick net or surber net would be deployed at a minimum of three locations. A biologist would place the net perpendicular to the active flow of the creek. A predetermined area of substrate located just upstream of the net would be disturbed by kicking or rubbing the substrate. Disturbed organisms would then flow downstream into the net or be scooped into the net by a second biologist.

Invertebrates from each replicate sample would be collected and preserved in a 10 percent buffered formalin/seawater solution and transferred to 70 percent ethanol for long-term preservation and subsequent taxonomic and biomass analysis. Following procedures employed in similar system characterization studies, such as conducted at Batiquitos Lagoon, Buena Vista Lagoon, and Bolsa Chica Wetlands, samples would be

sorted into major taxonomic groups. Abundance and wet weight would be determined and reported by group. By examining the changes in ratios and overall abundance or weight of the individual groups, this level of taxonomic reduction has generally proven appropriate to address seasonal and interstation variation, as well as to generally characterize the physical environment (e.g. freshwater or saltwater; high energy or low energy). This coarse level of taxonomy provides an economical and efficient means to explore many aspects of the invertebrate community and environmental stressors on the community; however, for questions regarding specific indicator species or refined community characterization, more detailed and costly taxonomic analyses are required. While the present budget and needs do not support the more detailed analyses at this time, samples collected and analyzed would be archived for future taxonomic study and analyses, should need for these additional data arise and funds become available.

In order to characterize the epibenthic macroinvertebrate community within lower San Juan Creek and its seasonal coastal lagoon, the by-catch captured by nets during fisheries studies would be identified and quantified. This approach allows for a larger sampling area at each station and less intrastation variability than observed with the use of small quadrat sampling, while retaining appropriate replication and the ability to calculate densities and biomass of organisms. This method is used regularly by the project team as a cost-effective means to sample large areas.

Cost for Invertebrate Survey $11,032

Personnel Merkel and Associates

Schedule Late April to mid-May and Late September to Early October

Task 3 QA/QC

All sampling equipment is checked and calibrated before every field survey. The leader of each field survey team will check that each sampling effort is following the specified procedures. Data are checked before leaving the field each day to make sure that no gaps in data collection, inadequate or otherwise unsatisfactory samples, or suspect results occur. Any work that may not meet requirements will be redone before leaving the field that day or will be redone the next day. Any transfer of samples from one entity to another will be accompanied by a chain of custody form.

Task 4 Data Management

All project data will initially be recorded in the field on hardcopy data sheets or tablets and then transferred in the office and laboratory to digital database files. Database queries will be used to extract summary information from the project database in preparation of tables and figures and for long-term trend analyses. In addition, this database will serve as the distributed format for nonspatial data. Hardcopies of the field data will be stored at a central, off-premises location. Digital files will also be backed up at an offsite location.

Data entry will follow a chain of custody protocol, with the field data recorder, data entry technician, and entry time documented as a part of the record. Samples will be checked for accuracy by a data entry technician and transferred to the computer database. A second data technician will be responsible for reviewing 50 percent of the data entered for each field sampling event. All summary data and analyses will be subsequently reviewed by the senior scientist. Once data is queried, it will be compared to raw data as a final course of

quality assurance. During the course of performing database queries, any odd records or missing data entries will generally become readily apparent through charting relationships or otherwise viewing data entries through a number of filtering steps. When this occurs, missing information will be traced back and recovered from the original data sheets prior to rerunning the query.

Spatial data will use ESRI ArcGIS® as a standard software format. All GIS-related data will be developed and maintained within the California State Plane Coordinate System (SPCS), based on the North American Datum 1983 (NAD 83), Zone 6, using the U.S. Survey foot as the standard unit of measure.

Sampling protocols, QA/QC manuals, and all data will ultimately be stored in Chambers Group's data management system. For data management, Chambers Group will use its exclusive software application, Bio Manager. Bio Manager is designed to track every aspect of environmental surveys, monitoring, and reporting; improve project management and communication; and provide immediate data access to all team members and decision-makers. Utilizing Bio Manager, all authorized members of the project team will interact with a secure, password protected web application. This real-time digital workspace is highly flexible and collaborative. All survey notes and photos, data, reports, correspondence, and QA/QC and sampling protocols will be stored in this web-based application.

Bio Manager will be helpful in:

- determining necessary protocols to follow before beginning work in the area;
- providing a continuous update of project status on a task/work related basis, and
- eliminating the need to track down project data such as permits, reports, documents, contracts, scheduled events, etc., associated with the project.

Cost for Data Management **$9,648**

Personnel **Chambers Group**

Schedule **Ongoing**

Task 5 Seasonal Coastal Lagoon Habitat Assessment

When all the field sampling and data analysis is completed, a final report will be prepared that describes the current condition of lower San Juan Creek and its seasonal coastal lagoon. The report will incorporate information obtained from the literature, historical aerial photographs, information on similar systems such as Topanga Creek Lagoon and San Mateo Creek Lagoon, as well as the information obtained from the baseline survey. The report will assess the value of the habitat in the project area as a southern California/lower creek habitat in general and as a potential steelhead rearing area. The report will be written so that the information can be incorporated easily into the environmental impact assessment for the Doheny Ocean Desalination Project. The draft report will be submitted for review. Comments on the draft report will be incorporated into the final report.

Cost for Habitat Assessment **$19,721**

Personnel **Chambers Group and Merkel and Associates**

Schedule **December 2015 through March 2016**

Task 6 Project Management and Progress Reports

Chambers Group will submit monthly progress reports to the SCWD/LBWD Project Manager and to MWDOC. In addition, Chambers Group's Project Manager will attend four meetings with the Project Manager to discuss the progress of the baseline environmental monitoring. Chambers Group's team will prepare a presentation on the monitoring program for the TAC and the project participants.

Cost for Project Management and Progress Reports **$14,675**

The total cost for this scope of work is **$153,346.** Please do not hesitate to contact me if you have any questions or need any additional information.

Sincerely,

CHAMBERS GROUP, INC.

Noel Davis, Ph.D.
Project Manager

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

Item No. 3

INFORMATION ITEM
January 5, 2015

TO: **Planning & Operations Committee**
(Directors Osborne, Barbre, Hinman)

FROM: **Robert Hunter, General Manager**

Staff Contact: Harvey De La Torre

SUBJECT: **Status of Reviewing and Revising MWDOC's Water Supply Allocation Plan**

STAFF RECOMMENDATION

Staff recommends the Planning & Operations Committee to receive and file the information provided below

REPORT

Last month, the Metropolitan (MET) Board approved a number of revisions to its Water Supply Allocation Plan (WSAP). The WSAP is the last step in MET's Water Surplus and Drought Management (WSDM) Plan during a drought. It is designed to distribute imported water in a fair and equitable manner to all of its member agencies during a period of shortage.

In preparation for the possible implementation of drought allocation this year and the recent adopted revisions to MET's WSAP, MWDOC began its process to review and updated its Water Supply Allocation Plan with its 28 member agencies through a series of staff workshops.

In the month of December, MWDOC held two WSAP workshops with its member agencies managers. In our first workshop, held in early December, we focused on reviewing the current formulas, calculations, and methodologies of the existing MWDOC Allocation Plan, including our existing policy principles established by the MWDOC Board in 2009, which lays the direction and foundation of our WSAP. They include:

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

- Seek best allocation available from MET
- Develop a MWDOC Plan in collaboration with our client agencies
- When reasonable, use similar method/approach as MET
- When MET's method would produce a significant unintended result, use an alternative approach
- Develop accurate data on local supply, conservation, recycling, rate structures, growth and other relevant adjustment factors
- Seek opportunities within MWDOC's service area to provide mutually beneficial shortage mitigation

We also reviewed the following four areas that MET recently changed in their allocation plan and evaluated their applicability to the MWDOC plan:

- Updating the WSAP Base Period
- Changing the Conservation Hardening Credit Calculation
- Inclusion of a Groundwater Replenishment Allocation
- Modifying the Penalty Rate Structure

With 18 member agencies attending the first WSAP Workshop, we received positive feedback on "pass-through" the MET revisions and were asked to bring back further analysis on the Base Period (comparing FY 2012/13 & FY 2013/14 to CY 2012 and 2013) and growth adjustment calculation.

At our second WSAP member agency manager workshop held on December 18, we focused on:

- Base Period Comparison
    - Comparing FY 2012/13 & FY 2013/14 to CY 2012 and 2013
- Baseline Mandatory Use Restriction Adjustment
    - Criteria and calculation
- Growth Adjustment Calculation
    - Applying an annual growth percent
- Review of Local Supplies
- Demand Hardening Credit Calculation
    - Comparing Device-Based savings calculation vs. GPCD savings calculation

With 23 member agencies attending the second workshop, we were able to achieve consensus and direction in the following areas:

- Updating the Base Period to FY 2012/13 and FY 2013/14; and
- Make a slight modification to the growth adjustment calculation by using the last two year's annual growth percent; and
- Support using the same Demand Hardening Credit GDCP savings methodology as MET; and
- Continuing with MWDOC "pooling" of the Penalty Rate Structure, which assesses allocation penalties to member agencies only if MWDOC exceeds its allocation with MET; and those penalties would be assessed on a prorated share of MWDOC's penalty amount with MET

Also at the second Workshop, MWDOC was able to provide the member agencies with a draft MWDOC WSAP model illustrating how each member agency's allocation is calculated.

MWDOC plans to hold a third WSAP workshop on January 22, and has asked for written comments from the member agencies on the revisions and plan no later than January 13.

Based on feedback from the member agencies, staff expects to present a list of WSAP recommended changes to the MWDOC Board for review and adoption next month.

Status of Ongoing MWDOC Reliability and Engineering and Planning Projects

December 22, 2014

Description	Lead Agency	Status % Complete	Scheduled Completion Date	Comments
Baker Treatment Plant or Expansion of Baker Water Treatment Plant	IRWD, MNWD, SMWD, ETWD Trabuco CWD		On line date is late 2016	MWDOC has been asked to help secure MET's concurrence on the quality of water being introduced into the South County Pipeline. MWDOC and MET have exchanged agreements and continue working on this issue. It is important to get it wrapped up by the end of the year to allow the actual construction tie-in of the new pipeline to the South County Pipeline to be made during a February 2015 shutdown.
Doheny Desalination Project	MWDOC			Work is continuing on the Foundational Action Program Studies for both the Doheny Desal and the SJBA. It is expected that the NEW information developed will provide an impetus for the project to move forward. South Coast Water District has requested assistance from MWDOC in following up on baseline environmental monitoring work that was previously scoped out but not funded; South Coast desires to proceed with this work to collect the necessary data to complete the CEQA work for a 5 mgd demonstration project.
Poseidon Resources Ocean Desalination Project in Huntington Beach				OCWD has revised and circulated the Clean Energy Capital report on the cost and financing options for the Poseidon Huntington Beach Ocean Desalination Project and conducted a workshop in December. The OCWD staff is planning a project update on other aspects of the Project at its January 7, 2015 Board meeting and potentially decide on a course of action.

Description	Lead Agency	Status % Complete	Scheduled Completion Date	Comments
				Staff will continue to monitor and participate in the project.
Orange County Water Reliability Study				Kick-off meetings have been held with MWDOC, OCWD, MET and two meetings have occurred with the full Workgroup. An update has been included in the January P&O Packet.
Other Meetings/Work				
				Karl Seckel participated in the South Orange County IRWMP Management Group discussions on: • Water supplies, including recycled supplies, stormwater capture and groundwater quality • Flood • Water Use Efficiency • Watershed Management • Water Quality Based on the discussions, the IRWMP Steering Group will be meeting to provide input as to particular directions for the IRWMP group to consider.
				Karl Seckel participated in the CalDesal meeting at ACWA where the membership reappointed the existing Board (including me) for another two years. Other discussions included agreement between CalDesal and WateReuse as to a joint letter recommending to DWR a cost-sharing of the Chapter 9 Water Bond Recycling funds of $725 M, with $525 M to recycling and $200 M to desalination, including ocean

Description	Lead Agency	Status % Complete	Scheduled Completion Date	Comments
				desalination. CalDesal is awaiting the outcome of the SWRCB Ocean Plan Amendments in the first or second quarter of 2015.
				The San Juan Basin Authority met in December and hired a Program Manager from among four candidates/firms responding to their RFP. Cathrene Glick from G3 Soil Works was hired to work in partnership with the Authority and its member agencies to develop a strategy for implementation of the San Juan Basin Authority Project under the Groundwater Management Plan. The Project involves an adaptive management approach to annually determine the amount of water available for use from the groundwater basin and to identify opportunities for recharging the basin through stormwater and/or other sources of water including recycled water, to cost-effectively maximize the production of water for the benefit of the member agencies; the project also includes an ocean water component and a seawater intrusion component. Ms. Glick and G3 Soil Works will be requested to: • Provide Authority with information and advice on environmental, engineering and financial issues that may impact the Project and/or that will, in Consultant's view, be required. • Identify contentious, costly or long lead time issues likely to be involved in the Project and recommend alternative strategies to deal with those issues. • Identify all procedural tasks and supporting activities that will be necessary to complete the Project as soon as possible and establish a likely timeline for said

Description	Lead Agency	Status % Complete	Scheduled Completion Date	Comments
				completion including development of requests for proposals for engineering, geotechnical and environmental services. • Identify required resources for meeting the deadlines and associated activities identified in the Project schedule. Identify any potential funding sources that may be available to support implementation of the project. • Develop and implement a work plan to be presented for approval by the Authority's Technical Advisory Committee (TAC) and ultimately the Board of Directors. • Attend monthly meetings of the Authority Board of Directors to report progress and answer questions, prepare the noticing, scheduling and conduct of all required public hearings/meetings required for the development of the project. • Perform studies and/or conduct assessments that are either required for, or support, the Project as determined by the Authority. The other item that is continuing is monitoring of the basin water levels and water quality constituents every two weeks to gain a better understanding of changes in the basin. The recent rain events have resulted in an increase in water levels, but the decreased pumping by both South Coast WD and the City of San Juan Capistrano have not yet been reestablished as of yet. A decision on the amount of pumping will occur based on the

Description	Lead Agency	Status % Complete	Scheduled Completion Date	Comments
				continued monitoring. MWDOC has an upcoming meeting with the SJBA staff to discuss progress on the Foundational Action Plan and to determine if there are other areas where MWDOC can lend assistance.

Status of Ongoing WEROC Projects
December 2014

Description	Comments
General Activities	Kelly Hubbard led the California Emergency Services Association, Southern Chapter Board Annual Planning Workshop on December 3, 2014. This half day workshop is for the Board to set the association's goals and activities for the coming year. The State Association has been in transition for 2 years moving into a state focused association with more of the planning being handled at the state level instead of at each chapter. As the incoming Southern Chapter President, Kelly worked with the board to identify each Board Member's purpose and beliefs for the organization. These beliefs will be used to develop a focus and plan for Southern Chapter activities.
Member Agency Coordination	On December 9th Lisa Parson and Kelly met with Metropolitan Water District of Southern California Emergency Services staff (Bart Garcia, Ian White, and Lorraine Aoys) to discuss suggestions for the MET Member Agency Operational Plan and communication lessons learned from the November 5th exercise. It was a very productive meeting in which the group identified areas of improvement and potential solutions through policy, procedures and training. A tour of the Met EOC and Eagle Rock Operations Center was provided. Kelly provided ICS/NIMS 100/700 and SEMS training top approximately 50 staff from various agencies. Kelly provided a presentation to WACO on Friday, December 12 titled Water Reliability and Disaster Response.
Coordination with the County of Orange	Kelly & Lisa attended the Orange County Emergency Management Organization (OCEMO) monthly meeting in Downtown Disney. The annual Holiday meeting includes the regular business of the organization, as well as annual awards of outstanding achievements in Emergency Management within Orange County as nominated by our peers.

Description	Comments
Coordination with Outside Agencies	Kelly participated in the Cal WARN State Steering Committee conference call. Kelly provided the ISDOC Executive Committee a report on the most recent OA Executive Board meeting, at which Kelly is the voting member for ISDOC.
WEROC Emergency Operations Center (EOC) Readiness	WEROC successfully participated in the MARS radio test for December. As continued follow-up on the November 5 Rolling Thunder Exercise, Lisa and Kelly spent a significant part of the month on reviewing the lessons learned, clarifying corrective actions and creating an action plan for those improvements. Some of the steps already taken, include: • Prepared a financial estimate for the supplies and upgrades needed for the WEROC EOCs in 2015. • Completed certificates of completion for all participants in the Nov 5th Rolling Thunder Exercise. • Created a G-drive account and uploaded shareable documents for EOC staff. • Created training presentations for In Case of Crisis and the Google suite of products. Lisa completed revisions to several aspects of the 4 plans within the In Case of Crisis phone application.

Status of Water Use Efficiency Projects

January 2015

Description	Lead Agency	Status % Complete	Scheduled Completion or Renewal Date	Comments
Smart Timer Rebate Program	MWDSC	Ongoing	September 2015	For November 2014, 64 smart timers were installed in the residential sector and 98 in the commercial sector. For program water savings and implementation information, see MWDOC Water Use Efficiency Program Savings and Implementation Report.
Rotating Nozzles Rebate Program	MWDSC	Ongoing	June 2015	For November 2014, 6,454 residential and 0 commercial rotating nozzles were installed in Orange County. For program savings and implementation information, please see MWDOC Water Use Efficiency Program Savings and Implementation Report.
Water Smart Landscape Program	MWDOC	On-going	November 2015	In October 2014, a total of 12,349 meters received monthly irrigation performance reports comparing actual water use to a landscape irrigation budget customized to each meter. For program savings and implementation information, please see MWDOC Water Use Efficiency Program Savings and Implementation Report.
SoCal Water$mart Residential Indoor Rebate Program	MWDSC	On-going	On-going	In November 2014, 487 high efficiency clothes washers and 1,064 high efficiency toilets were installed through this program. For program savings and implementation information, please see MWDOC Water Use Efficiency Program Savings and Implementation Report.
SoCal Water$mart Commercial Indoor Rebate Program	MWDSC	On-going	On-going	In November 2014, 136 high efficiency toilets were installed through this program.

Description	Lead Agency	Status % Complete	Scheduled Completion or Renewal Date	Comments
SoCal Water$mart Commercial Rebate Program (cont.)				For program savings and implementation information, please see MWDOC Water Use Efficiency Program Savings and Implementation Report.
Industrial Process Water Use Reduction Program	MWDOC	84%	December 2015	Survey scheduling is ongoing. A total of 41 Focused Surveys and 19 Comprehensive Surveys have been completed or are in progress. To date, 12 companies have signed Incentive Agreements. Updated discharger lists have been obtained, and outreach is continuing to sites with feasible water savings potential. Fabrica Fine Carpets has signed an Implementation Agreement for a water reuse project. The project is expected to complete in February 2015. Additionally, UCI Medical Center in Orange is in the process of signing an Implementation Agreement for water reduction devices.
MWDOC Conservation Meeting	MWDOC	On-going	Monthly	This month's meeting was held on December 4, 2014 and was hosted by the City of Anaheim. The next meeting will be on February 5, 2015 at the City of Santa Ana.
Metropolitan Conservation Meeting	MWDSC	On-going	Monthly	This month's meeting was cancelled. The next meeting will be January 15, 2015 at Metropolitan.
Water Smart Hotel Program	MWDOC	85%	June 2015	MWDOC was awarded a Bureau of Reclamation grant, to be matched with Metropolitan funds, to conduct up to 30 commercial and landscape audits of hotels. Enhanced financial incentives will be provided to augment the current SoCal Water$mart rebates. All grant funding for this program has all been reserved, and a wait list for has been created. In the event that any of the sites with reserved funding are unable to complete their projects, wait list sites would then become eligible on a first-come, first-served basis.

Description	Lead Agency	Status % Complete	Scheduled Completion or Renewal Date	Comments
Turf Removal Program	MWDOC	On-going	Ongoing	In November 2014, 173 rebates were paid, representing 608,483 square feet of turf removed in Orange County. To date, the Turf Removal Program has removed approximately 2,999,077 square feet of turf. For program savings and implementation information, please see MWDOC Water Use Efficiency Program Savings and Implementation Report.
California Sprinkler Adjustment Notification System	MWDOC	100%	December 2014	MWDOC was awarded a grant from the Bureau of Reclamation to develop the California Sprinkler Adjustment Notification System (CSANS). This system will e-mail or "push" an irrigation index to assist property owners with making global irrigation scheduling adjustments. Participants will voluntarily register to receive this e-mail and can unsubscribe at any time. The final report will be completed by the end of December and submitted to the Bureau of Reclamation. Staff is now gearing up to develop the Base Irrigation Schedule Calculator to be used in conjunction with CSANS.
Public Spaces Program	MWDOC	15%	December 2015	This program targets publicly-owned landscape properties located in the South Orange County IRWM Plan area and encourages the removal of non-functional turfgrass, the upgrade of antiquated irrigation timers, and the conversion of high-precipitation-rate fixed spray irrigation to low-precipitation-rate rotating nozzles and/or drip irrigation. To date, 10 cities, water districts, or other special districts (i.e., school districts) have applied for funding through this program, and four project proposals have been received.

Description	Lead Agency	Status % Complete	Scheduled Completion or Renewal Date	Comments
Home Certification Program	MWDOC	17%	July 2015	This program provides single-family sites with indoor and outdoor audits to identify areas for water savings improvements and opportunities and offers rebates for the installation of residential water efficiency devices, including smart timers and high efficiency rotating nozzles. In November 2014, MWDOC received twenty-one (21) applications for the Home Certification Program. Fifteen (15) surveys were conducted, and survey results are pending.
Landscape Irrigation Survey Program	MWDSC	Ongoing	June 2016	Through this program, Metropolitan offers, at no cost, the services of a certified landscape irrigation auditor who will survey and provide written recommendations for qualifying non-residential properties within Metropolitan's service area. To date, 124 sites in the MWDOC service area have contacted Metropolitan to request surveys.
Spray to Drip Conversion Pilot Program	MWDOC	28%	April 2016	This is a pilot program designed to test the efficacy of replacing conventional spray heads in shrub beds with low-volume, low-precipitation drip technology. Through a rebate program format, residential sites will be encouraged to convert their existing spray nozzles to drip. To date, 69 residential applications and 18 commercial applications have received a Notice to Proceed. Of these, 42 residential sites and four commercial sites have been completed.
CII Performance-Based Water Use Efficiency Program	MWDOC	2%	December 2015	This program will provide enhanced rebate incentives to commercial, industrial, and institutional sites and large-landscape properties (landscapes $\geq$ 1 acre). The program is scheduled to launch during the fourth Quarter of 2014.

Description	Lead Agency	Status % Complete	Scheduled Completion or Renewal Date	Comments
Landscape Training and Outreach	MWDOC	15%	Ongoing	The Orange County Garden Friendly (OCGF) Pilot Program promotes the use of climate appropriate plants and water efficient irrigation practices, with the overall goals of reducing water runoff and improving outdoor water use efficiency. The OCGF Pilot Program is a collaborative effort of the Orange County Stormwater Program (OCSP) and the University of California Cooperative Extension (UCCE). Each partner plays a role in planning and implementing the Program. After the completion of the Pilot Program, the steering committee met to review the Program's successes and lessons learned. The OCGF program held two events during Fall 2014 (October 12th and October 18th), and four more events are scheduled for Spring 2015.

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	November-14	487	1.12	2,865	19.27	99,592	2,751	17,598
Smart Timer Program - Irrigation Timers	2004	November-14	162	5.55	1,003	135.03	12,235	4,245	23,947
Rotating Nozzles Rebate Program	2007	November-14	6,454	2.15	28,710	333.65	401,112	2,111	8,518
SoCal Water$mart Commercial Plumbing Fixture Rebate Program	2002	November-14	136	0.48	734	6.51	46,093	3,426	30,406
Water Smart Landscape Program [1]	1997	October-14	12,349	881.22	12,349	3,524.44	12,349	10,347	61,351
Industrial Process Water Use Reduction Program	2006	October-14	0	0.00	0	0.00	11.00	252	1,004
Turf Removal Program[3]	2010	November-14	608,483	7.09	1,369,101	192	2,999,077	420	895
High Efficiency Toilet (HET) Program	2005	November-14	1,064	3.77	4,141	73.39	36,321	1,343	8,702
Home Water Certification Program	2013	November-14	15	0.029	90	0.227	168	3.952	1.835
Synthetic Turf Rebate Program	2007		0	0	0	0	685,438	96	469
Ultra-Low-Flush-Toilet Programs [2]	1992		0	0	0	0	363,926	13,452	162,561
Home Water Surveys [2]	1995		0	0	0	0	11,867	160	1,708
Showerhead Replacements [2]	1991		0	0	0	0	270,604	1,667	19,083
Total Water Savings All Programs			**901**		**1,418,993**	**4,284**	**4,938,793**	**40,272**	**336,244**

(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 01/02	FY 02/03	FY03/04	FY 04/05	FY 05/06	FY 06/07	FY 07/08	FY 08/09	FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY13/14	FY14/15	Total	Current FY Water Savings Ac/Ft (Cumulative)	Cumulative Water Savings across all Fiscal Years
Brea	17	107	178	132	143	132	175	156	42	186	144	93	115	47	1,667	0.36	293.63
Buena Park	9	45	88	81	84	85	114	146	59	230	145	105	106	48	1,345	0.32	218.55
East Orange CWD RZ	3	8	20	20	11	18	22	17	3	23	10	10	8	5	178	0.03	32.89
El Toro WD	21	88	108	103	83	91	113	130	32	162	112	134	121	53	1,351	0.35	221.45
Fountain Valley	36	127	209	196	178	205	219	243	72	289	158	115	102	42	2,191	0.32	400.71
Garden Grove	39	173	278	243	243	238	304	332	101	481	236	190	162	67	3,087	0.43	546.19
Golden State WC	37	195	339	374	342	339	401	447	168	583	485	265	283	148	4,406	1.00	762.68
Huntington Beach	114	486	857	738	680	761	750	751	211	963	582	334	295	120	7,642	0.90	1,425.99
Irvine Ranch WD	159	626	1,087	1,093	1,445	1,972	2,052	1,844	1,394	2,621	2,170	1,763	1,664	871	20,761	5.92	3,427.42
La Habra	8	40	86	81	66	96	136	83	22	179	128	82	114	34	1,155	0.27	190.76
La Palma	3	5	13	21	18	33	35	51	25	76	46	34	25	11	396	0.08	64.76
Laguna Beach CWD	17	88	119	84	68	57	77	77	27	96	57	38	37	16	858	0.08	156.22
Mesa Water	24	117	228	240	212	239	249	246	73	232	176	114	86	30	2,266	0.22	431.21
Moulton Niguel WD	158	630	841	640	570	652	716	742	250	1,127	679	442	421	276	8,144	1.47	1,419.10
Newport Beach	17	144	343	277	243	245	270	259	57	197	142	116	92	43	2,445	0.30	470.30
Orange	58	247	304	358	330	366	365	403	111	349	262	218	163	65	3,599	0.47	672.63
Orange Park Acres	-	-	-	-	-	4	8	-	-	-	-	-	-	-	12	0.00	2.76
San Juan Capistrano	16	95	120	107	102	109	103	127	43	190	110	76	73	45	1,316	0.32	229.51
San Clemente	32	182	235	170	136	204	261	278	63	333	206	140	94	59	2,393	0.39	421.50
Santa Margarita WD	140	510	743	573	592	654	683	740	257	1,105	679	553	662	371	8,262	2.55	1,382.42
Seal Beach	13	28	57	39	46	47	46	57	7	81	51	31	29	13	545	0.08	95.77
Serrano WD	9	16	54	39	39	30	31	23	7	21	20	13	10	9	321	0.07	62.17
South Coast WD	35	138	165	97	103	107	130	148	43	183	112	89	79	33	1,462	0.21	254.19
Trabuco Canyon WD	10	63	76	58	44	69	60	62	28	82	62	30	45	25	714	0.16	124.74
Tustin	21	89	152	138	127	152	146	144	45	174	97	78	59	27	1,449	0.17	269.73
Westminster	37	159	235	196	186	213	171	233	74	329	208	121	82	51	2,295	0.36	412.94
Yorba Linda	36	214	342	355	333	288	350	367	117	394	273	181	167	73	3,490	0.52	645.07
MWDOC Totals	1,069	4,620	7,277	6,453	6,424	7,406	7,987	8,106	3,331	10,686	7,350	5,365	5,094	2,582	83,750	17.33	14,635.28
Anaheim	917	677	904	1,364	701	854	847	781	860	910	477	331	285	140	10,048	0.95	1,911.47
Fullerton	40	196	369	289	263	269	334	330	69	397	270	200	186	97	3,309	0.69	568.31
Santa Ana	15	69	188	269	244	236	235	257	87	355	190	163	131	46	2,485	0.30	483.10
Non-MWDOC Totals	972	942	1,461	1,922	1,208	1,359	1,416	1,368	1,016	1,662	937	694	602	283	15,842	1.94	2,962.88
Orange County Totals	2,041	5,562	8,738	8,375	7,632	8,765	9,403	9,474	4,347	12,348	8,287	6,059	5,696	2,865	99,592	19.27	17,598.15

SMART TIMERS INSTALLED BY AGENCY

through MWDOC and Local Agency Conservation Programs

Agency	FY 08/09		FY 09/10		FY 10/11		FY 11/12		FY 12/13		FY 13/14		FY 14/15		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	9	0	0	2	0	8	0	9	8	4	0	34	5	71	71	344.75
Buena Park	3	1	0	0	0	0	4	19	3	0	0	0	2	10	12	30	64.81
East Orange CWD RZ	0	0	0	0	1	0	5	0	2	0	0	0	2	0	13	0	2.95
El Toro WD	0	25	2	18	5	5	26	2	7	2	11	0	3	5	68	326	1,747.43
Fountain Valley	1	0	0	6	2	2	8	2	3	2	4	0	5	6	43	23	91.87
Garden Grove	2	1	6	0	5	4	7	0	5	2	9	0	8	13	58	26	82.59
Golden State WC	1	2	9	22	7	4	13	3	9	49	9	25	29	5	124	132	415.10
Huntington Beach	13	1	6	27	6	36	15	4	18	33	20	35	13	0	136	160	547.65
Irvine Ranch WD	29	56	14	145	28	153	267	71	414	135	71	59	39	85	1,158	1,434	6,599.17
La Habra	0	0	0	21	0	0	3	0	4	7	2	0	3	7	20	36	114.42
La Palma	0	0	0	0	0	0	1	0	1	0	2	0	0	0	4	0	0.51
Laguna Beach CWD	2	0	2	14	4	1	109	2	76	2	71	0	3	0	301	19	123.18
Mesa Water	6	7	13	7	7	22	21	0	10	2	15	2	10	14	126	87	402.57
Moulton Niguel WD	21	23	17	162	36	60	179	31	51	74	40	45	26	76	495	553	1,914.52
Newport Beach	10	27	7	58	6	0	275	12	242	26	168	75	8	0	977	345	1,648.85
Orange	5	2	2	13	5	8	25	0	20	24	13	9	12	27	159	138	561.62
San Juan Capistrano	10	0	7	49	13	1	103	2	14	18	6	11	2	10	176	100	359.28
San Clemente	81	20	13	209	46	11	212	17	26	7	28	2	21	12	981	346	1,756.65
Santa Margarita WD	25	44	10	152	61	53	262	7	53	171	64	93	24	246	610	940	2,799.09
Santiago CWD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Seal Beach	0	0	0	1	0	0	0	3	1	0	1	36	0	11	2	51	68.21
Serrano WD	0	0	11	0	4	0	3	0	1	0	0	0	0	0	19	0	4.66
South Coast WD	11	6	3	10	13	3	78	10	13	16	8	4	5	18	163	146	639.73
Trabuco Canyon WD	1	0	2	0	2	10	12	0	6	0	2	0	3	0	71	103	620.76
Tustin	7	9	10	14	10	0	11	0	8	4	9	1	10	14	69	49	174.35
Westminster	3	0	3	0	1	1	2	0	1	1	2	0	13	16	41	30	107.31
Yorba Linda	8	5	5	21	25	0	22	0	20	0	12	5	23	2	196	85	460.74
MWDOC Totals	242	238	142	949	289	374	1,671	185	1,017	583	571	402	298	582	6,093	5,230	21,652.78
Anaheim	9	59	5	46	12	11	23	60	19	10	9	26	4	51	124	412	1,659.40
Fullerton	2	2	2	39	9	33	22	51	9	29	8	0	32	3	106	157	495.45
Santa Ana	2	4	1	8	8	0	6	5	8	19	7	8	6	27	42	71	139.36
Non-MWDOC Totals	13	65	8	93	29	44	51	116	36	58	24	34	42	81	272	640	2,294.21
Orange County Totals	255	303	150	1,042	318	418	1,722	301	1,053	641	595	436	340	663	6,365	5,870	23,947

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

Agency	FY 09/10			FY 10/11			FY 11/12			FY 12/13			FY 13/14			FY 14/15			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.	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	
Brea	8	100	0	32	0	0	130	0	0	65	120	0	84	0	0	157	0	0	498	220	0	8.28
Buena Park	0	0	2,535	29	0	0	32	0	0	65	0	0	53	0	0	150	0	0	366	75	2,535	448.95
East Orange	0	0	0	0	0	0	340	0	0	55	0	0	30	0	0	221	0	0	751	0	0	8.38
El Toro	145	2,874	890	174	0	0	357	76	0	23	6,281	0	56	3,288	0	1,741	8,684	0	2,584	21,493	890	377.19
Fountain Valley	21	0	0	83	0	0	108	0	0	35	0	0	0	0	0	107	0	0	488	0	0	7.31
Garden Grove	151	45	0	38	0	0	119	0	0	95	0	0	80	0	0	62	0	0	742	151	0	15.43
Golden State	280	29	0	303	943	0	294	0	0	257	2,595	0	192	0	0	372	964	0	1,942	4,531	0	77.22
Huntington Beach	39	3,420	305	203	625	0	458	0	0	270	0	0	120	0	0	745	0	0	2,250	4,909	2,681	723.89
Irvine Ranch	1,034	54,441	1,479	2,411	2,861	0	1,715	4,255	0	25,018	1,014	0	11,010	4,257	0	1,165	55	0	44,557	79,426	2,004	2,474.58
La Habra	0	273	0	0	0	0	33	90	0	0	0	0	15	0	0	109	338	0	181	1,236	900	215.56
La Palma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0.24
Laguna Beach	191	0	0	156	0	0	763	0	0	3,596	0	0	2,948	878	0	35	0	0	7,905	925	0	96.10
Mesa Water	195	83	0	118	0	0	297	277	0	270	0	0	361	0	0	98	0	0	1,620	385	343	112.98
Moulton Niguel	234	0	959	1,578	0	0	1,225	0	0	512	1,385	0	361	227	0	1,364	3,508	0	5,997	12,123	2,945	863.43
Newport Beach	92	4,781	0	337	1,208	0	640	3,273	0	25,365	50	0	19,349	6,835	0	253	668	0	46,123	17,554	0	709.16
Orange	129	0	0	135	30	0	343	0	0	264	0	0	245	120	0	227	668	0	2,462	981	0	50.38
San Clemente	729	1,299	0	2,612	851	0	4,266	117	1,343	631	172	0	415	5,074	0	252	0	0	9,489	7,538	1,343	359.13
San Juan Capistrano	656	5,709	0	1,452	0	0	949	0	0	684	30	0	370	0	0	290	732	0	4,905	8,131	0	229.66
Santa Margarita	1,731	937	611	3,959	3,566	0	4,817	0	0	983	0	0	389	0	0	1,053	1,513	0	14,176	6,084	611	395.68
Seal Beach	0	291	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	155	291	0	8.74
Serrano	1,498	0	0	364	0	0	58	0	0	190	0	0	105	0	0	41	0	0	2,374	0	0	42.95
South Coast	0	0	0	318	1,772	0	688	359	0	435	0	0	70	0	0	130	750	0	1,830	3,014	0	63.83
Trabuco Canyon	1,357	791	0	0	0	0	379	0	0	34	0	0	0	0	0	56	0	0	1,956	791	0	51.76
Tustin	314	0	0	512	0	0	476	1,013	0	378	0	0	329	0	0	212	0	0	2,793	1,013	0	54.15
Westminster	80	0	0	0	0	0	26	0	0	15	0	0	0	0	0	54	0	0	286	0	0	4.97
Yorba Linda	371	3,256	0	529	0	0	559	0	0	730	0	0	40	990	0	638	0	0	3,870	4,359	500	241.24
MWDOC Totals	9,255	78,329	6,779	15,343	11,856	0	19,072	9,460	1,343	59,970	11,647	0	36,622	21,669	0	9,834	17,880	0	160,310	175,230	14,752	7,641.19
Anaheim	273	164	105	372	382	0	742	38,554	0	459	813	0	338	0	0	429	0	0	3,010	39,913	105	539.99
Fullerton	48	0	1,484	416	0	0	409	0	0	119	0	0	107	0	0	519	0	0	2,159	64	1,484	291.46
Santa Ana	48	572	0	53	0	0	22	65	0	99	0	0	86	2,533	0	310	0	0	859	3,226	0	45.36
Non-MWDOC Totals	369	736	1,589	841	382	0	1,173	38,619	0	677	813	0	531	2,533	0	1,258	0	0	6,028	43,203	1,589	876.82
Orange County Totals	9,624	79,065	8,368	16,184	12,238	0	20,245	48,079	1,343	60,647	12,460	0	37,153	24,202	0	11,092	17,880	0	166,338	218,433	16,341	8,518.01

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

Agency	FY 02/03	FY 03/04	FY 04/05	FY 05/06	FY 06/07	FY 07/08	FY 08/09	FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	Totals	Cumulative Water Savings across all Fiscal Years
Brea	51	0	22	52	2	27	113	24	4	1	234	0	2	**532**	**300**
Buena Park	83	28	55	64	65	153	432	122	379	290	5	23	53	**1,762**	**797**
East Orange CWD RZ	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
El Toro WD	23	73	42	5	2	0	92	143	1	137	0	212	0	**753**	**452**
Fountain Valley	94	2	59	35	63	17	35	0	2	314	0	0	1	**623**	**463**
Garden Grove	199	51	297	34	136	5	298	130	22	0	4	1	0	**1,198**	**1,171**
Golden State WC	197	34	232	80	531	46	414	55	68	135	0	1	0	**1,804**	**1,522**
Huntington Beach	191	73	185	82	209	48	104	126	96	156	104	144	0	**1,523**	**1,213**
Irvine Ranch WD	1,085	87	325	1,044	429	121	789	2,708	1,002	646	1,090	451	10	**10,093**	**5,150**
La Habra	37	52	45	60	16	191	75	53	4	0	0	0	0	**543**	**429**
La Palma	0	0	0	5	0	0	140	21	0	0	0	0	0	**166**	**65**
Laguna Beach CWD	30	2	18	9	12	20	137	189	0	0	0	27	0	**446**	**250**
Mesa Water	155	22	130	241	141	141	543	219	669	41	6	0	79	**2,811**	**1,622**
Moulton Niguel WD	74	65	172	3	0	9	69	151	6	0	0	0	0	**580**	**659**
Newport Beach	230	9	77	24	94	98	27	245	425	35	0	0	1	**1,269**	**985**
Orange	144	22	553	127	88	18	374	67	1	73	1	271	0	**1,823**	**1,400**
San Juan Capistrano	34	21	181	0	6	2	1	1	0	0	0	14	0	**260**	**337**
San Clemente	36	5	95	40	173	2	18	43	0	19	0	0	0	**431**	**318**
Santa Margarita WD	16	3	56	0	0	6	23	11	0	0	0	0	2	**117**	**166**
Santiago CWD	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Seal Beach	34	44	40	61	45	1	2	124	0	0	0	0	0	**354**	**346**
Serrano WD	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
South Coast WD	31	8	54	8	4	9	114	56	422	84	148	0	4	**942**	**356**
Trabuco Canyon WD	1	0	6	0	0	0	4	0	0	0	0	0	0	**11**	**13**
Tustin	114	16	82	14	7	115	145	25	230	0	0	0	75	**832**	**647**
Westminster	109	32	153	57	104	40	161	16	63	35	1	28	0	**815**	**814**
Yorba Linda	36	12	42	4	118	10	24	8	30	0	1	0	0	**285**	**447**
MWDOC Totals	**3,004**	**661**	**2,921**	**2,049**	**2,245**	**1,079**	**4,134**	**4,537**	**3,424**	**1,966**	**1,594**	**1,172**	**227**	**29,973**	**19,922**
Anaheim	400	947	362	1,113	780	766	3,298	582	64	48	165	342	454	**10,363**	**5,456**
Fullerton	41	138	270	91	96	133	579	29	4	0	94	0	53	**1,556**	**1,277**
Santa Ana	153	589	227	624	373	493	815	728	39	12	16	17	0	**4,201**	**3,750**
Non-MWDOC Totals	**594**	**1,674**	**859**	**1,828**	**1,249**	**1,392**	**4,692**	**1,339**	**107**	**60**	**275**	**359**	**507**	**16,120**	**10,484**
Orange County Totals	**3,598**	**2,335**	**3,780**	**3,877**	**3,494**	**2,471**	**8,826**	**5,876**	**3,531**	**2,026**	**1,869**	**1,531**	**734**	**46,093**	**30,406**

[1] Retrofit devices include ULF Toilets and Urinals, High Efficiency Toilets and Urinals, 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.

Water Smart Landscape Program

Total Number of Meters in Program by Agency

Agency	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	FY 10-11	FY 11-12	FY 12/13	FY 13/14	FY 14/15	Overall Water Savings To Date (AF)
Brea	0	0	0	0	0	0	22	22	22	22	45.53
Buena Park	0	0	0	0	17	103	101	101	101	101	376.21
East Orange CWD RZ	0	0	0	0	0	0	0	0	0	0	0.00
El Toro WD	109	227	352	384	371	820	810	812	812	812	4,161.60
Fountain Valley	0	0	0	0	0	0	0	0	0	0	0.00
Garden Grove	0	0	0	0	0	0	0	0	0	0	0.00
Golden State WC	0	0	14	34	32	34	32	32	32	32	173.19
Huntington Beach	0	0	0	0	31	33	31	31	31	31	121.88
Irvine Ranch WD	638	646	708	1,008	6,297	6,347	6,368	6,795	6,797	6,723	32,510.23
Laguna Beach CWD	0	0	0	57	141	143	141	124	124	124	626.89
La Habra	0	0	0	23	22	24	22	22	22	22	117.89
La Palma	0	0	0	0	0	0	0	0	0	0	0.00
Mesa Water	170	138	165	286	285	288	450	504	511	511	2,504.21
Moulton Niguel WD	57	113	180	473	571	595	643	640	675	675	3,541.99
Newport Beach	27	23	58	142	171	191	226	262	300	300	1,244.29
Orange	0	0	0	0	0	0	0	0	0	0	0.00
San Clemente	165	204	227	233	247	271	269	269	299	336	2,029.03
San Juan Capistrano	0	0	0	0	0	0	0	0	0	0	0.00
Santa Margarita WD	619	618	945	1,571	1,666	1,746	1,962	1,956	2,274	2,274	12,189.10
Seal Beach	0	0	0	0	0	0	0	0	0	0	0.00
Serrano WD	0	0	0	0	0	0	0	0	0	0	0.00
South Coast WD	0	0	62	117	108	110	118	118	118	118	689.47
Trabuco Canyon WD	0	0	12	49	48	62	60	60	60	60	299.14
Tustin	0	0	0	0	0	0	0	0	0	0	0.00
Westminster	0	0	10	18	18	20	18	18	18	18	101.04
Yorba Linda WD	0	0	0	0	0	0	0	0	0	0	0.00
MWDOC Totals	**1,785**	**1,969**	**2,733**	**4,395**	**10,025**	**10,787**	**11,273**	**11,766**	**12,196**	**12,159**	**60,731.7**
Anaheim	0	0	0	0	142	146	144	190	190	190	618.83
Fullerton	0	0	0	0	0	0	0	0	0	0	0.00
Santa Ana	0	0	0	0	0	0	0	0	0	0	0.00
Non-MWDOC Totals	**0**	**0**	**0**	**0**	**142**	**146**	**144**	**190**	**190**	**190**	**618.83**
Orange Co. Totals	**1,785**	**1,969**	**2,733**	**4,395**	**10,167**	**10,933**	**11,417**	**11,956**	**12,386**	**12,349**	**61,350.53**

INDUSTRIAL PROCESS WATER USE REDUCTION PROGRAM

Number of Process Changes 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	Overall Program Interventions	Annual Water Savings[1]	Cumulative Water Savings across all Fiscal Years[1]
Brea	0	0	0	0	0	0	0	0	0	0	0
Buena Park	0	1	0	0	0	0	0	0	1	54	311
East Orange	0	0	0	0	0	0	0	0	0	0	0
El Toro	0	0	0	0	0	0	0	0	0	0	0
Fountain Valley	0	0	0	0	0	0	0	0	0	0	0
Garden Grove	0	0	0	0	0	0	0	0	0	0	0
Golden State	1	0	0	0	0	0	0	0	1	3	19
Huntington Beach	0	0	0	0	0	2	0	0	2	54	119
Irvine Ranch	0	0	2	1	1	1	1	0	6	98	268
La Habra	0	0	0	0	0	0	0	0	0	0	0
La Palma	0	0	0	0	0	0	0	0	0	0	0
Laguna Beach	0	0	0	0	0	0	0	0	0	0	0
Mesa Water	0	0	0	0	0	0	0	0	0	0	0
Moulton Niguel	0	0	0	0	0	0	0	0	0	0	0
Newport Beach	0	0	0	0	0	0	0	0	0	0	0
Orange	1	0	0	0	0	0	0	0	1	43	287
San Juan Capistrano	0	0	0	0	0	0	0	0	0	0	0
San Clemente	0	0	0	0	0	0	0	0	0	0	0
Santa Margarita	0	0	0	0	0	0	0	0	0	0	0
Seal Beach	0	0	0	0	0	0	0	0	0	0	0
Serrano	0	0	0	0	0	0	0	0	0	0	0
South Coast	0	0	0	0	0	0	0	0	0	0	0
Trabuco Canyon	0	0	0	0	0	0	0	0	0	0	0
Tustin	0	0	0	0	0	0	0	0	0	0	0
Westminster	0	0	0	0	0	0	0	0	0	0	0
Yorba Linda	0	0	0	0	0	0	0	0	0	0	0
MWDOC Totals	2	1	2	1	1	3	1	0	11	252	1004

[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 10/11		FY 11/12		FY 12/13		FY 13/14		FY 14/15		Total Program		Cumulative Water Savings across all Fiscal Years
	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	
Brea	0	0	3,397	9,466	7,605	0	5,697	0	9,809	0	26,508	9,466	13.37
Buena Park	0	0	0	0	0	0	0	0	0	0	0	0	-
East Orange	0	0	0	0	0	0	1,964	0	6,253	0	8,217	0	1.43
El Toro	0	0	4,723	0	4,680	72,718	4,582	0	6,754	2,975	20,739	75,693	37.80
Fountain Valley	0	0	1,300	0	682	7,524	4,252	0	7,247	0	13,481	7,524	6.38
Garden Grove	0	46,177	14,013	0	4,534	0	8,274	0	3,552	0	30,373	46,177	44.89
Golden State	0	0	42,593	30,973	31,813	3,200	32,725	8,424	30,604	0	137,735	42,597	71.71
Huntington Beach	801	3,651	27,630	48,838	9,219	12,437	20,642	0	22,918	37,650	81,210	102,576	69.29
Irvine Ranch	5,423	12,794	6,450	1,666	32,884	32,384	36,584	76,400	71,070	23,752	152,411	146,996	89.62
La Habra	0	7,775	0	8,262	0	0	0	0	2,042	0	2,042	16,037	10.35
La Palma	0	0	0	0	0	0	0	0	0	0	0	0	-
Laguna Beach	978	0	2,533	0	2,664	1,712	4,586	226	5,046	0	15,807	1,938	5.99
Mesa Water	0	0	6,777	0	10,667	0	22,246	0	26,295	0	65,985	0	18.19
Moulton Niguel	956	16,139	4,483	26,927	11,538	84,123	14,739	40,741	56,330	550,436	88,046	718,366	170.21
Newport Beach	0	0	3,454	0	3,548	2,346	894	0	3,437	0	11,333	2,346	5.14
Orange	0	0	12,971	0	15,951	8,723	11,244	0	15,651	199,116	55,817	207,839	50.84
San Clemente	0	0	21,502	0	16,062	13,165	18,471	13,908	24,774	0	80,809	27,073	36.85
San Juan Capistrano	0	0	22,656	103,692	29,544	27,156	12,106	0	16,264	832	80,570	131,680	100.35
Santa Margarita	4,483	5,561	1,964	11,400	10,151	11,600	17,778	48,180	52,433	145,013	86,809	221,754	69.76
Seal Beach	0	0	0	0	3,611	0	0	0	869	0	4,480	0	1.64
Serrano	0	0	0	0	0	0	2,971	0	0	0	2,971	0	0.83
South Coast	0	16,324	6,806	0	9,429	4,395	15,162	116,719	20,259	9,690	51,656	147,128	62.16
Trabuco Canyon	0	0	272	0	1,542	22,440	2,651	0	4,516	0	8,981	22,440	11.60
Tustin	0	0	0	0	9,980	0	1,410	0	4,694	0	16,084	0	5.24
Westminster	0	0	0	0	0	0	0	0	0	0	0	0	-
Yorba Linda	11,349	0	0	0	0	0	0	0	3,415	5,405	14,764	5,405	9.18
MWDOC Totals	23,990	108,421	183,524	241,224	216,104	303,923	238,978	304,598	394,232	974,869	1,056,828	1,933,035	892.81
Anaheim	0	0	0	0	0	0	0	0	0	0	0	0	-
Fullerton	0	0	0	0	0	0	0	9,214	0	0	0	9,214	2.58
Santa Ana	0	0	0	0	0	0	0	0	0	0	0	0	-
Non-MWDOC Totals	0	0	0	0	0	0	0	9,214	0	0	0	9,214	2.58
Orange County Totals	23,990	108,421	183,524	241,224	216,104	303,923	238,978	313,812	394,232	974,869	1,056,828	1,942,249	895.39

[1]Installed device numbers are listed as square feet

HIGH EFFICIENCY TOILETS (HETs) INSTALLED BY AGENCY

through MWDOC and Local Agency Conservation Programs

Agency	FY05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	FY 10-11	FY 11-12	FY 12-13	FY 13-14	FY 14-15	Total	Cumulative Water Savings across all Fiscal Years
Brea	0	2	7	43	48	8	0	0	38	53	199	**35.41**
Buena Park	0	1	2	124	176	7	0	0	96	81	487	**96.06**
East Orange CWD RZ	0	0	10	12	1	0	0	0	13	6	42	**8.60**
El Toro WD	0	392	18	75	38	18	0	133	218	106	998	**232.20**
Fountain Valley	0	69	21	262	54	17	0	0	41	38	502	**134.15**
Garden Grove	0	14	39	443	181	24	0	0	63	131	895	**212.88**
Golden State WC	2	16	36	444	716	37	80	2	142	131	1,606	**373.75**
Huntington Beach	2	13	59	607	159	76	0	0	163	318	1,397	**290.93**
Irvine Ranch WD	29	1,055	826	5,088	2,114	325	0	1,449	810	711	12,407	**3,106.64**
Laguna Beach CWD	0	2	17	91	28	11	0	0	45	62	256	**49.62**
La Habra	0	3	18	296	34	20	0	0	37	47	455	**113.55**
La Palma	0	1	10	36	26	13	0	0	21	24	131	**26.73**
Mesa Water	0	247	19	736	131	7	0	0	174	76	1,390	**373.33**
Moulton Niguel WD	0	20	104	447	188	46	0	0	400	626	1,831	**294.72**
Newport Beach	0	5	19	163	54	13	0	0	49	69	372	**80.61**
Orange	1	20	62	423	79	40	0	1	142	205	973	**204.84**
San Juan Capistrano	0	10	7	76	39	11	0	0	35	58	236	**46.60**
San Clemente	0	7	22	202	66	21	0	0	72	83	473	**101.33**
Santa Margarita WD	0	5	14	304	151	44	0	0	528	419	1,465	**207.94**
Seal Beach	0	678	8	21	12	1	0	2	17	23	762	**274.63**
Serrano WD	2	0	1	13	5	0	0	0	2	13	36	**7.06**
South Coast WD	2	2	29	102	41	12	23	64	102	123	500	**80.90**
Trabuco Canyon WD	0	0	4	23	23	0	0	0	10	34	94	**16.39**
Tustin	0	186	28	387	479	17	0	0	64	39	1,200	**329.11**
Westminster	0	17	25	541	167	23	0	0	35	44	852	**228.58**
Yorba Linda WD	0	14	89	323	96	18	0	0	40	86	666	**167.30**
MWDOC Totals	38	2,779	1,494	11,282	5,106	809	103	1,651	3,357	3,606	30,225	**7,093.87**
Anaheim	0	255	78	2,771	619	114	0	0	156	274	4,267	**1,157.01**
Fullerton	0	4	28	286	60	23	0	0	61	90	552	**125.51**
Santa Ana	0	11	25	925	89	23	0	0	33	171	1,277	**326.00**
Non-MWDOC Totals	0	270	131	3,982	768	160	0	0	250	535	6,096	**1,608.52**
Orange County Totals	38	3,049	1,625	15,264	5,874	969	103	1,651	3,607	4,141	36,321	**8,702.39**

HOME WATER SURVEYS PERFORMED BY AGENCY

through MWDOC and Local Agency Conservation Programs

Agency	FY 13/14		FY 14/15		Total		Cumulative
	Surveys	Cert Homes	Surveys	Cert Homes	Surveys	Cert Homes	Water Savings
Brea	1	0	0	0	1	0	0.02
Buena Park	0	0	0	0	0	0	0.00
East Orange	19	0	1	0	20	0	0.45
El Toro	0	0	3	0	3	0	0.00
Fountain Valley	3	0	3	0	6	0	0.07
Garden Grove	0	0	5	0	5	0	0.00
Golden State	0	0	0	0	0	0	0.00
Huntington Beach	2	0	2	0	4	0	0.05
Irvine Ranch	1	0	0	0	1	0	0.02
La Habra	0	0	1	0	1	0	0.00
La Palma	0	0	0	0	0	0	0.00
Laguna Beach	4	0	6	0	10	0	0.09
Mesa Water	0	0	0	0	0	0	0.00
Moulton Niguel	4	0	4	0	8	0	0.09
Newport Beach	2	0	6	0	8	0	0.05
Orange	2	0	12	0	14	0	0.05
San Clemente	15	0	7	0	22	0	0.35
San Juan Capistrano	4	0	12	0	16	0	0.09
Santa Margarita	15	0	10	1	25	1	0.35
Serrano	0	0	2	0	2	0	0.00
South Coast	6	0	3	0	9	0	0.14
Trabuco Canyon	0	0	1	0	1	0	0.00
Tustin	0	0	5	0	5	0	0.00
Westminster	0	0	0	0	0	0	0.00
Yorba Linda	0	0	1	0	1	0	0.00
MWDOC Totals	78	0	84	1	162	1	1.83
Anaheim	0	0	0	0	0	0	0.00
Fullerton	0	0	6	0	6	0	0.00
Santa Ana	0	0	0	0	0	0	0.00
Non-MWDOC Totals	0	0	6	0	6	0	0.00
Orange County Totals	78	0	90	1	168	1	1.835

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

[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**