

AGENDA
IRVINE RANCH WATER DISTRICT
ENGINEERING AND OPERATIONS COMMITTEE MEETING
TUESDAY, AUGUST 15, 2023

This meeting will be held in-person at the District’s headquarters located at 15600 Sand Canyon Avenue, Irvine, California. The meeting will also be broadcasted via Webex for those wanting to observe the meeting virtually.

To observe this meeting virtually, please join online using the link and information below:

Via Web: <https://irwd.webex.com/irwd/j.php?MTID=m7eeea55fc4330092bfc5d21c4d62fe0b>
Meeting Number (Access Code): 2483 578 3223
Meeting password: zj8V298ZQM

PLEASE NOTE: Webex observers of the meeting will be placed into the Webex lobby when the Board enters closed session. Participants who remain in the “lobby” will automatically be returned to the open session of the Board once the closed session has concluded. Observers joining the meeting while the Board is in closed session will receive a notice that the meeting has been locked. They will be able to observe the meeting once the closed session has concluded.

CALL TO ORDER 1:30 p.m.

ATTENDANCE Committee Chair: Doug Reinhart _____
Alt. Committee Member: John Withers _____

ALSO PRESENT Paul Cook _____ Kevin Burton _____ Wendy Chambers _____
Jose Zepeda _____ Paul Weghorst _____ Cheryl Clary _____
Steve Choi _____ Jim Colston _____ Fiona Sanchez _____
Rich Mori _____ Eric Akiyoshi _____ Jacob Moeder _____
Malcolm Cortez _____ Ken Pfister _____ Harry Cho _____
Alex Murphy _____ Kent Morris _____ _____ _____

PUBLIC COMMENT NOTICE

If you wish to address the Committee on any item, please submit a request to speak via the “chat” feature available when joining the meeting virtually. Remarks are limited to three minutes per speaker on each subject. Public comments are limited to three minutes per speaker on each subject. You may also submit a public comment in advance of the meeting by emailing comments@irwd.com before 9:00 a.m. on Tuesday, August 15, 2023.

COMMUNICATIONS

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

INFORMATION

- | | |
|---|--|
| <ol style="list-style-type: none">4. <u>UPCOMING PROJECTS STATUS REPORT – AKIYOSHI / CORTEZ / MOEDER / MORI / BURTON</u>
Recommendation: Receive and file.5. <u>SYPHON RESERVOIR IMPROVEMENT PROJECT FINANCIAL ANALYSIS AND DESIGN UPDATE – AKIYOSHI / MORI / BURTON</u> Recommendation:
Receive and file. | |
|---|--|

OTHER BUSINESS


6. Directors' Comments
7. Adjournment

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 electronically via the Webex meeting noted. Upon request, the District will provide for written agenda materials in appropriate alternative formats, and reasonable disability-related modification or accommodation to enable individuals with disabilities to participate in and provide comments at public meetings. Please submit a request, including your name, phone number and/or email address, and a description of the modification, accommodation, or alternative format requested at least two days before the meeting. Requests should be emailed to comments@irwd.com. Requests made by mail must be received at least two days before the meeting. Requests will be granted whenever possible and resolved in favor of accessibility.

August 15, 2023

Prepared by: E. Akiyoshi / M. Cortez /
J. Moeder / R. Mori

Submitted by: K. Burton

Approved by: Paul A. Cook 

ENGINEERING AND OPERATIONS COMMITTEE

UPCOMING PROJECTS STATUS REPORT

SUMMARY:

A status report of Irvine Ranch Water District's Upcoming Projects is presented to the Committee for information.

BACKGROUND:

The information, which is provided as Exhibit "A", is a status report submitted quarterly to the Committee for review.

FISCAL IMPACTS:

Not applicable.

ENVIRONMENTAL COMPLIANCE:

Not applicable.

RECOMMENDATION:

Receive and file.

LIST OF EXHIBITS:

Exhibit "A" – Upcoming Projects Status Report

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Exhibit "A"
UPCOMING PROJECTS STATUS REPORT

Project Name	Planning	Design	Construction	Construction
				Final Acceptance
UCI Meter Vault Replacement	In-Process	Aug-23	-	-
SR 133 - 36" Trunk Sewer Protection	Completed	In-Process	Dec-23	-
Coastal Z2 and Z4 Pump Stations Rehabilitation	Completed	In-Process	Jan-24	-
Silverado Bridge 174 DW Improvements	Completed	In-Process	Dec-23	-
Silverado Bridge 175 DW Improvements	Completed	In-Process	Apr-24	-
Woodbridge RW Replacement	Completed	Completed	In-Process	Oct-23
MWRP MPS-2 Pump Bases Replacement	Completed	In-Process	Oct-23	-
MWRP Biosolids Lift Station and Sewer Improvement	In-Process	Sep-23	-	-
Serrano Creek Raw Water Pipeline Replacement	Completed	In-Process	Sep-23	-
Radio Tower Improvements	In-Process	Sep-23	-	-
MWRP Solids Force Main Relocation	Completed	Completed	In-Process	Jan-24
Lake Forest Woods Sewer Improvements	Completed	In-Process	Jan-24	-
Santiago Canyon Pump Station Improvements	Completed	Completed	In-Process	Oct-24
Turtle Rock Chloramine Booster Station	Completed	Completed	In-Process	Mar-24
MWRP Compressed Natural Gas and Diesel/Gasoline Fueling Station	Completed	Completed	In-Process	Feb-24
MWRP Tertiary Filter Rehabilitation	Completed	Completed	May-23	Nov-25
Operations Center Purchasing Warehouse	Completed	In-Process	Oct-23	-
Wells 10 and 12, IDP Well ET-1 Rehabilitation	Completed	Completed	In-Process	Jan-24
Irvine Desalter Well Rehabilitation (Wells 76, 110, 106, 115R, ET2)	Completed	In-Process	Nov-23	-
Dyer Road Wellfield Facility Rehabilitation Group 1	In-Process	Nov-23	-	-
Santiago Creek Dam Outlet Tower and Spillway Improvements	Completed	In-Process	Dec-24	-
Rattlesnake Dam Risk Reduction Investigation	Completed	In-Process	-	-
Santiago Canyon Fleming Zone 8 Tank and Zone 8-9 BPS	Completed	Completed	In-Process	Jan-25
Generator Fuel Storage Upgrades	Completed	In-Process	Oct-23	-
Orange Heights Zone 6 Reservoir	Completed	On-Hold	-	-
Sewer Siphon Improvements Phase II	Completed	In-Process	Jan-24	-
Wells 51 and 52 Wellhead Equipping and Offsite Pipelines	In-Process	Dec-23	-	-
San Joaquin Reservoir Filtration	Completed	Completed	In-Process	Aug-24
Well OPA-1 PFAS Treatment	Completed	Completed	In-Process	Nov-23
Well ET-1 and SGU PFAS Treatment	Completed	Completed	In-Process	Dec-23
Zone A to Rattlesnake Reservoir BPS	Completed	Completed	In-Process	Dec-23
Orange Heights SAC/Baker Pipeline Relocation	Completed	Completed	On-Hold	-
MWRP Phase 3 Expansion	In-Process	Dec-23	-	-
Orange Heights Zn 5 to 6 and C+ to E Pump Stations	Completed	On-Hold	-	-
Syphon Reservoir Improvements	Completed	In-Process	Dec-24	-
Syphon Reservoir Intersection Improvements and Access Road	Completed	Completed	Sep-23	Sep-24
Lake Forest Zone B-C BPS	Completed	Completed	In-Process	Nov-23
East Irvine Zone 3 to 4 Pump Station Rehabilitation	In-Process	Nov-23	-	-
MWRP Service A Replacement	Completed	Completed	In-Process	Nov-23


UPCOMING PROJECTS STATUS REPORT

Project Name	Planning	Design	Construction	Construction
				Final Acceptance
Enterprise RW Pipeline Replacement	Completed	Completed	Sep-23	Mar-24
PA 1, Jeffrey Road Extension RW and DW (RA w/CDC)	Completed	Completed	In-Process	Dec-23
PA 51, District 5, F and N St DW, RW	Completed	Completed	In-Process	Aug-23
PA 51, District 5, Astor DW, RW (RA w/Heritage Fields)	Completed	Completed	In-Process	Dec-23
PA 51, Marine Way from Alton Pkwy to Bake Pkwy DW, RW (RA w/Heritage Fields)	Completed	Completed	In-Process	Dec-23
PA 51, Marine Way at Bake Parkway DW (RA w/Heritage Fields)	Completed	Completed	In-Process	Dec-23
PA 51, Serrano Creek Sewer Relocation	Completed	Completed	In-Process	Dec-23
PA 51, District 5 South Harrier DW, SS, RW (RA with Heritage Fields)	Completed	Completed	In-Process	Dec-23
PA 51, District 5 South Chinon DW, RW (RA with Heritage Fields)	Completed	Completed	In-Process	Dec-23
PA 51 GP-5 from Skyhawk to Treble DW, SS, RW (RA with Heritage Fields)	Completed	Completed	In-Process	Dec-23
PA 51, Marine Way from Skyhawk to Treble DW, RW (RA with Heritage Fields)	Completed	Completed	In-Process	May-24
PA 51, Treble from GP5 to Marine Way DW, RW (RA with Heritage Fields)	Completed	Completed	Dec-23	Jun-25
PA 51 Lynx from Harrier to Marine Way DW, SS (RA with Heritage Fileds)	Completed	Completed	Dec-23	-
PA 1, Orchard Hills Neighborhood 4 DW (RA with TIC)	Completed	Completed	In-Process	Dec-23
PA 1, Orchard Hills Neighborhood 4 RW (RA with TIC)	Completed	Completed	In-Process	Dec-23
East Orange, Orange Heights Tract 16199 SS, RW	Completed	In-Process	Sep-23	-
East Orange, Orange Heights Tract 17995 DW, RW	Completed	In-Process	Sep-23	-
East Orange, Orange Heights Jamboree and Chapman DW SS, RW	Completed	In-Process	Sep-23	-
The Meadows, SS (RA w/Toll Brothers)	Completed	Completed	In-Process	Sep-23
PA 51, Whatney SS (RA with Heritage Fields)	Completed	In-Process	Jan-24	-
Irvine Business Complex Sidewalk Improvement Relocations	In-Process	In-Process	-	-
OCWD Basin Equity Assessment Annual Reporting	In-Process			
CIP Asset Management Phase II - Linear Asset Prioritization	In-Process	-	-	-
Lead and Copper Rule Revision - Lead Pipe Inventory	In-Process	Oct-24	-	-
GIS Master Plan Implementation - Field Mapplet 9 to 10 Upgrade	In-Process	-	-	-
GIS Master Plan Implementation - Data Model Upgrade	In-Process	-	-	-

August 15, 2023

Prepared by: E. Akiyoshi / R. Mori

Submitted by: K. Burton

Approved by: Paul A. Cook 

ENGINEERING AND OPERATIONS COMMITTEE

SYPHON RESERVOIR IMPROVEMENT PROJECT FINANCIAL ANALYSIS AND DESIGN UPDATE

SUMMARY:

The District's engineering design consultant AECOM has completed the 60% design which includes the 60% construction plans and updated project cost estimates. The major project facilities include the zoned earthen embankment dam, spillway, sloped inlet/outlet, reservoir water quality management system, and algae filtration and disinfection systems. Staff will provide a presentation that includes an updated financial analysis and a summary of the overall scope of the project and the status of the design.

BACKGROUND:

Improvements to the Syphon Reservoir are needed to resolve challenges associated with having inadequate seasonal storage for recycled water. Each year, recycled water demands fluctuate considerably due to variations in weather patterns. IRWD's recycled water storage reservoirs allow IRWD to store surplus recycled water produced at IRWD's treatment plants during periods of low demand, generally in winter, and then use the storage during periods of high demand, generally in summer. Without adequate seasonal storage, the excess recycled water supplies during winter are lost to ocean disposal, and IRWD must then purchase costly supplemental imported water to meet summer demands.

In 2020, IRWD contracted with AECOM to design improvements to the Syphon Reservoir that would expand the storage capacity of the reservoir to 5,120-acre feet to meet the projected seasonal storage needs. AECOM has completed the 60% design which includes the 60% construction plans and updated project cost estimates. The major project facilities include the zoned earthen embankment dam, spillway, sloped inlet/outlet, reservoir water quality management system, and algae filtration and disinfection systems. With the 60% design complete, AECOM anticipates submitting the final design submittal by May 2024.

At the Committee meeting, staff will provide a presentation that includes an updated financial analysis and a summary of the overall scope of the project and the status of the design. The draft presentation is provided as Exhibit "A".

FISCAL IMPACTS:

The updated financial analysis of the project will be presented at the Committee meeting.

ENVIRONMENTAL COMPLIANCE:

Not applicable.

Engineering and Operations Committee: Syphon Reservoir Improvement Project Financial
Analysis and Design Update

August 15, 2023

Page 2

RECOMMENDATION:

Receive and file.

LIST OF EXHIBITS:

Exhibit "A" – 2023 Syphon Reservoir Improvement Project Financial Analysis and Design
Update Draft Presentation



SYPHON RESERVOIR IMPROVEMENT PROJECT

FINANCIAL ANALYSIS AND 60% DESIGN UPDATE

ENGINEERING AND OPERATIONS COMMITTEE



AUGUST 15, 2023

DRAFT ¹

1

UPDATED ANALYSIS

- Strategic Alignment
- Background
- Updated Financial Analysis
- Design Update



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STRATEGIC ALIGNMENT

3) Develop water recycling facilities and applications for optimal benefit

- Maximize the amount of recycled water produced by IRWD for the benefit of IRWD customers
- Reduce recycled water discharges to the ocean

10) Evaluate and invest in projects and programs that will enhance future long-term water supply reliability and resiliency to climate change

- Improve local water supply reliability: reduce imported water purchases by storing and using additional recycled water
- Expand drought-proof sources of water under changing climate conditions

13) Ensure financial and rate stability

- Reduce diversions of sewage to OC San; minimize CORF / Equity payments to OC San
- Reduce MWD untreated water purchases



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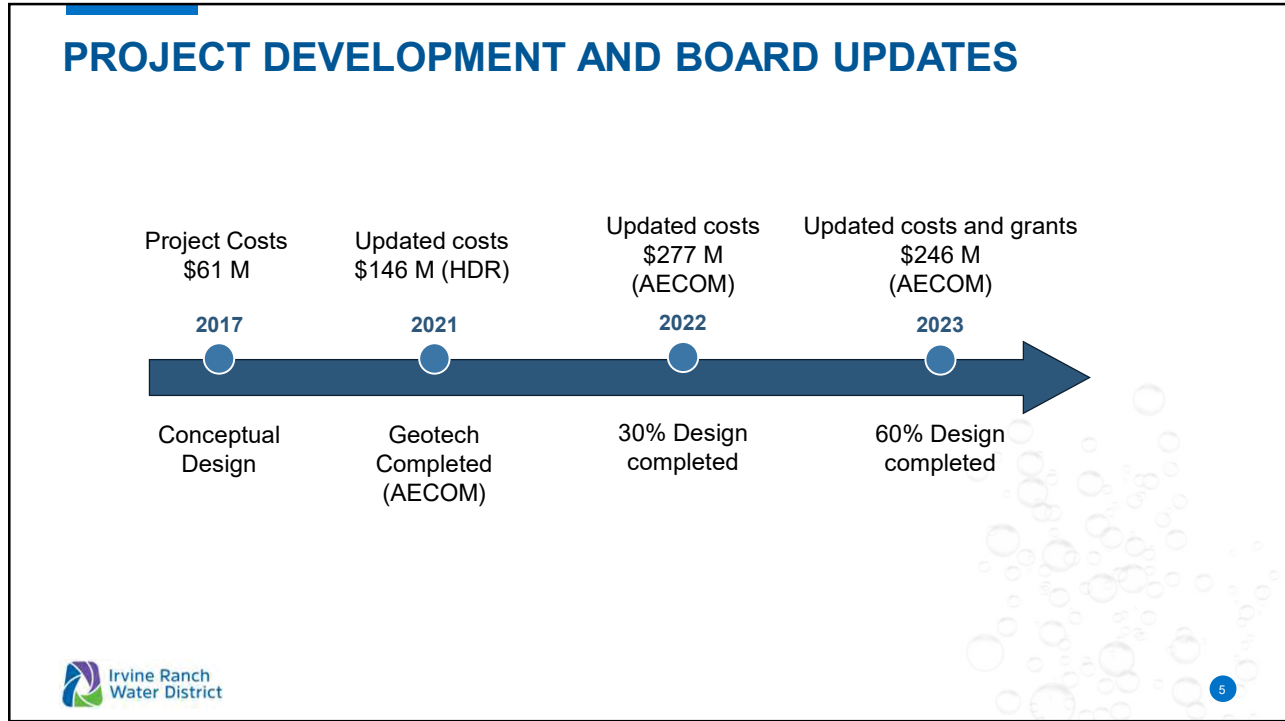
BACKGROUND



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Exhibit "A"



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SYPHON RESERVOIR EXPANSION PROJECT COSTS

Cost Component	30% Design 2022	60% Design 2023
Construction Cost	\$219 M	\$225 M
Environmental Restoration	\$17 M	\$21 M
Soft Cost	\$41 M	\$45 M
Subtotal	\$277 M	\$291 M
Grants		(\$45) M
Total Project Cost	\$277 M	\$246 M

Irvine Ranch Water District 6

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FINANCIAL ANALYSIS: KEY ASSUMPTIONS

MWRP Capacity at 28 MGD

Current Recycled Water Practices

GAP Alternative Reflects IRWD Replacement Practices

\$45 M in Syphon Grant Funding

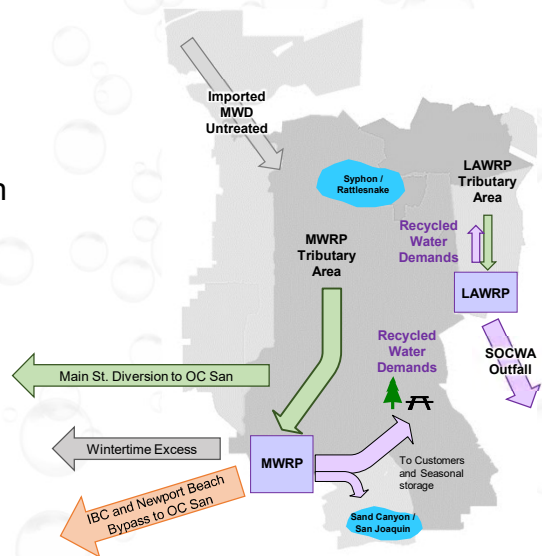


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SEASONAL STORAGE OVERVIEW

- Balances IRWD sewage flows with annual variations in recycled water demands
- Minimizes IRWD sewage disposal at OC San (CORF / Equity) and the South Orange County Water Authority ocean outfall
- Reduces amount of Metropolitan Water District untreated water purchased during peak summer season

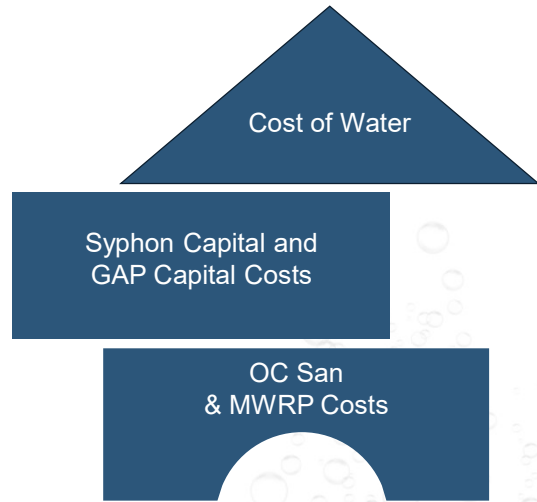


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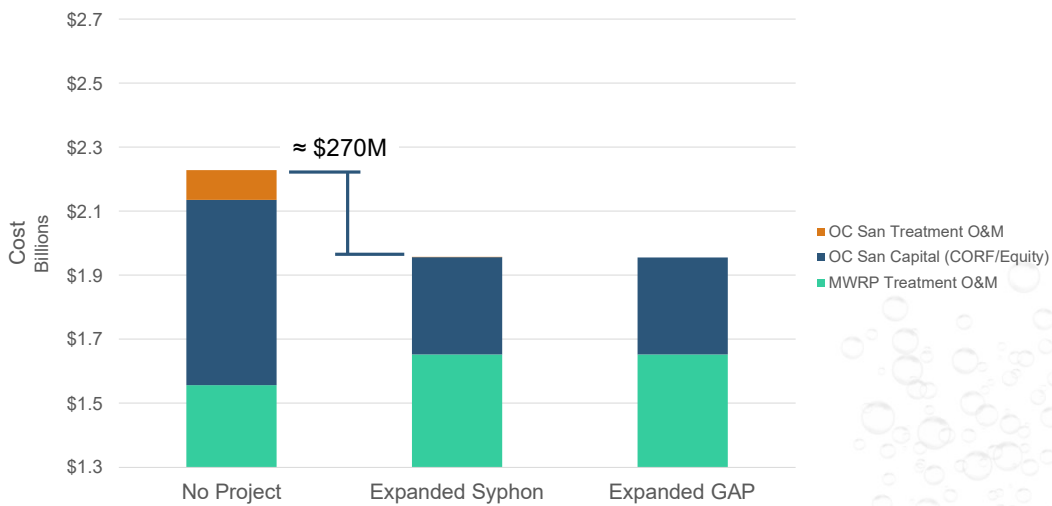
UPDATED FINANCIAL ANALYSIS

- Syphon capital costs at 60% design
 - Updated project cost to \$246M
- MWD untreated water escalation
 - Used 5.4% based on 50-years of published rates
 - Now 6.5% based on MWD published 2023-2032 rates
- GAP improvements capital costs
 - Updated based on ENR to \$143M
 - GAP replacement cost is consistent with IRWD replacement planning practices
- Facilities life cycle defined as 50 years
 - Earthen dam life cycle at 100+ years



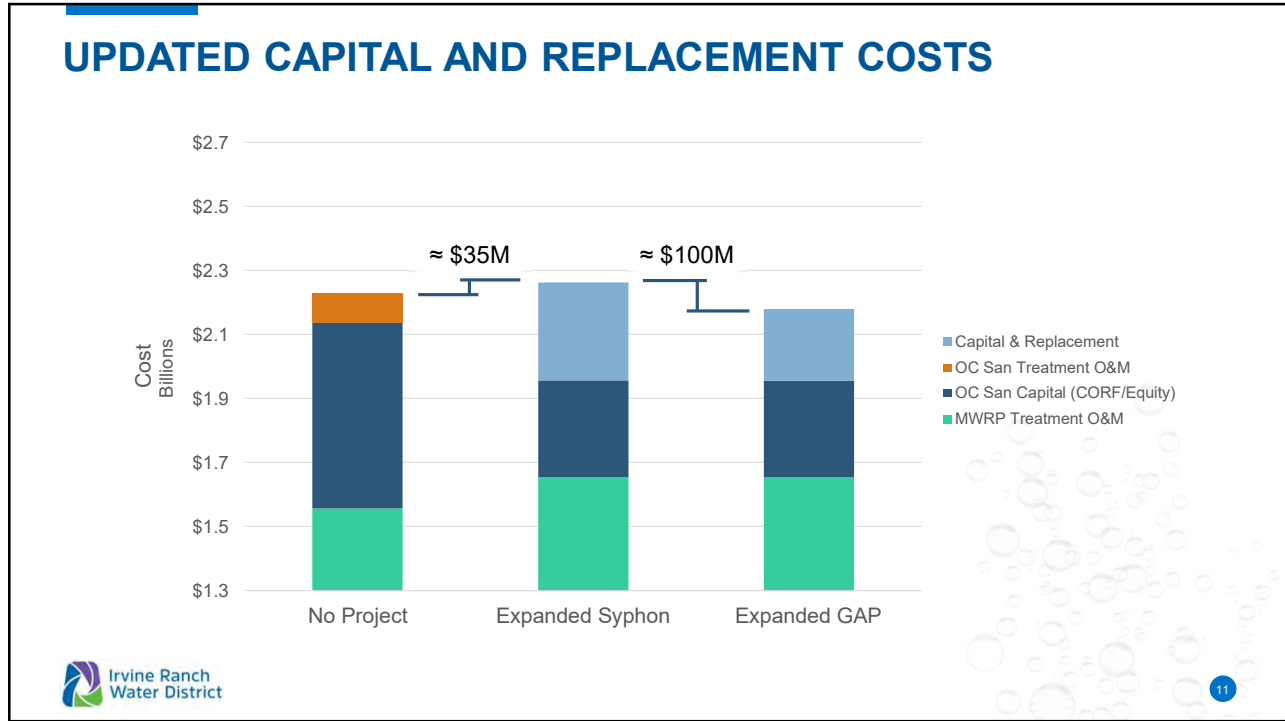
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OC SAN / MWRP TREATMENT COSTS

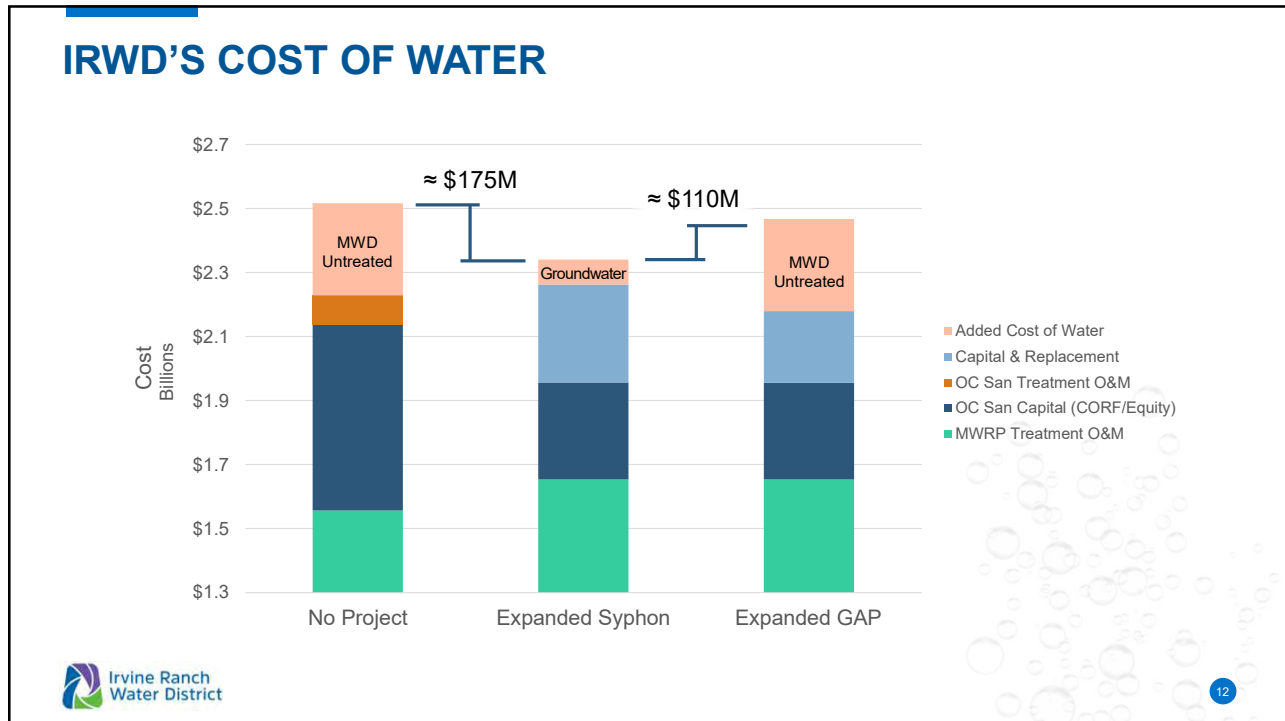


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Exhibit "A"



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CONCLUSIONS

Syphon Expansion remains the most cost-effective alternative

Syphon Expansion is financially responsible

Syphon Expansion is strategically aligned and environmentally responsible

Syphon Expansion adds certainty against an uncertain future



SYPHON RESERVOIR PROJECT UPDATE

AUGUST 15, 2023

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The slide features a dark blue background with a circular inset image showing an aerial view of a reservoir and a dam. The Irvine Ranch Water District logo is in the top right corner. The main text is centered on the right side, and a page number '14' is in the bottom right corner.

SYPHON RESERVOIR STORAGE CAPACITY



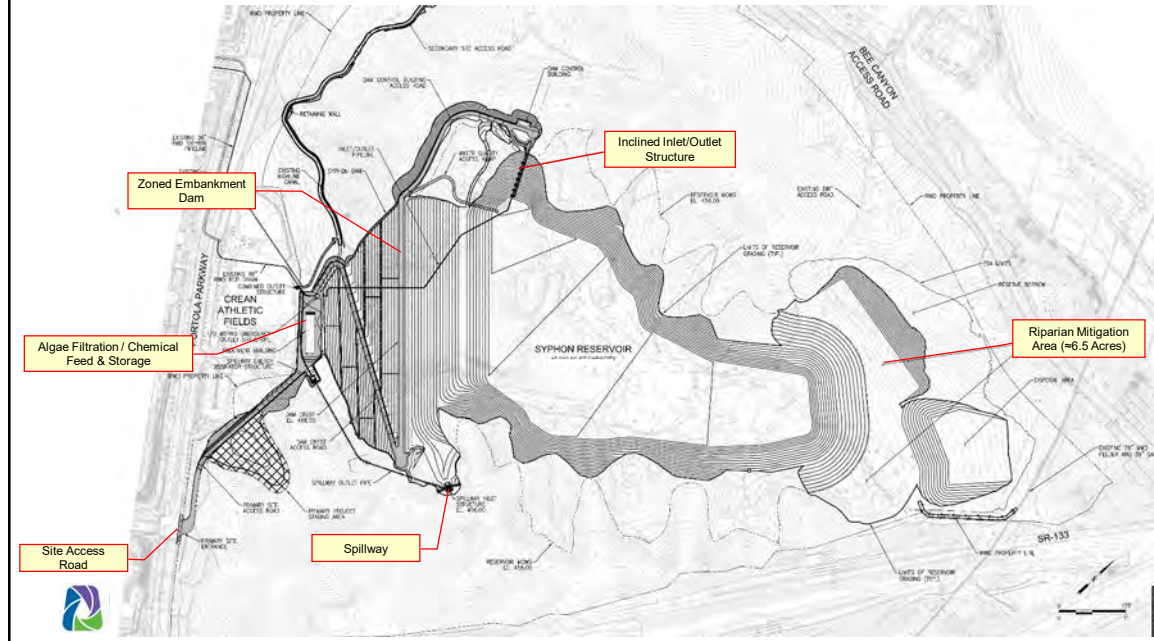
Existing Maximum Capacity – 500 Acre-Ft



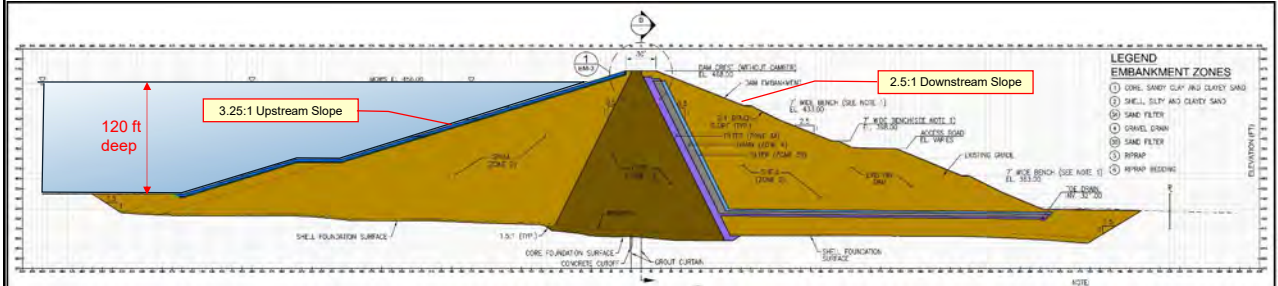
Proposed Maximum Capacity – 5,120 Acre-Ft



PROJECT OVERVIEW



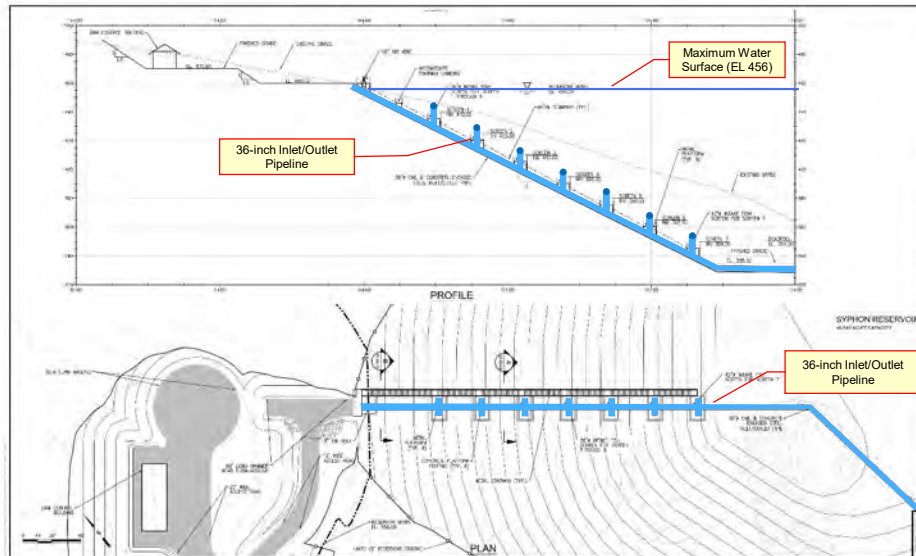
ZONED EMBANKMENT DAM – CROSS SECTION



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INCLINED INLET/OUTLET STRUCTURE

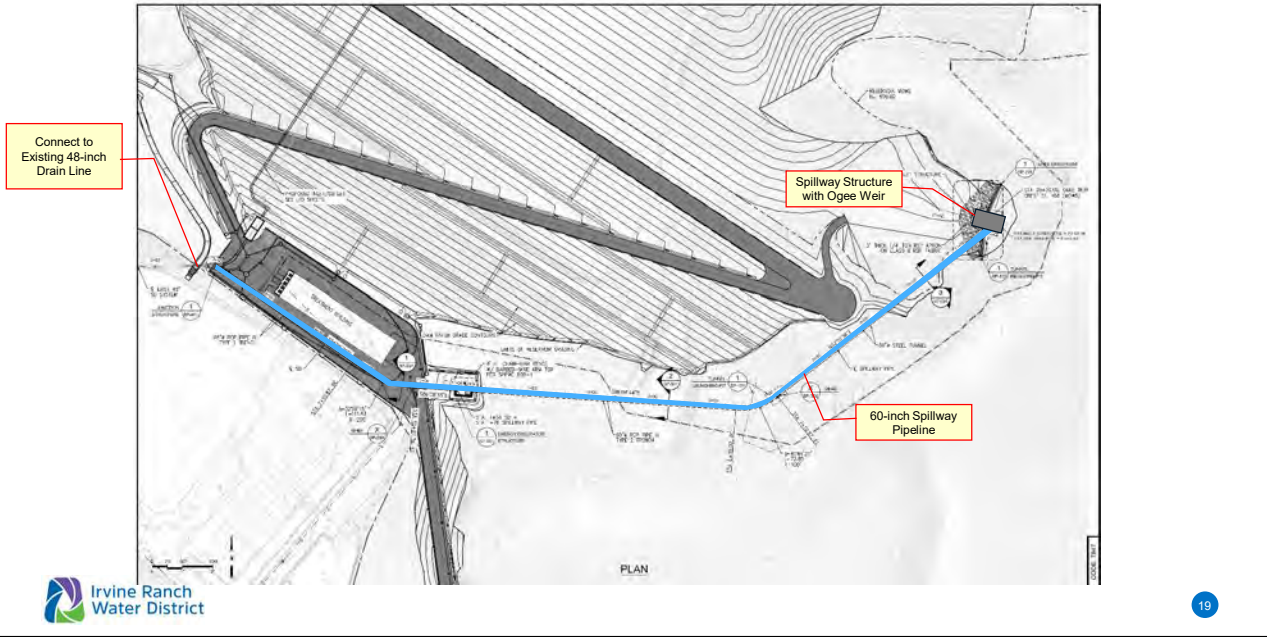


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Exhibit "A"

SPILLWAY STRUCTURE AND PIPELINE



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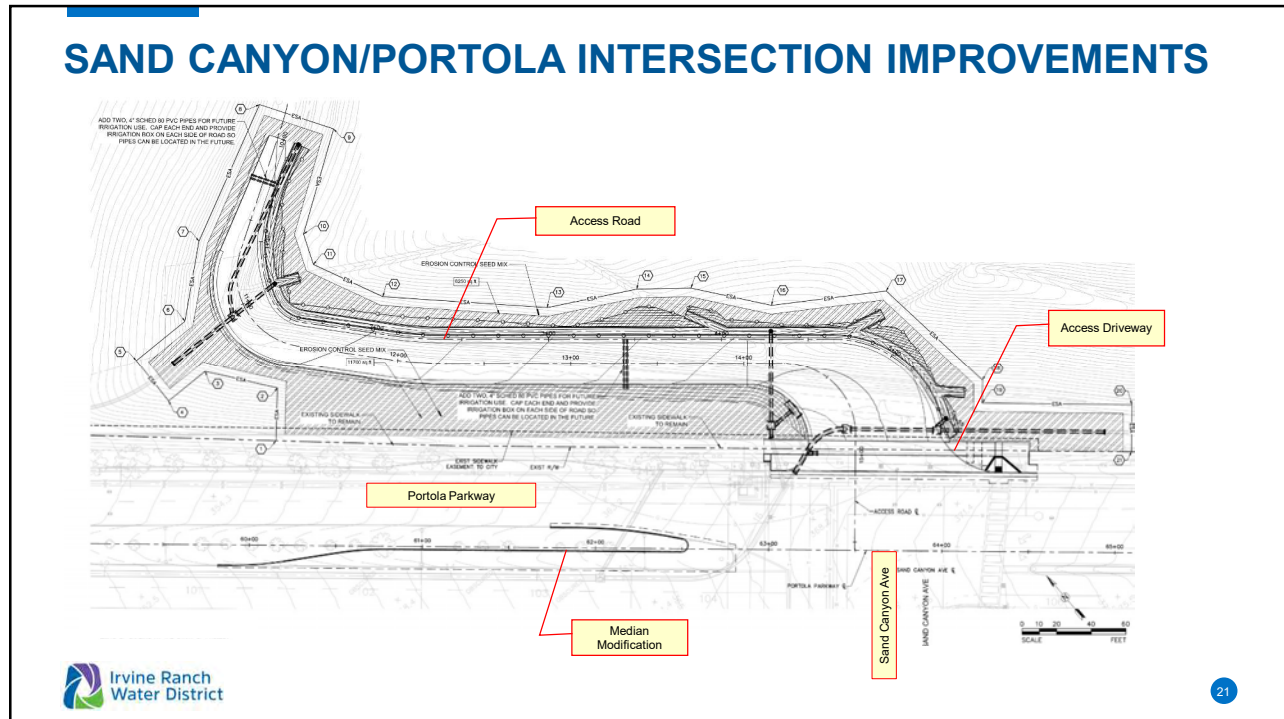
SAND CANYON/PORTOLA INTERSECTION IMPROVEMENTS

- Modify intersection for a new driveway into the site for
 - Construction activities
 - IRWD operations
- Modify the existing median to accommodate an east-bound left turn into the site
- Construct early to establish construction access prior to reservoir contractor mobilization



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Exhibit "A"



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PROJECT STATUS – 60% DESIGN RISK WORKSHOP

- 60% Design Risk Workshop facilitated by HDR (three days) in July
 - Reviewed geologic/geotechnical information, analyses, design reports, and drawings
 - Reviewed hydrologic and seismic hazard loading conditions
- Discussed Potential Failure Modes (PFMs)
 - Developed and screened 45 different PFMs
 - Characterized several PFMs as clearly negligible due to defensive design features
 - Performed semi-quantitative risk analysis (SQRA) and quantitative risk analysis (QRA) on “carried forward” PFMs
- Conclusions
 - 60% design is robust and modern dam design eliminates many PFMs
 - IRWD is effectively managing dam safety risk

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Exhibit "A"

PROJECT STATUS – 60% DESIGN: INDEPENDENT DESIGN & SAFETY REVIEW PANEL (IDSRP)

- A five-day workshop held in late July provided independent, third-party peer review of the engineering analyses, design, and overall safety of the project
- IDSRP provided several items for consideration:
 1. Consider potential impacts of embankment deformation on the facilities at the downstream toe
 2. Consider alternatives to concrete seepage partition walls within the embankment
 3. Consider additional design detailing and construction sequencing where the inlet/outlet pipeline intersects the grout cap beneath the dam
 4. Consider feasibility of a passive drainage system to handle stormwater during construction
 5. Consider that structures associated with the spillway and inlet/outlet facilities include instrumentation to detect movement
- IDSRP is pleased with the progress of the work and believes the project team has done an excellent job developing the 60% design



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PROJECT STATUS

- 60% Design Completed – May 2023
- Syphon Access Road Improvements Bid Opening – August 2023
- AECOM Complete 90% Design – December 2023



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SCHEDULE – PROJECT MILESTONES

Syphon Reservoir Improvements:

Preliminary Design Report and 30% Design Submittal	June 2022 (Completed)
Final Design Report and 60% Design Submittal	May 2023 (Completed)
90% Design Submittal	December 2023
100% Design Submittal	May 2024
Final Bid Package Submittal	July 2024
Construction Bid Opening	October 2024
Construction Complete	May 2029

Site Access Road Improvements:

Final Bid Package Submittal	July 2023 (Completed)
Construction Bid Opening	August 22, 2023
Construction Award	September 11, 2023
Construction Complete	September 30, 2024



THANK YOU

