

AGENDA  
 IRVINE RANCH WATER DISTRICT / SERRANO WATER DISTRICT  
 COMMITTEE MEETING  
 WEDNESDAY, JUNE 26, 2019

CALL TO ORDER 8:30 a.m., IRWD Operations Center, Committee Room, First Floor,  
 3512 Michelson, Irvine, California

ATTENDANCE Committee Members:

IRWD: Peer Swan _____	Doug Reinhart _____
SWD: Larry Pharris _____	Frank Bryant _____

ALSO PRESENT

Paul Cook _____	Wendy Chambers _____
Jerry Vilander _____	Tom Roberts _____
Kevin Burton _____	Malcolm Cortez _____
Cheryl Clary _____	Paul Weghorst _____
Jeremy Jungreis _____	Rob Jacobson _____
Claire Hervey Collins _____	Vittorio Roggero _____
Jacob Moeder _____	Rich Mori _____

**COMMUNICATIONS**

1. Notes: Burton
2. Public Comments
3. Determine the need to discuss and/or take action on item(s) introduced, which came to the attention of the District subsequent to the agenda being posted.
4. Determine which items may be approved without discussion.

**INFORMATION**

5. SANTIAGO RESERVOIR CAPITAL PROJECTS UPDATE – MOEDER / MORI / BURTON

Recommendation: Receive and file.

**ACTION**

6. CONCEPTUAL TERMS FOR AN IRVINE LAKE EMERGENCY SUPPLY PILOT PROGRAM – SMITHSON / WEGHORST / CLARY / COOK

Recommendation: That the Committee provide input to be used in finalizing the terms for the proposed Irvine Lake Emergency Supply Pilot Program and concur with staff presenting the Pilot Program terms to the South County Agencies; developing terms for an agreement between IRWD and SWD that would result in a new process to account for evaporation from Irvine Lake and to implement the Pilot Program; and developing terms for an amendment to the Amended and Restated Agreement for Construction, Operation and Maintenance of Baker Water Treatment Plant that would implement the Pilot Program.

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**OTHER BUSINESS**

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7. Director Comments
8. Adjourn

Availability of agenda materials: Agenda exhibits and other writings that are disclosable public records distributed to all or a majority of the members of the above-named Committee in connection with a matter subject to discussion or consideration at an open meeting of the Committee are available for public inspection in the District's office, 15600 Sand Canyon Avenue, Irvine, California ("District Office"). If such writings are distributed to members of the Committee less than 72 hours prior to the meeting, they will be available from the District Secretary of the District Office at the same time as they are distributed to Committee Members, except that if such writings are distributed one hour prior to, or during, the meeting, they will be available at the entrance of the meeting room at the District Office. The Irvine Ranch Water District Operation's Committee Room is wheelchair accessible. If you require any special disability-related accommodations (e.g., access to an amplified sound system, etc.), please contact the District Secretary at (949) 453-5300 during business hours at least seventy-two (72) hours prior to the scheduled meeting. This agenda can be obtained in an alternative format upon written request to the District Secretary at least seventy-two (72) hours prior to the scheduled meeting.

June 26, 2019

Prepared by: J. Moeder / R. Mori

Submitted by: K. Burton

Approved by: Paul A. Cook



IRWD / SWD COMMITTEE

## SANTIAGO RESERVOIR CAPITAL PROJECTS UPDATE

### SUMMARY:

This item provides an overview of current projects related to Santiago Reservoir (also referred to as Irvine Lake) including the replacement of the Outlet Tower, evaluation of the Santiago Creek Dam Spillway, development of an emergency action plan, and a potential project to remove accumulated sediment from the lake.

### BACKGROUND:

In 2008, the Division of Safety of Dams (DSOD) requested seismic analyses of three elements critical to the Santiago Creek Dam: 1) liquefaction of the foundation alluvium; 2) the status of the Terrance Fault; and 3) the seismic stability of the outlet tower. The foundation alluvium and terrace fault studies were completed in November 2011 and March 2012, respectively. The studies concluded that liquefaction of the foundation alluvium is unlikely and that the Terrace Fault is inactive. The DSOD agreed with the conclusions and did not require further action.

AECOM was retained to perform the seismic stability analysis of the outlet tower, which was completed in July 2017. The analysis concluded that the outlet tower would fail in a "Maximum Credible Earthquake" event and the debris and/or silt could obstruct the outlet and prevent a controlled drawdown of Irvine Lake. Based on DSOD's feedback, the alternative of a new sloped outlet was selected, and AECOM was retained to complete the preliminary and final design for the sloped outlet.

### Santiago Reservoir Outlet Tower Replacement:

In February 2019, AECOM completed the Santiago Creek Dam Outlet Tower Replacement Preliminary Design Report (PDR), which includes abandoning the existing outlet tower, utilizing the existing outlet pipeline, and construction of a new inclined outlet conduit. The final PDR was transmitted to DSOD for review; they recently indicated that their review of the PDR will begin in July. The final design for the outlet tower remains on hold until DSOD provides concurrence with the PDR findings. Staff continues to regularly follow up with DSOD to help ensure that the PDR review is completed in a timely manner.

### Santiago Creek Dam Spillway Assessment:

In June 2017, DSOD requested that IRWD and Serrano Water District (SWD) perform a comprehensive condition assessment of the Santiago Creek Dam spillway. GEI Consultants was retained in August 2017 to perform the assessment. The first phase of the assessment, which included evaluation of available information on the spillway design and construction, review of the geologic setting, and surface observation of the concrete spillway was completed in

February 2018. Based on the findings, GEI recommended that a second phase of the assessment be conducted to better define and understand the condition of the spillway.

The second phase of the assessment included non-destructive evaluation to determine the thickness of the concrete spillway, borescope exploration to confirm the presence or absence of voids beneath the spillway, concrete core sampling and strength testing, video survey of the spillway underdrain system, and additional geologic mapping in the area immediately downstream of the spillway. The proposed work plan for the assessment was transmitted to DSOD in February 2019. DSOD approved the work plan in March 2019, and GEI performed the work in May. GEI is currently reviewing the data and is on schedule to submit its findings in July 2019.

#### Emergency Action Plan and Inundation Mapping:

Senate Bill 92, which became effective on July 1, 2017, makes the owner of any state-regulated dam responsible for emergency preparedness with regard to the potential for loss of life and property resulting from the failure of a dam or its critical appurtenant structures. The law requires dam owners to prepare an inundation map and emergency action plan (EAP) for dams under the state's jurisdiction at least every ten years. The existing emergency response plan needs to be rewritten to meet current regulations and the existing inundation map is outdated and needs to be updated.

Stetson Engineers was retained in November 2017 to complete the inundation map and EAP. The completed inundation map was transmitted to DSOD on February 21, 2018. DSOD recently informed staff that the review of the inundation map will occur in July 2019. DSOD's approval of the inundation map is a prerequisite requirement to complete the EAP. It is anticipated that the EAP will be completed by October.

#### Potential Reservoir Desilting:

At the August 29, 2018 IRWD/SWD Ad Hoc Committee meeting, staff informed the committee that the bathymetric survey indicated sediment build-up at the bottom of the lake. The sediment build-up is concentrated around the outlet tower, reaches approximately elevation 715-feet and occupies about 2,200 acre-feet of the reservoir. AECOM developed and evaluated the following four alternatives for removing the deposited sediment.

- Draining the lake, removing the sediment, and relocating it on-site
- Draining the lake, removing the sediment, and disposing of it off-site
- Dredging the lake and relocating it on-site
- Dredging the lake, dewatering the sediment, and disposing of it off-site

The conceptual cost estimate for the potential sediment removal ranged from \$36 to \$70 million and requires removing about 2,200 acre-feet of sediment.

While the sediment removal would re-establish the lake bottom to its original elevation, it would also create additional storage at deeper areas of the lake that would be useable by SWD, but would be unusable by IRWD. The lake is currently the source of supply for multiple uses including SWD's Walter Howler Water Filtration Plant, IRWD's Baker Raw Water Pump Station (RWPS), and IRWD's recycled water system. SWD's water filtration plant is located at an elevation that can utilize the full depth of storage in Irvine Lake, but the Baker RWPS and IRWD's recycled water system require the lake to be maintained at a higher elevation to operate efficiently. As such, creating additional storage below certain lake levels provides no benefit to IRWD.

AECOM also evaluated the concept of grading the lake bottom to create additional storage at elevations that are usable by both agencies. The concept includes removing material at higher areas of the lake and placing the material at lower areas of the lake. This concept requires relocating 4,200 acre-feet of material from the upper areas of the reservoir, reducing the storage by an equivalent amount at lower lake levels. AECOM's conceptual cost estimate for this alternative is \$61 million.

Staff will provide more detail on these projects with a PowerPoint presentation at the Committee meeting.

FISCAL IMPACTS:

For the projects described herein, the cost split will be 75% IRWD and 25% SWD in accordance with the Irvine Lake ownership agreements.

ENVIRONMENTAL COMPLIANCE:

The projects are subject to the California Environmental Quality Act. In conformance with the California Code of Regulations Title 14, Chapter 3, Section 15044, appropriate environmental documents will be prepared when "meaningful information" becomes available.

RECOMMENDATION:

Receive and file.

LIST OF EXHIBITS:

None.

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June 26, 2019

Prepared by: C. Smithson / P. Weghorst

Submitted by: C. Clary / P. Weghorst

Approved by: Paul A. Cook



## IRWD/SWD COMMITTEE

### CONCEPTUAL TERMS FOR IRVINE LAKE EMERGENCY SUPPLY PILOT PROGRAM

#### SUMMARY:

The south Orange County agencies that are partners in the Baker Water Treatment Plant (South County Agencies) have expressed interest in obtaining emergency water supplies from Irvine Lake that could be delivered and treated at the Baker Plant in the event of an outage in the Metropolitan Water District supply system or during other emergencies. Staff has prepared conceptual terms for an Irvine Lake Emergency Supply Pilot Program that would be mutually beneficial to the South County Agencies, IRWD, and Serrano Water District (SWD). These terms were developed taking into consideration input from the IRWD Supply Reliability Programs (SRP) Committee as well as initial feedback from both SWD and the South County Agencies. At the committee meeting, staff will present the conceptual draft terms for the Pilot Program. Staff recommends that the Committee provide input to be used in finalizing the terms for the proposed Pilot Program and concur with staff on the next steps:

- Present the Pilot Program terms to the South County Agencies;
- Develop terms for an agreement between IRWD and SWD that would result in a new process to account for evaporation from Irvine Lake and to implement the Pilot Program; and
- Develop terms for an amendment to the Amended and Restated Agreement for Construction, Operation and Maintenance of Baker Water Treatment Plant that would implement the Pilot Program.

#### BACKGROUND:

In 2016, Municipal Water District of Orange County (MWDOC) completed the *Orange County Water Reliability Study* which concluded that the South County Agencies have a need for access to emergency water that could be available in the event of a 60-day outage of Metropolitan's system or during other emergencies. Since then, the South County Agencies have expressed interest in improving their system reliability by having access to emergency supplies from Irvine Lake. IRWD and SWD, as co-owners of Irvine Lake, are working to propose a program through which the two agencies could collaboratively provide emergency water from Irvine Lake to the South County Agencies.

In August and October 2018, staff reviewed concepts with the SRP Committee for the implementation of an Irvine Lake Emergency Supply Pilot Program that would be mutually beneficial to IRWD, SWD and the South County Agencies. Staff has prepared conceptual terms for such a Pilot Program taking into consideration input from the SRP Committee as well as feedback from both SWD and the South County Agencies. These terms are summarized in the presentation provided as Exhibit "A". At the Committee meeting, staff will present the conceptual draft terms for the Pilot Program and facilitate a discussion among the Committee meeting participants.

Overview of Conceptual Terms:

The following is a summary of conceptual terms for the proposed pilot program:

- The purpose of the Pilot Program is to maintain a 60-day emergency supply of water to IRWD, SWD, and the South County Agencies in Irvine Lake;
- The term of the Pilot Program would be 5 years;
- The South County Agencies would reimburse IRWD for the purchase of 4,000 AF of untreated water purchased from Metropolitan;
- IRWD and SWD would recover actual costs associated with operating and maintaining Irvine Lake;
- IRWD and SWD would assess the South County Agencies a capital facility use fee;
- Evaporation of water stored in the lake below the emergency supply pool would be shared among the Pilot Program participants;
- Evaporation of emergency water stored in the lake would be shared by the South County Agencies;
- The emergency supplies held for the South County Agencies would spill first from the lake;
- The South County Agencies could reimburse IRWD to purchase water to replace any South County Agency water spilled from the lake;
- The Pilot Program could be suspended to lower the lake for capital improvements;
- IRWD would deliver emergency water to the South County Agencies for treatment and use through the Baker Plant; and
- All costs that are allocated to the South County Agencies would be assessed as an add-on cost to the cost of all water produced and delivered from the Baker Plant.

FISCAL IMPACTS:

The price and payment terms associated with the proposed Irvine Lake Emergency Supply Pilot Program are contained in the presentation attached as Exhibit “A”. Consistent with these terms, IRWD and SWD would be reimbursed for a pro-rata share of operating and maintenance costs, evaporative losses and the use of capital facilities.

ENVIRONMENTAL COMPLIANCE:

The implementation of the proposed Irvine Lake Emergency Supply Pilot Program may be subject to environmental review consistent with the California Environmental Quality Act. Staff will return to the Committee in the future with any necessary recommendations for environmental review associated with the program.



RECOMMENDATION:

That the Committee provide input to be used in finalizing the terms for the proposed Irvine Lake Emergency Supply Pilot Program and concur with staff presenting the Pilot Program terms to the South County Agencies; developing terms for an agreement between IRWD and SWD that would result in a new process to account for evaporation from Irvine Lake and to implement the Pilot Program; and developing terms for an amendment to the Amended and Restated Agreement for Construction, Operation and Maintenance of Baker Water Treatment Plant that would implement the Pilot Program.

LIST OF EXHIBITS:

Exhibit "A" – Presentation on Conceptual Draft Terms for Irvine Lake Emergency Supply Pilot Program

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# Draft Terms for Irvine Lake Emergency Supply Pilot Program

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June 26, 2019





# Presentation Agenda

- Pilot Program Overview
- Program Benefits
- How the Program Works
  - Losses from Irvine Lake
  - Restoring Water
  - Program Suspension / Resumption
- Proposed Program Costs
- Next Steps

# Pilot Program Overview

- Parties: IRWD, Serrano Water District (SWD) and the “South County Agencies” that own capacity in the Baker Water Treatment Plant
  - El Toro water District
  - Moulton Niguel Water District
  - Santa Margarita Water District
  - Trabuco Canyon Water District
- Purpose: To provide up to 60-day emergency supply to IRWD, SWD, and the South County Agencies
- Program Term: Five years

# Program Benefits

- **To IRWD:**
  - A 60-day emergency supply
  - Reimbursement of costs
- **To SWD:**
  - A 60-day emergency supply
  - Reimbursement of costs
- **To the South County Agencies:**
  - Guaranteed 60-day emergency supply of water to use when MWD system outages prohibit deliveries of MWD untreated water to the Baker Plant

# How Program Works

- IRWD and SWD would purchase and deliver 5,800 AF of MWD untreated water from MWD into Irvine Lake (“Emergency Water”)
  - 4,000 AF for the South County Agencies
  - 1,300 AF for IRWD
  - 500 AF for SWD
- South County Agencies would pay:
  - Initial costs of 4,000 AF delivered into storage
  - Annual costs paid on per AF basis on all water from the Baker Plant
- Water would be delivered during an emergency through the Baker Plant

# Losses from Irvine Lake

- **Evaporation:** Cost of replacing evaporation would be shared by the South County Agencies, IRWD and SWD
  - South County Agency costs would be applied to annual cost of water from Baker Plant
- **Spills:** IRWD and SWD to use best efforts to avoid spills
  - South County Agencies' water spills first



# Restoring Water After Spills or Deliveries

- South County Agencies could ask IRWD to purchase additional water
- Initial and annual costs would be charged to the South County Agencies
- All restored water to be delivered by the end of the fifth year

# Suspending / Reuming Program

- The program could be suspended to lower the lake:
  - Perform capital improvements
  - Other unforeseen reasons
- IRWD would deliver Emergency Water
  - To Baker Plant for treatment and use
- Annual costs would be suspended
- Upon completion of work:
  - South County Agencies would have option to resume program
  - South County Agencies would purchase new Emergency Water

# Program Costs



# Program Cost Components

Annual operating costs and facility use fee are allocated proportional to uses and include:

- Annual operating and maintenance expenses
- Capital Facilities replacement and repairs:
  - Lake desilting
  - Spillway
  - Tower
  - Other
- Emergency Supply costs are allocated to all water delivered through the Baker plant

# O & M and Facility Use Fee

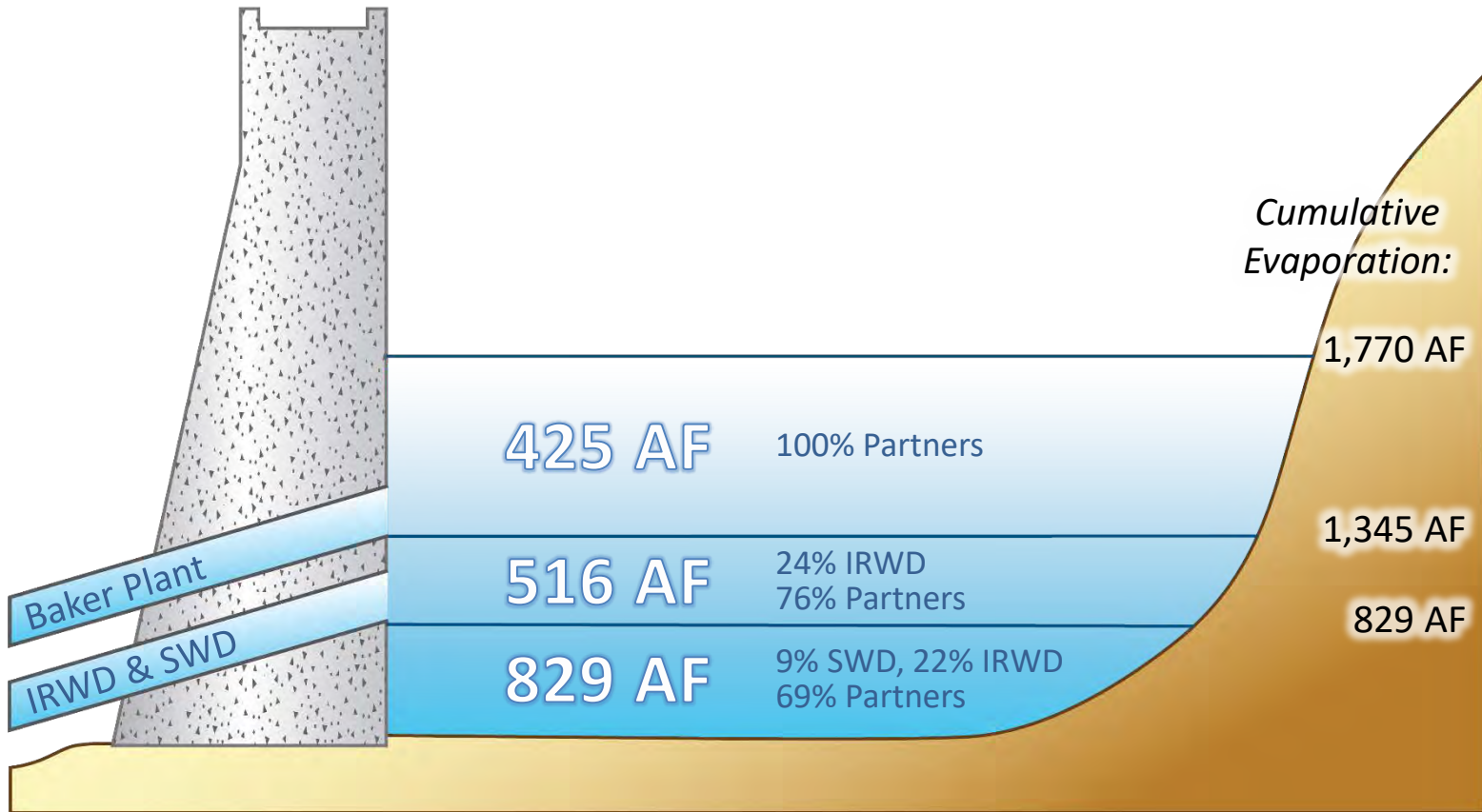
## Cost Components

	<u>Cost per Acre Foot</u>
Annual Maintenance (AMC)	\$93
Lake Desilting (\$34.4M)	16
Spillway Repair (\$25.0M)	20
Tower Replacement (\$16.0M)	13
Other replacement - includes concrete repair, sliplining (\$2.5M) & contrls and instrmnts (\$3.2M)	7
<b>Total Cost per Acre Foot</b>	<b>\$149</b>

# Irvine Lake Proposed Storage Pools



# Average Annual Evaporation Allocations



*Note: Evaporation quantities based on actual evaporation and average weather conditions.*

# Evaporation

<b>Average Annual Evaporation Allocation (AF)</b>					
<b>Agencies</b>	<b>Lake Dead Pool</b>	<b>Baker Dead Pool</b>	<b>Supply Pool</b>	<b>Total</b>	<b>Emergency Supply (\$/AF)</b>
<b>Serrano WD</b>	72			72	\$105
<b>Irvine Ranch WD</b>	186	126		312	\$175
<b>Santa Margarita WD</b>	229	156	170	555	\$254
<b>Moulton Niguel WD</b>	229	156	170	555	\$254
<b>El Toro WD</b>	85	58	64	207	\$254
<b>Trabuco Canyon WD</b>	28	20	21	69	\$254
<b>Total (AF)</b>	829	516	425	1,770	



# Baker Cost per Acre Foot without Program

## Estimated Average Cost to Produce an Acre Foot of Water from Baker

<b>Cost Components / AF</b>	<b>Year 1</b>	<b>Year 5</b>	<b>5 Year Average</b>
Water (MWDOC) (assume 4.1% growth)	\$731	\$858	\$793
Treatment (assume 3% growth)	\$197	\$222	\$209
<b>Total Cost / AF</b>	<b>\$928</b>	<b>\$1,080</b>	<b>\$1,002</b>

# Total Allocated Emergency Supply Cost

## 60 Day Emergency Supply Allocated to Baker Water over Five Years

<b>Additional Expense from Emergency Supply</b>	<b>Emergency Supply (in thousands)</b>	<b>\$/AF</b>
O & M / Facility (\$149 * 5 Yrs * 4,000 AF)	\$2,980	\$25
Evaporation (\$254 * 5 Yrs * 4,000 AF)	5,071	42
Evaporation for Deadpools after Program (\$47 * 4,000 AF)	189	2
<b>Total 5 Year Expense</b>	<b>\$8,240</b>	<b>\$69</b>
<b>Total Five Year Average Cost per Acre Foot from Baker</b>	<b>\$1,002</b>	
<b>Cost from Emergency Supply Allocated to 120,000 Acre Feet</b>	<b>\$69</b>	
<b>Average Cost per AF for Water and Emergency Supply</b>	<b>\$1,071</b>	

# Pilot Program Next Steps

- IRWD staff to meet with South County Agencies staff to present proposal.
- IRWD and SWD staff and legal counsel develop terms to amend the Irvine Lake operating agreement.
- IRWD and SWD staff discuss proposal and draft amendment with respective Boards.

Questions?

