MEETING OF THE BOARD OF DIRECTORS OF THE
MUNICIPAL WATER DISTRICT OF ORANGE COUNTY
Jointly with the
PLANNING & OPERATIONS COMMITTEE
November 13, 2018, 8:30 a.m.
Conference Room 101

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

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

Ex Officio Member: Director Barbre

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

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

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

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

ACTION ITEM

1. ADOPTION OF THE 2018 SOUTH OC INTEGRATED REGIONAL WATER MANAGEMENT PLAN

2. WATER SYSTEM OPERATIONS AND INTEGRATION OF NEW SUPPLIES

DISCUSSION ITEM

3. 2018 ORANGE COUNTY WATER RELIABILITY STUDY

4. REQUESTING MET LOCAL ASSISTANCE TO ACCOMMODATE PIPELINE SHUTDOWNS EXTENDING INTO THE SUMMER PERIOD

5. WATER USE EFFICIENCY PROGRAM: A REVIEW OF OUR APPROACH, CURRENT PROGRAMS AND FUTURE ACTIVITIES

6. WATER EMERGENCY RESPONSE ORGANIZATION OF ORANGE COUNTY (WEROC) SERVICES, GOALS AND STRATEGIC PLANNING PRESENTATION

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.)

7. 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

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

ADJOURNMENT

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

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

Item No. 1

ACTION ITEM
November 21, 2018

TO: Board of Directors

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

Robert Hunter, General Manager

Staff Contact: Karl Seckel
Charles Busslinger

SUBJECT: **Adoption of the 2018 South OC Integrated Regional Water Management Plan**

STAFF RECOMMENDATION

Staff recommends the Board of Directors adopt the attached resolution adopting the 2018 South OC Integrated Regional Water Management Plan (2018 IRWM Plan), the Integrated Regional Water Management Plan for watersheds in South Orange County which include; Aliso Creek, Dana Point Coastal Streams, Laguna Coastal Streams, San Clemente Coastal Streams, San Juan Creek, and San Mateo Creek. Adoption of the plan is required to allow grant funding to flow from Proposition 1 to MWDOC and other agencies.

COMMITTEE RECOMMENDATION

Committee recommends (To be determined at Committee Meeting)

SUMMARY

In accordance with Proposition 1 Guidelines and IRWM Plan Standards, agencies who have or will receive grant funding must also adopt the 2018 IRWM Plan. MWDOC is one of the key regional Orange County agencies providing guidance in this process. In addition, MWDOC has been one of the agencies working together cooperatively through the Tri-County Funding Area Coordinating Committee (TCFACC) with respect to IRWMP funding from DWR through the San Diego Funding area. Adoption of the Plan by MWDOC is a key step in helping to bring grant funds into South Orange County. Since formation of the SOC IRWMP, approximately $36 million in grant funds have been secured.

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

DETAILED REPORT

Water is a key element for sustaining the economy that allows our region to thrive. Significant investments in water, sewer, flood control infrastructure, and habitat restoration have been made over the past several years to bolster local water reliability and promote sustainability. Planning and investments to carry the region through the next several decades are critical to preserving the quality of life in South Orange County. Integrated Regional Water Management (IRWM) planning seeks to meet these water needs through integration and collaboration.

MWDOC is a member of the South Orange County Watershed Management Area (SOCWMA), which was formed with the cities, the County of Orange, and the water/sewer districts located within the SOCWMA. The SOCWMA was formally accepted through the State of California's Regional Acceptance Process within the San Diego Regional Water Quality Control Board's jurisdictional boundary. OC Public Works serves as the IRWM Group's lead.

The original 2005 South Orange County Integrated Regional Watershed Management Plan (IRWM Plan) was developed pursuant to Senate Bill 1672 (SB 1672) of the State of California, known as the Integrated Regional Water Management Planning Act of 2002. The IRWM Plan was subsequently adopted by the Watershed Management Area (WMA) members and other stakeholders[1] including MWDOC. The 2005 IRWM Plan was formally adopted by the MWDOC Board on June 15, 2005 (Resolution 1768).

California voters passed the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 [Proposition 50] (California Water Code Sections 79560-79565) to fund competitive IRWM grants for projects consistent with an adopted IRWM Plan; the 2005 IRWM Plan met eligibility requirements to garner funds for projects in South Orange County through this grant program.

California voters also passed the Safe Drinking Water, Water Quality, and Supply, Flood Control, River and Coastal Protection Bond Act [Proposition 84] (Public Resources Code Sections 75001-75130) in November 2006, which required that IRWM Plans be updated to meet new guidelines and plan standards in order to be eligible for Proposition 84 grant funding. The IRWM Plan was updated in 2013 to comply with Proposition 84 plan guidelines and standards issued by the Department of Water Resources. Adoption of the 2013 IRWM Plan was required for IRWM Grant programs. The 2013 IRWM Plan was adopted July 18, 2013 by unanimous vote of the WMA Executive Committee. The MWDOC Board approved a resolution adopting the 2013 IRWM Plan at the October 15, 2014 meeting (Resolution 1997).

[1] Members include the County, the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Ranch Santa Margarita, San Clemente, and San Juan Capistrano, as well as Municipal Water District of Orange County, South Orange County Wastewater Authority, El Toro Water District, Irvine Ranch Water District, Santa Margarita Water District, South Coast Water District, Moulton Niguel Water District, and Trabuco Canyon Water District.

Passage of Assembly Bill 1471, the Water Quality, Supply, and Infrastructure Improvement Act of 2014 [Proposition 1] in November 2014 similarly required that IRWM Plans be updated to be eligible for Proposition 1 IRWM grant funding. At its May 3, 2018 meeting the WMA Executive Committee voted to adopt the 2018 IRWM Plan after an extensive Member Agency and stakeholder update process, which included several meetings and workshops. The Orange County Board of Supervisors adopted the 2018 IRWM Plan on September 11, 2018.

In accordance with Proposition 1 Guidelines and Plan Standards, agencies who have or will receive grant funding must also adopt the 2018 IRWM Plan; as a result, adoption resolutions are being presented to the governing boards of all 22 Member Agencies. Following approval and adoption of the 2018 IRWM Plan, County of Orange staff will work with SOCWMA Member Agencies and stakeholders to develop a slate of projects for submittal to the State Department of Water Resources for Proposition 1 IRWM Grant funding.

MWDOC staff recommendation is to adopt the 2018 IRWM Plan in continued coordination with the SOCWMA IRWM Group as a Member Agency and to qualify MWDOC for Proposition 1 IRWM grant funds. MWDOC currently has the 'South Orange County Irrigation and Indoor Efficiency, Runoff Reduction, and Pollution Prevention Program' on the SOCWMA IRWM List of current projects.

Compliance with CEQA: This action is not a project within the meaning of CEQA Guidelines Section 15378 and is therefore exempt from CEQA since this is solely the adoption of a Resolution to approve the updated South Orange County Integrated Regional Watershed Management Plan.

MWDOC Proposal

In January 2018, the County of Orange announced the South Orange County Watershed Management Area Call for Projects to be included in the 2018 IRWM Plan. In February 2018, MWDOC submitted a proposal for the implementation of a comprehensive and holistic regional water use efficiency improvement Program targeting public agencies, residential, commercial, industrial, and institutional (CII) properties. Through a consumer based rebate format, the Program will encourage the replacement of high water using devices such as non-functional turf, antiquated irrigation timers, high-volume conventional spray irrigation heads, rain barrels and cisterns. In addition, the Program will provide free landscape design assistance, implementation of efficient indoor industrial processes, conversions from potable to recycled water, and plumbing retrofits. Together, these water efficient measures will increase water supply, reliability and efficiency, and are estimated to save South Orange County approximately 1,500 AFY. MWDOC's Program is considered a potential regional project by the County of Orange, and ranked fourth out of thirty two projects submitted across the South Orange County Watershed Management Area.

The entire 2018 IRWM Plan is available at: http://arcg.is/1WWTmb

Attached is a summary presentation regarding the South Orange County IRWMP organization.

South Orange County Watershed Management Area 2018 IRWM Plan Adoption

Charles Busslinger
November 21, 2018

IRWM Background

Integrated Regional Water Management (IRWM) is a collaborative effort to manage all aspects of water resources in a region. IRWM:

- ***crosses jurisdictional, watershed, and political boundaries;***
- ***involves multiple agencies, stakeholders, individuals, and groups; and***
- ***attempts to address issues and differing perspectives of all involved through mutually beneficial solutions.***

IRWM Funding Areas

IRWM Plans & State Funding

Why do we have an IRWM Plan for South Orange County and why does the 2018 IRWM Plan need to be adopted/approved by SOCWA?

- State Department of Water Resources (DWR) manages the IRWM program and allocates grant funds to each Funding Area (e.g. Proposition 1) – *South OC is in the San Diego Funding Area*
- Approved IRWM Regions (like SOCWMA) are eligible for IRWM Grant funds, as long as they:
  - Develop an IRWM Plan that meets DWR Plan Standards for each State Bond
  - Record adoption/approval of the IRWM Plan by IRWM Group agencies and any other groups seeking IRWM Grant funding through the IRWM Plan
  - Prioritize water resource projects based upon water needs of the Region
- Plan must be updated for Proposition 1 in order to qualify for funding

South OC IRWM Governance

The South OC Watershed Management Area (WMA) governance structure includes:

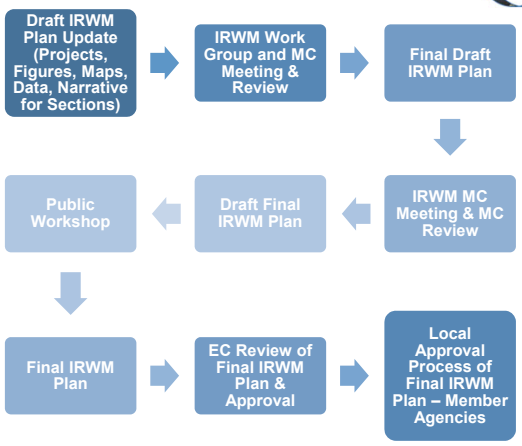
- **Stakeholders,**
- **Management Committee comprising staff representation from member agencies, and**
- **Executive Committee comprising elected officials from the member agencies.**

The Executive Committee has the authority to approve the IRWM Plan and any significant updates per a Cooperative Agreement between the 22 member agencies – MWDOC is a member agency.

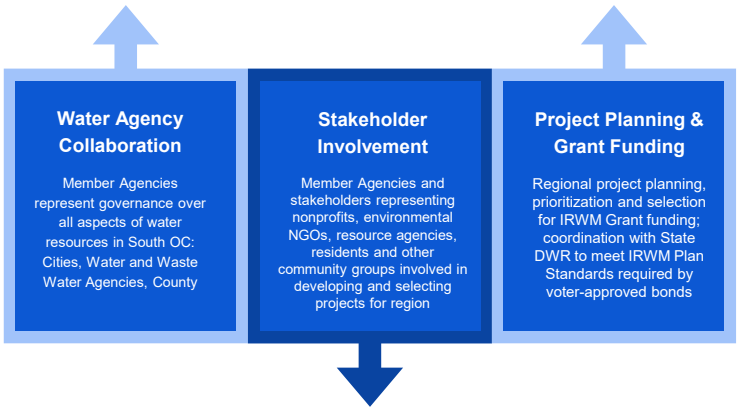
IRWM Plan Update Process

The 2018 IRWM Plan update process was extensive to ensure that all of the State Plan Standards and updated technical information applicable to South OC water resources were incorporated.

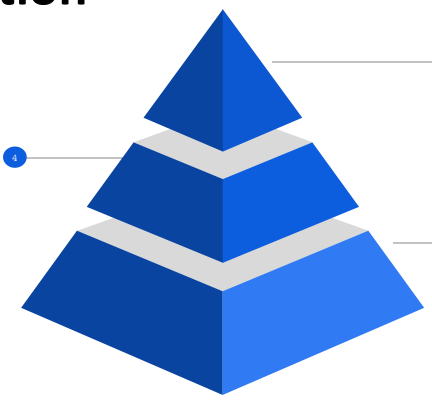
After Executive Committee & public review/comment, the 2018 IRWM Plan was approved by the Executive Committee at their May 3, 2018 meeting.



South OC IRWM Group Overview



IRWM Plan Implementation: Project Prioritization



Strategies

3 Measurable; applicable to project metrics & utilized in project ranking and design

Objectives

4 Quantifiable realization of the IRWM Goals as they apply to real-world projects; measurable

Goals

5 Represent the bedrock of the IRWM Plan and overarching priorities of the WMA; drive project prioritization to meet multiple benefits

IRWM Plan Goals for Projects

Natural Resources

Benefit aquatic and riparian ecosystems with consideration for climate change on water availability; benefit terrestrial ecosystems; benefit air, climate and energy resources with consideration for reducing GHG emissions; research, evaluation, monitoring, planning, recreation and education

Water Quality

Control anthropogenic pollutants over developed area of WMA; control anthropogenic dry weather flows; control wet weather flows to meet NPDES MS4 Permit criteria, with consideration for climate change impacts to flow regimes; improve water quality regulatory framework, knowledge and/or awareness of issues

Water Supply Reliability & Efficiency

Increase potable and non-potable supplies; improve reliability of supplies with consideration for climate change on local and external sources; reduce consumption from outdoor/indoor uses and through water utility operations; research, evaluation, planning & education

Flood Risk Mgmt

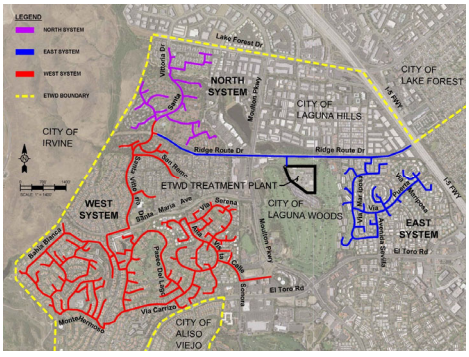
Improvement of conveyance, remove property from FEMA 100-yr floodplain, consider climate change on flow regimes; reduce scour and erosion; preserve or return floodplains as open space; planning, studies and research to acquire data for planning and identification of potential climate change impacts

Integrated Water Resource Management & Project Priorities to Maximize Benefits

Grant Funding for IRWM Projects

IRWM Grant Program	Total Grant Award	Local Match Amount	Total Local Investment
Proposition 50	$25,000,000	$44,981,994	$69,981,994
Proposition 84 - Planning	$457,416	$447,244	$904,660
Proposition 84 - Round 1	$2,316,780	$2,833,560	$5,150,340
Proposition 84 - Round 2	$1,708,647	$106,206,903	$107,915,550
Proposition 84 - Drought	$1,500,000	$5,725,000	$7,225,000
2015 Proposition 84	$4,949,368	$19,584,138	$24,533,506
GRAND TOTALS	**$35,932,211**	**$179,778,839**	**$215,711,050**

EXAMPLE: Water Supply Project



Water District Recycled Water Expansion Project:

El Toro Water District project included installation of a recycled water distribution system and tertiary treatment plant to accomplish the following:

- Increase supply reliability and reclamation on a service-area wide level
- Produce and deliver an estimated 980 acre-feet per year of tertiary treated recycled water
- Conversion of over 200 dedicated landscape irrigation meters from potable to recycled water

Financing (Total cost: $34,400,000):

- **Prop 50 IRWM: $4,624,915**
- SRF Loan: $26,700,000
- Metropolitan Water District Rebates: $900,000
- ETWD Reserves: $2,200,000

EXAMPLE: Water Quality Project

Dairy Fork Wetland:

Identified need to address a high concentration of pollutants in urban runoff from 1,500 acre catchment & invasive *Arundo donax*; project accomplished:

- Wetland system designed to reduce pollutant load by up to 99% (bacteria, metals, nutrients, oil) from 1,500 acres
- Removal of Arundo and replacement with native plants
- Aids in preserving beneficial uses of Aliso Creek by reducing pollutant loading

Financing (Total cost: $1,374,000):

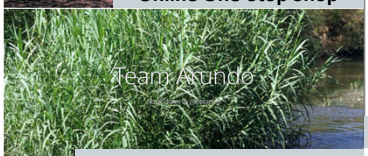
- OCTA, M2 Tier 2: $568,100
- **2015 Prop 84 IRWM: $500,000 ($100k habitat)**
- Match from Cities: $305,900
- 20-year O&M: $200,000

Next Steps for IRWM

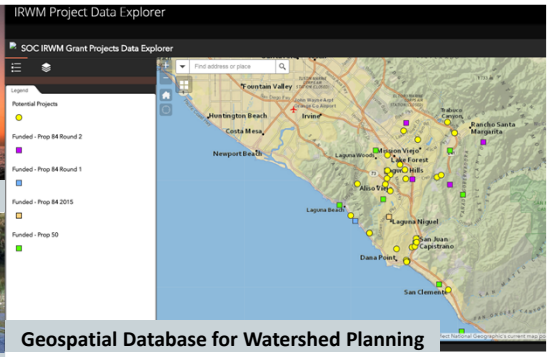
IRWM Plan Update	Water Needs Assessment	Project Planning & Data Management	Proposition 1 IRWM Grant
IRWM Plan update process to meet 2016 IRWM Plan Standards included a public comment period in March and was approved by the Executive Committee May 3rd. The updated plan will be submitted to the State Department of Water Resources (DWR) in Fall 2018.	San Diego Funding Area Tri-FACC started process in late 2017, will continue through 2018. Goals are to identify the most critical issues for disadvantaged communities (DACs) and other stakeholders, conduct outreach to determine the highest priority water-related issues.	Continue to build the Data Management System (DMS)/website to best fulfil regional planning needs; provide data for regional project development and collaborate with stakeholders to determine which projects best meet the goals of the WMA.	Conduct a call for projects in the Fall 2018 to develop a slate for DWR consideration; conduct workshops and prepare presentation of projects to DWR and stakeholders. Anticipate grant application process to start in early 2019, ending in mid 2019.

Collaboration Tools: Website & Data

Online One-Stop Shop



Habitat Restoration Mapping



Geospatial Database for Watershed Planning

South OC Data Management System: http://arcg.is/1WWTmb

Questions?

Contact:
Charles Busslinger
cbusslinger@MWDOC.com

ACTION ITEM
November 21, 2018

TO: Board of Directors

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

Robert Hunter, General Manager Staff Contact: Karl Seckel

SUBJECT: **Water System Operations and Integration of New Supplies**

STAFF RECOMMENDATION

Staff recommends the Board of Directors approve the Phase 1 work which includes completion of White Papers on the integration of new local water supplies into the OC water distribution system. The cost to complete White Papers on the topics listed below to help us develop an assessment of additional work needed is estimated at $90,000. The White Papers will focus on the following topics:

- Doheny desalinated water integration,
- Poseidon Huntington Beach desalinated water integration, and
- Local water (groundwater and/or desalinated water) integration into the East OC Feeder #2 pipeline.

Upon completion of the White Papers, staff will return to the Board with refined costs and schedules for completion of the recommended work activities.

COMMITTEE RECOMMENDATION

Committee recommends (To be determined at Committee Meeting)

Budgeted (Y/N): Y	Budgeted amount: $90,000	Core X	Choice __
Action item amount:	Cost Center: 23, Line item: 7010		
Fiscal Impact (explain if unbudgeted):			

SUMMARY

Multiple water supply projects are currently under consideration in Orange County which include desalinated water and percolation of treated recycled water, and captured stormwater into groundwater basins for subsequent pumping and treatment. The possible integration of multiple treated water sources into the OC water distribution system at various points could result in unintended consequences. Staff and consultants have begun a process to identify key issues and develop strategic pathways toward solutions for successful integration of these supply sources. A scoping workshop on water supply integration issues was held on August 31 where input was developed from consultants Black & Veatch, Hazen & Sawyer and Means Consulting, along with input from Metropolitan staff.

Staff will continue working with consultants Black & Veatch and Hazen & Sawyer to develop the information as recommended above. This initial work will consist of a literature review and determination of additional work that will need to be conducted for the specific instances in Orange County. Staff will then return to the Board with defined scopes of work and schedules to complete the identified work.

DETAILED REPORT

On May 16, 2018 the Board authorized the General Manager to enter into contracts with consultants Black & Veatch and Hazen Sawyer for their participation in a scoping workshop on water integration issues.

On August 31, 2018 MWDOC held a Water System Operations and Integration Workshop which was attended by both consulting firms, technical staff from multiple OC water agencies, MET technical staff and other water quality/water operations experts. Attachment A is a summary of the discussions and results coming out of the August Workshop.

The collaborative discussion identified a number of potential issues that could arise within the OC water system resulting from the simultaneous introduction of multiple sources of water. Potential issues include:

- The impact of potentially low volumes (flows) of imported water deliveries in portions of pipelines at certain times of the year leading to low chloramine residuals and water quality deterioration (e.g. nitrification). Chloramine loss due to reactions with low levels of bromide in seawater permeate could exacerbate this issue.
- Mixing of desalinated seawater with other sources of water of varying quality including:
    - MET water blend of Colorado River and State Water Project water
    - Groundwater from the OCWD basin
    - The above water sources flowing south in the Joint Transmission Main (JTM) and blending with desalinated Doheny source water flowing north in the same pipeline
    - Agencies receiving water blends which may be further blended with local water supplies from their systems.

The pH, alkalinity, TOC, bromide, chloramine residual, and other water quality characteristics may vary among these water sources on daily, monthly and seasonal bases. Planning needs to account for the water quality and operational considerations. Our goal is to understand the breadth and depth of these issues prior to any of these projects going on-line.

- Understanding and developing approaches for avoiding consequences to home plumbing systems
- Working out an acceptable resolution with MET for the water quality issues in the EOCF#2 pipeline
- Potential impacts on MET Diemer Plant operations or stranding of assets, especially under conditions of unexpected outages of local supply systems
- Control of hydraulic transients (pressure surges) during loss of power

Workshop Recommendations

The outcome of the workshop was the identification of a number of potential follow-up items and recommendations:

1. Develop White Papers to cover the following topics:

   - Doheny desalinated water integration,
   - Poseidon Huntington Beach desalinated water integration, and
   - Local water (groundwater and/or desalinated water) integration into the East OC Feeder #2 pipeline.

   The White Papers will consider local water source blending implications through:

   A. Existing literature review and reconciliation of any differences between the literature and each of the three specific situations;

   B. Analysis of the potential impacts of pipeline flow reversal. The majority of the OC distribution system is designed for water coming from the north and flowing generally to the south. New local supplies would potentially reverse flows in several pipelines that result in water flow reversals in pipelines throughout the year;

   C. Evaluation of local supplies blending with various blends of State Water Project and Colorado River water and providing recommendations on the need for pipe loop studies for corrosion and related issues;

   D. Development of a regulatory strategy for water integration that will meet all state and federal requirements; and

   E. Development of mitigation strategies for resolving pipeline low flow water quality issues as demands vary throughout the year and local supplies provide larger portions of OC water demands.

2. Evaluate hydraulic and transient (pressure surge) management strategies, including a benefit/cost analysis of the possible use of blending tanks for hydraulic transient control.

3. Evaluate water quality benefits of using storage tanks for hydraulic and transient management approaches.

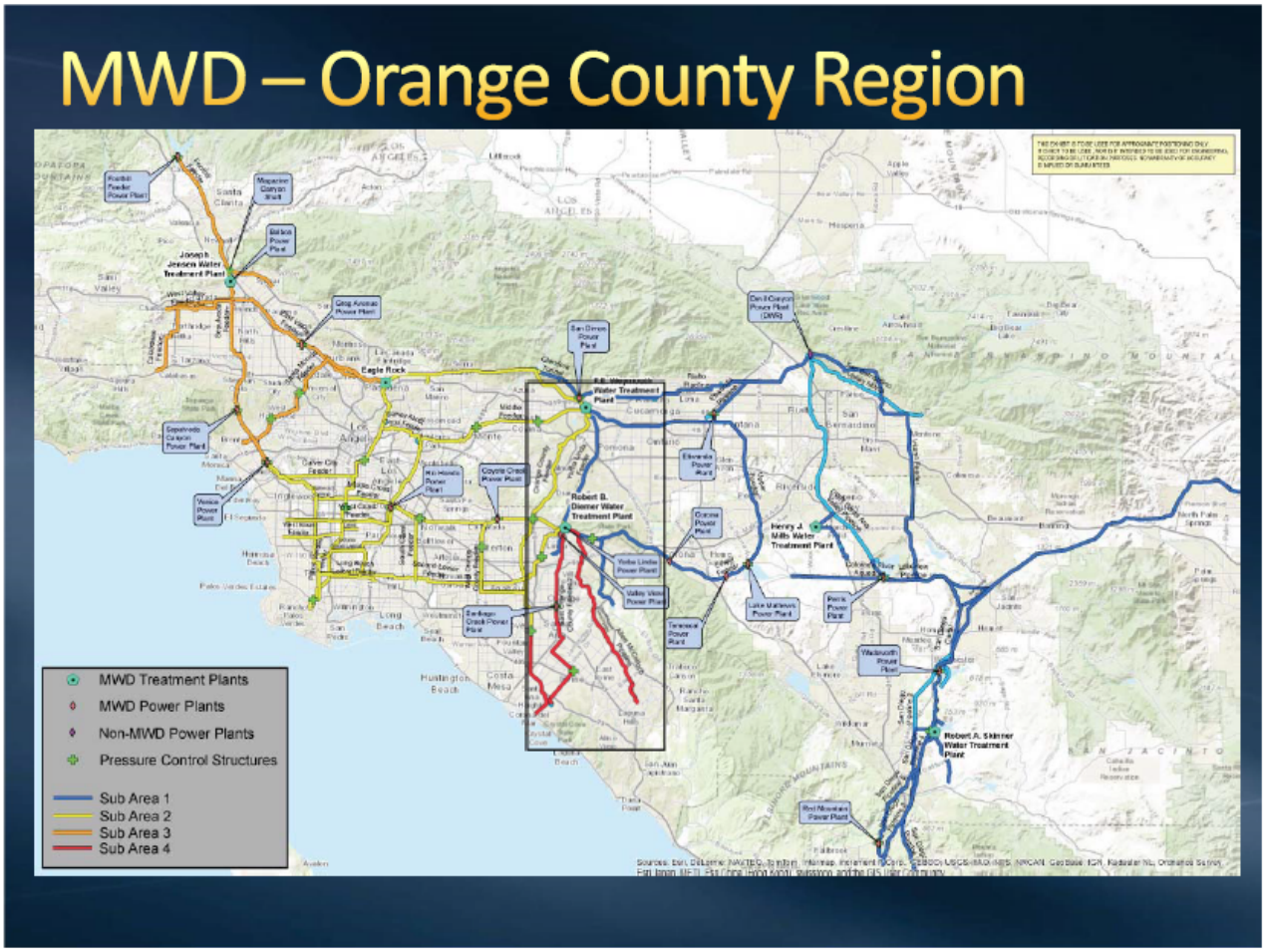
4. Develop critical control points/plans for managing distribution operations year-round.

5. Develop a water quality blending model that could be used to aid ongoing operations.

6. Leverage the existing MET hydraulic model and add portions of the non-MET OC distribution system to the existing MET model to better understand the implications of different operating strategies. Also incorporate a water quality module into the OC hydraulic model for analysis of water constituents, water age, and chloramine residual.

7. Analyze the economic impacts of local water introduction on existing MET operations (i.e. Diemer operations).

On October 18, 2018 MWDOC staff met with MET Facility Planning staff to discuss MET's experiences with, and the capabilities of, MET's hydraulic model. MWDOC staff also began a discussion about the possibilities of leveraging existing MET model data for inclusion into an OC water distribution model. MET staff was generally favorable to the idea of sharing information, and are currently evaluating a number of possible alternatives that will be discussed with MET executive management. A slide of the MET distribution system is provided below.



A meeting is being scheduled to view a demonstration of a water quality blending model developed by Black & Veatch for the Tampa Bay Water system that was highlighted during the August Workshop. Tampa Bay currently blends groundwater, surface water from local rivers and an off-stream reservoir, and desalinated seawater into their system.

Staff has also been providing assistance to one of our consultant's in pursuing a Water Research Foundation research grant which will look at similar issues. Potential grant funds could help with Phase 2 work items. We also anticipate that we will include MET in Phase 2 work, but will embark on Phase 1 work using our consultants.

Next Steps

Staff and our consultant are currently working through the workshop recommendations; and with the Board's approval, will proceed with the White Papers on new supply integration. Staff will also coordinate an inventory of the size, material makeup and age of the OC pipelines and the distribution systems in South Orange County. This work will constitute Phase 1.

Following completion of the Phase 1 White Papers, staff and the selected consultant(s) will present a refined plan with cost estimates for completing the balance of the related

integration planning and analysis work. This effort will include multiple participants including project proponents and those potentially impacted by these projects.

At a high level the work can be summarized as:

Phase 1 Work Items	Timeframe	Cost Estimate
1. **Selection of consultant(s) and completion of White Papers**	3-6 mo.	$90,000
2. **Inventory** existing OC pipelines (size, age and material)	3-6 mo.	MWDOC staff will collect
Phase 1 Estimate		$90,000

Following completion of the White Papers, staff will be coming back to the Committee with refined schedules and costs. The current Rough Order of Magnitude (ROM) estimates for the remaining work include:

Phase 2 Work Items	Timeframe	ROM Cost Estimate
3. **Identification of potential Project Partners** including project proponents, MET and affected agencies; **and hiring of consultants**	3-6 mo.	TBD
4. **Development of refined Scopes of Work** including development of regulatory and mitigation strategies, determination of the need and level of effort for loop studies and transient [pressure surge] analyses required	3-6 mo.	TBD
5. **Hydraulic** & **Water Quality Modeling**	6 mo.	$150,00 - $250,000
6. **Transient Analysis** (if needed)	TBD	TBD
7. **Loop Studies** (if needed)	6 -9 mo.	$250,000 - 300,000
8. **Follow-up Work**	2-3 mo.	$30,000 - $50,000
9. **3rd Party Review** (if required)	2-3 mo.	$20,000

ATTACHMENT A

Date: September 22, 2018
To: Karl Seckel, Municipal Water District of Orange County
From: Ed Means, Means Consulting LLC
Subject: Summary of Local Water Introduction Workshop Lines of Investigation

The following represents consultant participant observations regarding potential studies (highlighted in black).

Ed Means:

- **Develop individual White Papers on Doheny, HB, and EOCF#2 specific pump-back issues** (consider local blending implications) considering:
    - Summarize literature and reconcile any differences
    - Pipeline flow reversal
    - Local supply blending and evaluation of need for pipe loop studies
    - Regulatory strategy
    - Develop mitigation strategies for resolving pipeline low flow (use of the OCWD basin/pumping, boosters, etc.)
- **Evaluate hydraulic and transient management strategy** for Doheny, HB, and EOCF#2 (benefits and life-cycle cost of blending tank for hydraulic and transient control; consider energy recover opportunities)
- **Evaluate water quality benefits of the optimum hydraulic and transient management study** (chloramine decay management, cost, siting, etc. vs. residual boosting strategy)
- **Develop critical control points/plan (ISO 22000) for managing operations** (consider grid manager concept used for South East Queensland, including Brisbane, Gold Coast, Sunshine Coast; an equally complex and larger area than OC)
    - Identify contingency operating strategies to resolve low flow situations (today and with proposed projects).
- **Develop a Water Quality Blending Model** (ala Tampa) including all three projects
- **Modify the MWD model to include water age/chloramine residual/blend**

In addition,

- DBPs – appear to <u>not</u> be an issue although there was some discussion about individual species
- MWD policy principles on pumpback are probably in need of refreshing

- Idling of capacity at Diemer and how that is handled by MWD will be an important component of determining the cost viability of HB. Doheny is a different set of circumstances.

Black and Veatch:

- MWD is focused on assuring there is no impact on existing infrastructure (liners, materials in contact with water) due to differences in water quality or flow direction. **Consider white paper on studies already in "the literature" to determine if additional studies are needed.**
- MWD indicated that they want chloramine residual and alkalinity of new supplies to be similar to those in the existing water supply in order to avoid chemical reactions where two sources intersect. Steve Dishon at SCWD remarked that they did this successfully at their brackish groundwater desalter.
- MWD remarked that CCPP issue is vitally important. They like the addition of sodium bicarbonate for managing CCPP. They want several water quality parameters to be tracked – LSI, pH, CCPP.
- MWD has completed a hydraulic model of their entire system. That model does not include water age/water quality analyses.
- **DDW is likely to require an "influence model" to show where new water supplies will go in the existing system. A model such as the one B&V prepared in Tampa can provide numerous analyses:**
    - Water age
    - Water quality
    - Influence model – DDW likely to require.
    - Operational control modeling as well as predictive modeling to help inform member agencies to help them manage their systems as different blends of supplies are delivered to them.
- OCWD added CCPP tracking as part of the initial expansion of GWRS. Lime stabilization, better plant control through flow equalization (also added with initial expansion) helped arrest impacts on pipeline liners. OCWD is now relining sections with epoxy that were damaged before these improvements.
- Per OCWD, cost of epoxy repair is $5 million for about 20,000 feet of 60-inch and 78-inch pipe.
- IDE provides second pass RO at Carlsbad; it is expected Huntington Beach would also provide second pass RO. Second pass RO improves B/Br control.
- MWD believes that a blending tank is needed. We'd need **an analysis to demonstrate whether a blending tank is or isn't based on their criteria described in these notes. See recommendation about modeling below.**
- Per B&V's prior integration concept studies for Huntington Beach, blending tank would have to be located much farther east to match HGL of MWD pipelines, increasing pipeline and pumping costs. If located closer to the MWD pipelines near point of introduction of new water supplies, additional pump facilities would be needed. In either case, chloramine boosting would likely be required.

- MWD would also focus on re-dissolution of salts and other constituents into the water from deposits on pipe walls. This would impact water quality regulatory compliance, customer satisfaction with taste and odor and color.
- MWD is concerned about partially stranding of Diemer if 65 MGD of new supply is brought online. MWD pointed out that MWDOC and its member agencies are already paying for Diemer, so these costs would carry forward on top of costs for new supply sources. Could be inadvertently hurting itself in a way. **Develop a financial framework to address potential stranded costs at Diemer.**
- Economic considerations were raised: it is customary to think about keeping desal water online at full capacity as a baseload, and supplementing system with imported water. This is opposite of what might be most economically effective – base loading the system using the cheapest water available (MWD water ostensibly), then supplementing with expensive water (desal). MWDOC will continue to have to pay for Diemer costs, including stand-by costs (a premium to maintain reliability). **MWDOC should consider the best strategy that balances these issues.**
- Issue of maintaining water quality in transmission system was raised. MWD criteria calls for maximum retention time in their system of 3 days. In South County, they are able to adjust the pressure control structures feeding the area to vary flow from each source, such that water changes direction periodically and turns over to avoid water quality issues. A concept was discussed where groundwater producers in OC could turn off wells periodically to force more flow in MWD system to accomplish similar goals.
- When considering whether to allow introduction of a water supply into the MWD system, MWD considers water quality parameters. If any constituents are above the MCL, that is a “deal killer” that won’t be allowed. If constituents are below MCLs but above their historical averages in the MWD system, then MWD gives consideration to how the new supply benefits the system or if it creates a betterment of other parameters.
- **Prepare a White Paper literature review to summarize results of studies that have already been done on these issues. Could lead to conclusion that no further work is needed; could show what additional study should be conducted for these projects.**
- **Prepare a hydraulic model like Tampa’s, and more detailed conceptual design building on study previously performed to more precisely analyze flow directions, predict water quality and mixing, define infrastructure modification needs, etc.**
- **Consider performing loop studies for these exact supply sources. Since the Doheny pilot is decommissioned, could start this process with a paper study. DDW may force performance of actual studies.**
- Key things for MWD:
    - MWD needs transparency to be able to see what is coming into their system and have control to cut it off. **Figure out facilities needed and how to give MWD monitoring and control they’d accept.**

    - **Develop contractual and institutional agreements to allow for MWD transparency and control needs. Consider outlining an approach to this.**

- There are two experimental items that come to mind based on our discussion depending on if MWDOC wants to pursue this kind of work, perhaps in a tailored collaboration with MWD. It is possible both of these experiments have been performed in the period where I was off doing other things, so the lit review should labor to obtain the status of research:
    1. **Determine the fate of bromide in the various methods of boosting chlorine when residual decay is observed**. Previous studies have looked at the behavior of the residual, but did not determine the chemistry or the fate of bromide.
    2. **Assess the impact of bromide on nitrosamine formation**. Ed asked this question, and it seemed like MWD and Stuart Krasner either raised the issue or have looked into it.

    Upon reflection, there is some merit to thinking that bromide will catalyze nitrosamine formation. Nitrosamine formation requires the presence of the organic nitrogen portion of the compound (for instance “dimethyl” or “diethyl”), but it also requires a “nitrosating agent”, which can be the result of oxidizing ammonia. It is well known that the “breakpoint” reaction of chlorine and ammonia is fundamentally the oxidation of ammonia, and will occur faster in the presence of bromide.

    There is also some research that could be formulated around better and different sampling of existing desal plants. For instance, at Carlsbad, you could sample:

    - chlorinated permeate
    - chloraminated finished water at the plant
    - chloraminated finished water at Vallecitos
    - chloraminated finished water prior to blending at Twin Oaks
    - chloraminated finished water after boosting at Twin Oaks
    - chloraminated finished water after blending at Twin Oaks

Participants

- **Develop Ocean Desal Product Water Quality Criteria** – Some further examination is required where no blending with source water would occur. Also, seasonal and diurnal variations in downstream WQ after point of introduction of local water should be evaluated.
- Rapid shutdown of local supply source impact on Diemer WTP operation, WQ and pipelines/appurtenances from hydraulic surges – **evaluate need for back-up power for some partial flow, adequate surge control protection at**

source water plants and storage to prevent Diemer WTP operational and WQ problems.

- **Pipe Loop Distribution System Integrity Testing** – I don't see a need for Poseidon as long as the work from West Basin and Long Beach is considered good work as the ocean water doesn't vary much. The bigger problem is reversing flows in pipelines that may have exposed metal surfaces and accumulation of corrosion products within tuberculated areas – classic cause of red water problems where unlined cast iron pipes are present. This is only a possible issue with older water systems installed before 1950.
- **Protection of vulnerable system pipelines from higher pressure** from pumping into gravity flow lines – possible need for slip lining where pressure may need to be higher than pipe design and accelerated fatigue type failures (lining failures, leaks, breaks)
- Will reduced production from Diemer WTP impact its product water quality? Unsure of this issue raised by Sun Liang.
- **Disinfection residual and water age issues during low demand periods** – since ocean desal projects want to operate as base loaded supplies, at the fringe of MET's distribution system lower flows will result in longer transient times and reduced residuals that could adversely impact both MET and local system disinfection residuals. **System hydraulic modeling will be required** for low winter month demand periods in first MET's system without the new local sources and with the new local sources to pinpoint vulnerable areas and then local system modeling may have to be conducted if water ages are greater than 2 or 3 days at local turnouts. Determine minimum flow requirements at turnouts. This may require changes in local groundwater production and possibly need for additional wells in the OCWD Basin area and possibly booster chloramination stations for SOC.

Hazen Team

- MWDOC provided initial questions for discussion during the workshop:
    - How can unintended consequences be avoided (related to mixing and chloramine stability)?
    - What needs to be done to operationally ease transitions of new water supplies?
    - Is seawater desalination integration the most difficult scenario, or are there others?
- Water Quality
    - Results of previous studies were presented and discussed (Carlsbad, West Basin, Long Beach). The question of additional work was raised in light of Doheny planning to go online in 2 years. Additional distribution system materials could be present compared with those tested in previous

work. **The concept of a white paper to summarize corrosion pilot testing results was raised.**

- The need for an inventory of distribution system materials was identified by MET. While good work was performed in previous pilot loop studies of desalinated water integration, **differences that may necessitate additional pilot testing include (1) different distribution system and household plumbing materials and tuberculation, and (2) different treatment targets or approaches.**
- The question was raised about the importance of mimicking velocities to represent scale disturbance.
- Water quality targets were discussed for water that might enter MET's pipelines:
    - MET would prefer to see less than 0.3 mg/L bromide. It was noted that this is lower than the 0.75 mg/L bromide level in the Carlsbad contract (which is based on the agricultural study performed to ensure that recycled water could meet 1 mg/L)
    - MET will not accept water above any MCLs. If above historical values, MET will consider water quality on a case by case basis.
    - Discussion of whether + LSI/CCPP may be sufficient rather than matching MWD alkalinity and calcium – Sun Liang was not sure if he agrees with this. **A white paper analysis could be performed that evaluates corrosion outcomes for different water qualities similar to those that would result from desalinated water and MWD water.**
    - Additional consideration for potential components in a water source that could be a catalyst for formation of COCs like nitrosamines
- Discussion about modeling capabilities for water age and water quality. SCWD noted that modeling may be necessary for permitting in the case of a positive bacti.
- MET noted the value of piloting to mitigate potential issues, with an example of $7M in testing conducted by Tampa Bay Water. Hazen can bring in Chris Owen (formerly TBW) to discuss any distribution system issues during and after integration.
- MWDOC noted additional information is needed on options for chloramination including clearwells, booster chlorination, and maintenance of residual into the distribution system. Potential impacts of flow directions during boosting were identified. **Analysis of approaches for chloramination and residual maintenance in several scenarios could be conducted in a desktop study.**
- Hydraulics MET views a tank/reservoir as a safer approach for hydraulics, pipeline integrity, and water quality prior to injecting water into a pipeline.

Approaches of designing a 5-hour clearwell or a smaller tank with chemical boosting was discussed and could be evaluated further.

- Two important points need to be balanced: 1. System reliability, 2. Water quality in South Orange County feeders.
- MWD provided information that formal downsizing of Diemer does not make sense because it feeds the central pool and back up to Weymouth. Skinner could be downsized.
- Hydraulic model of system – **To determine the extent of migration of flows from various sources throughout the system, MET and MWDOC systems will need to be incorporated into one working model including demand, flow, and water quality.** It will allow for changes to inputs (time of year demands, sources, etc.) to efficiently assess the effects they will have on the water quality and hydraulics within the system including flow directions, velocities, and residence time. Currently the model is only flow, but water quality could be added.
- Effect of the new flow sources on Diemer production will be a very important issue for MWD. The potential for the sudden need for flow should HD Desal drop off-line is a major consideration considering the time required to bring Diemer up to the required capacity.
- Pipeline pressures and conditions will need to be evaluated to determine if the existing system is capable of handling the pressures associated with the pumpback operations. The possible reconfiguration of existing facilities will need to be considered to accommodate potential reverse flow in pipelines, changes in pressures, etc.
- Will have to meet with MWD personnel to determine hydraulic transient (i.e., pressure surge) criteria that will have to be met when designing the new facilities and connections to their system. Generally, they do not like to see any "significant" pressure surges that are above and beyond what the system already experiences.
- Biofilms, friction losses, and stagnation were discussed, including where and what conditions affect which challenge
- Discussion of current low-flow areas in the MET system – San Juan, EOCF (one location hasn't taken water for a year), lower pressure structures at the end of EOCF2, CM1/

- Additional considerations
  - MET discussed communications, transparency, and control concerns. MET would want to see the information and have confirmation that the agency partner sending water into the system would have operator integrity, focus on quality rather than the bottom line cost. Policy procedure would need to go to the MET Board, and would not allow degradation of water quality (for example).
  - Troy Walker discussed the grid manager contract for Australia desal, including CCP accreditation and ISO 22000. This concept could be evaluated with specific actions identified for integration of desalination (or

other water sources), working with MET to establish acceptable controls to enable supply integration into MET pipelines. Troy will try to provide a CCP write up to Ed.

- Contracting for the Water - There was a discussion of reliability versus cost of water. **A study of the impact of reliability versus cost of water in rate payer bills could be conducted,** including:
  - Base case
  - Take or pay case
  - Mixed approach to pay for both demand and reliability separate on the bill.
- Interagency agreements may be a primary challenge. Discussion of potential agreements with pumpers to take minimum flows (e.g., EOCWD)

These potential studies should be the topic of a focused meeting with the MWDOC staff to determine which are realistic pursuits and, of those, which stakeholder(s) should take the lead.

Ed Means
President
Means Consulting LLC

Item No. 3

COMMITTEE DISCUSSION ITEM
November 13, 2018

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

FROM: **Robert Hunter, General Manager**

Staff Contact: Karl Seckel

SUBJECT: **2018 Orange County Water Reliability Study**

STAFF RECOMMENDATION

Staff recommends the Planning & Operations Committee receive discuss and file this report. Staff also recommends that the 2018 Reliability Study be one of the topics for the next month's Elected Officials Forum.

COMMITTEE RECOMMENDATION

Committee recommends (To be determined at Committee Meeting)

SUMMARY

The following is a chronology of information provided and presentations given regarding the 2018 Orange County Water Reliability Study:

- September 15, MWDOC sent out an 81-page informational "Background Report" prior to the first workshop with our Member Agencies. The purpose of the background report was to provide advance information for the September 20 Workshop.
- September 20, MWDOC held a 3 ½ hour Workshop, with 26 attendees representing 20 of our Member Agencies, and included a 120-slide PowerPoint presentation on the Reliability Study. The presentation included a full description of the work

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

completed including the approach, methodology, project evaluations, and findings. The presentation was called a “Quality Control Draft” with the purpose of providing draft study analyses and findings to our Member Agencies, in order to receive their comments and input, and to ground truth the concepts and evaluations of the draft report. Updates, corrections, and input will be incorporated into the final report.

- September 29, MWDOC sent out corrections for the Cadiz Project analysis based on an updated term sheet. MWDOC staff worked directly with Cadiz staff to produce the analysis for Santa Margarita Water District (SMWD) as a project participant and sponsor (lower cost water), and for potential retail partners that may contract for water from Cadiz (higher cost water).
- October 1, a full discussion and presentation of the draft report was held with MWDOC’s Planning & Operations Committee.
- October 5, a full discussion and presentation of the draft report was made to the Water Advisory Committee of Orange County (WACO) group.
- October 9, a short presentation and discussion was held with the Orange County Business Council (OCBC) Infrastructure Committee.
- October 19, a full discussion and presentation was held with the SMWD Board.
- October 24, a shortened presentation was held at the MWDOC/OCWD Joint Planning Committee.
- October 25, a discussion on the Reliability Study was held at the MWDOC Member Agency Managers meeting focusing on comments received to date and on next steps. Member Agencies reached agreement that additional meetings on the topic were not needed, aside from individual agency follow-up upon request.
- October 25, a short follow-up presentation was made to the South Coast Water District (SCWD) Board, as the entire Board and legal counsel had attended the October 5 WACO meeting.
- November 1, a discussion and presentation was made to the South Orange County Integrated Regional Water Management (IRWM) Executive Committee.
- November 5, a follow-up meeting was held with the SMWD General Manager and Board members Olson and Gibson to discuss the contents and implications of the Reliability Study.
- In addition, MWDOC received and responded to two requests for additional information from Poseidon Resources Corporation. During this process, the need for minor adjustments in the cost-analysis for the Poseidon Project were discovered. The adjustments did not significantly change the project evaluations, rankings, or findings.
- MWDOC staff met with OCWD staff regarding examination of additional options for moving Poseidon water to South Orange County. The need for this work by OCWD was based on recent meetings they held with the South Orange County agencies,

where the agencies requested more information regarding the cost for conveying smaller amounts of capacity for Poseidon water to South Orange County.

Meeting Comments

MWDOC staff compiled a summary of the comments collected at all of the above meetings from either direct discussions or from written questions submitted by the agencies during or after the meetings. A summary of the comments and responses were shared with the MWDOC Member Agencies at the October 25 MWDOC Member Agency Managers meeting. The summary is attached and includes yellow highlighted sections that are the main areas for follow-up with respect to questions that have been raised. Staff will cross-check these with the final report as well as with additional analyses based on implications from the study.

The preliminary assessment of these questions and comments has identified a number of issues and implications:

1. Evaluation of the Regional Recycled Water Program (Carson Project) – Is it a beneficial project? Who pays and who receives the benefits? Is it good for Orange County? Is it good for Metropolitan at $1,600 per AF? What does South Orange County pay, and what benefits do they receive? Should there be any specific performance terms for agencies receiving the water during allocation situations?

2. Use of Metropolitan storage – What does it look like in our modeling? Does Metropolitan need more put and take capacity? What is the split between the State Water Project (SWP) and Colorado River Aqueduct (CRA) side of Metropolitan and how do these work independently when either the SWP or the CRA are constrained in any particular year and have low flows?

3. New 400,000 AF reservoir – Further quantification required of the need, operation and benefits of the conceptual project.

4. Changes to Metropolitan's Water Supply Allocation Plan (WSAP) – The Reliability Study identified areas of conflict between local supply development and improvements or benefits under a Metropolitan allocation. Can the WSAP be improved to allow agencies to significantly improve their drought protection? Extraordinary supplies seem to be the holy grail of drought protection. How can these opportunities be opened up for agencies that want to make such investments? Should Metropolitan offer drought protection for a price? Should local projects get more of a credit under the WSAP? Do we want to remain under a "share the pain" allocation system, or is it time to go down another path?

5. Metropolitan Emergency Storage – What level of storage should Metropolitan be providing for emergency situations including for concurrent outages of the CRA, SWP, and Los Angeles Aqueduct?

6. Operational issues associated with new projects – These include a large gamut of concerns, from operational issues associated with adding new projects within Metropolitan and Orange County. Such as, issues with water moving different directions within the systems, getting approval from Metropolitan for introducing local sources into the Metropolitan system, long residence times during low demands or during periods of certain operations, chloramine residual decay, and water quality

issues from blending various sources of water. Issues can also include the stranding of assets (Metropolitan and local) and the base-loaded integration during low demand winter months. MWDOC is looking at hydraulic and water quality modeling to help provide insight on some of these issues.

7. Stranding of Metropolitan assets – How much "rolling-off" of Metropolitan supply is anticipated? How to incorporate this into planning? What are the operational and financial implications?
8. Future Metropolitan rate structure – What changes are needed or what changes can be anticipated?
9. Metropolitan long term Total Dissolved Solids (TDS) issues
    a. How are TDS control issues working on the CRA? Can additional measures be implemented?
    b. Feasibility of lowering the TDS via reverse osmosis of a portion of CRA flows? Is this the most cost effective way of managing TDS for the groundwater basins and recycling? What are the hidden costs of TDS on plumbing and other?
    c. TDS for groundwater basins with respect to replenishment water?
    d. Quagga control with respect to replenishment water?
10. Improved Groundwater Basin Management & Metropolitan Programs – How to provide better drought and emergency protection by conjunctive use or other Metropolitan programs. Historically, there have been problems with developing effective Metropolitan groundwater programs. The recent drought allocations and groundwater basins at low storage levels are situations that should be discouraged in the future. How can we help to make progress on this? Should we convene a working group of the groundwater basin managers?
11. Metropolitan's 2020 Integrated Water Resources Plan (IRP) Update – initial thoughts for the process include:
    a. Use of scenario planning to address climate issues.
    b. More clarity/specificity on what the plan is moving forward. What opportunities are there for Metropolitan and/or local investments, as well as deciding how these opportunities should be worked out.
    c. Looking at the issue of Metropolitan Member Agencies "rolling-off" the system or decreasing their dependence on Metropolitan (how can we develop an overall "low cost plan for Southern California" by working together). Of note, this was part of the origin for Metropolitan's first IRP.
    d. More definitive forecast of Local Resources projects to be included.
    e. More clarity between Water Use Efficiency investments and benefits, with evaluation separate from recycling and local projects (i.e., not grouped together).

f. More definitive evaluation of benefits that could accrue from improved groundwater management issues within Metropolitan.

g. Resolution of the Los Angeles Aqueduct as a “local project” that should stand on its own and not be included with other local projects.

h. Targeting projects to provide specific reliability benefits in certain areas of MET.

Comment Letters

Comment letters have been received to date from the following entities:

- East Orange County Water District (EOCWD)
- Irvine Ranch Water District (IRWD)
- Mesa Water District (Mesa Water)
- Moulton Nigel Water District (MNWD)
- Orange County Coastkeeper (OC Coastkeeper)
- Orange County Taxpayers Association (OC Taxpayers)
- Orange County Water District (OCWD) (two separate letters)
- South Coast Water District (SCWD)

The comment letters have been forwarded to the MWDOC Board of Directors and are attached.

In general, the letters included comments of appreciation for undertaking the 2018 Reliability Study, commendation for the detailed and technical analysis, and an appraisal that the study was valuable to the Member Agencies and the public in making informed decisions.

Specific comments covered a wide range of topics. In some cases, contrary comments were received on the same topic. The major themes from the comment letters and MWDOC’s staff response include:

1. Limitations of Planning and Forecast Methods

   A number of comments were related to the ability of planning studies to precisely, accurately, or reasonably produce reliable estimates of future conditions, which are then utilized to evaluate future supply needs and potential projects. Specific concerns ranged from climate change to cost estimates for projects in different stages of planning or delivery methods. There are generally recognized limitations to planning studies and there are also well developed techniques to address these limitations.

   For example, the 2018 Reliability Study utilized four scenarios to define reasonable boundaries for climate change and regional investments in water supply projects. The study projects were analyzed under all four scenarios to establish a range of probably results. Projects in different phases of development need to be evaluated and compared. Cost estimating procedures generally call for an increase in cost estimates (e.g., allowances or contingencies) for more conceptual projects. MWDOC has particularly focused on making the project cost estimates as comparable as possible. The estimates can never be 100% accurate. However, they are reasonable and useable for the purposes of the Reliability Study. Orange County needs to make decisions on water supply projects. It is not a viable argument that we should not

evaluate and compare projects because we cannot precisely predict conditions in 2050. We make decisions in the present based on the best information and analyses available.

2. Concerns over Study Use and Decision Preemption

   A concern was raised that the study could potentially be used by opponents of certain projects in an attempt to convince regional permitting agencies to deny a permit or financial support for a project with an unfavorable ranking. That is certainly a possibility. MWDOC has received comments from parties in the past that our reports or letters were being used by groups to misrepresent our conclusion or statement. This has occurred simultaneously on opposite sides of the same issue. If the concern is future misrepresentation, MWDOC cannot prevent the misrepresentation, but we certainly can correct it. However, MWDOC cannot tailor our study findings or conclusions to arbitrarily support or oppose any project. A goal of this study was to perform an independent, unbiased evaluation. It is crucial that we maintain that goal and result.

   A second concern, was that MWDOC was preempting project decisions by our Member Agencies by the inclusion of project rankings. To the contrary, we have emphasized repeatedly within the draft report, that is not the intention of the 2018 Reliability Study. In fact, part of the draft report addresses conditions under which some lower ranking projects might be implemented. The evaluation and ranking of projects was included in the first presentation of the 2018 Reliability Study project scope to the MWDOC Board in February 2017 and has been a consistent element of the study design and discussion. We received suggestions to both eliminate the rankings from the final report and that they are an essential element of the report. MWDOC is providing information and analysis. The decision to implement a project is left up to the Member Agency.

3. Member Agency Participation

   A number of comment letters noted that the Member Agency participation in the 2018 study was notably less than in the 2016 study. This is true, as the 2016 and 2018 studies are fundamentally different. In 2016, we were developing methodologies and tools which were then applied to one scenario (moderate climate change with no WaterFix) and theoretical portfolios of projects were assembled to demonstrate different ways to reach water reliability. Numerous workshops were held with the MWDOC Member Agencies to discuss and evaluate the assumptions used by the reliability model.

   Coming out of the 2016 study, we had gained significant insight and developed the methods and tools for reliability analysis and scenario planning. Two major comments we received on the 2016 study were that it was (a) too restrictive in terms of planning scenarios in that only one scenario was carried forward for final analysis, and (b) its usefulness for decision making was limited in that specific projects could not be objectively compared. The 2018 study was designed to address these issues.

   The tools developed in 2016 were applied to four scenarios that were designed to bookend likely conditions of climate change and regional project investment. All four scenarios included the WaterFix becoming operational in 2035. Additionally, specific

projects were then objectively evaluated to meet Orange County's water supply and system (emergency) reliability needs. MWDOC worked closely with Member Agencies and project proponents to verify assumptions, project yield, and financial information for the projects. The emphasis of this consultative effort was to make sure the information and analysis were correct.

4. Future Water Demand Levels

   There were several comments regarding MWDOC's assumptions about future demand levels. Some parties felt that we have overestimated future water demands and had not included enough analysis of more rigorous demand management programs. These topics were the focus of extensive discussion in the 2016 study, and were not appreciably changed for the 2018 study, except where there were climate change impacts. Current Orange County water demands are actually larger than those predicted, but within the expected range of weather-related variables. Additionally, three different levels of water use efficiency efforts were included in the 2016 study. While outside the scope of the 2018 study, the evaluation of additional demand management options will be considered for future work.

   There was also a question relating to the potential impacts from plans by the San Diego County Water Authority (SDCWA) and the Los Angeles Department of Water and Power (LADWP) to significant reduce the volume of water purchased from Metropolitan. The implication being that reduced water use by the SDCWA and LADWP would increase potential supplies for others. While this question was not specifically examined in the 2018 Reliability Study, by evaluating significantly different demand reductions as a variable (e.g., LADWP reducing demand by 15%, 30%, and 45%), this question is partially included in the Metropolitan regional demand projections.

5. Suggested Changes in Project Scope

   MWDOC received comments that we should both increase and reduce the scope and considerations of the 2018 Reliability Study. Scope expansions included the addition of additional projects, possible Metropolitan rate models or schedules, water quality impacts in the distribution systems from new supply projects, as well as Orange County groundwater basin management and projects. We also received comments that MWDOC should take a completely Orange County-focused approach and disregard impacts to Metropolitan water quality and the stranding of Metropolitan assets by new Orange County water supply projects. While we are evaluating if some of the additional project issues can be addressed in the final report, most of that work will need to be addressed in future efforts. The potential impacts on future project financial analyses, by significant changes in the structure of Metropolitan rates (i.e., shift from variable to fixed rate model) would be largely based on conjecture and well outside the scope of the current study. However, a great deal of attention was focused in the 2018 Reliability Study on the regional water supply investments by Metropolitan on their rates.

   The management of the Orange County groundwater basin is not the function or responsibility of MWDOC. We are appreciative of the cooperation and contribution OCWD has made to both the 2016 and 2018 Reliability Studies, and concur that the evaluation of groundwater basin management and specific groundwater projects should remain within their sphere of responsibility and not ours. We have identified a

number of projects which can meet the future supply needs within the Orange County basin area in the draft report and recommend that they be evaluated. We will participate with OCWD to the degree they desire.

6. Content of Final Project Report

   MWDOC received a number of suggestions and observations relative to the final study report. It was emphasized that the report will be used by a diverse audience including water professionals, elected officials and the general public. Therefore, the final report must present information that is accessible to the entire audience. We also had requests that MWDOC more explicitly include the baseline assumptions of the study and include detailed project financial information and analyses to facilitate independent evaluation. We are currently evaluating ways to meet these requests for both simpler and more complex information.

Next Steps

The next steps include the following:

1. Complete the Final Report for discussion with the MWDOC Board. Staff believes they can have a Final report ready for the December 19 Board meeting (note, staff **does not** believe the report will be available for the December 3 Planning & Operation Committee meeting.
2. Complete additional analysis on the Strand Ranch Integrated Water Banking Program using the results of the study and bring back a proposal for consideration by the MWDOC Board and Member Agencies.
3. Staff to work through the list of 2018 Reliability Study implications to share with the MWDOC Board and Member Agencies. This will be targeted for the December 3 Planning & Operations Committee for discussion purposes.
4. Complete additional work on systems integration for local water in South Orange County. This includes work related to operations and water quality issues as identified in the August 2018 Local Project Integration Workshop. An item is included in this month's Planning & Operations Committee meeting on the issues identified during the Workshop. This also includes work associated with securing/developing a working hydraulic model, hopefully from Metropolitan, that can be used to evaluate various operational scenarios regarding the residence time of water delivery in Orange County as well as other water quality parameters.
5. Complete the study/evaluation of the IRWD South Orange County Interconnection delivery capacity over time, for review by South Orange County agencies, and to assist the agencies in the decision-making process regarding emergency supply projects.

Attachments: (1) Summary of meeting comments and responses

(2) Comment letters received

To: **MWDOC Member Agencies**

From: **Karl Seckel**

Date: **October 25, 2018**

DRAFT Comments and Responses to Comments on the OC Water Reliability Study

Attached for review and comments by the agencies is a compilation of all the comments received to date on the Reliability Study, going back to the original workshop with the agencies. I also summarized at the beginning of the comments what I thought were the major issues raised with the study. And lastly, I highlighted in yellow where I thought we had additional follow-up to do or issues to incorporate into the final report.

Please take a look to see if your issues or other issues raised were summarized properly and if you believe the responses are appropriate or if additional clarification is needed.

Some had indicated the need for additional meetings. This issue is to be discussed at today's Manager's Meeting at the MWDOC offices.

Thanks for your help.

I need comments back by November 2 to get them into our next P&O Packet.

RELIABILITY STUDY COMMENTS AND RESPONSES FROM VARIOUS WORKSHOPS AND PRESENTATIONS THOUGH OCTOBER 23, 2018

Summary and Overview of Comments to Date

An overall summary of comments is as follows:

- Some are still in the mode of trying to understand the implications of the study. It should be noted that MWDOC staff is also in this mode and is examining the information developed from the study to better influence issues arising at MET that staff believes might include:
    - MET's 2020 IRP
    - Review of the LRP program at MET
    - Review of the WSAP program at MET and more specifically how local projects are counted during water shortages and how additional "extraordinary supplies" might be developed for increased drought protection
    - MET's discussion of emergency storage levels in the event of a concurrent outage of the import systems
    - Stranding of assets (local or at MET) including accommodating projects within the low demand months
    - Rolling off of MET for water supplies by the MET member agencies
        - This seemed to be a particular hot topic to better understand the distinction of where future supplies will come from (MET investments, local investments or some combination – but understand those in such a way to prevent over or under investing in future reliability).
    - MET's future rate structure and how MET will charge for water over the long run
    - Other issues
- Water quality issues seem to be of interest, including operational issues associated with integrating local projects (joint operation of the MET and Local systems) and improving the TDS of supplies used for water recycling.
- See other items highlighted in yellow in this document.

The detailed comments recorded are grouped by topical area, if applicable, and provided below, typically with responses.

1. Questions on the OC Water Demand Forecast

- There are many factors that can change our demands out to the year 2050. This is just an observation and a cautionary note.
    - Agreed. It should be noted that we need to make our decisions in the present using the best information we have, and do not let uncertainty bar planning, otherwise we might not make any progress.

- Does this study this fully take into account the new conservation legislation?
    - It does to a certain degree. We have not specifically modeled the compliance demands under the new state legislation, but anecdotally we believe that the demands projected herein will meet the initial standards of 55 gpcd indoor usage plus outdoor usage at an ETAF of O.70 (Evapotranspiration Adjustment Factor). Another issue for the future is how much tightening the State will do and we will have to wait and see on that.
- How confident are you in the forecast of OC demands because this plays in so many aspects of the study including the concerns with stranding of assets (we want to make sure we fully use any investments we make)?
    - Request by MWDOC to the agencies: What are you seeing in terms of rebound in demands within your agencies? It was noted that the hot weather the past several years may be why the rebound is above where we expected it to be and asked for input from the agencies.
    - One agency noted the weather plays a major factor – and also, at least within their agency, growth has been greater than expected; if the gpcd consumption is adjusted for the growth, it still shows that water use is at an efficient level even though the overall rebound is faster than expected.
- How solid are the demand projections and the accompanying need for additional investments for the service area based on economic uncertainty?
    - The water demand forecast for Orange County is based on the latest set of demographic projections from the Center for Demographic Research (an Orange County institution that specializes in projections of population, housing and employment), and is derived from a statistical analysis of weather and climate, conservation, and economy. This current demand forecast is substantially lower than prior forecasts, but much more in line with current actual water use trends. However, it is important to continue to update these demand forecasts every five or so years to reflect trends that are more difficult to predict. The tools and models used to estimate supply reliability can easily be updated with new water demand forecasts as they are prepared. .

2. New Supplies Included Under the Various Scenarios

- It was noted that it is likely that we will see New SWP Transfers prior to 2035 given the direction of the State Water Contract extension and other provisions included in the Extension Agreement Provisions; the Agreement in Principle dated June 2018 includes these provisions and DWR has initiated CEQA proceedings on such. This should be noted in the study.
    - Include a discussion in the report that the SWP contact amendment (anticipated in 2019) will provide increased flexibility for multi-year transfers prior to 2035 (and beyond). This will likely provide MET with increased opportunities to store water in wet years – assuming storage is available. This should potentially reduce the gaps identified in the report.
- Has there been a decision made that Carson is being built? What is the criteria being used to determine which supplies will be available and when?
    - It was noted that the MET Board has not made any commitments to Carson and that is why we had to add costs into the MET forecast whenever new supplies were added. We also decreased the MET sales whenever new LRP projects were shown coming on-line.
- It was explained that a very difficult and tricky aspect of the reliability study is estimating what MET projects will occur in the future, what local projects will occur, what LRP projects will occur and what transfers will occur, all out to 2050. These forecasts of new investments are used to evaluate the resulting reliability and cost of water within MET and how those translate to OC. And then we evaluate what improvements in reliability occur based on projects implemented in OC. If we simply looked at MET's reliability now and out to 2050 without any supply improvements, essentially any project we could identify would likely test out to be very cost effective. But that is not a reasonable approach. MET and the MET member agencies have always made investments and these strategic investments are what has made MET so reliable over time. In fact, at the October MET Board meeting, the MET Board approved staff moving forward on the Antelope Valley East Kern (AVEK) Water Bank investment that would increase MET's put and take from the water bank by 70,000 AF per year in each direction. This investment is being made because MET realized that a zero or 5% allocation is a possibility on the State Water Project (based on the 2016 experience) and it was difficult for MET, under those circumstances, to meet demands in the western portion of the MET service area. This example of adaptive management and these types of investments are expected to continue.
- With respect to developing local supplies, it was requested we add a notation that MET considers itself to be "a supplemental supplier" and this attitude is heavily imbedded among MET staff. This causes problems at times with how certain portions of the MET service area view MET as the primary supplier (such as SOC). Having such a belief seems to mean to MET that they don't have the obligation to provide water ALL the time. We

have all been meetings with MET where they have been very clear that they are a supplemental supplier.

- It was noted that MET's IRP calls for achieving reliability collectively between MET and local agencies (a different perspective). Keeping better track of projected new supplies by others is an area of the next MET IRP update that staff believes we should influence at MET. An improved clarity in communications of intentions will help bring the planning of MET, the MET member agencies and the local agencies closer together.

- It was noted that if MET switches their rate structure (especially the fixed vs. variable coverage), it could have an impact on the development for local projects within the LRP.
  - Several noted this concern. MET has historically looked at some level of charges that may not be avoidable over the long run. Others have suggested MET match fixed charges to cover fixed costs and variable charges to cover variable costs. Each of these options will have both impacts and implications towards development of local supplies.

3. Methodology Examples/Questions

- It was noted that from the Policy Makers perspective, it can be difficult to differentiate between supply gaps and system gaps and which projects provide both.
  - It was noted that maybe we should flip the order when presenting to discuss system reliability before supply reliability.
  - It may be possible to develop a criteria that can be used for selecting both supply and system needs at the same time. We looked at this after the first workshop and came up with the alternative metric we tried using, called the "Evaluation Metric" (EM). It helped but did not totally solve this issue.
- A question was asked about the benefits of a project if the project costs less than the MET rate.
  - The way we are calculating the benefits in the modeling work depends on what supplies are provided by the project and whether the supplies are provided during shortages (valued at a higher amount) compared to supplies that simply offset MET water (valued at a lower amount). The benefits are independent of the cost of the project. But, our EM includes both costs and benefits.
- One participant noted that they were having trouble with understanding the difference between MET reliability vs. local reliability. When they look at MET's projections they don't know to what degree other agencies' want to roll-off the MET system and how this is accounted for.
  - In our modeling work, any time we brought more LRP supplies on, the MET sales were decreased. This handles it in the modeling, but it is an issue MWDOC has flagged – if most all MET agencies are decreasing their dependence on MET, we face the potential that MET could become an inefficient, high-priced, supply of

last resort. This would not be a good outcome and would cost all of us more in the long run. Local and regional coordination is essential. The OC Water Reliability Study is looking from the OC water perspective to evaluate the question of which sources of supply and which investments make sense regionally within OC and within Southern California. Continuing to purchase water from MET should remain a priority for all of MET's member agencies, combined with the development of local projects in a diversified portfolio when they make sense, with alignment between MET and local agencies to achieve full reliability.

- MWDOC staff intends to advocate at MET for improved clarity on this issue as MET develops its 2020 IRP.

4. OC Basin Building Blocks of Reliability Generalized for 2030

- The question was posed as to how you define a shortage in the Basin? This is a technical area of the modeling. The modeling assumes certain purchases of water by OCWD for groundwater replenishment up to a maximum of 65,000 AF per year when it is available. During shortages, the purchases by OCWD are limited to 25,000 AF per year. The model tries to achieve a certain BPP and when it cannot hit that BPP a shortage is registered. This is not how it happens in reality, but this methodology flags when changes in the basin management or water conservation would have to be triggered to balance the system. OCWD has several options with respect to basin management. These were deemed beyond the scope of the study. OCWD has done a good job managing the basin throughout the recent droughts.

5. Climate Change Issues

- Climate modeling is improving all the time -do you have a glimpse of what MET will use for Climate Change modeling coming up.
  - It was noted that staff was not entirely happy because MET had not really evaluated impacts from Climate Change in its 2015 IRP. We plan to advocate for a more robust analysis in their 2020 IRP update.
- Input was provided, based on what is going on at JPL that the climate modelers are not focusing on the right aspects of interactions of the atmospheric circulation, oceans, land surface and ice.
  - We will attempt to follow up on this issue to get more information.
- Include more discussion of the climate models and their strengths and weaknesses.
  - Because we used planning scenarios for the analysis to bracket future outcomes, this may be beyond the scope of the study. However, we are interested in any opportunities that arise to provide a more predictive aspect of what will happen in the future.

- How does the 2017-2022 hydrology get modified for Climate Change?
    - Every out year hydrology is impacted by either the Minimal or Significant climate change impacts using the delta method to modify the historical hydrology with what might occur as the future hydrology under each of the two scenarios.
    - Under all scenarios, the sequence of history from 1922 to 2016 are kept in order, although eventually, we would expect improved climate models to predict different sequences and durations of wet and dry cycles.

6. Potential Local Projects by OCWD NOT included in the modeling

- Several groundwater producers suggested adding a project called "Basin Management" as another project that would be appropriate by OCWD.
    - It was noted that some had misinterpreted the question marks in the table as questioning whether these projects would happen or note; it was clarified that the intent of the question marks was not whether the projects would happen or not, but coming up with a quantity forecast for project.
    - OC Basin management is the responsibility of OCWD and should be pursued as such.

7. Questions on Specific Projects

- Cadiz - how would it work if the overall Cadiz project did not move forward, would SMWD still receive any benefits?
    - Dan Ferons noted that SMWD would get the first 5 TAF regardless of the size of the project. The project probably won't happen if it goes much below 35 TAF.
- Pump-in to the EOCF#2 - With respect to the pump-in to the EOCF#2, it was requested to explain where the water was originating from.
    - The source of the water is groundwater that is exchanged with MET water after the emergency ends. It was explained that the concept includes wells would be cost-shared between the OCWD groundwater producers and SOC with SOC paying about 1/3rd of the cost in exchange for the groundwater producer allowing the water to flow to SOC during an emergency event. The costs were estimated based on 3 wells with an interconnection to the EOCF #2.
- Baker Treatment Plant - The question was raised about whether the Baker Treatment Plant is assumed to be operational during the emergency outage.
    - Under all emergency scenarios, the Baker Plant is operational and those supplies have already been accounted for, with water coming either from MET or from Irvine Lake, to be treated and conveyed into SOC. The net "recovery needs" outlined for the SOC agencies already has the Baker supplies subtracted.
- Direct Potable Reuse in SOC - The slide presentation did not note the extent to which direct potable reuse (DPR) might be plausible for SOC.

- It was noted that the background report estimated a potential for SOC of about 2,000 AF. The SOC agencies felt it could be more. By way of follow-up discussions with SMWD and MNWD, it appears that within these two agencies, there may be excess wastewater in the amount of 8,000 to 10,000 AF. Assuming 80% recovery for DPR, and assuming a target amount of maybe 50% of the available wastewater, the potential for SOC for these two agencies is about 4,000 AF. They also noted that wastewater not being used by others could also be used for DPR which could increase the overall potential depending on the regulations and availability of regional storage. The discussions identified an optimistic timeline of maybe 5 years and a more realistic timeline of 10 years for DPR to come to fruition. The discussions did not suggest that all other planning and supply decisions be put on hold, but that moving forward on reliability investments, as long as they are smart ones, should continue. Staff from MNWD and SMWD provided some valuable insights into DPR. MWDOC staff will prepare a longer write up for inclusion in the final report.

- Why not consider DPR plausible vs. 400 TAF yield surface reservoir?
  - At this point we are not forecasting the need for either one. The reservoir exercise was simply one of "testing" potential benefits. Much more work would be required before committing to a major reservoir and it would be expected to take about 15 to 20 years to develop. The development of DPR water in north OC is not needed (all wastewater is committed) and for SOC, it will depend on the regulations and the cost.
- Some projects are based on untreated MET water costs and several noted that MET's flat projection for the treatment surcharge over the long run did not seem correct (sandbagging was the description). The rate does not even seem to increase for electricity and chemicals and manpower which increase every year.
  - MWDOC is aware of the flat forecast in the treatment surcharge by MET which is part of the Cost of Service Study by MET. MET must comply with its Cost of Service study and Proposition 26.
  - It was noted that when you look at the long-term forecast there are no capital improvements, and the treated rates are within a $1 or so each year, although the percentage increase from year to year varies between the treated and untreated rates. Staff will look into the reality of this forecast.
- Poseidon Project - With respect to the ranking of SOC local projects for system reliability, are you saying that Poseidon is not reliable? And, how did you bifurcate the costs for Poseidon (Basin only vs. SOC)
  - This system reliability ranking table focuses on the cost-effectiveness of providing reliability on a unit basis in South Orange County, not whether one project is more or less reliable. In fact, we assumed that all reliability projects were equally reliable from a performance basis. Perhaps a better title or a footnote could provide clarity.

  - The Poseidon Project provides 50 mgd of supply at the plant site in Huntington Beach at one cost of water. That water was conveyed, 15 mgd to SOC and 35 mgd to the OC Basin. The capital and operating costs for integrating the costs in each direction was then added to the cost of water at the plant site to arrive at separate cost of water for SOC and the OC Basin.
- IRWD Emergency Supplies - One of the things that seems to be missing is the existing IRWD emergency water supply.
  - We did not forget it, can be found within several of the slides and it notes that we are additionally looking at the option of emergency wells. The study of the IRWD SOC Emergency Interconnection is expected to be completed in December 2018.
- For SOC, why didn't you consider a groundwater storage concept with San Mateo Basin?
  - A project was considered in the 1990's that would have required a joint venture with the Marine Corps Base Camp Pendleton; the 1990's project anticipated a potential groundwater basin yield of about 2,000 AF ± and also considered storage of imported water for use for emergency purposes in an arrangement with the Marine Base. No current discussions or contacts have been made with the Marine Base involving this expanded opportunity. Environmentalists consider this the last pristine basin in or nearby to OC and want to protect it from outside influences.
- Have you looked at raising the amount of water stored in the OC Basin or other OC Basin operational changes?
  - The evaluation of OC Basin management was not within the scope of this study and is the responsibility of OCWD.
- How were the supplies from the SOC projects anticipated to be physically integrated into the SOC water system? How did you deal with the minimum flows that have to go through the MET meters at CM-10 and CM-12?
  - It was noted that both CM-10 and CM-12 were in the process of being converted from venturi meters to mag meters to allow a lower flow to be metered and an increased flow range to be accommodated. Furthermore, MWDOC had looked conceptually at moving Doheny water into the South County Pipeline via a booster pump station and had included other costs for chloramination stations if they need to be installed to maintain water quality. It was suggested that additional work needs to be conducted in this area and that MWDOC had begun the process of seeking input from MET and water quality experts to assist in these areas so we know what to expect before we start the integration operations of local projects.
- Can additional supplies really be developed from the Colorado River?
  - We have discussed this issue at MET and the input provided is that yes, additional supplies can be secured, but they will come at an increasing cost.

With the pending Colorado River Drought Contingency Plan and the structural supply imbalance on the Colorado River, we face difficult issues.

- One participant noted that Carson is problematic from the standpoint of LA allowing water to be transferred out of LA County (out of the service area where the water was sold). I would like to see more information on the projects and time periods when the projects might come online. Perhaps you can identify additional projects as hedges in case any of the suggested projects encounter problems.
  - It was noted that the scenario options table involving MET supplies could be annotated to make the date of integration more apparent. We can also provide a list of alternative supplies that could be developed in the event the ones we forecast do not come to fruition.
  - It was noted that this is also one of the responsibilities of MET's IRP and that MWDOC would advocate for additional clarity for the 2020 MET IRP.
- It was suggested that MWDOC should model the SOC water distribution system with local projects to better understand the operational issues that might arise and to better understand water quality issues.
  - Staff has been looking into this issue with water quality experts and MET staff. A recent meeting was held with MET staff to get a preview and understanding of MET's hydraulic model and to understand it the model can be provided to us.
- What is the "regional storage reservoir" included?
  - The concept of adding a regional surface reservoir was to see if a second surface reservoir (similar to but smaller than DVL) would be beneficial based on generating additional wet year water. Conceptually, the modeling outcome was marginally beneficial.
- Where would 400 TAF surface reservoir be located?
  - To be determined; the conceptual modeling simply asked the question "if it exists and costs roughly $2B, would it be useful?"

8. OC Project Economic Analysis

- With respect to the analysis, what would happen if you add another 10 years to the project life to show how the projects perform when the capital cost component drops off?
  - Conceptually, the projects can begin to look more favorable, but you also need to consider additional R&R investments that would be needed to keep things running. This would offset some of the benefit. Also, because of the discounting factor and that the extension of project life is 30 years or more out into the future, it does not make a significant difference.
- This chart for ranking projects need to explicitly note whether they are for system or supply benefits. This can be confusing to the reader. This supports the earlier comment that the report should focus on system analysis prior to supply reliability.

- Concur.

- The concept of negative NPV/AF is very abstract. I suggest focusing on NPV.
  - We tried several ways and came back to NPV, which can be either positive or negative and used a similar metric per peak capacity (mgd) for the emergency metric.
- Since there was not an attempt to identify benefits (other than cost avoidance), I would rename "Benefit/Cost Ratio" to Evaluation Metric."
  - We moved to this terminology.

9. Water Use Efficiency

- Conservation will harden in the future
  - Yes, we cannot conserve the same water twice to close our gaps and conservation can reach a point of diminishing returns for a certain level of investment. That is why we talk about Water Use Efficiency and setting a scientifically based standard that we should be shooting for throughout Southern California, rather than simply conserving more water.
- Why did you only count on 10% conservation to help close future gaps – we just made it through a multi-year drought where we conserved 25% and we are no worse off – shouldn't we use 25% reduction?
  - First, we believe that demand hardening will occur in the future with new plumbing codes making indoor use very efficient and landscape ordinances reducing how much water can be saved outdoors during mandatory water use restrictions under droughts. Our water demand forecast reflects this gain in water use efficiency but reduces the amount of drought conservation that can occur in the future without impacting public health and safety. Second, we believe that there is a cost associated with mandatory water use restrictions, such as costs of replacing landscapes, potential impacts to economy from businesses potentially leaving the area due to reliability issues, and impacts to quality of life that are difficult to quantify. And lastly, as we noted multiple times in the study effort, each local area can adopt whatever planning criteria they want as long as the expectations of the area are worked out between the provider and the customers of the provider. In discussions with our water agencies, 10% seemed to be a reasonable dividing point, with a frequency of not more than 1 in 20 years.

10. Roll-Off at MET

- I would like to see MET's 1928 Laguna Declaration renewed in some way, with MET developing desalination and stormwater projects and integrating them into their existing treatment plants and/or distribution system in a way that would maximize

efficiencies and costs for all. I personally think that we are going down a bad policy road to follow the concept that agencies "make their own decisions about how reliable they want to be…some may choose conservation, some may pay more for reliability." I think this is a policy that has many implications. I also have concerns about diminished property values and damaged local economies in cities that decide they can't "afford" to invest in reliability.

- I think a new Laguna Declaration would give the private industry/scientific community the push that is needed to develop treatment technologies and energy efficiencies that could be financed and brought online as the existing debt that is paying for retrofitting the system is paid off. We couldn't have gone to the moon if MET hadn't provided a secure supply of water that kept CalTech scientist here and founding JPL – which designed and built the rockets that eventually got us to there.

- In the overall MET reliability, was the intent of other agencies to roll-off of MET included into the study?
    - To the degree that additional local projects were brought on line under MET's LRP, the MET sales were decreased in our modeling. However, as has been noted several times, the local planning and MET planning are only synced to a certain degree. Staff's observation is that the linkage between the two should be improved, otherwise we will either collectively under or over invest in our water system. There should be a way of avoiding this.
- We should develop an estimate of cost impacts of stranding MET's assets and what might happen under certain scenarios.
    - Concur. We believe this is a good topic for MET's 2020 IRP.
- We need more information as to when the MET projects might come online - perhaps identify alternative projects as short-term hedge projects and long-term projects. What I thought I heard here is that the study laid out what we think will happen over time with respect to investments MET would be making via LRP Projects and direct projects in which they invest (WaterFix, transfers, banking, CRA, other) and your question was what if some of those projects hit roadblocks, are there others in standby mode? What other projects might be called upon? This was an attempt to evaluate or inject project "risk" into the analysis (risk being defined as economic risk, permitting risk, technological risk, governance risk, etc.). I'm trying to contemplate the increasing cost impacts of MET's stranded assets that are occurring at the same time we are planning and developing alternative local supplies, while at the same time we are going to experience significant levels of increased conservation (and the attendant cost impacts from that). I have often indicated that I think our studies would benefit from professional economic analysis with the goal of "smoothing" these impacts or at least providing awareness as I think the cities in particular don't well understand the unfunded liabilities that are not shown on their utilities' balance sheets. As these cost impacts hit during the "short-term" period before the WaterFix is online, while there is an impending crisis on the CRA and with little firm understanding of how the State intends to implement

SB606/AB1668, I think the water community is going to focus on year-to-year supply and reactive approaches like extreme conservation. This approach risks the trust the public has in us…they will forgive one extraordinary drought period that resulted in some dead lawns, but another one, particularly if there is a "Day Zero" aspect, will be looked at as incompetence. Hence my comment about not wanting to reject ANY local supply options.

- The issue embodied in the comment is a good one that says that coordination between local supplies, import supplies, demand and WUE investments must all be considered or we will be missing something. This, in essence, is what we have attempted to capture in the study. It is not easy to do.

11. Risks to Reliability

- You might want to add some discussion in the report of additional supply risks:
  - CRA shortage sharing and where this is going
  - Longer duration droughts
  - Impacts, especially to the Bay-Delta supplies from sea level rise
  - Changes to endangered species laws and the Coordinated Operations Agreement between the SWP and the CVP as the Feds seem to be taking a new direction on these issues.
  - Discussion of how the local economy is impacted by reliability (this is not accounted for in your benefit numbers)
    - These are all good topics. Some are very difficult to include in the study in a quantitative method.

12. Project Evaluations

- Use same cost of money for all projects; use same escalation rate for each project.
  - In carrying out the analysis, we had standard assumptions to begin with. The difficulty occurred with not wanting to make changes to certain projects, more particularly the Doheny Local and the Poseidon Project costs at the fence line. Both of these projects were formulated by others and we did not want to change the basic assumptions for these projects. Most all other projects were standardized using 4% cost of money with flat amortization over 30 years, 3% O&M escalation, 4% discount.
  - Knowing the indoor water use demands for SOC would be interesting numbers to have for the evaluation of emergency supplies.
    - Staff will develop these.
  - Capital cost components typically drop off after 30 years and the unit costs of projects become much more competitive. What happens in 2051 and beyond? Because the analysis techniques utilize Present Valuation of costs of projects,

what occurs 30 years or more into the future is not heavily weighted in the analysis (the use of PV analysis was specifically selected for this reason). Simply dropping out the capital without any additional adjustment for Rehabilitation and Replacement (R&R) costs after 30 years may not be a good assumption.

- Normalize escalation costs across all projects and footnote if a different assumption is used than the proponent. Look at Doheny as a sample - Phase 1 uses 2% and Phases2 and 3 use 3%. Should be consistent across the county. The differences noted occurred when there was a specific project moving forward, such as the Doheny Local and the Poseidon Project. We did not want to change the assumptions of what the proponents were using and be accused of skewing the analysis. Standardization was our goal, but we got only part-way there.

- Economic Analysis – Recommend the analysis be done for SOC and OC Basin separately (for OC Basin, possibly include West OC well field, Prado Projects, SARCCUP, etc.).
  - The analyses for the SOC and OC Basin were performed separately from one another. The only overlapping projects were the Poseidon Project and the Strand Ranch Water Banking.

General Input and Feedback

- It was noted that this was an update from 2016 - is the biggest change the inclusion of the WaterFix?
  - That is one of the main changes; the others are the update on the CRA shortage sharing, climate change and assumptions of projects by MET. In addition, this version of the study evaluated specific projects and ranking metrics for agencies to be able to use to make decisions.
- Is your board going to vote to approve this study, and if that is case is this going to be the official MWDOC stance on the various projects?
  - It was noted that the Board does not normally take actions of "approving the projects" or "approving a report" – they typically take a "receive and file" action. However, it is expected that the MWDOC and MET Directors will discuss a number of issues addressed in the study to move positions forward at MET and with MWDOC policies
- Include 2016 line on reliability graphs (shortage vs. probability).
  - These were provided but on only two graphs at the MET level.
- Tie or compare 2018 findings back to 2016 findings.
  - The reliability curves were compared to 2016 results for two graphs at the MET level. The two studies were quite different. Adaptive management is included in both for the long run, but the 2018 study approached more specific local project recommendations compared to the 2016 study. The results coming out of the 2018 study are what should be used for any future planning.
- "No New Projects" – should be modified to include WaterFix only, or add a line for WaterFix only.

  - We will provide a footnote for clarity purposes.
- I think you should craft a clear recommendation/finding related to "Extraordinary Supplies" for SOC.
  - We believe we have, but more work on the concept needs to occur, both for the Strand Ranch and for SARCCUP.
- I suggest adding a finding that OCWD should consider opportunities for improved "Basin Management" strategies that would eliminate shortages.
  - This was deemed beyond the scope of the study and was specifically requested by OCWD to not be evaluated by MWDOC as it is beyond MWDOC's responsibility.
- Include a discussion of how the CRA drought contingency plan is incorporated or not.
  - The recent releases on the Drought Contingency Plan for the Colorado River supplies is almost identical to the modeling we performed. For our modeling, we used the draft DCP from a year ago and the additional shortage contributions from all the parties were the same as they are in the current document.
- The OCWD groundwater basin is very reliable and has been successful - why have you included it in the study?
  - It is important to take a collective look of what water supplies will be needed for the future as a MET region and locally within Orange County. The OCWD Basin is an important piece of this puzzle. For those MWDOC agencies (as well as the Cities of Anaheim, Fullerton, and Santa Ana) that draw from the OCWD Basin, it is important to assess the reliability of imported water from MET that makes up the rest of water demands. Congratulations are in order to OCWD for what it has accomplished in terms of firming up groundwater over the years and for continuing to make needed investments in the coming future.
- Is this being type of work being done other places?
  - The use of scenario planning is becoming more and more the standard practice, especially given that we cannot predict the future with absolute accuracy. Scenario planning helps us to understand the implications of what might occur in the future. The OC Reliability study goes even further by integrating reliability planning to define the "need" for projects along with economics of projects and may be the first of its type.
- To gain public approval, have you looked at the carbon emission from each project?
  - The primary purpose for the 2018 OC Reliability Study is to evaluate water supply reliability and the economics of various local water supply projects that can best achieve the reliability. While carbon emissions are an important element when considering projects, it was not factored into this study.
  - It should be noted that studies conducted by MET and others have shown that the energy use (and by way of extension carbon emissions) for importing water

from SWP and CRA to Southern California are on par with advanced water treatment for water reuse and desalination.

- Does this study consider locally created pump generation storage for electrical generation?
    - No, it does not. We are aware of discussions involving pumped-storage energy generation at Lake Mead, but we did not look at energy generation in this study.
- We are affected by the agricultural use.
    - Agricultural water use is the major water use in the State. A large issue coming to roost is the over-drafting of the Central Valley groundwater system that has been going on for 70 years or more. We have to bring the system into balance and that will likely be done by a combination of taking some lands out of production, and better water management brought together under the Sustainable Groundwater Management Act.
- I thought I heard you say there was a goal for each agency to get to a 60-day emergency supply. Where is each agency at now?
    - The OC basin area and Brea/La Habra are mostly compliant already, although they may want to look at back-up energy sources to help local production and pumping when there is a grid outage. For SOC, it was not that long ago that problems were created with winter period shutdowns of 5 days. Many strategic investments have been made for SOC and today, my guess is collectively, SOC stands at approximately 20 to 30 days.
- For impacts from major earthquakes, has any work been done on "bypasses" to allow the major conveyance systems (Colorado River Aqueduct, State Water Project and Los Angeles Aqueduct) to be re-routed to alternate systems to circumvent impacts from the earthquakes?
    - No, based on the size and logistics issues involved, it would be incredibly expensive. The current thinking is to store sufficient water in Southern California to allow us to survive until the large conveyance systems can become operational again.
- I hope that we can have more meetings on the study to further refine the outcomes. While what was stated regarding the ever increasing demands, I tend to focus more on the green projection line. The decisions need to be made with respect to continued conservation. I know that SOC has a significant emergency supply deficit. I find Local Reliability important.
    - We will consider additional meetings with the member agencies.
- You mentioned independence. One way to do so is to keep in in local water production the public hands and not private.
- We believe the report went too far in indirectly telling the agencies what projects should be implemented.

  - All the member agencies have their own authority to decide what they would like to implement. Our goal was to provide unbiased information for the member agencies to make their own decision, or our Board to make their own decisions.
- How can we lose more than half of the MET supply 35% of the time; what is the scenario and duration?
  - The Red line is the baseline without any new projects including the WaterFix. Extreme shortage events would result in very low State Water Project allocations of 0 to 5% and with the more drastic shortage provisions on the Colorado River, MET could find itself primarily utilizing water pulled from storage.
- We should be invited to watch and participate in all of the study discussion meetings in the future. We would like live streaming of the meetings. We would like OCWD to utilize this study in their discussion.
- This study is a tool and a snapshot in time. I think it is one of the more useful things we have done and will help up with advocating at MET.
- Provide a list of those areas where the OC Reliability Study has highlighted an action or follow-up issue with MET.
  - MWDOC staff is currently compiling such a list.
- Need more meetings to further understand the implications of the study; I'm struggling with trying to understand the implications of the analyses you've conducted. It's a lot to take in, and that's where I thought more meetings would be helpful. Some of the projects you analyzed haven't proceeded past a conceptual stage and some are full-fledged projects with completed EIR's.
  - If agreed to by the larger MWDOC member agency workgroup, MWDOC staff is more than willing to conduct additional meetings. This issue will be discussed at the October 25 MWDOC Manager's group to see what level of interest there is. Furthermore, MWDOC is willing to meet and discuss any aspects of the project with any agencies desiring such, so if a collective workgroup is not arranged, staff are available to meeting one on one with our agencies.
- Note the receipt of the letter from OCWD and the MWDOC response back on various issues with respect to the 2018 Study.
  - Copies of the letters can be provided upon request.
- TDS is a major water quality issue with respect to water recycling and there are hidden costs to the consumer from having high TDS supplies. Can you quantify the costs involved? What will MET do about the high TDS on the CRA supplies? Can they do more work on limiting natural TDS sources within the Colorado River watershed?
  - This issue needs to be resolved for the long run to enable recycling of supplies with a reasonable TDS limit and to limit the build-up of salts in groundwater basins that if not dealt with, could result in the need for desalination of future groundwater supplies. It is unknown which point of intervention (treat or divert high TDS supplies from getting in the Colorado River, treating say the MET

Colorado River Aqueduct, or treating recycled supplies to knock down the TDS of the water) would be the best investment for the long run. We will attempt to develop information on such.

- Concerns were raised with developing sufficient storage resources to protect OC for six months with respect to emergency supplies.
  - It was indicated that MET has a study underway on the amount of emergency storage required in the MET system (currently 630,000 AF) to deal with outage and recovery durations for various earthquakes impacting the importation of water into Southern California.
- Will the MWDOC Board support any LRP applications submitted by its agencies?
  - MWDOC's policy has been that MWDOC will forward any LRP project for consideration to MET assuming they meet the MET guidelines for the program. If the projects move on for consideration at the MET board, it does not necessarily mean that our MET directors will absolutely support every project that is moving forward (our MET directors who also sit on the MWDOC Board cannot participate in the discussions because of conflict rules at MET). The recent criteria for support of LRP projects at MET has more conditions than the previous criteria of first come first served.
- There is a lot of confusion regarding the industry meaning of the phrase "New Water;" perhaps a clear definition can be developed for inclusion in a glossary.
  - New water indicates that the water source has not yet been developed or used for potable water purposes (or is not currently offsetting the need for) potable water and would include (i.e. ocean desalination, stormwater capture, recycled water, DPR, IPR or groundwater production over and above what is currently being produced).
- During the development of MWDOC's Water Conservation Master Plan, definitions and distinctions were developed for various "conservation terms" outlined below. The definitions of use for purposes of the reliability study should be provided so all know and understand the use of the various terms:
  - Water conservation – typically a general term that can be confusing because it can mean many things. It typically refers to a beneficial reduction in water use, whether for an emergency situation or for long term demand reductions. It can include both passive and active conservation (passive occurs due to plumbing code changes and regulations, whereas active conservation results from specific investments that result in reductions in water use). The problem with the term is it means so many things. In the study, we have developed the terms noted below that we believe are more descriptive. The other issue with the term is that it has no dimension of efficiency and so everyone is treated the same whether they are currently being water conscious or not.
  - Water use efficiency - long term beneficial reductions in water use or increased efficiency of water use over the long term due to investments, plumbing code changes or behavioral changes. These are based on scientific estimates of what

levels of use for a specific purpose are reasonable or efficient (indoor use, landscape irrigation per unit of landscape, etc.) and are judged on an efficiency basis instead of simply using "less."

- Demand curtailment – for our study, this term is used to describe consumer responses to requests for beneficial reductions in water use to deal with short term emergencies or droughts lasting one to several years. These are typically short term responses to "specific water agency requests for reduced use" because of a problem with water supplies. We also use the term of consumer response or consumer cutback.
- Demand management – a general term similar to water conservation; we believe the terms water use efficiency and demand curtailment or demand cutback are more appropriate for the study discussions.
- These terms will be added to our glossary.

- A better definition/explanation of the Doheny Regional project is needed, including the needs for regional buy-in/fiscal support, purchasing/distribution agreements (partnerships), helping water reliability education/promotion by participating entities.
  - In the study effort, Doheny Local was used to describe the project currently being pursued by South Coast Water District. By way of the study effort, we did not want to imply any changes in what South Coast is permitting or proposing and simply provided it as "what is happening" at this time.
  - In the study effort, the Doheny Regional was specifically described as the remaining amount of capacity that could be developed in the Doheny Desalination Project over and above what is being developed by South Coast Water District. The full scale project was nominally estimated at 15 mgd; this would allow development of 10 mgd above and beyond what is being developed by South Coast Water District. Other variations are possible such as a 5 mgd expansion. A proposal or proposed structure for such a project as far as actual participation by local entities has not yet been developed. The study assumed the structure would be put together by a number of agencies and the participating agencies would develop terms and conditions for such a proposal including assessment of the integration needs to distribute the water during normal operations and during emergency operations. MWDOC conducted work in the area of integration to look at optional delivery paths for the water including to the Joint Regional Transmission line heading north, the Local Transmission main heading south and the Water Importation Pipeline heading south with additional pumping provided to boost the Doheny Desal water into the South County Pipeline.
  - These definitions will be added to our report.
- Input was received that projects are at different levels of development and so a comparison of projects to one another is not appropriate or could cause the evaluation of projects to be skewed.

- This issue is inherent in any type of planning related study when projects are in different stages of development. In fact, the Study Limitations section of our background report made specific reference to this issue, as noted below. The MWDOC study utilized the latest information from various sources, including from our member agencies, and we believe the study meets the overall goal of providing an accurate comparison of the benefits provided by the various projects analyzed.

Study Limitations (from the Background Report)

Most of the MET and local water supply project information (e.g., supply yield, cost, project terms, potential operational dates) has advanced from a conceptual level used in the 2016 OC Study to a feasibility level for this study. And while this has resulted in improved understanding of these projects and their potential costs and benefits, preliminary and final designs for these projects are still several years out (i.e. the economics presented in this Study could change prior to final project implementation). Most of the project assumptions are based on published reports, evaluation summaries and contract terms provided by project sponsors—with MWDOC conducting supplemental analyses on regional projects. Given these caveats, MWDOC believes that the project information used for the 2018 OC Study is adequate for understanding the relative benefits, trade-offs, and potential financial consequences of implementing local projects in Orange County given our current understanding of hydrologic and regulatory risks.

Irvine Ranch
WATER DISTRICT

October 25, 2018

Mr. Rob Hunter
General Manager
Municipal Water District of Orange County
18700 Ward Street
Fountain Valley, CA 92708

Subject: IRWD Comments on 2018 Update to Orange County Water Supply Reliability Study

Rob:

The Municipal Water District of Orange County (MWDOC) has recently completed its draft 2018 Update to the Orange County Water Supply Reliability Study (2018 Study). This study is an important, objective, and comprehensive evaluation of how gaps in future water supplies can be met with different local and regional water supply projects. Irvine Ranch Water District (IRWD) appreciates the hard work that MWDOC staff and consultants have put into this study and compliments the team for objectively comparing project alternatives. We also commend MWDOC staff for encouraging and incorporating input received from its member agencies. The purpose of the letter is to provide the following IRWD comments on the study.

IRWD's comments, which have been reviewed with and approved by the IRWD Board of Directors, are as follows:

1. The future demand forecasts that were developed for the initial Supply Reliability Study (completed in 2016), with the input of MWDOC's member agencies, are reasonable. These demands adequately reflect the expected impacts of the State imposing water budgets on retail water agencies throughout the County. The study adequately demonstrates that water demands are not likely to increase in Orange County in the future.

2. The project evaluation metrics that are used in the updated 2018 Study provide a good method of comparing the benefits and costs of the projects. IRWD supports the comparison of the projects based on the metrics used in the study. Comparing the benefits and costs of alternatives is an essential component of water supply reliability planning. Even though not all the potential indirect benefits of the projects have been identified, IRWD supports MWDOC's efforts is applying this water supply reliability planning method.

3. The study should include the objective evaluation and comparison of the extension of the existing South County Interconnect Agreement between MWDOC, OCWD, IRWD and other South County Agencies. Evaluation of the extension of this agreement should take into consideration the results of MWDOC's ongoing hydraulic evaluation of the affected facilities in coordination with input provided by IRWD engineers. This common sense alternative needs to be included for the consideration of those agencies that deem it important, regardless of potential changes to a new South County Interconnect Agreement. Without consideration of this alternative, the 2018 Study is incomplete.

4. The 2018 Study references only briefly that the water supply reliability of the Orange County Groundwater Basin (Basin) area could be improved by changing the way that the Basin is managed. The study should be expanded to include an objective evaluation of implementing basin management improvements including expanded purchases of available supplies from Metropolitan Water District of Southern California (Metropolitan) for direct or in-lieu recharge in the Basin. It needs to be recognized that optimizing the purchases and recharge of water available from Metropolitan is among the most economical alternatives for improving the water supply reliability of areas reliant on the Basin and meeting the emergency needs of South County. Maintaining the Basin about 150,000 AF from being full, would benefit the entire county. Without consideration of this alternative, the 2018 Study is incomplete. IRWD encourages MWDOC and OCWD to work together on developing this evaluation.

5. It is our understanding that the study incorporates, as a baseline, the use of water supplies from Irvine Lake to provide system reliability improvements to the capacity owners in the Baker Water Treatment Plant. The 2018 Study should include a description of the assumptions included in this baseline project. IRWD and the other partners in the Baker Plant have recently initiated discussions whereby Irvine Lake could supply up to 60 days of emergency water for the Baker Plant. IRWD and the other Baker Plant partners are willing to confer with MWDOC to assist in finalizing its baseline study assumptions for this use of Irvine Lake.

6. The study should incorporate an analysis of the potential improvements in water supply reliability that might be achieved in Orange County should Los Angeles Department of Water and Power and the San Diego County Water Authority succeed in becoming less reliant on supplies from Metropolitan. Such efforts by these agencies to become more self-reliant could reduce the need to invest in future local water supply projects in Orange County.

7. Recently, other MWDOC member agencies have commented on the importance of each agency having the ability to opt out of participation in specific projects evaluated in the 2018 Study. IRWD agrees with this principle when any of the following are expected to occur as a result of a project:

a. Significant financial impacts with no improvement in water supply reliability;
b. Detrimental impacts to water quality;
c. Impacts to investments in other infrastructure;
d. System integration issues;
e. Operational challenges;
f. Infringements on capacity rights;
g. Requirements for an agency to give up existing supplies; or
h. MWDOC member agencies subsidizing the cost of supplies available to other Metropolitan member agencies.

IRWD recommends that MWDOC include in its 2018 Study a discussion of the importance of agencies being able to opt out of a project under any of the conditions listed above.

IRWD greatly appreciates the opportunity to provide the comments listed above. We request that you provide a copy of this letter to each of your Board members in advance of MWDOC's November 13, 2018 Planning and Operations Committee meeting. Please contact me at (949) 453-5590 if you have any questions or if you would like to meet to discuss these comments further.

Sincerely,

Paul A. Cook
General Manager

Enclosure

cc: IRWD Board of Directors
MWDOC Board of Directors

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October 25, 2018

Robert J. Hunter
General Manager
Municipal Water District of Orange County
18700 Ward Street
Fountain Valley, CA 92708

SUBJECT: Municipal Water District of Orange County – Orange County Water Reliability Study

Dear Mr. Hunter:

Mesa Water District (Mesa Water®) would like to acknowledge the leadership that the Municipal Water District of Orange County (MWDOC) has taken to ensure that water reliability is being strategically considered across MWDOC's member agencies through the 2018 Orange County Water Reliability Study (Study). Additionally, Mesa Water commends MWDOC on the tremendous effort of developing a Study that attempts to address the specific water supply needs for each of Orange County's regions and the difficulties involved in meeting all of their member agencies' needs.

Regarding the Study and the supporting development approach, Mesa Water offers the following comments for consideration:

1. **Project Ranking**: The Study (PowerPoint slide 94) attempts to rank various Orange County water supply projects based on cost and other unknown factors. Mesa Water believes MWDOC should be supportive of any project that would alleviate the identified potential water supply gap without prejudice of one type of project over another.

Each MWDOC member agency has the responsibility to approach water supply reliability based on the water supply conditions and philosophies set by its governing Board. Thus, a one size fits all ranked solution does not translate into meaningful water supply reliability for all MWDOC member agencies. Further, the water supply reliability needs of south Orange County MWDOC member agencies are significantly different than Orange County Water District's member agencies (Basin members). MWDOC is encouraged to support any water supply reliability project that those regions believe will support their long-term water supply needs.

Recommendation: Please consider removing the project rankings from PowerPoint slide 94 of the Study, and providing support to the respective MWDOC member agencies for the regional water supply projects they choose to pursue.

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2. **Water Supply Assumptions**: While the Study does a good job in trying to identify future water supply conditions, it appears that minimal input has been requested from MWDOC's member agencies. Several assumptions have been made in the Study that could dynamically change the findings and conclusions of the Study based on the information that should be provided by each of MWDOC's member agencies. In completing the 2016 Orange County Water Reliability Study, MWDOC took great efforts to engage MWDOC's member agencies to ensure that future water supply conditions were well vetted.

Recommendation: Please consider approaching the 2018 Study in the same manner as the 2016 Study by facilitating a series of workshops to vet each member agency's water demands and supply challenges.

3. **Metropolitan Water District of Southern California (MWD) Stranded Assets/Water Quality**: Findings 4, 5, and 6 on Power Point slide 114 indicate that large-scale local supply development could potentially strand MWD's assets and such projects should consider a reduced size to ensure they would not negatively impact MWD's operations. The Study should primarily consider Orange County water reliability development, and consider MWD operational protocols as a secondary need. While it is understood there are MWD feeder water quality challenges associated with reduced base flows, that is an operational challenge for MWD to address. This issue should not be a limiting factor in the development of a regional Orange County water supply development project.

Recommendation: Please consider removing Findings 4, 5 and 6 on PowerPoint slide 114, and using this as a criterion to support future Orange County water supply reliability projects.

Thank you for the opportunity to comment on the Orange County Study. Mesa Water looks forward to ongoing collaboration with MWDOC and its member agencies on future Reliability Studies. Should you have questions or need further clarification on our comments, please contact me.

Sincerely,

Paul E. Shoenberger, P.E.
Mesa Water District General Manager

Cc: Mesa Water District Board of Directors
MWDOC Board of Directors

SOUTH COAST  **WATER DISTRICT**

November 6, 2018

Mr. Rob Hunter
General Manager
Municipal Water District of Orange County
18700 Ward Street
Fountain Valley, CA 92708

Subject: SCWD Comments to the 2018 Orange County Water Reliability Study

Dear Mr. Hunter:

The South Coast Water District (SCWD) entrusts the Municipal Water District of Orange County (MWDOC) as a wholesale water supplier to 2.3 million residents in Orange County and resource planning agency whose efforts focus on sound planning and appropriate investments in water supply development, water use efficiency, public information, legislative advocacy, water education and emergency preparedness. As such, SCWD appreciates the effort that went into the 2018 OC Reliability Study, to specifically account for the WaterFix as a 2035 base condition, implementation of a Drought Contingency Plan for the Colorado River, new climate change modeling, and other relevant factors. It's also valuable that the 2018 OC Reliability Study reviewed the water needs and supply options for the entire County to determine possible projects for the future and to enable informed decision making.

South Coast Water District offers the following comments on the Study:

1. It is imperative that any potential water reliability projects be rated through a system which brings to light the projects which best meet the needs of the region as a whole. As the report is quite lengthy and provides a detailed analysis, the ranking portion of the report is quite clear and easily understood by water professionals and the public alike. SCWD fully encourages MWDOC's rankings of potential water supply and system reliability projects, as MWDOC represents a neutral 3rd party expert ranking of these projects. As such, SCWD requests that rankings stay in this and subsequent OC Reliability studies.

2. Through a collaborative process, the MWDOC member agencies provided input to determine water demand forecasts for the Reliability Study. SCWD is supportive of the future demand forecasts and thinks it adequately addresses the future impacts of proposed State imposed water use efficiency and conservation targets.

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3. This 2018 update contains facts, figures, information and analysis that have changed since the initial 2016 Water Reliability Study. In upcoming years, additional projects, updates to legislations such as potable reuse, and updates to demand management will be available. We encourage MWDOC to update the OC Water Reliability Study on a regular basis (perhaps biennially) and include any future projects to ensure the regional outlook is continually reviewed.

4. South Orange County faces different challenges than north and central Orange County, such as enhanced water system reliability challenges during catastrophic interruptions of MWD imported supplies. SCWD understands that all MWDOC member agencies and affected parties may not completely agree with the full results of the OC Reliability Study.

   In fact, in 2016, SCWD decided that further detailed analyses and scenarios were needed in addition to the 2016 OC Reliability Study for SCWD to properly evaluate our water supply reliability needs. Hence, SCWD commissioned its own reliability study (also performed by CDM Smith), using the 2016 MWDOC study as a starting point. This study focused on rankings of the potential south Orange County water reliability projects that would best meet the needs of the SCWD ratepayers. SCWD then assembled a community-based stakeholder group to participate in an integrated dialogue as part of the Water Reliability Working Group. The purpose of the Water Reliability Working Group was to solicit input on South Orange County water reliability challenges, to provide to the SCWD Board of Directors for review and consideration. Additional information can be found at: https://www.scwd.org/services/drinking/supply/water_reliability/default.htm

   We encourage MWDOC staff to provide support and assistance to any member agency interested in performing their own reliability study to further understand their specific local challenges and solutions.

Thank you again for routing this 2018 OC Reliability Study for member agency review, along with conducting a thorough workshop with the member agency managers to discuss the draft study. Please feel free to contact me at rshintaku@scwd.org with any questions or comments.

Sincerely,

Rick Shintaku, General Manager
South Coast Water District

cc: South Coast Water District Board of Directors

EAST ORANGE COUNTY WATER DISTRICT

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October 26, 2018

Mr. Robert Hunter
General Manager
Municipal Water District of Orange County
18700 Ward Street
Fountain Valley, CA 92807

RE: Draft 2018 MWDOC Water Reliability Study

Dear Mr. Hunter:

East Orange County Water District (EOCWD) would like to thank Municipal Water District of Orange County (MWDOC) for its continued leadership as a water resource planning agency and as a facilitator of water management projects and programs that benefit Orange County and its member agencies. The Draft 2018 MWDOC Water Reliability Study is an excellent example of the type of quality work MWDOC produces, something that can serve as a valuable planning document and help agencies make informed decisions as they seek to address their water reliability needs and challenges, particularly as we work to comply with the new requirements required under SB606 and AB1668.

In reviewing the draft study, EOCWD appreciates the depth of MWDOC's evaluation and analysis of many potential projects, located within and outside of Orange County. However, EOCWD following comments:

- Provide further information on the short-term and long-term projects and their attendant feasibility, risks, economic impacts/drivers, politics, and where they are in their respective project "life-cycles." Some may be near-term projects that could be constructed soon to "hedge" against certain events, some may be long-term projects due to their uncertain feasibility (e.g., new regional storage). Additionally, have all potential reliability projects been identified and analyzed?

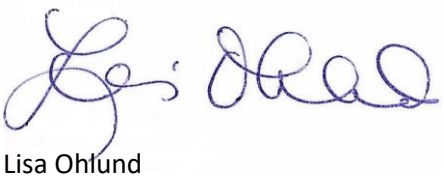
- Re-evaluate the need to "rank" projects. As noted above, there are varying feasibilities in each of the identified projects; it may be presumptuous to rank projects as doing so could distort the perception of the value of a project precipitously.

- Provide a summary of changes from the 2016 Study to understand basic assumptions that may have changed as well as changes to the recommendations that were made at that time.

- Provide additional meetings to drill down into some of the near-term issues that were identified in the 2016 Study and where we have additional clarity now; e.g., realistic conservation quantities during "normal" periods versus "drought" periods, MET's supply plans for varying CRA and SWP delivery conditions (2019-2035) as well as OCWD's supply plans for this same time period.

Thank you, again, for your continued leadership and for your excellent work on the Draft 2018 MWDOC Water Reliability Study. EOCWD appreciates the opportunity to provide comment and looks forward to ongoing dialogue and collaboration with MWDOC on county water reliability issues. If you have any questions or need for clarification, please contact me at 714.538.5815 or lohlund@eocwd.com.

Sincerely,



Lisa Ohlund
General Manager
East Orange County Water District

cc: Karl W. Seckel, P.E., Assistant General Manager/District Engineer, MWDOC
MWDOC Board of Directors

moulton niguel water district

October 25, 2018

Rob Hunter
General Manager
Municipal Water District of Orange County
18700 Ward Street
Fountain Valley, California 92708

SUBJECT: Municipal Water District of Orange County 2018 Water Reliability Study Comments

Dear Mr. Hunter:

Moulton Niguel Water District appreciates the Municipal Water District of Orange County (MWDOC) studying the long-term reliability of Orange County and providing agencies with the opportunity to provide input on the draft report released in September. The District has reviewed the draft 2018 Water Reliability Study and has several comments:

1. In the 2016 Water Reliability Study by MWDOC, local agencies were provided the opportunity to participate in an iterative process to work collaboratively with MWDOC to ensure that an alignment in approach across local agencies and MWDOC was developed. This resulted in a successful planning document that provided a tool that local agencies could then utilize to inform their own local planning decisions. The 2018 Study update skipped this important iterative process and ignored the feedback provided by multiple agencies to avoid ranking projects due to the local policy and decision making intrinsic to any ranking methodology. Moulton Niguel Water District asks MWDOC to remove the sections that provide project rankings which is fundamentally a local decision to determine approach in evaluating which projects to participate in or pursue.

2. Increasing the local production of water in South Orange County will decrease water flows through existing transmission mains, most notably the East Orange County Feeder #2, Joint Transmission Main and Allen McCullough Pipelines. It is imperative than any cost-benefit analysis of local projects also include the necessary facilities to ensure that water quality regulations are met, especially during the winter months (December through February). The decreased flows through those pipelines would impact the disinfection degradation and create necessary improvements at additional costs which was not included in the 2018 Study. There are also contractual flow obligations through the CM-10 takeout which need to be accounted for in the project cost evaluation.

3. The Study also does not analyze the impacts of local agencies taking more aggressive actions towards demand management. As MWDOC staff is aware, meeting long term supply reliability goals has two broad strategy alternatives: reducing demands or increasing water supplies. The focus of the study is on evaluating new water supply projects to meet the overall gap. Agencies

could also implement more aggressive demand management programs through pricing, marketing, education and other efficiency incentives to reduce demands to prepare for future droughts through extending storage further than would be otherwise. The study included mention of water demands under a 20 percent landscape conversion but fails to account for local agencies implementing further efforts to reduce demands, especially considering the State of California's passage of AB 1668 and SB 606. Moulton Niguel Water District is happy to share some research we've done on the success and cost-effectiveness of water efficiency as an alternative to solely focusing on new water supplies.

4. Direct potable reuse was notably omitted as a potential local new supply in the 2018 Water Reliability Study's project list. Moulton Niguel Water District currently reclaims between 60 and 70 percent of the treated wastewater produced in our service area for beneficial use. As the State develops standards for direct potable reuse by its 2023 deadline, the option to beneficially reuse treated wastewater directly into the potable water system could provide a key strategy towards meeting both supply and system reliability goals. This could provide upwards of approximately 4,000 acre-feet per year of new local potable water supplies for Moulton Niguel Water District alone.

5. Metropolitan Water District currently collects the majority of its revenue on a volumetric basis and its costs are primarily fixed regardless of the amount of water sold. Metropolitan in the past has reviewed and discussed shifting towards a higher fixed cost recovery rate structure. In order to ensure the study provides agencies with a full picture of potential outcomes, MWDOC should also evaluate the impact of Metropolitan shifting towards more of a fixed cost-based rate structure to ensure agencies have the complete picture in evaluating the financial risk associated with their projects.

We appreciate the efforts by MWDOC staff to engage with local agencies and solicit input into the planning process. However, before the MWDOC Board takes any actions on the draft study, we respectfully request that the updates referenced be made to ensure a robust planning document that recognizes local decision making in implementing any new projects.

Thank you for your consideration.

Sincerely,

Joone Lopez
General Manager

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OCTAX
Orange County Taxpayers Association

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October 31, 2018

Mr. Rob Hunter

General Manager

Municipal Water District of Orange County

18700 Ward Street
Fountain Valley, CA 92807

Dear Mr. Hunter:

I am writing to provide comments on the Municipal Water District of Orange County's ("MWDOC's") draft Water Reliability Study Update ("Update").

Access to safe, clean and affordable water is a critical component of the Orange County economy. Despite past investments in local water supplies, Orange County must still import approximately half of its water supply from climate-dependent sources that have significant legal, political and regulatory constraints. This makes it imperative that Orange County continue to invest in county-based, local water supplies that enhance water supply reliability and independence in a financially responsible manner.

The Orange County Taxpayer's Associations' ("OCTax") interest in the Update is to ensure that the economic analysis of public-serving infrastructure projects is done in an accurate and transparent manner. The Update acknowledges that the economic analysis has multiple limitations due to a number of different factors. In this regard, OC Tax offers the following comments and suggested edits:

1. The Update should include detailed financial information that serves as the basis for each project's cost estimate. Absent such transparency it is not possible for stakeholders to ensure with any level of certainty that the cost estimates for each project are accurate or that the projects' financial appraisal is reasonably comparable.

   OCTAX has found that the means of delivering a project can result in disparate financial accounting. Projects delivered under a stand-alone project finance structure differ from traditional publicly financed projects.

   Projects not undertaken on a stand-alone project finance basis sometimes treat costs such as land acquisition, permitting, financing and staff time as "sunk." Costs for projects in early development stages are often internalized by the agency/utility. Therefore, it is important for stakeholders to understand whether project costs relied upon by the Update reflect the ratepayer's "all-in" costs.

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Orange County Taxpayers Association

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2. The Update attempts to provide a cost comparison among projects that are in different phases of development, and many of the projects evaluated in the Update may never be built. Project's in early phases of development typically only have engineering level cost estimates while projects in later stages of development likely have cost estimates based on a formal construction bidding and procurement process. Adjusting for inflation factors alone to account for the time a project requires to reach construction cannot account for the disparity in the accuracy of project cost estimates. In this regard, the Update should assign each project a level of cost certainty commensurate with the development status of the project.

3. The Update should distinguish between projects proposed to be delivered under a Public Private Partnership ("P3") and those proposed to be delivered under a public agency Design Bid Build ("DBB") project delivery method.

   OC Tax supports P3 public infrastructure projects because of the financial protections afforded taxpayers/ratepayers. According to a 2016 *Ernst & Young* report, 74% of large water infrastructure projects are over budget by an average of 49%; and large infrastructure projects in North America are delayed by an average of 33 months prior to the start of operations. According to data from the Congressional Budget Office, operations & maintenance costs are, on average over a 30-year project, 69% higher than costs during the first year of operations excluding inflation.

   Concern about a project's operational financial risk is illustrated by the Update's risk assessment of the Doheny desalination project, which states: *"Slant well technology is a new technology that has only been tested at a pilot scale at Doheny Beach and Cal Am."*

In closing, it is important that stakeholders do not misrepresent the contents or conclusions of the Update and that its limitations be clearly identified early and often throughout the report.

Sincerely,

Carolyn Cavecche

President and CEO

Orange County Taxpayers Association

cc: MWDOC Board of Directors

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18700 Ward Street
Fountain Valley, California 92708

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October 9, 2018

Mr. Michael Markus General Manager
Orange County Water District
18700 Ward Street
Fountain Valley, CA 92708

RE: MWDOC 2018 Orange County Reliability Study
OCWD Letter of September 28, 2018

Dear Mr. Markus

Thank you for your letter of September 28th. We appreciate your quick preliminary comments on the 2018 Reliability Study after the Member Agency Workshop of September 20, 2018. The comment period will remain open until October 26, 2018, thereby allowing all parties five weeks after the workshop to review and comment. We anticipate having the study back in the Planning and Operations Committee on November 5, 2018.

Let me address each of your comments in order.

1. <u>MWDOC Member Agencies have not been fully engaged in the development of this study as previously occurred with the earlier 2016 version.</u>

   This is true as the 2016 and 2018 studies are fundamentally different. In 2016, we were developing methodologies and tools which were then applied to one scenario (moderate climate change with no WaterFix). Also theoretical portfolios of projects were assembled to demonstrate different ways to reach water reliability. As you state, "numerous workshops were held with the MWDOC Member Agencies to jointly discuss and evaluate the assumptions ultimately used by the model." Coming out of the 2016 study, we had gained significant insight and developed the methods and tools for reliability analysis and scenario planning. Two major comments we received on the 2016 study were that it was (a) too restrictive in terms of planning scenarios in that only one was carried forward for final analysis, and (b) the study's usefulness for decision making was limited in that specific projects could not be objectively compared. The 2018 study was designed to address these issues. The tools developed in 2016 were applied to four scenarios that were designed to bookend likely conditions of climate change and regional project investment. All four scenarios included the WaterFix becoming operational in 2035.

Additional, specific projects were then objectively evaluated to meet Orange County's water supply and system (emergency) reliability needs.
MWDOC worked closely with Member Agencies (including OCWD) and project proponents to verify assumptions, yield, and financial information for the projects. The emphasis of this consultative effort was to make sure the information and analysis were correct. MWDOC will continue to entertain input, suggestions and collaboration discussion with its agencies regarding the study results and any updates that may be required from time to time.

2. Numerous assumptions also need to be made to project future water supply conditions and future water demands and those assumptions should be fully discussed and vetted with your Member Agencies.

I agree that future water demand and supply conditions should be discussed. Part of the discussion occurred during the 2016 study. For example, the demand projections in 2018 are essentially those of 2016, and extensive discussions were held as part of that study. Discussions with Member Agencies were held to identify and quantify future water supply projects. The discussions with OCWD resulted in the final expansion of the GWRS system being included in the supply baseline. However, other groundwater basin projects were not included in the project analysis based on your specific request. The September 20, 2018 Member Agency workshop was designed to facilitate this same discussion along with the stated offer to meet with each individual Member Agency to answer questions and discuss the study.

3. MWDOC should not be ranking and in effect telling its Member Agencies what future water supply projects they should be implementing for the following reasons: (four bullet points follow)

MWDOC is not telling our Member Agencies what projects implement. We make this very clear at several points in the presentation. What the 2018 study does do is develop a range of reliability needs under different scenarios, details information on several prominent projects, evaluates those projects, and presents MWDOC's findings based on those analyses. As clearly stated, each agency makes its own decisions and can come to other decisions based on their own priorities (please refer to slide #44 of the 2018 Reliability Study PowerPoint presented in the September 20, 2018 Workshop, that notes "Agencies can take different paths to be reliable" and it outlines optional paths within that slide). The MWDOC Board of Directors clearly has the right, if not the obligation, to request both the analysis and the ranking to make their own informed decisions.

a. No one can predict water supplies and demands with specificity and certainty.

I agree; and especially when the planning period is greater than 30-years,

but that does not mean we should do "nothing" with respect to future planning. Therefore, the 2018 study uses scenarios to evaluate likely ranges of water supplies and demands. While we cannot predict with certainty, we can develop regional ranges for planning to better inform us regarding potential future impacts. As various proponents seek to move projects forward, we are often asked, "will MET be reliable" and what will MET water cost over time. The study provides both answers. Our working concept is that it is better to move forward with reasonable and workable estimates than without any estimates.

b. It is up to the governing body of each water agency in Orange County to decide what projects they desire to develop and/or participate in.

I agree that it is up to the governing body of each water agency to decide what projects they desire to develop. Although I think you would agree with me that there are some problems with project opt-out provisions. We make your exact point related to demand curtailment; that it is up to each agency to decide "what level of demand curtailment" works in their service area. In the 2018 study, we assumed that with demand hardening a reasonable working limit was for agencies to ask their customers to reduce water use by 10% every 20 years. But, like you, we make the point that a utility could decide that it is an acceptable level of service to request a 25% reduction every three-years. This would have the result of requiring significantly less new supply development. However, it is highly probable that customer support would be limited for the size and frequency of those reductions. But it is the individual utility's decision.

c. Each MWDOC member agency governing body is responsible for allocating financial resources in the best manner possible for its individual agency. Having the MWDOC Study in effect telling your Member Agencies how they should spend their money is not appropriate.

Again, we agree with the responsibilities of each agency, and that also applies to MWDOC. In your opening paragraph you write "the study provides a good analysis of future water supply needs for the region that MWDOC Member Agencies can use in evaluating potential future projects and water supply strategies." That is exactly what the study was designed to do; not dictate Member Agency actions.

d. The various potential future water supply projects and programs being evaluated are in different stages of development and can be different in nature. Additionally, the nature of the projects can be different. Some are storing water. Some are creating new annual supplies, while another project relies upon capturing intermittent rainwater.

Absolutely. Because the projects are in different stages of development and provide different benefits, we closely reviewed costing assumptions and contingencies. There is no guarantee that any project will be constructed. Therefore, the study looks at what projects could substituted for projects that do not move forward. Because the projects are different in nature, we considered how different types of projects could meet specific needs and integrate into a comprehensive system.

In your closing paragraph you request that any sections of the MWDOC Study ranking or recommending projects be removed. I have passed this request on to my Board of Directors.

Thank you for your ongoing review and active participation.

Sincerely,

Robert J. Hunter
General Manager

cc: MWDOC Board of Directors
MWDOC Member Agencies
OCWD Board of Directors
OCWD Producers

ORANGE COUNTY COASTKEEPER®
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Costa Mesa, CA 92626
Phone 714-850-1965
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www.coastkeeper.org

October 26, 2017

Via email to:
Mr. Rob Hunter
General Manager
Municipal Water District of Orange County
18700 Ward Street
Fountain Valley, CA 92708

Subject: Comments on 2018 Update to Orange County Water Supply Reliability Study

Dear Mr. Hunter,

Orange County Coastkeeper is a nonprofit environmental organization that believes all people have the inalienable right to clean water. Coastkeeper's work promotes and restores water resources that are Drinkable, Fishable, Swimmable, and Sustainable. After reviewing the documents for the Municipal Water District of Orange County (MWDOC) 2018 Water Reliability Study we have the following comments:

1. MWDOC staff have done a great job collecting, consolidating and analyzing the data for this report. The background document and presentations produced for the study provide an objective, science based review of the reliability needs and water supply options for Orange County. As the only Orange County water district covering all of Orange County, MWDOC has the unique ability and obligation to analyze these issues. By nature the individual cities and water districts that provide Orange County's water are focused on their own service area and the specific projects they are interested in. As explained in the draft study, some projects considered by individual suppliers may have negative implications for the rest of the county, including stranded assets and unwanted impacts to water quality, the environment and ratepayers. The narrow focus of the local districts makes it critical that MWDOC maintain its independent county wide perspective in the study to insure that the public and decision makers get objective information free from local agency bias.

2. The final document must be designed for use by the general public as well as agency staff and elected officials. The draft background document states "The purpose of the 2018 OC Reliability Study is to develop and present information that will enable informed decision making by staff and elected officials….." The ratepayers that provide the funding for MWDOC and all of the other water suppliers also have a need for and right to objective information on their water supply. This information is necessary for the public to participate in the decision making process at MWDOC and the local water suppliers. Also, this is complicated information and from comments expressed already it is clear that even some Water District Directors and staff do not understand the underlying concepts or see the big picture. A clear and understandable final report with an executive summary is necessary to insure that the main points of the report are understood by all.

3. The rankings of projects must stay in the final report and be expanded to include projects that were not ranked in the draft report. The rankings are the most understandable and important part of the report. This much needed simplification of the complicated data in the report clarifies economic, supply and reliability realities and gives important insight into the variety of options for future water supplies. It is not

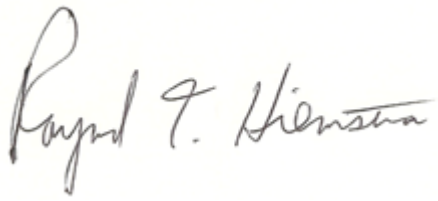
surprising that proponents of some of the projects that did not rank well are calling for the ranking to be eliminated in the final report. MWDOC should not bow to these narrow interests. The final report should also include rankings for the Carson recycling, West Orange County Wellfield, Prado Dam Stormwater Capture and the SARCCUP projects. The pilot version of the Carson project is already under construction and feasibility studies are complete for the West OC and Prado projects. The SARCCUP project is already funded through a state grant program.

4. As mentioned in the 2018 draft background report a 2016 water supply analysis produced for Coastkeeper by James Fryer suggested that the water demand projections used in the 2016 report (and again in the 2018 draft) are too high. That is still our opinion. The 2018 draft MWDOC report talks about a hardening of demand going forward due to many indoor water conservation improvements having been made. We believe that there is still huge potential for conservation improvements not only indoors but through outdoor landscape improvements. There are over one million housing units in Orange County and with landscaping consuming 60%-70% of our water supply there are plenty of water conservation opportunities still available.

5. The final report should combine the primary and additional findings and incorporate them into the report simply as findings. A review of the "additional" findings does not show them to be less important than the others, all of the findings are significant and provide needed information to the reader.

6. All written comments on the MWDOC 2018 Water Reliability Study should be posted on the MWDOC website similar to how the Regional Water Boards post information on their projects.

Thank you for your consideration.
Regards,



Raymond Hiemstra
Associate Director
Orange County Coastkeeper

ORANGE COUNTY WATER DISTRICT
SINCE 1933
ORANGE COUNTY'S GROUNDWATER AUTHORITY

September 28, 2018

Rob Hunter
General Manager
Municipal Water District of Orange County
18700 Ward Street
Fountain Valley CA 92708

SUBJECT: Municipal Water District of Orange County - Orange County Water Reliability Study

Dear Mr. Hunter:

The Municipal Water District of Orange County (MWDOC) is in the process of preparing and finalizing the 2018 Orange County Water Reliability Study (Study). The Study provides a good analysis of future water supply needs for the region that MWDOC member agencies can use in evaluating potential future projects and water supply strategies.

A draft of the Study was recently presented to and discussed with the MWDOC member agencies on September 20, 2018. The Study will be discussed with the MWDOC Policy and Operations Committee on October 1, 2018.

The Orange County Water District (OCWD) has not had sufficient time to analyze all of the information in the Study and respectfully requests the MWDOC Board to provide your member agencies additional time to review and provide comments on the Study prior to the MWDOC Board taking any final action on the document. At this time, OCWD provides the following preliminary comments on the Study:

1. The MWDOC member agencies have not been fully engaged in the development of this Study as previously occurred with the earlier 2016 version. The Study relies upon a model developed by CDM Smith to assess the potential benefits of possible future projects. For the 2016 Study version, numerous workshops were held with the MWDOC member agencies to jointly discuss and evaluate the assumptions ultimately used by the model. Workshops of this nature have not occurred with the 2018 Study.

2. Numerous assumptions also need to be made to project future water supply conditions and future water demands and those assumptions should be fully discussed and vetted with your member agencies. Minor reasonable changes to the assumptions currently being made can have major impacts to the Study results. OCWD believes the MWDOC member agencies should have the opportunity to participate in those types of decisions.

3. MWDOC should not be ranking and in effect telling its member agencies what future water supply projects they should be implementing for the following reasons:

    - No one can predict future water supplies and demands with specificity and certainty. The MWDOC Study does a good job of highlighting the many variables that could impact our future water resources and makes reasonable estimates in attempting to assess future water supply conditions. However, reasonable changes can be made to the MWDOC Study assumptions that result in different future water supply conditions for our region. If our future is different from what is being projected in the Study, then MWDOC could be telling its member agencies to fund and implement the wrong projects.

    - It is up to the governing body of each water agency in Orange County to decide what projects they desire to develop and/or participate in. Each water agency governing body has a duty to represent its constituents in the best manner possible. Governing bodies can have different water reliability philosophies and different financial resources. One governing body could decide it never wants its constituents to be called upon to temporarily reduce their water demands during a drought period while another governing body could decide that asking its constituents to reduce their demands by up to 25% three out of every ten years is acceptable. One governing body could decide it is willing to reduce future water supply uncertainty by developing a new local water supply project while another governing body could decide it is willing to accept a certain level of uncertainty. One governing body could decide it wants to develop a project it knows it can permit while another governing body could decide to attempt to develop a less expensive project that may not be permittable. The MWDOC Study and project recommendations are making these types of decisions for Orange County water agencies which is not appropriate nor under MWDOC's or any other water agency's authority.

    - Each MWDOC member agency governing body is responsible for allocating financial resources in the best manner possible for its individual

agency. Having the MWDOC Study in effect telling your member agencies how they should spend their money is not appropriate

- The various potential future water supply projects and programs being evaluated are in different stages of development and can be different in nature. The estimated cost of the projects vary in refinement and accuracy. This makes it difficult to compare the projects. Some of the projects are only concepts. Some of the projects have had CEQA completed. It is also debatable if some of the projects even have a chance of occurring due to regulatory and institutional issues - while other projects may be relatively easy to permit. It is unreasonable to assume all the projects will eventually obtain the permits necessary for their construction. Additionally, the nature of the projects can be different. Some are storing water. Some are creating new annual supplies, while another project relies upon capturing intermittent rainwater. Again, each MWDOC member agency governing body needs to evaluate these types of issues and make decisions that are best for its service area.

Given these issues, OCWD respectfully requests that any sections of the MWDOC Study ranking or recommending projects be removed.

Thank you for your consideration.

Sincerely,

Michael R. Markus, P.E., D.WRE, BCEE, F.ASCE
General Manager

Cc: OCWD Board of Directors
OCWD Groundwater Producers
MWDOC Board of Directors

SINCE 1933

ORANGE COUNTY WATER DISTRICT

ORANGE COUNTY'S GROUNDWATER AUTHORITY

October 26, 2018

Rob Hunter
General Manager
Municipal Water District of Orange County
18700 Ward Street
Fountain Valley CA 92708

SUBJECT: Municipal Water District of Orange County - Orange County Water Reliability Study

Dear Mr. Hunter:

The Municipal Water District of Orange County (MWDOC) is in the process of preparing and finalizing the 2018 Orange County Water Reliability Study (Study). The Study provides a good analysis of future water supply needs for the region that MWDOC member agencies can use in evaluating potential future projects and water supply strategies. MWDOC has indicated that comments on the Study will be received until October 26, 2018.

Orange County Water District (OCWD) provided preliminary comments on the Study via a letter dated September 28, 2018. OCWD's primary comment with that letter was MWDOC is in effect telling its member agencies what future water supply projects they should be implementing. By ranking projects and presenting them in the manner chosen in the Study, it will be difficult for your member agencies to implement projects not favorably described therein. OCWD again respectfully request MWDOC to remove any portions of the Study discussing project rankings and offers the following to support this request.

- MWDOC's member agencies may have different water reliability objectives than what is assumed in the Study. Changing the reliability objectives of the Study could change the project rankings table.
- Orange County's water supply future could be different than the scenarios used in the Study. The Study attempts to "bookend" possible future conditions of climate change and regional water supply project investments to evaluate what future local projects should be considered. Due to the numerous variables that will impact future water supplies, OCWD suggests that actual 2040 water supply conditions in our region could easily fall outside these bookends. The project rankings table could then significantly change.
- MWDOC should recognize the inherent nature and uncertainty of any study attempting to predict the future and the need to acknowledge the limitations of such an effort and to avoid making any absolute conclusions about potential projects.
- It is difficult to compare many of the potential future projects being ranked in the Study as they are in various stages of development, different in nature, provide

different direct and indirect benefits, and some projects may not be viable and/or permittable.

- The Study could potentially be used by opponents of certain projects in an attempt to convince regional permitting agencies to deny a permit or financial support for projects with an unfavorable ranking that are being considered by your member agencies. Such a scenario would be particularly frustrating to your member agencies.

OCWD also suggests it would be helpful to your member agencies if one comprehensive final document could be prepared regarding the Study that also provides the technical data and assumptions used in its preparation. Currently, MWDOC has only provided a Background Report and a PowerPoint presentation for review and comment. For example, no technical backup data has been provided to support the financial analysis presented in the Study. This element of the Study is new to your member agencies. This data should be provided for review prior to any type of board action.

In summary, OCWD believes the MWDOC study provides good information to your member agencies to assist them in evaluating the future reliability of imported water supplies to help determine what future water supply projects they should consider for implementation. However, for the reasons provided in this letter and our previous letter, OCWD believes the study goes too far in attempting to compare and rank a variety of projects in an uncertain future. By doing such MWDOC is indirectly telling its member agencies what projects they should implement and is making it difficult for its member agencies to consider projects not ranking high with this specific analysis under your assumed future conditions. For these reasons OCWD again respectfully requests MWDOC to delete any sections of the Study ranking or indirectly recommending projects.

Thank you for your consideration of our comments.

Sincerely,

Michael R. Markus, P.E., D.WRE, BCEE, F.ASCE
General Manager

Cc: OCWD Board of Directors
OCWD Groundwater Producers
MWDOC Board of Directors

Item No. 4

COMMITTEE DISCUSSION ITEM
November 13, 2018

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

FROM: **Robert Hunter, General Manager**

Staff Contact: Karl Seckel

SUBJECT: **Requesting MET Local Assistance to Accommodate Pipeline Shutdowns Extending into the Summer Period**

STAFF RECOMMENDATION

Staff recommends the Planning & Operations Committee support staff's recommendation below and request assistance from MWDOC's MET directors to resolve the upcoming shutdown issues.

COMMITTEE RECOMMENDATION

Committee recommends (To be determined at Committee Meeting)

SUMMARY

MWDOC has been meeting with its agencies regarding upcoming pipeline "shutdowns" that will begin as soon as March 2019. Pipeline "shutdowns" are required from time to time to conduct inspections to better understand the condition of the pipeline and at other times to conduct maintenance and rehabilitation and repairs (R&R). Due to the number of shutdowns being pursued by MET (MET has a tremendous amount of R&R scheduled) and the complexity and extent of the shutdowns (installing steel liners in 100 miles of prestressed pipelines), several of the shutdowns have been pushed into summer periods. While this work is normally completed during the winter period (Nov – Apr) when demands are lower and it is easier for the retail agencies to meet demands without certain of their MET service connections, MET and their contractors realize significant financial savings by extending the shutdown period through the summer season thereby completing the work

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

sooner and avoiding mobilization and demobilization costs incurred by having more shutdowns of shorter periods.

MWDOC's agencies typically do not like to go without access to MET water during the summer high demand periods, and proceeding with shutdowns during these periods increase the risks and costs to the retail agencies. These additional risks occur even if they are groundwater producers with pumping access to the OCWD groundwater basin. MWDOC has promoted the position that we should be working cooperatively with all of our agencies and MET to provide assistance in accommodating these shutdowns, but MWDOC staff also feels that financial assistance from MET would be beneficial. We believe that MET should reinvest some of the savings by absorbing a portion of the costs being incurred by local agencies to accommodate the summer shutdowns. Here is what we are finding with our agencies:

- Groundwater agencies have quite a bit of flexibility in their systems because they often can take large amounts of import water and they can pump the majority of their water in summer periods.
- However, when asked to go without MET water for summer periods, the groundwater agencies become concerned because if they lose a well (say a motor fails or some other issues causes the well to shutdown) they could have trouble meeting 100% of their demands with one well out.
- To accommodate such a situation, our groundwater producing agencies will typically look at the following options to improve the reliability of meeting demands without any problems during summer periods:
    1. Work with neighboring agencies who may not be impacted by the specific pipeline shutdown to see what supplies can be counted on for summer periods. Water may be able to be conveyed through existing interconnections or new interconnections may be necessary. Capital costs may be incurred or the cost of water provided between agencies may include additional charges that make the water more expensive than the water they typically would have pumped.
    2. The impacted agencies can accelerate work to rehabilitate wells prior to the pipeline shutdown to better ensure they will continue to operate without problems during the shutdown period.
    3. The impacted agencies can accelerate their schedule to rehabilitate other key operational facilities such as blending reservoirs, improvement of control systems, improvement of chlorination or chloramination facilities. All of this work may or may not have been planned to be completed prior to the shutdown taking place; the additional expenditures of funds will require the retail staff to seek budget amendments from their governing board or council.
    4. Typically, with access to MET water at the flip of a switch, the issues identified above are not critical, but when they become the difference between triggering a shortage of water to their customers, the sensitivity of losing access to MET water becomes critical.

Discussion

Staff has had a number of discussions with MET staff on this issue, including directly with Jim Green, the Chief of Operations at MET. We have conveyed to Jim that we understand the issues facing MET and our goal is to work with them to ensure they can shut down and complete their Rehabilitation and Repair (R&R) work on the facilities to ensure reliability for the long run, which is also in the best interests of our agencies. We have requested funding assistance to help the local agencies prepare for such events. To date, we have requested:

- Relief from water costs over and above typical water costs by agencies, such as when a neighboring agency supplies water through an interconnection, they often have a mark-up on the water.
- We have requested relief from other MET charges such as the capacity charge and the RTS charge, in a situation where it would have helped MET for one of our agencies to take MET water to help maintain water quality in a section of a pipeline, because other portions of the pipeline were shut down.

The reception by MET staff has been lacking because they do not have any official authority to provide financial assistance to local agencies with the exception of offering to waive capacity charges if they occur. With the rehabilitation of the prestressed concrete cylinder pipe (PCCP) sections of the Second Lower Feeder and the AMP, we have urged MET to seek a way to provide the needed assistance. The trade-offs in costs should be enormous when you consider that for MET to install an additional bulkhead in a pipe, say at a specific location to enable a specific service connection to be maintained in operation, may be $1 million dollars, including the shutdown and refilling operations. Additionally, if the shutdown work was underway, and a well went out and resulted in one of our agencies having to go to their public to request emergency conservation measures to reduce demands to the level of existing supplies, the political costs would be enormous. Furthermore, MET might be able to conduct the work during many shorter duration periods, but the costs incurred for constant starting and stopping work would be extremely expensive. This is not something we want to take lightly. It is in our best interest to plan these events in a manner to provide the level of comfort so that the shutdowns can proceed as planned. A small expenditure by MET will go a long way towards securing local assistance. In a very recent discussion, MET staff indicated they will make this a higher priority to take to management for consideration. MWDOC staff is suggesting expedited consideration to provide flexibility for MET staff particularly for the upcoming March 2019 shutdown of the Second Lower Feeder that will impact Golden State Water Company and the City of La Palma. The City of Buena Park may be able to help its neighbors out but hydraulic investigations need to proceed.

We are in the process of collecting information on expenses that are needed to accommodate the shutdown; examples of costs to be incurred by the local agencies include:

- Hydraulic modeling of the water system to determine its ability to move water to a neighboring agency or to determine if water service from a neighboring agency will be sufficient (estimated at about $15k per agency, in this case, about $45k total).

- Change out of constant speed pumps to variable frequency drive for more efficient operations (estimated costs = $40k).
- Installation of reservoir mixers to maintain chlorine residuals at specific levels in existing reservoirs (tighter control is needed because of reduced flexibility without the MET system available) (estimated costs = $20k).
- Servicing of pump motors and replacement of pump bowls and shafts; cleaning of the wells; all of this work to ensure reliability (estimated cost $225k per well).
- Construction of a new interconnection with a neighboring agency; the interconnection along with 1500 feet of connecting pipe (estimated cost =$425k).
- Rehab of an existing interconnection (estimated cost $55k).
- Cost mark-ups of water from a neighboring agency to cover costs of system investments when they send water out of their agency.

The costs above are not the entirety of local costs associated with the local agencies being able to accommodate the Second Lower Feeder shutdown. MWDOC staff expectations are not for MET to reimburse 100% of these costs, but to provide partial funding assistance, maybe in the 30% range, sort of an "expediting" cost or incentive for taking these projects out of order to make them happen in the current year. It especially makes sense in this instance, as these same service connections will be out of service in another year or two when MET relines the OC portion of the Second Lower Feeder. It will be beneficial when these cost items go to the city council and the report indicates they have been expedited ahead of the shutdown and there has been cooperation from MET to provide funding assistance.

Requesting assistance from MET will trigger several issues. One is getting assistance from the Auditor to provide guidance to staff or to help resolve the form of agreement that is needed for cost-sharing. Another will be to establish limits of some type. The intent is not to box MET staff in to make the program onerous, but to provide transparency and disclosure to avoid abuse of the system. Maybe the first several of these cost-sharing opportunities are set up under a pilot program to test them out and see what issues arise. Staff is interested for the Second Lower Feeder Shutdown for 2019 and for the future where MET will want to shut the AMP down for up to six months at a time to maximize the amount of continuous pipe lining that can be accomplished without having to put the pipeline back into operation sooner than planned.

MET Administrative Code Covering Shutdowns

Attached is section 4503 from MET's Administrative Code that covers shutdowns. The Administrative Code provides that MET will conduct planning to limit shutdowns to 7 days or less and implies that the Member Agencies only need to be able to meet annual average conditions (demands in the time frame of November to April). The Code indicates that advance notice of one year is required for shutdowns lasting more than 7 days but it does not indicate the level of non-MET supplies an entity must have for these longer duration

shutdowns - it is silent on the issue. The particular shutdown we are currently discussing is for the Second Lower Feeder which will start in March 2019 and continue through September 2019 and so will proceed through the summer period. Previously, MET had scheduled the shutdown to occur in February through May, but due to competing conflicts with various other shutdowns, the schedule was pushed through the summer period of 2019. This is why MWDOC staff feels it is appropriate for MET to share in a portion of the local agency costs associated with the shutdown.

Staff Recommendation

Staff believes the quickest resolution of these types of issues is by way of our MET directors in discussions with MET staff at the senior management level. Staff believes it would be helpful to request assistance from our MET directors to help resolve this issue and expedite funding from MET. The total of all the costs listed above is about $1 million. Staff feels that something on the order of 30% would be a reasonable cost-share, at say $300,000.

Attachment
Excerpt from MET Administrative Code on Shutdowns

§ 4503. Suspension of Deliveries.

(a) Whenever repairs or maintenance of the District's system, in the opinion of the General Manager of the District, shall require suspension of delivery of water at any point or points, such delivery may be suspended without liability on the part of the District; provided, that except in cases of emergency, as determined by the General Manager, notice of such suspension of service shall be given to the affected member public agency in advance of such suspension. Metropolitan will make a concerted effort to notify and work with member public agencies regarding all scheduled interruptions. The District will schedule non-emergency interruptions for the low demand months of the year, typically October through April, in coordination with the member public agencies.

(b) Each member agency shall have sufficient resources such as local reservoir storage, groundwater production capacity, system interconnections or alternate supply source to sustain:

(1) A seven-day interruption in Metropolitan deliveries from raw and treated water distribution facilities based on average annual demands of the affected facility.

(2) For service connections installed or modified after December 31, 2008 on raw water conveyance facilities, a seven-to twenty-one-day interruption in Metropolitan raw water deliveries based on average annual demand of the affected facility.

If a member public agency has been provided with a sixty (60) day notice of when an interruption in service is to occur, the member public agency shall be responsible for and reimburse direct costs, excluding labor costs, incurred by Metropolitan in the event that a scheduled non-emergency interruption is postponed or cancelled at the request of the member public agency as a result of insufficient local resources, and the District agrees to such cancellation or postponement. Direct costs shall be determined by Metropolitan's General Manager, in consultation with the affected member agency. These direct costs shall be applied to the member public agency's water invoice following cancellation or postponement of the shutdown.

(c) Except in cases of emergency, the District, working with the member agencies, will produce a shutdown schedule each September for the annual shutdown season from October through April. The District will also develop a three-year shutdown schedule, which will give notice of the proposed shutdowns greater than seven days at least one-year in advance.

Section 322.4 based on Res. 7260 – May 12, 1970, amending Res. 3896 – August 18, 1950; amended by M.I. 33642 – March 10, 1981. Section 322.4 repealed and Section 4503 adopted by M.I. 36464 – January 13, 1987, effective April 1, 1987; amended by M.I. 42278 - February 11, 1997; paragraph amended by M. I. 44812 - March 12, 2002; paragraph amended by M. I. 45943 – October 12, 2004; paragraphs assigned (a), (b), (c), & (d) designations and amended by M. I. 45988 – November 9, 2004; paragraph (b) amended, (b)(1) and (2) added by M. I. 47730 - December 9, 2008; deleted paragraph (d) by M.I. 50323 - December 8, 2015.

DISCUSSION ITEM
November 13, 2018

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

FROM: **Robert Hunter, General Manager**

Staff Contact: Steve Hedges, Water Use Efficiency Programs Supervisor
Joe Berg, Director of Water Use Efficiency

SUBJECT: **Water Use Efficiency Program: A review of our approach, current programs and future activities**

STAFF RECOMMENDATION

Staff recommends the Planning & Operations Committee receive and discuss the Water Use Efficiency Program presentation.

COMMITTEE RECOMMENDATION

Committee recommends (To be determined at Committee Meeting)

SUMMARY

In preparation for the FY 2019-20 budget process, Water Use Efficiency staff will provide a presentation summarizing MWDOCs approach to evolve new programs, what programs currently exist, and what programs will be implemented in the future.

This presentation focuses only on water use efficiency. Staff will present the Water Loss Control Shared Services Business Plan to the Board in December.

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

MWDOC's Current and Future Water Use Efficiency Efforts

Joe Berg, Director of WUE
Steve Hedges, WUE Supervisor
Municipal Water District of Orange County

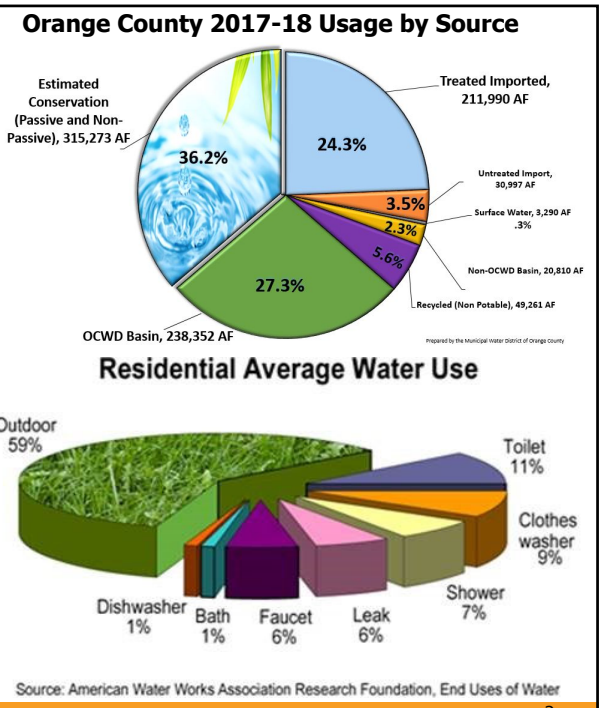
November 13, 2018

Discussion Topics

1. Why Water Use Efficiency?
2. Current Water Use Efficiency Efforts
3. Water Use Efficiency -2 Years Out-
4. Water Use Efficiency - 5 to 10 Years Out-

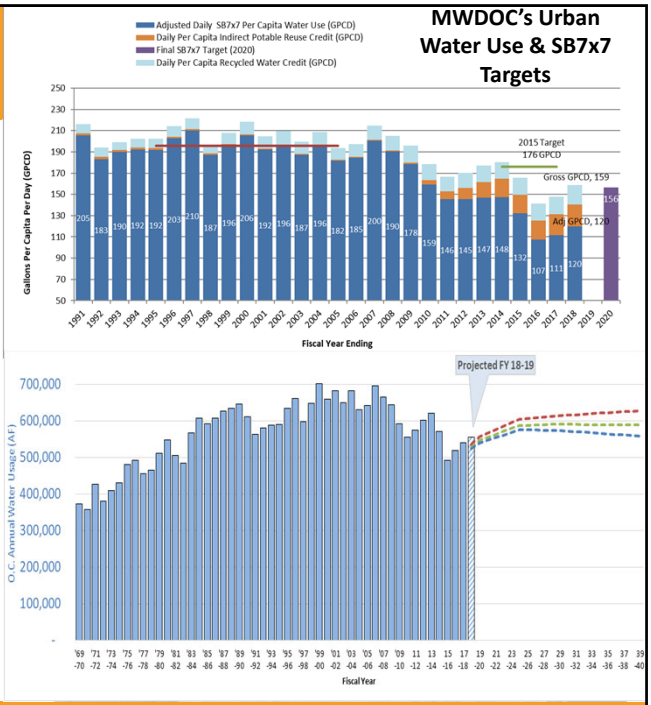
Why Water Use Efficiency?

1. **MWDOC's Mission**
   - Our mission is to provide.....**and to promote water use efficiency for all of Orange County.**
2. **Still the Least Expensive Water Alternative**
3. **Support Retail Water Agencies in their Efforts to Comply with State Mandates**
   - County-wide Implementation of Programs
   - Metropolitan Resources
   - Grant Funding
4. **MWDOC Visibility in the Community**
   - Promotes all of MWDOC's Efforts
5. **Conservation Ethic**
   - Promotes the Sustainability of Southern Calif.



Why Water Use Efficiency? (cont)

6. **Long Term requirement to Supply Reliability**
   - MET's IRP
   - WUE Master Plan
   - Urban Water Management Plan
     - Long Term Planning
     - Emergency Response
7. **State Mandate Compliance**
   - SB7x7-Water Conservation Act of 2009
   - AB 1668 and SB 606
8. **Reliability Study**
   - Long-term Supply and Demand Forecasting
   - Demand Projection Scenarios



Water Use Efficiency Today

1 Water Use Efficiency Staff
- Five FTE's
- Three Interns
- Current Staffing Plan calls for no increase
  - Excluding Water Loss Control

2 Water Use Efficiency Expenditures

Latest Five Year Totals	
WUE Budget, Staffing and Programs (Core + Choice)	$5,400,000*
Rebates Paid to Orange County Rate Payers	$54,700,000
Grant Acquisition Funds for Programs	$4,303,000

*Choice = $1,180,000; Core = $4,220,000

Joe Berg
Direct of WUE

Steve Hedges
WUE
Supervisor

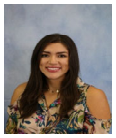
Beth Fahl
Senior WUE
Analyst

Rachel Waite
WUE Analyst I

Rachel Davis
WUE Analyst II

WUE Interns

Jonathan
Meier



Alexis
Correa

Sam
Felter

Water Use Efficiency Today (cont)

3 MWDOC's New Program Evolution
- Initial Assessment of New Water Savings Opportunity
  - Proof of Concept
  - Quantify Water Savings
- Pilot Implementation –Small Scale
  - Refine Implementation
  - Re-evaluate Water Savings
  - Results to MET's PAC for further development
  - Program Funded by MET and/or Grants
- County-Wide Implementation
  - Quantitative and Qualitative Evaluation for Refined Water Savings and Program Implementation
  - MET's PAC Accepts Quantitative Water Savings
  - Program Funded by MET and/or Grants
- Program Shifted to MET and Offered Region-Wide
  - Implementation Through MET's Vendor

Typical Program Evolution

1. Initial Assessment of New Program
2. Pilot Implementation with Host Agency
3. Orange County-Wide Implementation
4. MET's Vendor Offering

Examples Include Smart Timers, Turf Removal and Spray to Drip Programs

Water Use Efficiency Today
(cont)

4 Implementation Programs for Residential, CII & Public Agency

Rebate Opportunities			
	Residential (SF + MF)	Commercial, Industrial, Institutional CII	Public Agency
Indoor	• High Efficiency Toilets, • Clothes Washers	• Water Savings/Incentive Program, • High Efficiency Toilets • Clothes Washers, • Cooling Towers, • Waterless Urinals, • Ice machines	• Water Loss Control and Leak Detection
Outdoor	• Smart Timers, • Turf Removal, • Spray to Drip, • Landscape Design	• Smart Timers, • Turf Removal, • Spray to Drip, • Landscape Design, • Large Rotary Nozzles	• Smart Timer, • Turf Removal, • Spray to Drip, • Landscape Design, • Recycled Water
	Education and Public Outreach		
	Qualified Water Efficient Landscapes (QWEL), H2O for HOA's, Community Events, California Friendly Landscape Training (CFLT), Turf Removal Training		

Water Use Efficiency Today
(cont)

5 Service to Our Member Agencies
- Member Agency Staff Support
- Program Implementation and Funding Acquisition
- Regional Representation

6 Metropolitan Leadership
- Project Advisory Committees (PAC)
- MWDOC Rep at Water Use Efficiency Meetings
- Steer the Future of Water Use Efficiency in S. Calif.

7 Drought Preparedness
- Water Shortage Contingency Plans
- Outreach

8 Memberships in Organization
- California Water Efficiency Partnership, CalWEP
- Alliance of Water Efficiency, AWE
- American Water Works Association, AWWA
- Association of California Water Agencies, ACWA
- Calif. Landscape Contractors Association, CLCA

MWDOC

CALIFORNIA WATER EFFICIENCY PARTNERSHIP

EPA WaterSense for

CLCA

American Water Works Association

ACWA Association of California Water Agencies

Bringing Water Together

Water Use Efficiency Two-Years Out

1. Implement Programs Involving all Sectors will Continue to be a Core Task
   - Making Water Conservation a California Way of Life
   - Demand Hardening of Water Savings
2. What Will Implementation Programs Look Like?
   - Standardized Rebates
   - Water Use Efficiency Education Programs (Outdoor/Landscape)
   - Public Outreach/Social Media
   - Enhanced Target Marketing
   - Automated Meters
   - Pressure Regulated Valves
   - Landscape Design
   - Water Loss Control
   - New Technology Research

Water Use Efficiency Two-Years Out (cont)

3. Policy Development
   - State and Federal Mandates
   - Manufacturing Standards
   - Building Codes
   - Metropolitan Program Refinements
4. Program Evaluation and Research
   - Implement Pilot Programs to Establish Viability and Water Savings of New Technologies
   - Program Evaluations to Improve Program Offerings and Determine Water Savings
5. Working with Metropolitan
   - Project Advisory Committee Representation (PAC)
   - Member Agency Administered Funding
   - MET's IRP Planning

Visioning WUE 5 to 10 Years Out

1. Standardized Rebates
2. Water Use Efficiency Education to All Sectors
   - Public Outreach/Social Media
   - Implementation Programs
3. New Technologies will Provide Data at an Increasingly Fine Granularity
   - Improve Programs, Consumption Modeling, Leak Detection/Prevention
   - Expanded Research Efforts
   - Targeted Outreach for Better Program Design
4. Policy Development
5. Research and Evaluation
6. Integrating Water Efficiency and Watershed Health
   - Holistic Approach to Water Efficiency
7. Preparing Today for a Future of the Unknowns

Discussion

MWDOC MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

Item No. 6

DISCUSSION ITEM
November 13, 2018

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

FROM: **Robert Hunter, General Manager**

Staff Contact: Kelly Hubbard, WEROC Manager

SUBJECT: **Water Emergency Response Organization of Orange County (WEROC) Services, Goals and Strategic Planning Presentation**

STAFF RECOMMENDATION

Staff recommends the Planning & Operations Committee received and discuss the WEROC program presentation.

COMMITTEE RECOMMENDATION

Committee recommends (To be determined at Committee Meeting)

SUMMARY

In preparation for the FY 2019-2020 budget process, WEROC staff will provide a presentation summarizing how WEROC's services have evolved, current services, and then goals and a strategy looking forward to best support our Member Agencies and MWDOC.

Budgeted (Y/N): NA	Budgeted amount: NA	Core _X_	Choice __
Action item amount: $0	Line item:		
Fiscal Impact (explain if unbudgeted):			

WEROC Services, Goals and Strategic Planning

Kelly Hubbard

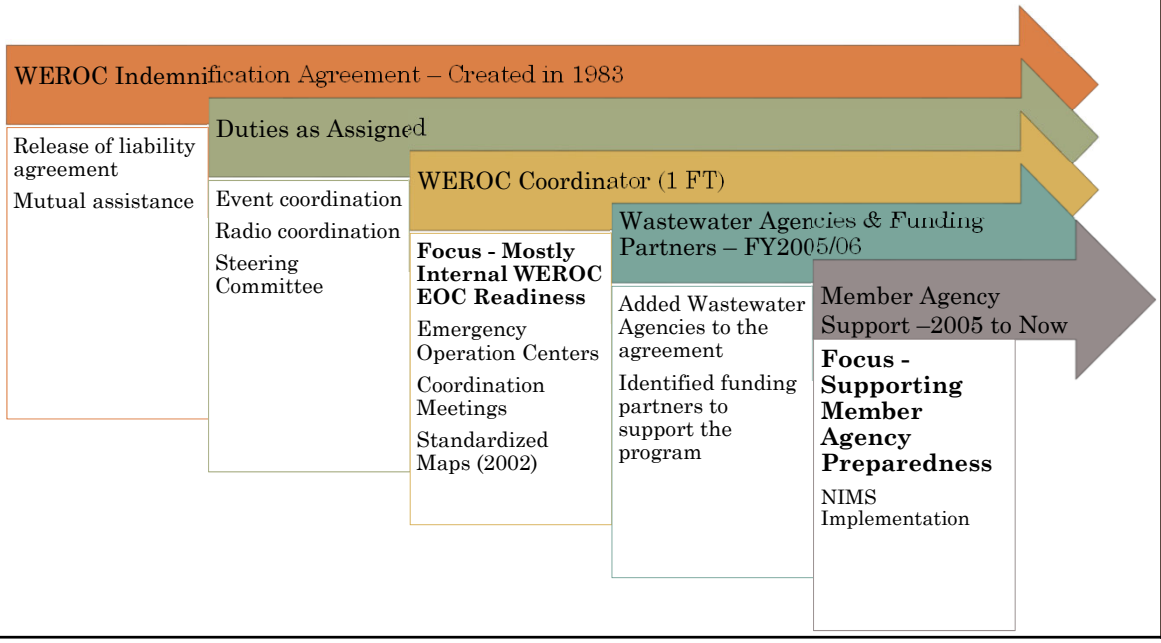
WEROC Manager

Planning and Operations Committee – November 13, 2018

Agenda

- WEROC Beginnings & Progression
- WEROC Today
- Benefit of WEROC Services
- Current Project Emphasis
- Goals and Strategy Looking Forward
- Member Agency Support Opportunities

WEROC Beginnings and Progression



WEROC Today

- Support Orange County Water and Wastewater Utilities state of readiness for emergency response.
- Through coordination and support during and immediately following an emergency, assist the water utilities in restoration of systems.
- Represent the utility interests as a liaison to outside coordinating partners during all phases of emergency management.

WEROC Signatories – 35 Total

- Cities:
  1. Anaheim
  2. Brea
  3. Buena Park
  4. Fountain Valley
  5. Fullerton
  6. Garden grove
  7. Huntington Beach
  8. Laguna Beach
  9. La Habra
  10. La Palma
  11. Newport Beach
  12. Orange
  13. San Clemente
  14. San Juan Capistrano
  15. Santa Ana
  16. Seal Beach
  17. Westminster
- Special Districts:
  1. Costa Mesa Sanitary District
  2. East Orange County Water District
  3. El Toro Water District
  4. Irvine Ranch Water District
  5. Laguna Beach County Water District
  6. Mesa Water District
  7. Midway City Sanitary District
  8. Moulton Niguel Water District
  9. Municipal Water District of OC
  10. Orange County Sanitation District
  11. Orange County Water District
  12. Santa Margarita Water District
  13. Serrano Water District
  14. South Coast Water District
  15. South OC Wastewater Authority
  16. Trabuco Canyon Water District
  17. Yorba Linda Water District
- Private:
  1. Golden State Water Company
- Potential Future Signatories:
  - Cities of
    1. Cypress
    2. Stanton
    3. Tustin
    4. Villa Park
  - Special Districts
    1. Emerald Bay Community Services District
    2. Rossmoor-Los Alamitos Area Sewer District
    3. Sunset Beach Sanitary District

WEROC Budget & Funding Partners

- FY 2018-2019 Budget
  - Staffing and Programs - $383,000
  - Capital Improvements - $106,000
  - Total - $489,000
- Grant Funding Received (2005-2016): $918,000
- Funding Agencies
  - City of Anaheim
  - City of Fullerton
  - City of Santa Ana
  - Municipal Water District of Orange County
  - Orange County Sanitation District
  - Orange County Water District
  - South Orange County Wastewater Authority

WEROC Staffing & Responsibilities

- **Overall**
  - MWDOC Staff Training and Response Commitment
  - Day-to-Day Member Agency Support
  - Real Disaster Response Coordination
- **WEROC Manager (FT) – Kelly Hubbard**
  - Staff and Member Agency Training
  - EOC Exercises – WEROC, Member Agency & OA
  - **Advocacy**
  - **Regional & National Planning and Coordination**
  - Grants
- **WEROC Program Coordinator (FT) – Francisco Soto**
  - Emergency Plans
  - Radio Systems
  - EOC Maps
  - EOC Support Tools
- **WEROC Administrative Assistant (PT; proposed FT) – Janine Schunk**
  - Contact Management
  - AlertOC
  - SafetyCenter
  - EOC Physical Maintenance

Benefit of WEROC Services

- Preparedness
  - Training, Planning and Exercises
  - Day to Day Member Agency Support
  - WEROC EOC Preparedness
  - MWDOC Staff Commitment to Training
- **WEROC Emergency Response Coordination**
  - MORE and MORE of this!
  - MWDOC Staff Commitment to Respond!
  - Information Collection → Intelligence Sharing
  - Inter-Agency Cooperation
  - Resource Needs
- Recovery Support
  - FEMA Public Assistance Process
  - Post Event Secondary Impacts Planning

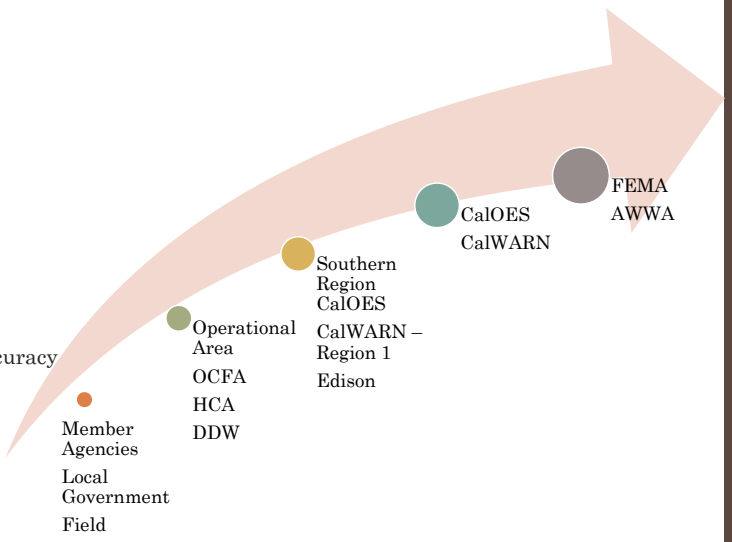
Current Project Emphasis

- WEROC EOC Facility Improvements (South EOC and MWDOC)
  - 800 MHz Radio - completed
  - Seismic Safety
  - Improving Functionality
- Updating Emergency Plans
  - WEROC Emergency Operations Plan
  - OC Water and Wastewater Multi-Agency Hazard Mitigation Plan
- Regional Planning
  - Edison Public Safety Power Shutoff (PSPS) Program
  - New Dam Inundation Mapping and Emergency Action Plan Requirements
  - Member Agency Emergency Planning Requirements Matrix
- Training & Exercises
  - Four Exercises between October and January!
- Lessons Learned/Corrective Actions – Implementation
  - Emergency Water Quality Sample Kit (EWQSK)

Goals and Strategy Looking Forward

Resilient and Sustainable Programming

- **Regional Advocacy**
  - Implications and problem assessment
  - Emergency Plan Writing and Review Processes
  - Coordination and Meetings
  - Trainings and Exercises
- WEROC Program
  - 5 year Training and Exercise Program
  - Emergency Plan Update Cycle
- Contact Management
  - Creating processes for efficiency and accuracy
- MWDOC Business Continuity Plan
- Incorporating Disaster Lessons into Programs



Member Agency Support Opportunities

- Emergency Plan Development
  - Templates, development, and review
  - Standard plans
  - Specialty plans – Dam Emergency Action Plans
- Emergency Disaster Finance tools
  - Forms
  - Standard Contract Language
- Disaster Training and Exercises Design and Facilitation
  - Targeted to individual agencies
  - Support with development
- Cyber and Information Security support
  - Operations, SCADA, Billing, Customer Support, IT)
- Grant Writing Support
  - UASI
  - Hazard Mitigation

Questions

Kelly Hubbard

WEROC Emergency Manager

(714) 593-5010

Khubbard@mwdoc.com

ENGINEERING & PLANNING	
Orange County Reliability Study	A more detailed report is included in the P&O Committee that includes a summary of all comments received so far on the 2018 Reliability Study. Staff has also summarized a number of key follow-up activities for additional work. Staff anticipates providing the Final Plan for a receive and file action by the Board at the December 19 meeting.
South Orange County Emergency Service Program	Dudek has continued to assist MWDOC and IRWD to determine if the existing IRWD South Orange County Interconnection capacity to provide emergency water to South Orange County can be expanded in capacity or extended beyond its current time horizon of 2030. Modeling and evaluation of a number of options or the IRWD system is required for the study effort. Phase 1 of the study examined the ability of the **existing IRWD system** to convey water to SOC during emergency situations. The preliminary results of the Phase 1 evaluation indicates the following: • Approximately 21 cfs (ranges from 16 cfs to 35 cfs) is available to send to SOC in 2018, however, most of that capacity goes away by 2022 as demands build in the IRWD system. • With 10% conservation by IRWD, it appears as if additional capacity is available, but it drops to about 9 cfs by 2023 and will continue dropping until IRWD increases groundwater production. Phase 2 is examining the **future ability of the IRWD system** (beyond 2025) to convey water to SOC during emergency situations. Phase 2 also considers additional groundwater production for the IRWD service area of 12,500 AF per year to be developed by 2025. While exploring options for the future groundwater production, the study will also evaluate other options for conveying water to SOC as additional water production is brought on-line by IRWD. The Phase 2 work is nearing completion and a meeting with the South County agencies is expected in December. The final report will be completed in January or February. The total needs of the SOC agencies are estimated to range between 31 and 43 cfs (equivalent to 20 to 27.5 mgd).
OC Water System Operations & Integration of New Supplies	See Water System Operations and Integration of New Supplies – Status Report information item in this packet.

Strand Ranch Project	MWDOC is using the modeling from the Orange County Reliability Study to evaluate how "extraordinary supplies" from the Strand Ranch Project can be utilized by the MWDOC agencies to provide drought protection over the next 7 to 11 years or longer. CDM Smith is working on understanding the key terms of the water banking arrangement.
Upcoming Issues with MET	
MET Evaluation of Regional Storage Portfolio (ERSP)	MET Evaluation of Regional Storage Portfolio (ERSP). Metropolitan's emergency water storage objective is based on the potential for major earthquake damage to the State Water Project and Colorado River aqueducts that transport imported water supplies to Southern California (following the San Andreas M7.8 'Great ShakeOut' scenario developed by the US Geological Survey). MET has established a Member Agency Workgroup to consider updates to MET's emergency storage objective, including: 1. Updating emergency criteria, 2. Revising the framework for determining emergency storage volume. The new framework would shift from a traditional single equation for determining emergency storage volume, to an updated evaluation that considers various combinations of criteria to determine a storage amount that provides an envelope of alternatives for MET's emergency storage that could provide reliability during the outage period. 3. Proposed periodic re-evaluation of emergency storage volume to coincide with completion of each new IRP (every 5 years). MET released a White Paper on October 29, 2018 to member agencies for their review and feedback. The paper discusses a methodology for review and update of emergency criteria and re-evaluation of Metropolitan's emergency storage. Included in the proposed outage period criteria is: A. Recognition that an outage on the SWP could exceed previous estimates of six months (now one to two years), and B. Incorporation of increased operational flexibility of the MET system which was demonstrated during the last drought. Some areas in the MET's service area that normally receive SWP water from the East Branch could be served by delivering DVL water to Mills through the Inland Feeder/Lakeview Pipeline intertie.

	These changes modify the Emergency Outage Criteria from a minimum/ maximum outage criteria to an 'effective outage' duration which better represents conditions. Comments on the White Paper and are due by November 13th. A third Workgroup meeting was held November 1, 2018 which continued the discussion on updating emergency storage criteria and re-evaluation of Metropolitan's Emergency Storage Requirements. MET staff is planning to present an update to the MET WP&S Committee before the end of the year.
Poseidon Resources	Poseidon continues working with the Santa Ana Regional Water Quality Control Board (SARWQCB) to renew and update its existing National Pollution Discharge Elimination System permit and comply with new regulations (referred to as the Ocean Plan amendments) which were approved by the State Water Resources Control Board in May 2015. On October 1, 2018 SARWQCB notified Poseidon that their application for the revised ocean discharge diffuser design, which was required by the Ocean Plan Amendment, was complete. The Permit Streamlining Act (PSA) requires a responsible agency to approve or disapprove of an application within 180 days. Poseidon maintains that their application is subject to the PSA, while SARWQCB contends that this application is not subject to the PSA. Poseidon expects the SARWQCB to act on its permit in the next 4-6 months. Assuming approval, Poseidon would then seek a permit from the California Coastal Commission in 2019.
SMWD Rubber Dams Project	SMWD is continue to work on additional technical studies to complete the response to comments on the Draft Environmental Impact Report (DEIR).
Doheny Ocean Desalination Project	South Coast WD released the Doheny Ocean Desalination Project Draft Environmental Impact Report (EIR) on May 17, 2018. A Public Meeting for the EIR was held on June 26, 2018, and the EIR public comment period closed on August 6, 2018. Consultant GHD is currently working on an updated Coastal Hazard Technical Study to address comments received. A Request for Qualifications (RFQ) for a 3rd party legal firm to assist with Design-Build-Operate (DBO) contract development was released and interviews with 5 respondents were held August 22, 2018. The South Coast WD Board is currently in negotiations and anticipates awarding the contract in the near future. South Coast WD staff also submitted a grant application for up to $20 million for project construction through Bureau of Reclamation 'Water SMART: Desalination Construction Projects under the WIIN Act'. The

	Bureau of Reclamation expects to contact potential award recipients and unsuccessful applications toward the end of 2018.
Doheny Ocean Desalination Pilot Study	MWDOC staff is closing out the final equipment issues with the Doheny Desalination Pilot Study; the Indar submersible pump and the Mobile Test Facility (MTF). The MTF was to be leased to Michael Baker International for a 1 year pilot study at Camp Pendleton through San Diego County Water Authority. The MTF is no longer needed as SDCWA cancelled the project due to permitting difficulties. Consultant Geoscience made multiple attempts over the past 10 months to sell the pump to; agencies that had previously expressed interest, pump contractors, and for salvage value. None of the parties were ultimately interested in the pump, and the pump salvage value is less than the shipping cost to relocate the pump back from the testing facility. Currently the pump is being shipped back to SCWD. Staff also contacted the MTF manufacturer, Intuitech, who in 2016 indicated an interest in buying the MTF. On October 30, 2018 Intuitech indicated they are no longer interested in purchasing the MTF. The MTF has been stored at South Coast WD for the past two years. Staff will be contacting the Project Participants this month to discuss salvage of the remaining equipment and close out of the Project.
Meetings	
	Harvey De La Torre and Charles Busslinger attended the MET Evaluation of Regional Storage Workshop on November 1, 2018.
	Karl Seckel and Charles Busslinger met with MWDOC member agencies from South OC on October 23, 2018 to discuss the potential for Direct Potable Reuse in South Orange County as a result of comments from the 2018 OC Reliability Study.
	Director Sat Tamaribuchi, Rob Hunter, Karl Seckel and Charles Busslinger met with Dr. Sorooshian, Dr. Gao, and Dr. Hsu from the UCI Center for Hydrometeorology and Remote Sensing (CHRS) on October 23, 2018. Dr. Sorooshian provided an overview of CHRS research currently being conducted using satellites to measure worldwide precipitation. This research has the potential to provide improved precipitation estimates for large portions of the world that can better inform climate modeling.

	Karl Seckel and Charles Busslinger met with MET Facility Planning staff on October 18, 2018 to discuss MET's experiences with, and the capabilities of, MET's hydraulic model. MWDOC staff believe that MET may be amenable to sharing the details of the model to assist MWDOC with the development of a hydraulic model of the Orange County distribution system. We would have to add pipelines downstream of the MET system to complete the model.
	Karl Seckel and Charles Busslinger met with Manoj Patel from Sustainable Technology. We will be putting him in contact with MET Water Quality staff as Sustainable Technology has some products that may be able to help with algae control in reservoirs and quagga control.
	Karl Seckel and Kelly Hubbard participated in a Workshop at Chapman University entitled Future Earthquakes in Southern California and Preparedness Workshop conducted by Dr. Ramesh Singh, Convenor, Professor, School of Life and Environmental Sciences, Schmid College of Science and Technology at Chapman University. The participants included faculty, students and experts in various field of scientific and seismic research and preparedness response. The seismic experts commented that they do not have the ability to predict earthquakes and suggested that we refrain from describing earthquakes as being "over-due" as it implies we know when they are due. They said it was ok to describe the last 100 years on the San Andreas fault as "quiet". There is still much we do not know about earthquakes, although our understanding has improved considerably.
	Karl Seckel met with GM Dan Ferons and SMWD directors Betty Olson and Chuck Gibson. The purpose of the meeting was to discuss the implications of the 2018 OC Water Reliability Study. The discussion was quite wide-ranging. SMWD suggested a quarterly follow-up to track some of the key issues coming out of the study.
	Presentations regarding the OC Water Reliability Study over the past month or so included: • WACO • OCBC Infrastructure Committee

	• SMWD Board • MWDOC/OCWD Planning Committee • MWDOC Member Agency Manager's • South Coast Water District Board • SOC IRWMP Executive Committee A more complete report is included in the P&O Committee.
	MWDOC has held several meetings with Mesa Water regarding the shutdown of the Orange County Feeder that will proceed through the summer of 2019. The issues adverse to Mesa's needs were resolved.
	MWDOC has held several meetings with Golden State Water Company, the City of La Palma and the City of Buena Park, regarding the shutdown of the Second Lower Feeder for installation of a steel liner. The shutdown will eliminate access to MET service connections for Golden State and La Palma and will proceed through the summer of 2019. MWDOC has been advocating at MET for assistance for these agencies to accommodate a summer shutdown of MET. A more complete report is included in the P&O Committee.
	Karl Seckel and MWDOC Director Megan Schneider to discuss the OC Water Reliability Study and South Coast's progress on the Doheny Project.

Status of Ongoing WEROC Projects
October 2018

Description	Comments
Coordination with WEROC Member Agencies	Ongoing: WEROC, with Michal Baker as the lead consultant, is facilitating 19 agencies through the process of updating the Orange County Water and Wastewater Multi-Jurisdictional Hazard Mitigation Plan. Update: The plan has been submitted to CalOES & FEMA for approval. The plan will then be returned to each agency for Board approval before being resubmitted to FEMA for final approval. WEROC Radio Replacement Update: Francisco Soto continues to work with member agencies, Motorola, and the Sheriff's Communications staff to implement the OC 800 MHz radio system for WEROC. Update: Currently working with the City of Laguna Beach and the City of Seal Beach to program the WEROC channel into their existing radios. Radio tests will be conducted on the second Wednesday of each month. 34 of the 37 agencies with the WEROC radio participated this month. Kelly Hubbard is working with TCWD and the County on writing the Holy Incident-Post Fire Debris Flow Response Plan. TCWD has a facility within the possible debris flow area and is identifying how to best protect the facility, as well as what the impacts of its lost would be. Francisco Soto presented to the MWDOC Public Affairs Workgroup regarding the completed Water Quality Translations for Member Agencies to use in a disaster. These are the standard water quality notices translated to the 9 most used languages in OC and are required under various circumstances. He provided the public affairs staff background on how to utilize the translations and where to find the full documents.
Training and Programs	Kelly attended FEMA AWR-356 Community Planning for Disaster Recovery to assist in the process of starting on long-term water utility recovery planning. Kelly hosted AlertOC training for Member Agencies and MWDOC staff. AlertOC is the county's reverse notification system for emergencies.

	Francisco provided WEROC EOC Staff with training on the Incident Action Plan process and Situation Summaries by utilizing the documents that were created in the last WEROC exercise. WEROC coordinated two Department of Water Resources (DWR) Flood Fight and Sand Bagging training classes at El Toro Water District. The training focused on flood fighting techniques and hands-on sand bagging tutorials and hillside stabilization. Kelly developed and hosted the first WEROC Cyber and Information Security Forum for Water and Wastewater Utilities. This program addressed how policy and technical concepts intersect for true cyber and information security. The audience included IT staff, Emergency Managers, and Management staff. Special thanks to Nolan King of Moulton Niguel Water District who assisted Kelly with the program. Francisco attended the California Water and Wastewater Agency Response Network (CalWARN) Fall Meeting in Rancho Mirage. Discussion topics included "How the Water Desk can help agencies and Operational Areas with Emergency Professionals", and the "Edison Public Safety Power Shutoff (PSPS)." Francisco provided New Employee MWDOC Continuity of Operations Training to Rachel Davis and the three new WUE interns.
Coordination with the County of Orange	Francisco attended the October Orange County Emergency Management Organization (OCEMO) General Meeting and OCEMO Exercise Design meeting. Delcie Hynes and Diana LaRusso from the Social Services Agency provided a presentation on "Providing Support to Local Jurisdictions: O.C. Kids Connect; Another Option for Unaccompanied Minors." The Exercise Design meeting continues to plan for the January 2019 county-wide exercise. County and FEMA Recovery Exercise Update: WEROC staff is working with the County and FEMA on a Recovery Exercise on October 18, 2018 that involves responding to a 7.8 earthquake on the San Andreas Fault. The exercise scenario will begin 3 weeks after the earthquake and focus on recovery operations. The exercise is unique in that it is testing long term recovery concepts by focusing in on housing and infrastructure repair. Harvey De La Torre, Melissa Haley, Charles Busslinger, Kelly and Francisco attended the County and FEMA Recovery Exercise on October 18, 2018. All

	of the noted staff also attended a training prior to the exercise to prepare for the unique discussion concepts a recovery exercise involves. Ongoing: The Operational Area has started its review and update of the County of Orange and Orange County Operational Area Flood, Dam and Reservoir Annex. This update will combine what was two separate plans, as well as address planning requirement updates in Dam Emergency Action Planning that were implemented this year. Kelly attended the October OA Dam planning meeting to participate in reviewing the last section of the plan. CalOES called into the meeting to provide additional guidance to the dam agencies on what their expectations are for coordination with emergency response agencies. There is one more county meeting in November. However, Kelly will continue to work with member agencies to meet the coordination requirement and to provide review of their plans.
EOC Readiness	Janine Schunk successfully participated in the OA and MET Radio Test and WebEOC tests for the month. Janine and Leah Frazier developed and hosted the International Great Shakeout activities for MWDOC staff on October 18. They facilitated a Drop, Cover and Hold On drill, had staff practice proper evacuation procedures for the building and then provided an entertaining presentation on the many uses of heavy duty trash bags following a disaster. Hint: They are good for more than just trash.
Event Coordination – Edison PSPS Events	Southern California Edison (SCE) Public Safety Power Shutoff (PSPS) Plan – Background: SCE will utilize this program to proactively shut off power in high fire risk areas when extreme weather conditions present a clear and imminent threat to Edison power lines. UPDATE: Kelly and Francisco are working with CDR to finalize WEROC Maps that include the Edison PSPS Plan maps. Agencies will use this information to work with Edison on possible impacts, concerns and to update their own Power Outage Plans. On October 13, 2018 Kelly was notified by the County Operational Area that Edison may implement their PSPS program due to predicted Red Flag Warning conditions. Kelly worked with the County staff for several days to continue to receive updates and to share those with the potentially impacted agencies. At the same time, the high winds caused approximately 12,000 outages in OC due to wind damages. Between October 13-15, Edison reports

	that all outages were due to wind damages and that no outages were proactive shut-downs.

Status of Water Use Efficiency Projects

November 2018

Description	Lead Agency	Status % Complete	Scheduled Completion or Renewal Date	Comments
Smart Timer Rebate Program	MWDSC	Ongoing	Ongoing	In September, 255 residential and 4 commercial smart timers were installed in Orange County. For program water savings and implementation information, see MWDOC Water Use Efficiency Program Savings and Implementation Report.
Rotating Nozzles Rebate Program	MWDSC	Ongoing	Ongoing	In September 2018, 173 rotating nozzles were installed in Orange County. For program savings and implementation information, please see MWDOC Water Use Efficiency Program Savings and Implementation Report.
SoCal Water$mart Residential Indoor Rebate Program	MWDSC	Ongoing	Ongoing	In September 2018, 322 high efficiency clothes washers and 42 premium high efficiency toilets were installed through this program. For program savings and implementation information, please see MWDOC Water Use Efficiency Program Savings and Implementation Report.
SoCal Water$mart Commercial Rebate Program	MWDSC	Ongoing	Ongoing	In September 2018, no commercial devices were installed through this program. For program savings and implementation information, please see MWDOC Water Use Efficiency Program Savings and Implementation Report.
Industrial Process/ Water Savings Incentive Program (WSIP)	MWDSC	75%	July 2020	This program is designed for non-residential customers to improve their water efficiency through upgraded equipment or services that do not qualify for standard rebates. Incentives are based on the amount of water customers save and allows for customers to implement custom water-saving projects. This fiscal

Description	Lead Agency	Status % Complete	Scheduled Completion or Renewal Date	Comments
				year, two projects have been completed, saving over 28 AFY. Total water savings to date for the entire program is 673 AFY and 3,215 AF cumulatively.
Turf Removal Program	MWDOC	Ongoing	Ongoing	In October 2018, 29 rebates were paid, representing $98,275.82 in rebates paid this month in Orange County. To date, the Turf Removal Program has removed approximately 21.8 million square feet of turf. For program savings and implementation information, please see MWDOC Water Use Efficiency Program Savings and Implementation Report.
Spray to Drip Conversion Program	MWDOC	Ongoing	Ongoing	This is a rebate program designed to encourage residential and commercial sites to convert their existing conventional spray heads to low-volume, low-precipitation drip technology. To date, 236 residential sites and 63 commercial sites have completed spray to drip conversion projects.
Recycled Water Retrofit Program	MWDSC	100%	September 2018	This program provides incentives for commercial sites to convert dedicated irrigation meters to recycled water. To date, Metropolitan has provided a total of $465,881.93 in funding to 29 sites irrigating 90 acres of landscape, and MWDOC has paid a total of $56,950.00 in grant funding to 20 of those sites. The total potable water savings achieved by these projects is 220 AFY.

Orange County

Water Use Efficiency Programs Savings
and
Implementation Report

Retrofits and Acre-Feet Water Savings for Program Activity

Program	Program Start Date	Retrofits Installed in	Month Indicated		Current Fiscal Year		Overall Program		
			Interventions	Water Savings	Interventions	Water Savings	Interventions	Annual Water Savings[4]	Cumulative Water Savings[4]
High Efficiency Clothes Washer Program	2001	September-18	322	0.93	672	3.24	117,217	4,044	30,390
Smart Timer Program - Irrigation Timers	2004	September-18	259	1.39	875	26.54	23,588	8,188	54,890
Rotating Nozzles Rebate Program	2007	September-18	173	0.69	1,845	14.06	566,152	2,749	19,638
Commercial Plumbing Fixture Rebate Program	2002	September-18	0	0.00	2,114	8.88	95,887	4,964	49,327
Industrial Process/Water Savings Incentive Program (WSIP)	2006	September-18	2	1.66	2	1.66	33	673	3,215
Turf Removal Program[3]	2010	October-18	79,398	0.93	252,130	5.95	21,847,208	3,059	13,340
High Efficiency Toilet (HET) Program	2005	September-18	42	0.15	74	3.15	60,177	2,224	19,276
Water Smart Landscape Program [1]	1997						12,677	10,621	72,668
Home Water Certification Program	2013						312	7.339	15.266
Synthetic Turf Rebate Program	2007						685,438	96	469
Ultra-Low-Flush-Toilet Programs [2]	1992						363,926	13,452	162,561
Home Water Surveys [2]	1995						11,867	160	1,708
Showerhead Replacements [2]	1991						270,604	1,667	19,083
Total Water Savings All Programs				**6**	**257,712**	**63**	**24,055,086**	**51,904**	**446,580**

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

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

(3) Turf Removal Interventions are listed as square feet.

[4] Cumulative & annual water savings represents both active program savings and passive savings that continues to be realized due to plumbing code changes over time.

HIGH EFFICIENCY CLOTHES WASHERS INSTALLED BY AGENCY

through MWDOC and Local Agency Conservation Programs

Agency	FY 12/13	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	FY18/19	Total	Current FY Water Savings Ac/Ft (Cumulative)	Cumulative Water Savings across all Fiscal Years	15 yr. Lifecycle Savings Ac/Ft
Brea	93	115	114	76	57	56	15	1,938	0.06	503.15	1,003
Buena Park	105	106	91	76	54	50	7	1,575	0.03	397.02	815
East Orange CWD RZ	10	8	8	8	3	1	1	194	0.00	53.75	100
El Toro WD	134	121	111	65	47	50	11	1,582	0.05	398.83	819
Fountain Valley	115	102	110	76	65	49	9	2,458	0.04	664.64	1,272
Garden Grove	190	162	165	251	127	87	22	3,672	0.08	947.91	1,900
Golden State WC	265	283	359	260	138	156	34	5,205	0.16	1,343.77	2,693
Huntington Beach	334	295	319	225	180	141	27	8,414	0.13	2,311.37	4,354
Irvine Ranch WD	1,763	1,664	1,882	1,521	1,373	1,203	233	26,102	1.12	6,411.44	13,506
La Habra	82	114	87	66	53	48	14	1,389	0.06	347.81	719
La Palma	34	25	34	29	10	14	2	474	0.01	120.35	245
Laguna Beach CWD	38	37	39	32	19	20	7	959	0.03	253.68	496
Mesa Water	114	86	89	113	80	54	13	2,585	0.07	708.08	1,338
Moulton Niguel WD	442	421	790	688	575	527	107	10,555	0.57	2,554.04	5,461
Newport Beach	116	92	95	66	61	51	13	2,688	0.07	749.91	1,391
Orange	218	163	160	124	80	74	20	3,992	0.09	1,101.35	2,066
Orange Park Acres					-	-	-	12	0.00	4.09	6
San Juan Capistrano	76	73	92	63	33	33	5	1,497	0.02	392.16	775
San Clemente	140	94	141	75	70	85	16	2,721	0.07	710.19	1,408
Santa Margarita WD	553	662	792	466	367	274	69	9,859	0.38	2,475.89	5,101
Seal Beach	31	29	38	23	9	17	1	620	0.00	162.96	321
Serrano WD	13	10	26	8	11	8	-	365	0.00	100.05	189
South Coast WD	89	79	68	43	44	36	7	1,627	0.03	423.70	842
Trabuco Canyon WD	30	45	47	34	28	22	1	821	0.01	211.93	425
Tustin	78	59	80	66	44	49	9	1,670	0.04	447.97	864
Westminster	121	82	109	149	84	65	14	2,665	0.04	696.25	1,379
Yorba Linda	181	167	156	123	56	67	15	3,834	0.08	1,056.06	1,984
MWDOC Totals	5,365	5,094	6,002	4,726	3,668	3,237	672	99,473	3.24	25,548.35	19,218
Anaheim	331	285	295	266	213	173	-	10,855	0.00	3,037.43	5,617
Fullerton	200	186	211	165	107	99	-	3,794	0.00	998.43	1,963
Santa Ana	163	131	132	259	141	124	-	3,095	0.00	806.18	1,601
Non-MWDOC Totals	694	602	638	690	461	396	-	17,744	0.00	4,842.04	3,428
Orange County Totals	6,059	5,696	6,640	5,416	4,129	3,633	672	117,217	3.24	30,390.40	22,646

SMART TIMERS INSTALLED BY AGENCY

through MWDOC and Local Agency Conservation Programs

Agency	FY 12/13		FY 13/14		FY 14/15		FY 15/16		FY16/17		FY17/18		FY18/19		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	9	8	4	0	43	6	20	4	31	4	32	0	12	0	175	80	584.33
Buena Park	3	0	0	0	4	10	7	4	10	7	15	3	9	4	55	48	184.05
East Orange CWD RZ	2	0	0	0	2	0	1	0	11	1	6	0	1	0	32	1	26.81
El Toro WD	7	2	11	0	8	9	9	17	33	8	29	4	13	0	157	359	2,728.64
Fountain Valley	3	2	4	0	7	10	13	1	33	12	28	12	13	1	132	53	228.37
Garden Grove	5	2	9	0	10	14	13	11	28	0	27	2	15	0	143	40	208.43
Golden State WC	9	49	9	25	39	12	35	16	56	37	88	6	35	13	348	211	976.48
Huntington Beach	18	33	20	35	19	2	42	12	88	94	70	30	43	0	385	298	1,300.84
Irvine Ranch WD	414	135	71	59	67	310	239	207	344	420	416	78	153	39	2,338	2,403	13,079.68
La Habra	4	7	2	0	4	7	3	1	12	7	8	0	7	2	51	46	235.19
La Palma	1	0	2	0	2	0	3	2	1	0	5	0	2	0	17	2	8.29
Laguna Beach CWD	76	2	71	0	86	0	86	1	27	0	11	0	2	0	510	20	272.36
Mesa Water	10	2	15	2	17	28	36	12	149	41	49	0	11	0	378	154	855.93
Moulton Niguel WD	51	74	40	45	46	95	163	100	236	129	284	33	119	55	1,317	889	4,261.73
Newport Beach	242	26	168	75	11	9	28	43	30	12	24	0	10	0	1,072	409	2,940.58
Orange	20	24	13	9	18	31	51	13	69	10	61	13	42	26	388	204	1,075.03
San Juan Capistrano	14	18	6	11	6	19	20	8	22	8	23	5	10	0	255	130	745.55
San Clemente	26	7	28	2	28	24	26	3	37	13	38	41	13	0	1,102	415	3,014.29
Santa Margarita WD	53	171	64	93	53	321	189	136	326	221	273	220	91	19	1,518	1,611	6,917.32
Santiago CWD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Seal Beach	1	0	1	36	1	12	2	2,446	2	4	5	0	1	0	13	2,502	6,804.34
Serrano WD	1	0	0	0	4	0	11	2	4	0	8	0	6	0	52	2	17.80
South Coast WD	13	16	8	4	104	73	9	11	7	0	15	2	2	0	295	214	1,307.18
Trabuco Canyon WD	6	0	2	0	6	1	16	50	13	3	20	0	10	0	133	157	1,062.61
Tustin	8	4	9	1	18	14	33	8	33	23	27	1	21	0	191	81	403.52
Westminster	1	1	2	0	13	17	7	1	17	12	22	0	12	0	99	44	231.71
Yorba Linda	20	0	12	5	32	2	61	27	72	71	68	10	34	0	440	193	985.15
MWDOC Totals	1,017	583	571	402	648	1,026	1,123	3,136	1,691	1,137	1,652	460	687	159	11,596	10,566	50,456.22
Anaheim	19	10	9	26	7	52	30	34	87	10	62	0	27	0	333	457	2,930.89
Fullerton	9	29	8	0	40	26	32	12	53	7	43	0	1	0	243	199	1,080.63
Santa Ana	8	19	7	8	9	27	22	26	15	3	11	0	1	0	94	100	422.18
Non-MWDOC Totals	36	58	24	34	56	105	84	72	155	20	116	0	29	0	670	756	4,433.70
Orange County Totals	1,053	641	595	436	704	1,131	1,207	3,208	1,846	1,157	1,768	460	716	159	12,266	11,322	54,890

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

Agency	FY 13/14			FY 14/15			FY 15/16			FY 16/17			FY 17/18			FY 18/19			Total Program			Cumulative Water Savings across all Fiscal Years
	Small		Large	Small		Large	Small		Large	Small		Large	Small		Large	Small		Large	Small		Large	
	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	
Brea	84	0	0	157	45	0	74	2,484	0	0	0	0	0	0	0	0	0	0	572	2,749	0	61.57
Buena Park	53	0	0	248	0	0	45	98	0	0	0	0	0	0	0	0	0	0	509	173	2,535	815.14
East Orange	30	0	0	221	0	0	0	0	0	0	0	0	30	0	0	0	0	0	781	0	0	20.63
El Toro	56	3,288	0	1,741	28,714	0	730	4,457	0	55	242	0	36	0	0	0	0	0	3,260	43,348	890	1,374.09
Fountain Valley	0	0	0	107	0	0	222	0	0	0	0	0	85	0	0	0	0	0	919	2,874	0	19.34
Garden Grove	80	0	0	88	50	0	110	0	0	55	98	0	52	0	0	0	0	0	855	254	0	35.24
Golden State	192	0	0	583	1,741	0	1,088	0	0	207	6,008	0	161	-495	0	35	0	0	3,480	10,837	0	289.91
Huntington Beach	120	0	0	798	1,419	0	1,345	2,836	0	149	3,362	0	-37	0	0	0	0	0	4,001	9,135	2,681	1,351.83
Irvine Ranch	11,010	4,257	0	1,421	632	0	1,989	5,047	0	335	9,511	0	356	-215	0	0	0	0	46,498	43,325	2,004	4,986.44
La Habra	15	0	0	109	338	0	300	0	0	0	0	0	0	0	0	0	0	0	1,515	55,404	900	369.02
La Palma	0	0	0	0	0	0	46	505	0	0	2,385	0	33	0	0	0	0	0	89	3,163	0	38.08
Laguna Beach	2,948	878	0	2,879	1,971	0	1,390	0	0	0	0	0	0	0	0	0	0	0	11,948	2,896	0	355.81
Mesa Water	361	0	0	229	0	0	166	0	0	113	0	0	36	0	0	0	0	0	2,062	302	343	199.99
Moulton Niguel	361	227	0	1,596	4,587	0	5,492	1,441	0	153	5,872	0	893	0	0	243	38	0	12,728	20,598	2,945	1,783.14
Newport Beach	19,349	6,835	0	460	3,857	0	348	670	0	0	0	0	45	0	0	0	0	0	46,865	16,632	0	1,812.10
Orange	245	120	0	304	668	0	631	91	0	0	0	0	0	0	0	0	0	0	3,133	5,853	0	118.53
San Juan Capistrano	370	0	0	495	737	0	310	593	0	75	123	0	59	0	0	0	0	0	5,027	3,143	0	465.39
San Clemente	415	5,074	0	326	0	0	426	0	0	0	0	0	146	0	0	40	1,400	0	10,062	11,948	1,343	828.92
Santa Margarita	389	0	0	1,207	1,513	0	1,820	837	0	15	0	0	224	0	0	0	0	0	15,387	7,283	611	852.79
Seal Beach	0	0	0	40	5,261	0	0	2,300	0	0	0	0	0	0	0	0	0	0	155	7,561	0	157.83
Serrano	105	0	0	377	0	0	695	0	0	0	0	0	0	0	0	0	0	0	1,907	291	0	98.75
South Coast	70	0	0	4,993	13,717	0	1,421	2,889	0	16	0	0	0	0	0	0	0	0	9,628	18,870	0	566.88
Trabuco Canyon	0	0	0	56	0	0	130	0	0	0	4,339	0	0	0	0	0	0	0	729	4,339	0	149.82
Tustin	329	0	0	408	0	0	317	386	0	65	-341	0	30	0	0	0	0	0	4,444	1,849	0	127.30
Westminster	0	0	0	54	0	0	73	0	0	105	0	0	50	0	0	47	0	0	748	0	0	12.54
Yorba Linda	40	990	0	921	0	0	1,715	0	0	213	0	0	0	0	0	42	0	0	5,790	1,103	500	478.49
MWDOC Totals	36,622	21,669	0	19,818	65,250	0	20,883	24,634	0	1,556	31,599	0	2,199	-710	0	407	1,438	0	194,823	274,867	14,752	17,369.58
Anaheim	338	0	0	498	712	0	794	5,221	0	147	3,953	0	0	0	0	0	0	0	4,020	49,799	105	1,402.16
Fullerton	107	0	0	684	1,196	0	521	7,015	0	65	3,034	0	0	0	0	0	0	0	2,910	11,309	1,484	719.68
Santa Ana	86	2,533	0	310	0	0	0	1,420	0	0	1,106	0	0	0	0	0	0	0	859	5,752	0	146.67
Non-MWDOC Totals	531	2,533	0	1,492	1,908	0	1,315	13,656	0	212	8,093	0	0	0	0	0	0	0	7,789	66,860	1,589	2,268.51
Orange County Totals	37,153	24,202	0	21,310	67,158	0	22,198	38,290	0	1,768	39,692	0	2,199	-710	0	407	1,438	0	202,612	341,727	16,341	19,638.09

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

Agency	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	Totals	Cumulative Water Savings across all Fiscal Years
Brea	234	0	10	91	734	242	0	**1,607**	**586**
Buena Park	5	23	56	591	133	49	0	**2,538**	**1,363**
East Orange CWD RZ	0	0	0	0	0	0	0	**0**	**0**
El Toro WD	0	212	6	268	35	737	717	**2,516**	**750**
Fountain Valley	0	0	1	249	0	895	0	**1,767**	**755**
Garden Grove	4	1	167	676	410	0	0	**2,451**	**1,805**
Golden State WC	0	1	0	1,008	53	93	0	**2,958**	**2,278**
Huntington Beach	104	144	7	783	641	10	0	**2,964**	**1,942**
Irvine Ranch WD	1,090	451	725	11,100	5,958	1,599	413	**29,878**	**9,794**
La Habra	0	0	0	340	42	0	0	**925**	**664**
La Palma	0	0	0	0	509	0	0	**675**	**159**
Laguna Beach CWD	0	27	0	0	0	0	0	**446**	**373**
Mesa Water	6	0	79	661	782	0	0	**4,254**	**2,545**
Moulton Niguel WD	0	0	3	413	281	506	0	**1,783**	**1,032**
Newport Beach	0	0	566	0	0	0	0	**1,834**	**1,550**
Orange	1	271	81	275	2,851	458	414	**5,902**	**2,280**
San Juan Capistrano	0	14	0	0	0	0	0	**260**	**457**
San Clemente	0	0	1	0	0	0	0	**432**	**444**
Santa Margarita WD	0	0	2	90	743	598	506	**2,054**	**368**
Santiago CWD	0	0	0	0	0	0	0	**0**	**0**
Seal Beach	0	0	0	0	184	278	0	**816**	**519**
Serrano WD	0	0	0	0	0	0	0	**0**	**0**
South Coast WD	148	0	382	0	0	0	0	**1,320**	**646**
Trabuco Canyon WD	0	0	0	0	0	0	0	**11**	**18**
Tustin	0	0	75	358	212	2	64	**1,468**	**1,007**
Westminster	1	28	0	146	177	25	0	**1,163**	**1,191**
Yorba Linda	1	0	0	226	84	338	0	**933**	**684**
MWDOC Totals	**1,594**	**1,172**	**2,161**	**17,275**	**13,829**	**5,830**	**2,114**	**70,955**	**33,208**
Anaheim	165	342	463	3,072	309	1,808	0	**15,561**	**8,466**
Fullerton	94	0	178	476	621	274	0	**3,052**	**2,015**
Santa Ana	16	17	5	1,293	238	582	0	**6,319**	**5,637**
Non-MWDOC Totals	**275**	**359**	**646**	**4,841**	**1,168**	**2,664**	**0**	**24,932**	**16,119**
Orange County Totals	**1,869**	**1,531**	**2,807**	**22,116**	**14,997**	**8,494**	**2,114**	**95,887**	**49,327**

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

INDUSTRIAL PROCESS/WATER SAVINGS INCENTIVE PROGRAM

Number of Projects by Agency

Agency	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	Overall Program Interventions	Annual Water Savings[1]	Cumulative Water Savings across all Fiscal Years[1]
Brea	0	0	0	0	0	0	0	0	0	0	0
Buena Park	0	0	0	0	1	0	0	0	2	54	528
East Orange	0	0	0	0	0	0	0	0	0	0	0
El Toro	0	0	0	0	0	0	1	0	1	9	1
Fountain Valley	0	0	0	0	0	1	0	0	1	23	36
Garden Grove	0	0	0	0	1	0	0	0	1	0	1
Golden State	0	0	0	0	0	0	0	0	1	3	31
Huntington Beach	0	2	0	1	2	0	1	0	6	180	656
Irvine Ranch	1	1	1	0	2	1	1	0	10	119	692
La Habra	0	0	0	0	1	0	0	0	1	0	1
La Palma	0	0	0	0	0	0	0	0	0	0	0
Laguna Beach	0	0	0	0	0	0	0	0	0	0	0
Mesa Water	0	0	0	0	0	0	0	0	0	0	0
Moulton Niguel	0	0	0	0	0	0	0	0	0	0	0
Newport Beach	0	0	0	1	0	0	0	0	1	21	81
Orange	0	0	0	0	1	2	1	0	5	97	545
San Juan Capistrano	0	0	0	0	0	0	0	0	0	0	0
San Clemente	0	0	0	0	0	0	0	0	0	0	0
Santa Margarita	0	0	0	0	0	0	0	0	0	0	0
Seal Beach	0	0	0	0	0	0	0	0	0	0	0
Serrano	0	0	0	0	0	0	0	0	0	0	0
South Coast	0	0	0	0	1	1	0	0	2	134	213
Trabuco Canyon	0	0	0	0	0	0	0	0	0	0	0
Tustin	0	0	0	0	0	0	0	0	0	0	0
Westminster	0	0	0	0	0	0	0	0	0	0	0
Yorba Linda	0	0	0	0	0	0	0	1	1	20	2
MWDOC Totals	1	3	1	2	9	5	4	2	32	662	2787
Anaheim	0	0	0	0	0	0	0	0	0	0	0
Fullerton	0	0	0	0	0	0	0	0	0	0	0
Santa Ana	0	0	0	0	1	0	0	0	1	11	428
OC Totals	1	3	1	2	10	5	4	2	33	673	3215

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

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

TURF REMOVAL BY AGENCY[1]

through MWDOC and Local Agency Conservation Programs

Agency	FY 12/13		FY 13/14		FY 14/15		FY 15/16		FY 16/17		FY 17/18		FY 18/19		Total Program		Cumulative Water Savings across all Fiscal Years
	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	
Brea	7,605	0	5,697	0	71,981	30,617	118,930	404,411	8,354	479	9,853	27,234	3,180	0	228,997	472,207	**406.07**
Buena Park	0	0	0	0	11,670	1,626	77,127	16,490	3,741	0	4,586	0	1,230	0	98,354	18,116	**64.76**
East Orange	0	0	1,964	0	18,312	0	27,844	0	0	0	0	0	0	0	48,120	0	**30.06**
El Toro	4,680	72,718	4,582	0	27,046	221,612	63,546	162,548	13,139	48,019	7,273	42,510	5,263	5,797	130,252	553,204	**426.83**
Fountain Valley	682	7,524	4,252	0	45,583	5,279	65,232	0	3,679	0	8,631	0	2,849	27,679	132,208	40,482	**93.44**
Garden Grove	4,534	0	8,274	0	67,701	22,000	177,408	49,226	11,504	0	4,487	0	0	0	287,921	117,403	**281.06**
Golden State	31,813	3,200	32,725	8,424	164,507	190,738	310,264	112,937	0	0	0	0	0	0	581,902	346,272	**636.92**
Huntington Beach	9,219	12,437	20,642	0	165,600	58,942	305,420	270,303	9,560	21,534	14,236	6,032	7,937	0	561,045	421,737	**629.23**
Irvine Ranch	32,884	32,384	36,584	76,400	234,905	317,999	782,844	2,675,629	231,483	46,725	86,893	61,037	18,109	10,281	1,435,575	3,234,915	**2,676.87**
La Habra	0	0	0	0	14,014	1,818	49,691	72,164	0	0	3,003	0	1,504	0	68,212	90,019	**99.42**
La Palma	0	0	0	0	4,884	0	10,257	59,760	0	0	0	0	0	0	15,141	59,760	**42.63**
Laguna Beach	2,664	1,712	4,586	226	13,647	46,850	47,614	0	3,059	0	589	0	0	0	75,670	48,788	**82.86**
Mesa Water	10,667	0	22,246	0	131,675	33,620	220,815	106,896	4,173	77,033	17,373	77,785	1,360	0	415,086	295,334	**396.89**
Moulton Niguel	11,538	84,123	14,739	40,741	314,250	1,612,845	889,748	1,059,279	220,749	0	98,271	0	41,689	0	1,596,423	2,840,054	**2,763.50**
Newport Beach	3,548	2,346	894	0	33,995	65,277	76,675	375,404	2,924	0	5,938	6,499	0	25,000	127,428	474,526	**341.25**
Orange	15,951	8,723	11,244	0	120,093	281,402	289,990	106,487	12,847	2,366	11,956	0	10,320	1,798	485,372	400,776	**562.65**
San Clemente	16,062	13,165	18,471	13,908	90,349	1,137	215,249	438,963	4,267	0	33,083	7,098	5,134	0	404,117	474,271	**524.07**
San Juan Capistrano	29,544	27,156	12,106	0	101,195	32,366	197,290	143,315	2,624	40,748	0	0	0	0	365,415	347,277	**509.68**
Santa Margarita	10,151	11,600	17,778	48,180	211,198	514,198	534,048	550,420	17,010	28,094	62,706	25,000	19,624	23,198	878,962	1,217,651	**1,268.89**
Santiago	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**-**
Seal Beach	3,611	0	0	0	15,178	504	17,349	15,911	1,234	0	752	0	0	0	38,124	16,415	**33.87**
Serrano	0	0	2,971	0	41,247	0	127,877	4,403	5,450	0	555	0	4,000	0	182,100	4,403	**108.45**
South Coast	9,429	4,395	15,162	116,719	84,282	191,853	181,102	128,290	14,967	0	13,319	7,806	5,990	0	331,057	465,387	**532.10**
Trabuco Canyon	1,542	22,440	2,651	0	14,771	0	42,510	88,272	1,465	0	4,788	0	1,536	0	69,535	110,712	**111.78**
Tustin	9,980	0	1,410	0	71,285	14,137	232,697	33,362	11,173	0	16,926	0	5,941	6,894	349,412	54,393	**230.98**
Westminster	0	0	0	0	14,040	34,631	71,833	23,902	11,112	0	10,033	0	3,961	0	110,979	58,533	**95.71**
Yorba Linda	0	0	0	0	112,136	12,702	360,279	116,985	19,420	0	9,529	3,696	11,856	0	524,569	133,383	**382.47**
MWDOC Totals	**216,104**	**303,923**	**238,978**	**304,598**	**2,195,544**	**3,692,153**	**5,493,639**	**7,015,357**	**613,934**	**264,998**	**424,780**	**264,697**	**151,483**	**100,647**	**9,541,976**	**12,296,018**	**13,332.42**
Anaheim	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**-**
Fullerton	0	0	0	9,214	0	0	0	0	0	0	0	0	0	0	0	9,214	**7.74**
Santa Ana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**-**
Non-MWDOC Totals	**0**	**0**	**0**	**9,214**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9,214**	**7.74**
Orange County Totals	**216,104**	**303,923**	**238,978**	**313,812**	**2,195,544**	**3,692,153**	**5,493,639**	**7,015,357**	**613,934**	**264,998**	**424,780**	**264,697**	**151,483**	**100,647**	**9,541,976**	**12,305,232**	**13,340**

[1]Installed device numbers are listed as square feet

HIGH EFFICIENCY TOILETS (HETs) INSTALLED BY AGENCY

through MWDOC and Local Agency Conservation Programs

Agency	FY 12-13	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19	Total	Cumulative Water Savings across all Fiscal Years
Brea	0	38	146	154	4	6	0	**456**	**116.31**
Buena Park	0	96	153	112	13	3	0	**687**	**215.26**
East Orange CWD RZ	0	13	26	24	0	0	0	**86**	**24.09**
El Toro WD	133	218	869	264	12	6	5	**2,048**	**611.66**
Fountain Valley	0	41	132	220	7	9	0	**832**	**278.72**
Garden Grove	0	63	350	363	7	4	0	**1,488**	**474.87**
Golden State WC	2	142	794	512	9	11	1	**2,802**	**877.53**
Huntington Beach	0	163	1,190	628	4	3	0	**2,904**	**821.99**
Irvine Ranch WD	1,449	810	1,777	2,798	638	239	57	**17,205**	**6,026.15**
Laguna Beach CWD	0	45	112	81	1	4	0	**392**	**118.10**
La Habra	0	37	94	83	5	1	0	**591**	**215.86**
La Palma	0	21	59	52	4	2	0	**224**	**66.01**
Mesa Water	0	147	162	162	7	3	0	**1,621**	**650.09**
Moulton Niguel WD	0	400	2,497	1,939	49	40	4	**5,734**	**1,344.48**
Newport Beach	0	49	168	243	11	6	0	**731**	**208.28**
Orange	1	142	978	416	17	10	2	**2,191**	**608.89**
San Juan Capistrano	0	35	140	202	3	9	2	**534**	**139.85**
San Clemente	0	72	225	246	11	6	0	**878**	**255.87**
Santa Margarita WD	0	528	997	1,152	114	34	0	**3,343**	**793.90**
Seal Beach	2	17	50	69	-1	0	0	**857**	**421.72**
Serrano WD	0	2	40	55	3	0	0	**121**	**28.68**
South Coast WD	64	102	398	235	11	7	0	**1,028**	**266.55**
Trabuco Canyon WD	0	10	108	169	2	3	2	**344**	**77.50**
Tustin	0	64	132	201	12	10	1	**1,517**	**589.83**
Westminster	0	35	161	359	3	4	0	**1,335**	**460.36**
Yorba Linda WD	0	40	280	379	12	8	0	**1,259**	**388.69**
MWDOC Totals	1,651	3,330	12,038	11,118	958	428	74	**51,208**	**16,081.24**
Anaheim	0	156	1,188	614	70	19	0	**5,884**	**2,192.98**
Fullerton	0	61	293	286	14	9	0	**1,064**	**313.92**
Santa Ana	0	33	602	293	20	0	0	**2,021**	**687.54**
Non-MWDOC Totals	0	250	2,083	1,193	104	28	0	**8,969**	**3,194.44**
Orange County Totals	**1,651**	**3,580**	**14,121**	**12,311**	**1,062**	**456**	**74**	**60,177**	**19,275.68**