NOTICE OF A SPECIAL MEETING
OF THE BOARD OF DIRECTORS OF THE
OLIVENHAIN MUNICIPAL WATER DISTRICT
1966 Olivenhain Road, Encinitas, CA 92024
Tel: (760) 753-6466 • Fax: (760) 753-5640

Pursuant to AB3035, effective January 1, 2003, any person who requires a disability related modification or accommodation in order to participate in a public meeting shall make such a request in writing to Stephanie Kaufmann, Executive Secretary, for immediate consideration.

DATE: WEDNESDAY, MAY 31, 2023

TIME: 4:00 P.M.

PLACE: DISTRICT OFFICE

NOTE: ITEMS ON THE AGENDA MAY BE TAKEN OUT OF SEQUENTIAL ORDER AS THEIR PRIORITY IS DETERMINED BY THE BOARD OF DIRECTORS

1. CALL TO ORDER
2. PLEDGE OF ALLEGIANCE
3. ROLL CALL
4. DETERMINATION OF A QUORUM
5. ADOPTION OF AGENDA
6. PERSONAL APPEARANCES AND PUBLIC COMMENTS
7. CONSIDER A PRESENTATION ON THE RESULTS OF RECENT INVESTIGATIONS FOR THE SAN DIEGUITO VALLEY BRACKISH GROUNDWATER DESALINATION PROJECT AND DISCUSSION OF FUTURE STEPS (INFORMATIONAL ITEM)
8. CONSIDER PUBLIC COMMENTS
9. CLOSED SESSION

   A) POTENTIAL LITIGATION – ONE POTENTIAL CASE [PURSUANT TO GOVERNMENT CODE SECTION 54956.9 (d)(2)]

10. OPEN SESSION
11. ADJOURNMENT

Agenda Item 7

OLIVENHAIN
Municipal Water District

Memo

Date: May 31, 2023

To: Olivenhain Municipal Water District Board of Directors

From: Joey Randall, Assistant General Manager

Via: Kimberly A. Thorner, General Manager

Subject: **CONSIDER A PRESENTATION ON THE RESULTS OF RECENT INVESTIGATIONS FOR THE SAN DIEGUITO VALLEY BRACKISH GROUNDWATER DESALINATION PROJECT AND DISCUSSION OF FUTURE STEPS**

Purpose

The purpose of this agenda item is to brief the Board on the results of recent hydrogeologic investigations, the groundwater level monitoring program, the status of Lake Hodges, project economics, and interagency coordination with regard to the San Dieguito Brackish Groundwater Desalination Project. This item will also brief the Board on planned activities for FY 2024. The workshop is intended to provide an opportunity for Board questions, discussion, and input related to the project.

Recommendation

Staff recommends the Board consider the information presented, ask questions, discuss the project, and provide staff with input on future work plans.

Alternative(s)

None, this is an opportunity for Board discussion.

Background

OMWD receives 100 percent of its potable water supply as imported water from the San Diego County Water Authority (SDCWA). The main sources are the San Joaquin-Sacramento Bay-Delta, and the Colorado River. These sources are distant from OMWD and face regulatory, drought, and climate-change challenges. For these reasons, OMWD has been investigating opportunities to diversify its water supply portfolio by developing supplies that are locally controlled, reliable, and cost-competitive. Currently, local potable supply opportunities include desalinated seawater and brackish groundwater desalination.

In 2008, the Board directed staff to investigate brackish groundwater desalination opportunities instead of purchasing potable water directly from the Carlsbad Seawater Desalination Plant. The direction at that time was to seek brackish desalination opportunities within OMWD's control at cost equal to or less than the cost of Carlsbad desalinated water, which OMWD had been a partner in and could have elected to receive.

A 2010 opportunities and constraints report identified brackish groundwater desalination opportunities in both the San Elijo and San Dieguito Groundwater basins.

OMWD received United States Bureau of Reclamation funding and, in 2016, finalized a feasibility report that concluded the San Elijo Basin was potentially feasible as a source of potable supply, pending additional hydrogeologic and environmental investigations. The San Elijo Basin remains a potential source of supply. However, there appear to be significant challenges related to groundwater extraction and avoidance of environmental impacts. As a result, staff shifted the focus of further studies to the San Dieguito Groundwater Basin.

OMWD was awarded State of California grant funding and in 2017 completed a feasibility study of the San Dieguito Basin. The study concluded that the project was technically feasible and that potable water could be produced at a cost that was less than desalinated seawater, and competitive with imported water.

OMWD was awarded additional State of California and Metropolitan Water District of Southern California grant funding and in 2020 completed a 12-month pump test in the San Dieguito Basin. The resultant 2021 Hydrogeologic Report confirmed the feasibility study results, identifying only minor impacts to the groundwater basin storage and mitigable impacts to local wells. The results were presented to the Board in April 2021 and to stakeholders and public a week later.

On March 30, 2022, a special meeting of the Board of Directors was held to consider a presentation on the results of investigations in the previous year. OMWD consultants made a presentation on legal, regulatory and environmental analysis related to the project. The key conclusion was that there are clear paths forward for environmental and regulatory compliance and permitting. OMWD consultants also presented an economic analysis of the project, and the benefits derived from comparing it to continuing to buy water from SDCWA. With reasonable assumptions for the input variables, the project has an estimated financial benefit of $18 million over 30 years, when compared to status quo SDCWA purchases. These results indicate the project has strong potential and supported the continuation of project planning to reduce uncertainties. At the Special Board Meeting, staff identified several investigations that would be conducted in fiscal year 2023.

Fiscal Impact

The work completed in fiscal year 2023 and planned for fiscal year 2024 is included in the Board-approved budget.

Is this a Multi Fiscal Year Project? **Yes**

In which FY did this capital project first appear in the CIP budget? **2007**

Board Approved Total Project Budget: **$42,837,000**

Total Grant Funding Received: **$1,370,000**

Current Fiscal Year Appropriation: **$700,000**

To-Date Approved Appropriations: **$4,562,000**

Expenditures and Encumbrances as of May 11, 2023: **$4,567,641**
(this includes Desal Partners/San Elijo Well carryforward expenditures)

Discussion

The San Dieguito Valley Brackish Groundwater Desalination Project is OMWD's largest current potential capital project, with a Board-approved budget of more than $42 million. The budget is discussed in more detail later in this memorandum. The project supports OMWD's historical goal of obtaining one-third of its water supply from local sources, when combined with our recycled water supply.

Preliminary results are now available from the investigations conducted in fiscal year 2023, and are discussed in detail below.

Hydrogeologic Investigations

Geoscience Support Services, Inc. has been OMWD's hydrogeologic consultant since the 2017 feasibility study. During FY 2023, the hydrogeologic investigations focused on two main areas:

- Geophysical Work to further refine the configuration of the groundwater basin for 1) refining the groundwater model layer thickness and assessing potential optimal well sites, and 2) understanding the bedrock system as part of the water rights analysis.
- An estimation of return flows from imported water usage to the groundwater basin. Return flow is that portion of water supplied by OMWD, Santa Fe Irrigation District (SFID), City of San Diego (City), and City of Del Mar (Del Mar) to their customers, that flows past the landscape root zone and recharges the groundwater. It can be a result of irrigation or septic tank discharges.

Geoscience initially recommended several areas for well sites based on desktop studies performed for the feasibility study. To better locate the optimal well sites, the San Dieguito Groundwater Basin model needs to be updated (as part of the proposed FY 2024 activities described in the sections below) by possibly adding another layer for the bedrock formation, refining thicknesses for the identified aquifers (model layers) and aquifer parameters. All these model update tasks require additional data collection including the geophysical investigations being conducted in this FY 2023.

Geoscience was provided notice to proceed to conduct geophysical investigations in April 2023, and the investigations have been conducted this month (May 2023) in order to develop further data on the groundwater basin. All data developed to date will be used to select sites for borehole investigations to collect physical data to evaluate the capacity of the aquifer and product water qualities. The geophysical investigations consisted of

seismic reflection and electrical resistivity surveys along lines across the basin. The original scope includes three lines, but it was later increased to six lines at no additional costs to the entire project budget. The two methods were selected to collect a suite of data required for the basin assessment. For the seismic reflection method, a hammer is dropped on a plate, and recording devices along the line measure the response time for the sound wave to move through the ground. Through this technique, the depth to clay layers and bedrock can be estimated and used to define the overall basin boundaries. The work will also include Sting Electrical Resistivity Tomography. Resistivity methods work on the principle that different earth materials will respond differently to electrical currents passed through the ground. The work will analyze the resistivity of various rock/soil layers underground to determine the thickness and lateral extent of each unit. Depending on progress, staff may report on the findings from the geophysical work.

Geoscience has completed a refined estimate of return flow in the watershed that recharged to the groundwater basin, based upon meter records from OMWD, SFID, and the City of Del Mar. Return flow of foreign/imported water is also known as *San Fernando* water rights, after the California Supreme Court decision that recognized such rights. Return flow from imported or "foreign" water may be reclaimed by the supplying agency under most circumstances. The current estimate of return flows is summarized below in acre-feet per year (AFY):

OMWD	1,050
SFID	800
City of San Diego	400
City of Del Mar	100
Total	2,350

Using the factors described in the next section, if all of this return flow could be recovered, it would equate to potable water production of approximately 1.8 MGD.

Project Capacity

At a minimum, the San Dieguito Valley Brackish Groundwater Desalination Project has been envisioned as a 1.0 million gallon per day (MGD) capacity project. Based on similar projects, smaller capacities were not thought to be cost-effective. However, it is known that larger projects would increase benefits and cost-effectiveness through efficiencies and economies of scale.

Throughout the course of the economic analysis, the project team started to look into these concepts in more detail. When the economic model was constructed and the

team was able to perform “what if” scenarios, a 1.3 MGD project was determined to have significantly better benefits than a 1.0 MGD project. Not only were cost increases associated with a larger project determined to be reasonable, but the hydrogeologic study determined that the additional increment of water was available to be extracted from the basin with little impact. Updated hydrogeologic information indicates that there is surplus water available to support a 1.5 MGD project, and this capacity is used in the new updated economic analysis to illustrate the associated benefits. There remain water rights investigations, inter-agency coordination, and regulatory processes to formally adopt this capacity, or some other capacity, as the Project capacity.

Brackish groundwater desalination plants need to be shut down periodically for equipment maintenance, repair, and replacement. The team set aside three weeks per year for this activity such that the plant would be operational 94 percent of the time. Reverse osmosis membranes typically have an efficiency in the low 80s percent, meaning that for every 100 acre-feet (AF) of raw water supply, 80 AF of potable water is produced. The 1.5 MGD project capacity calculations follow:

- Plant Capacity = 1.5 MGD
- Annual Production = 1,680 x 0.94 = 1,580 (AFY), rounded to 1,600 AFY.
- Raw Water Required = 1,580/0.8 = 1,980 AFY, rounded to 2,000 AFY

<u>Economic Analysis</u>

Doug Gillingham, of Gillingham Water Planning and Engineering, Inc, has prepared the economic analysis framework. There are two areas where Gillingham Water provides special expertise that is unique and particularly valuable to OMWD: economic analysis, and clear, well-documented decision support to management and the Board.

Gillingham Water has recently assisted several water agencies with economic analysis and decision support for important water infrastructure including:

- $5B SDCWA Regional Conveyance System
  (OMWD Board presentation, August 19, 2020)
- $130M - $150M Vista Flume Replacement for Vista Irrigation District
- $100M+ Water Supply Alternatives for Sweetwater Authority

Additionally, it prepared a feasibility study of the Mission Valley Brackish Groundwater Desalination Project for the City of San Diego and were the lead author for the San Diego Formation Groundwater Sustainability Plan.

Gillingham Water has provided assistance to OMWD with several aspects of the studies for both the San Elijo and San Dieguito groundwater basins. The scope of the Economic Analysis conducted in FY 2023 includes:

- Review of typical OMWD financial planning assumptions
- Construction of a spreadsheet model
- Development of planning scenarios and economic analysis
- Sensitivity testing of input variables
- Feasibility assessment
- Summary memorandum

The key conclusions from the economic analysis are:

1. Project benefits are derived from comparing the project to continuing to buy water from SDCWA. SDCWA's mid-range rate forecast is a key assumption in the economic model.
2. The economic analysis is particularly sensitive to the project production capacity. The hydrogeologic analysis was based on a groundwater production of 2,000 acre-feet per year, which will support 1.5 million gallons per day (MGD) of potable water production. 1.5 MGD is assumed in the economic analysis.
3. With reasonable assumptions for the input variables, including an assumption of $13.5 million in grant funding and a conservative amount of receiving only ½ the amount of potential MWD Local Resources Project funding, the project has an estimated $31 million benefit over 30 years, when compared to SDCWA purchases. $13.5 million in grant funding is reasonable and conservative as the Bureau of Reclamation's Title XVI program alone allows for grants up to 25 percent of the total project cost. There are also other funding programs available at both the state and federal levels. Even with no grant funding, the project has an estimated benefit of $19 million over 30 years.
4. Sensitivity Testing: The economic analysis has included sensitivity testing of key input variables, to test the robustness of the finding that the project is economically advantageous. Changing any of the key inputs individually to pessimistic settings reduces but does not eliminate the economic advantage of the project; multiple inputs need to be set concurrently to pessimistic levels before the project loses its advantage. Conversely, adjusting inputs to more optimistic levels increases the project's economic advantage.
5. With the proposed increase in Project capacity there are increased costs for pipelines to deliver the water for distribution. As a result, the anticipated total project cost for a 1.5 mgd production plant is$54 million, exclusive of costs through fiscal year 2023. Staff will continue to seek project financial partnerships.
6. The potential cost and non-cost advantages of the Project support continuing with project planning, design, permitting, grant funding applications, and more.

Groundwater Level Monitoring Program Update

With the cooperation of well owners in the basin, OMWD has been monitoring pumping and groundwater levels and water quality at a network of 18 wells in the San Dieguito Valley since 2016. Continuous recorders and spot measurements are made and the data is downloaded quarterly. IKG Environmental performs the monitoring under contract to OMWD. The data is provided to Geoscience to support their work and will provide a base line for Sustainable Groundwater Management Act compliance, if the project moves forward. In the future, the data may also be provided to the State of California database.

Lake Hodges Update

Lake Hodges is formed by the Hodges Dam on the San Dieguito River constructed in 1918, upstream of the project groundwater basin. The dam and lake are owned and operated by the City of San Diego (City). The City, SFID, and San Dieguito Water District have rights to utilize the water. In addition, SDCWA owns and operates a pumped-storage project where water is pumped from Lake Hodges to Olivenhain Reservoir during times of low power usage, and then released back to Lake Hodges through turbines that generate power during peak power demand periods. The power is sold to San Diego Gas and Electric.

Recently, the California Department of Water Resources' Division of Safety of Dams has determined that the Lake Hodges Dam has deficiencies, and has ordered that the lake water level be kept below 280 feet. The dam spillway crest is set at an elevation of 315 feet. As a result of this order, SFID/SDWD can no longer take water from the lake, and SDCWA's pumped-storage project cannot operate. The City of San Diego is in the planning process for a new dam but expects it will take 12 or more years to complete.

The existing Hodges dam seeps water that ends up in the San Dieguito River, with a portion percolating into the groundwater basin, providing a portion of the basin's recharge in the water balance. With the construction of a new dam, the seepage should be greatly reduced and this will be taken into account in the future hydrogeologic work.

Interagency and Private Company Coordination and Potential Partnerships

OMWD has been coordinating with other governmental agencies and private companies in the San Dieguito Valley since 2016 to inform them of the project goals, seek input, and investigate partnership opportunities. Those groups include, but are not limited to:

- SFID
- Rancho Santa Fe, Whispering Palms, and Fairbanks Ranch Community Services Districts (CSD)
- City of San Diego (City)
- City of Del Mar (Del Mar)
- San Elijo Joint Powers Authority (SEJPA)
- Regional Water Quality Control Board
- San Dieguito River Park Joint Powers Authority
- State of California 22nd Agricultural District
- Fairbanks Ranch Association
- Fairbanks Ranch Country Club
- Del Mar Country Club
- Surf Cup Sports
- Private well owners

During the one-year pump test phase of the project, a successful partnership with the City of San Diego and Surf Cup Sports resulted in a site for the test well, and a beneficial use and permitted discharge for the water from the test. Partnering with SEJPA on this, and other projects has resulted in the preferred brine disposal alternative. The Project has been coordinated closely with the City of San Diego. The City has recently added new staff to their Water Utilities Department and OMWD is scheduled to update them on May 25, 2023. OMWD staff will cover any significant results verbally at the workshop.

Moving the project forward will require groundwater management discussions and agreements with SFID, San Diego, and Del Mar potentially through SGMA. These agencies could become groundwater management partners and there may be opportunities for them to become project financial partners. Financial partnerships might provide an opportunity to further increase Project capacity, with the associated benefits to all partners. In July 2022, at their request, staff presented the Project to the SFID Board of Directors. The SFID Board was receptive to the Project and later in the year, staff met with SFID staff to initiate discussions of a possible groundwater management and financial partnership. SFID staff are currently considering a framework of possible partnerships that has been proposed by OMWD.

Groundwater Management Partnerships / Possible SGMA

Prior to investing in project construction, OMWD will need to have the highest level of confidence in the long-term sustainability of the San Dieguito basin as a source of supply to the project. To achieve this, staff believes it will be essential for OMWD to work with the other water agencies overlying the basin – SFID, City of San Diego, and City of Del Mar – to explore the administrative and legal arrangements that may be necessary for coordinated basin management.

One option for developing groundwater management plans could be for overlying water agencies to consider the voluntary formation of one or more Groundwater Sustainability Agencies (GSAs) under the provisions of the California Sustainable Groundwater Management Act (SGMA), and to consider the development and voluntary adoption of a common Groundwater Sustainability Plan. Initial coordination by OMWD with the other overlying agencies will need to explore their levels of interest in participating in formal SGMA processes.

Regardless of whether the initial coordination leads to a formal SGMA process or to other forms of agreement and coordination separate from SGMA, outreach will be an essential component of the next phase of work to confirm groundwater basin sustainability in support of the project.

Grant Funding

Staff has aggressively pursued local, state, and federal grant funding to ensure the project is cost-effective for ratepayers. To date, more than $1.37 million dollars has been awarded to support various phases of the project. Nearly $550,000 in award funding was secured to support the initial exploratory and feasibility studies conducted to determine if the project is viable and at which locations to focus future efforts. In particular, the California Department of Water Resources Water Desalination Grant Program Round 3 provided $250,000 in funds to complete a feasibility study of the San Dieguito Valley Groundwater Basin as a potential future water source.

As the feasibility study for the San Dieguito Valley Groundwater Basin was nearing completion, staff notified the Board of new grant opportunities from the DWR Water Desalination Grant Program - Round 4, funded through Proposition 1. Staff was successful in its pursuit of additional funding and was notified that the Design Pilot would receive a total of $650,000 in grant funds. Shortly thereafter, OMWD worked with SDCWA to submit a proposal to Metropolitan for Future Supply Actions funding

program. The proposal was well-received and OMWD was awarded an additional $175,000 grant to support portions of the Design Pilot project.

Staff continues to pursue additional grant opportunities. Staff is working with Congressman Peters' office on a request for $2.5 million in FY 2024 Community Project Funding in support of the next phases of the project. If awarded, the funding would require only a 20 percent funding match and potentially cover work on an Environmental Impact Report/Environmental Impact Study, analysis of the Sustainable Groundwater Management Act issues, and calibration of the hydrogeologic model.

Numerous funding opportunities are also being investigated to support future project phases from various local, state, and federal agencies. These include, but are not limited to, USBR's Title XVI Water Reclamation and Reuse/Desalination program, the Water Infrastructure Improvements for the Nation Act, DWR's Water Desalination Grant Program and Sustainable Groundwater Management Grant Program, the California Office of Planning & Research's Integrated Climate Adaptation and Resilience Program, Metropolitan's Local Resources Program, the Drinking Water State Revolving Fund, and the California Infrastructure and Economic Development Bank.

FY 2024 Activities and Budget

In FY 2024, staff has included the following activities in the draft budgets that the Board saw at its May 2023 meeting. The hydrogeologic investigations will include drilling two small diameter borings and conducting pump tests, locating the optimum well sites, adding the watershed model to the groundwater model, updating the estimate of existing pumping, adding additional hydrologic record to the model and recalibrating it, and updating the scenario analysis.

The water rights analysis will be discussed separately (in closed session). The economic analysis will be updated to reflect new information about the project costs, financial factors, and SDCWA rates.

Staff will issue a request for proposals for the preparation of an Environmental Impact Report and or Environmental Impact Statement, and preparation of preliminary designs, select consultants, and start preparation of the documents and associated supporting studies.

Activity	Approximate Budget
Hydrogeologic Investigations	$ 600,000
Water Rights Investigations	$ 100,000
Updated Economic Analysis	$ 15,000
Environmental Impact Report/Study, Preliminary SGMA	$ 600,000
Preliminary Design (Start)	$ 509,000
Groundwater Level, Flow, and Water Quality Monitoring	$ 45,000
Staff and Consultant Support	$ 150,000
Total	$2,019,000
FY 24 Budget	$2,100,000

Five-Year Budget and Schedule

The cost estimate conducted in 2022 estimated the total capital cost of the project, inclusive of design and administration, and inclusive of an allowance for additional planning studies, was approximately $47 million for a project sized at 1.0 mgd, and approximately $49 million at 1.3 mgd. These estimates assumed project construction in 2027, and included projected escalation up to that date, and reported the costs in 2027 dollars.

For the current updated economic review, with the project capacity anticipated to be 1.5 mgd, the project team estimates the 2027 total capital cost to be approximately $54 million, in 2027 dollars, and excludes the $4.562 million spent to-date. The new estimate is inclusive of additional facilities necessary to convey the larger flow of product water into more distant portions of the OMWD distribution system having sufficient demands to accept the flow.

With the potential to increase project capacity, the new capital cost estimate exceeds the District's current adopted budget. However, as the final project sizing is still subject to change, and because it is possible that other agencies could elect, if invited by the District, to participate in the project and share in project funding.

The Board-approved budget is currently $42.8 million. Staff will be proposing a revised budget and 10-year capital spending program next year, during the preparation of the next biennial budget. At that time, staff will propose an increase of the total Project cost to the most current estimate based on the anticipated capacity of the plant and revised cost estimates.

OMWD's current adopted five-year budget and schedule is shown in the following table. OMWD is pursuing grant funding from the Community Project Funding program through

the Environmental Protection Agency. Should OMWD be successful in receiving funds, the project schedule will be accelerated.

Fiscal Year	Board Approved Total Project Budget[1] (at 1mgd)	Estimated Future Total Project Budget[2] (Based on 1.5mgd)	Grant Funding	Planned Activities
Thru 2023	$4,562,000	$4,562,000	$1,370,000	Feasibility Study, Pilot Test Well, Water Rights
2024	$2,100,000	$2,100,000	$2,500,000 *Potential Pending – Congressman Peters Community Project Funding	Hydrogeology, Environmental, Preliminary Design, Water Rights
2025	$2,813,000	$2,813,000	$703,250 *Potential USBR Title XVI Funding	Continued Environmental, Permitting, and Design
2026	$11,345,000	$6,345,000	$1,586,250 *Potential USBR Title XVI Funding	Design, Bidding, Construction
2027-2028	$22,017,000	$42,742,000	$8,548,400 *Potential USBR Title XVI Funding	Construction and Start-Up
Total	$42,837,000	$58,562,000	$14,707,900	

[1] Board approved total project budget is based on cost estimates from the feasibility study conducted in 2018 for a 1.0 MGD capacity desalination plant.
[2] Projected total project budget is based on the most recent construction estimate from Tetra Tech and economic analysis from Gillingham water for a 1.5 MGD capacity desalination plant.

A Water Rights and Sustainability Investigation will be considered separately by the Board (Closed Session).

The conclusion thus far is that there is a path forward on regulatory/environmental issues and that project's hydrogeologic, economic, water rights, and sustainability analyses support advancing the project to final planning and regulatory agency coordination.

At the Board meeting, Staff will incorporate any direction received by the Board into the FY 2024 and future work plan.

Supplemental Information:

- *Workshop Presentation*
- *Draft Return Flow Calculations (Geoscience)*
- *Draft Gillingham Water Planning and Engineering Economic Analysis Summary*

SAN DIEGUITO VALLEY GROUNDWATER PROJECT UPDATE

May 31, 2023

OLIVENHAIN
Municipal Water District

Workshop Purposes

- Share FY 2023 Progress
- Discuss Project Feasibility
- Discuss Plan for FY 2024 and Beyond
- Discussion by Board of Directors

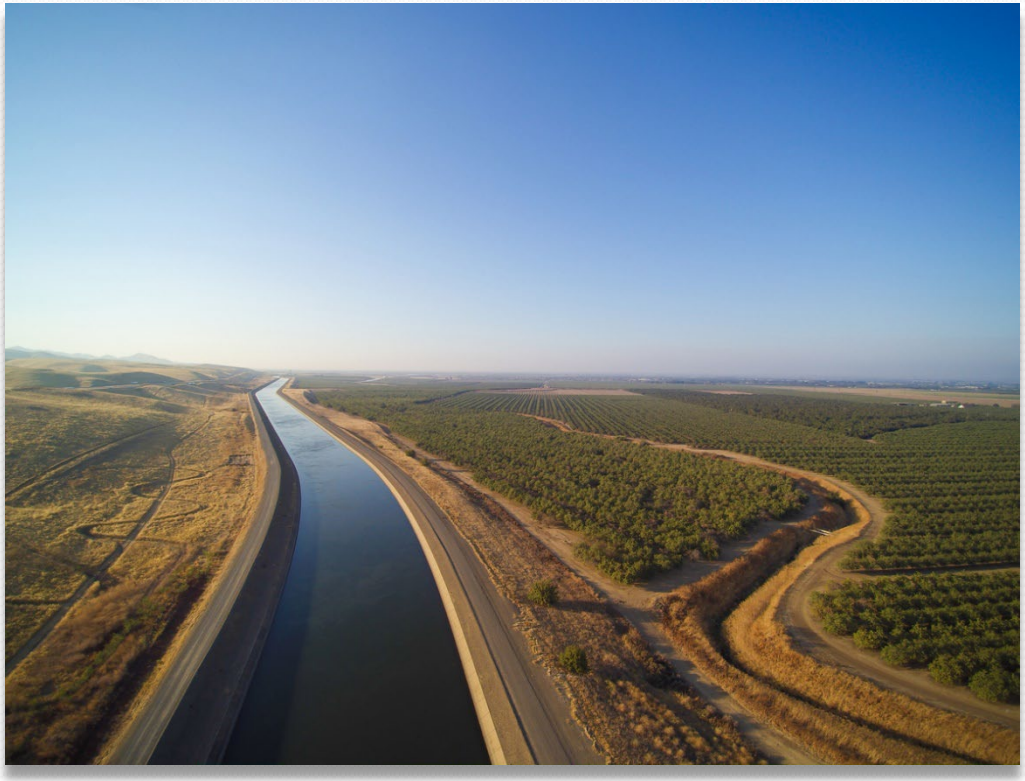
Agenda

- San Dieguito Project Background – OMWD Staff
- Hydrogeology – Consulting Engineer
  - Board Q & A
- Economic Analysis – Gillingham Water
  - Board Q & A
- Next Steps – OMWD Staff
  - FY 2024 Investigations
  - 5-Year Schedule & Budget
  - Questions March 30, 2022
  - Board Q & A
- Closed Session

Project Background

State of Water in California

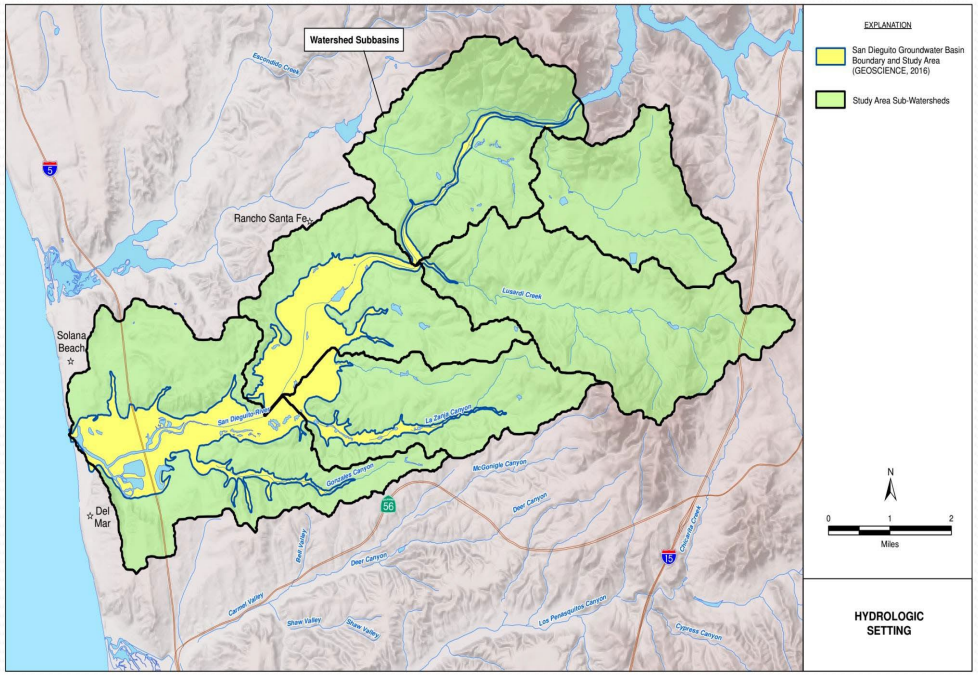
- OMWD reliant on imported water
- Imported water increasingly expensive
- Imported water more vulnerable
- OMWD Goal – 1/3 local supply
- Groundwater
  - Drought-proof
  - Reliable
  - Cost-competitive
  - Local control
- OMWD 1 of 7 SD water agencies without local potable supplies



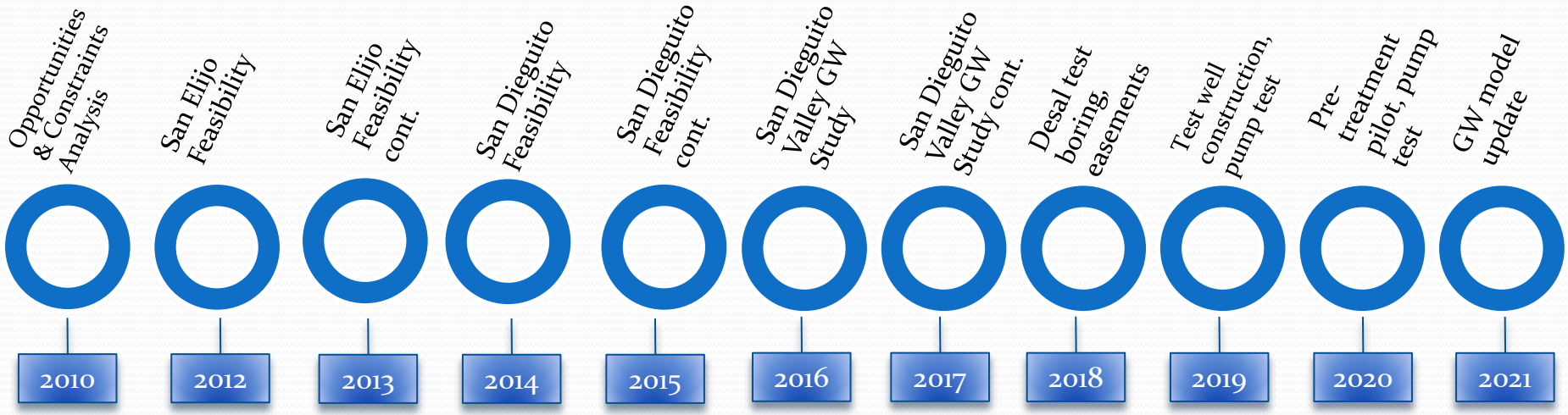
Project Background

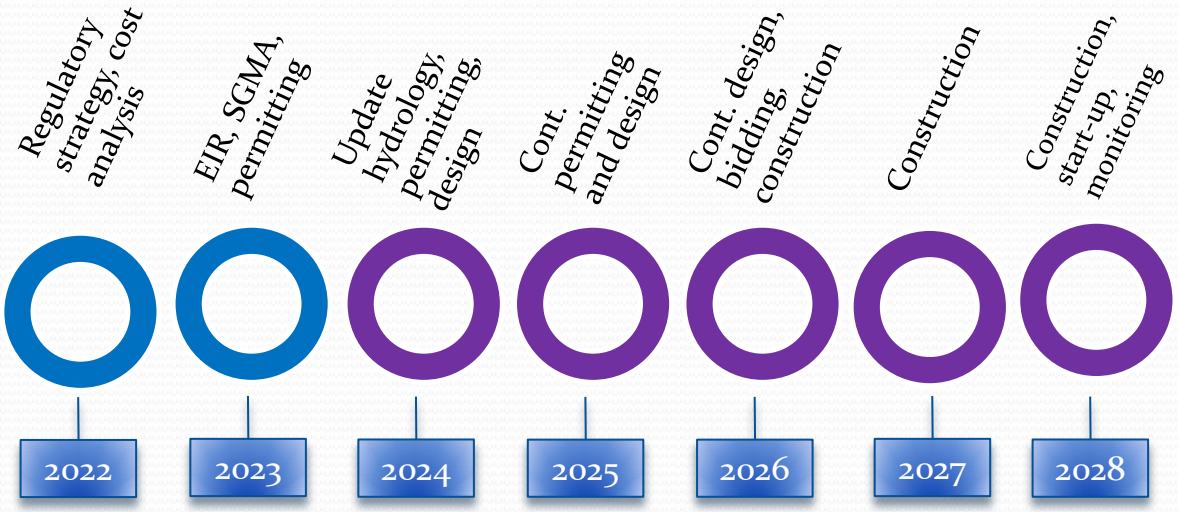
2008-2016

- 2008 board direction - brackish groundwater, rather than Carlsbad Desalination
- 2010 Opportunities & Constraints
  - San Elijo GW
  - San Dieguito GW
- 2016 San Elijo - potentially feasible (USBR funding)

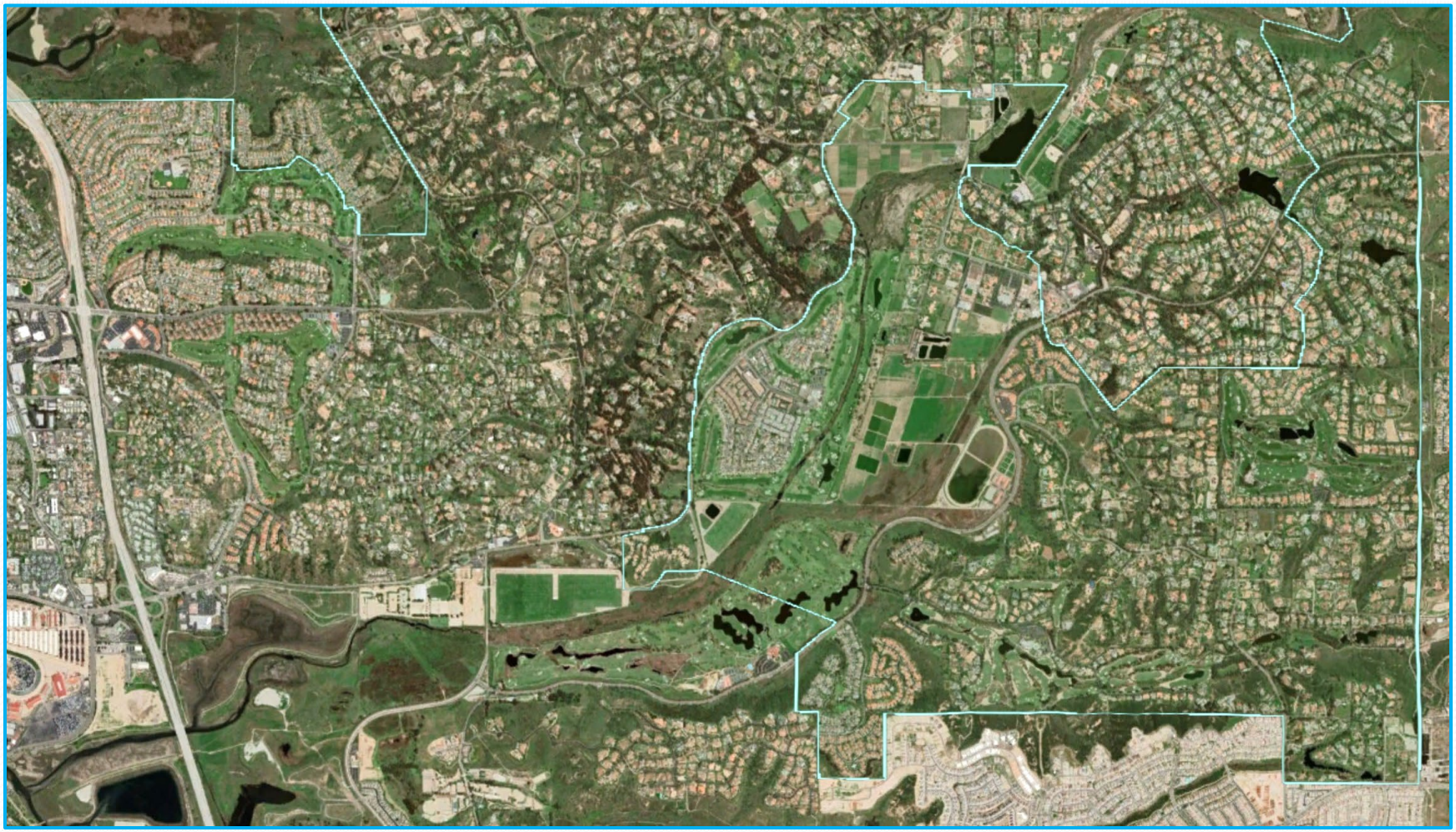


Project Timeline



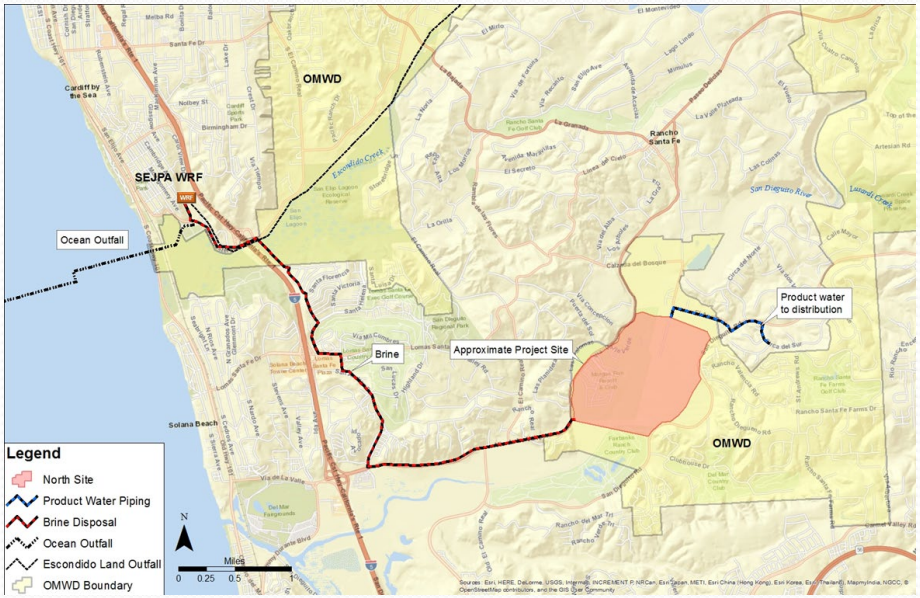


Study Area



2017 DWR San Dieguito Feasibility Study

- Project feasible and sustainable at 1 MGD or more
- Cost-competitive with imported water, less than desalinated seawater
- North Valley Wellfield preferred, not influenced by surface water
- Meet state and federal drinking water regulations
- Brine disposal via SEJPA ocean outfall, RWQCB preference



2021 DWR/MWD San Dieguito Pump Test

- Briefed board and stakeholders April 2021
- Confirmed feasibility study results
- Minor impacts to basin storage
- Impacts to local wells—mitigable

Summary of Environmental Constraints

- Clear path forward for environmental compliance and permitting
  - Standard suite of environmental studies and permits will be needed
- Difficulty of path depends on size and location of project
  - Proximity to San Dieguito River and its habitats will affect environmental requirements
- Next steps:
  - Siting study to define site alternatives
  - Begin CEQA compliance
    - Precursor to most permit submittals

Summary of Regulatory Strategy

- Clear path forward for regulatory compliance and permitting
  - No insurmountable regulatory hurdles – have identified well siting and treatment design considerations
- Next steps:
  - Siting study with hydrogeologic evaluation to determine:
    - *Optimum location of extraction sites.* Should be selected to provide highest well capacity
    - *Estimate time of travel for effects on shallow aquifer*. Consider distance of well setback from river to avoid classification of wells as GWUDI

Economic Findings & Recommendations

1. **Non-Cost Factors:** The project provides improved supply reliability, environmental sustainability, and local control

2. **Cost Factors:** With reasonable assumptions, the project is significantly less costly than the No Project alternative over a 30 period of analysis

3. **Next Steps:** The Non-Cost and Cost findings support advancing the project to final planning and agency coordination (SGMA et. al.)

Funding Review

- Feasibility Study
  - $500k
  - $250k Funded by DWR Grant
- Pilot Test Well
  - $1.3M ($650k Funded by DWR Grant)
  - $175 MWD/SDCWA Iron and Manganese Removal Pilot Testing
- Ultimate Project (if approved)
  - Board approved budget $42M
  - CIP Fund/ Future Grants

Funding Awarded to Date

Year	Agency	Program	Project Phase	Amount
2018	MWD	Future Supply Action	Iron and Manganese Removal Pilot Testing	$175,000
2017	DWR	Water Desalination Grants Program Round 4	Pilot Test Well	$650,000
2014	DWR	Water Desalination Grants Program Round 3	San Dieguito Feasibility Study	$250,000
2012	USBR	WaterSMART (Title XVI)	San Elijo Feasibility Study	$150,000
2010	DWR	Prop 84/IRWM Round 1	Initial Feasibility Study	$145,000

Funding Opportunities Under Pursuit

- Community Projects Funding in Congressional Appropriations Bill
  - Working with legislators, primarily Scott Peters' office, for $2.5 million in funding to support FY 24 work (Environmental Impact Report/Environmental Impact Study, analysis of Sustainable Groundwater Management Act issues, and calibration of the hydrogeologic model)

Future Funding Opportunities

- USBR's Title XVI Water Reclamation and Reuse/Desalination program
- Water Infrastructure Improvements for the Nation Act
- DWR's Water Desalination Grant Program
- DWR's Sustainable Groundwater Management Grant Program
- California Office of Planning & Research's Integrated Climate Adaptation and Resilience Program
- MWD's Local Resources Program
- Drinking Water State Revolving Fund
- California Infrastructure and Economic Development Bank

Potential Partnerships

- Santa Fe ID
- City of San Diego
- City of Del Mar
- Community Services Districts
- Private Entities – Water Supply

Community Outreach

- RSFFPD (3/16/2017) – Feasibility Study Outreach
- Solana Santa Fe Elementary (10/17/2017 + 12/4/2018) – Community Meeting & Public Workshop
- Del Mar City Council (4/1/2019) – Project Summary
- Whispering Palms CSD (10/8/2019) – Project Summary
- Public Webinar (4/27/2021) – Project Status Update
- Met WD Future Supply Actions Program (10/17/21) – Project Summary
- SD River JPA (3/4/2022) – Project Summary
- OMWD (3/30/2022) – Board of Directors Workshop
- SFID (7/21/2022) – Project Status

Board Questions, Discussion, Input

OLIVENHAIN
Municipal Water District
A Public Agency

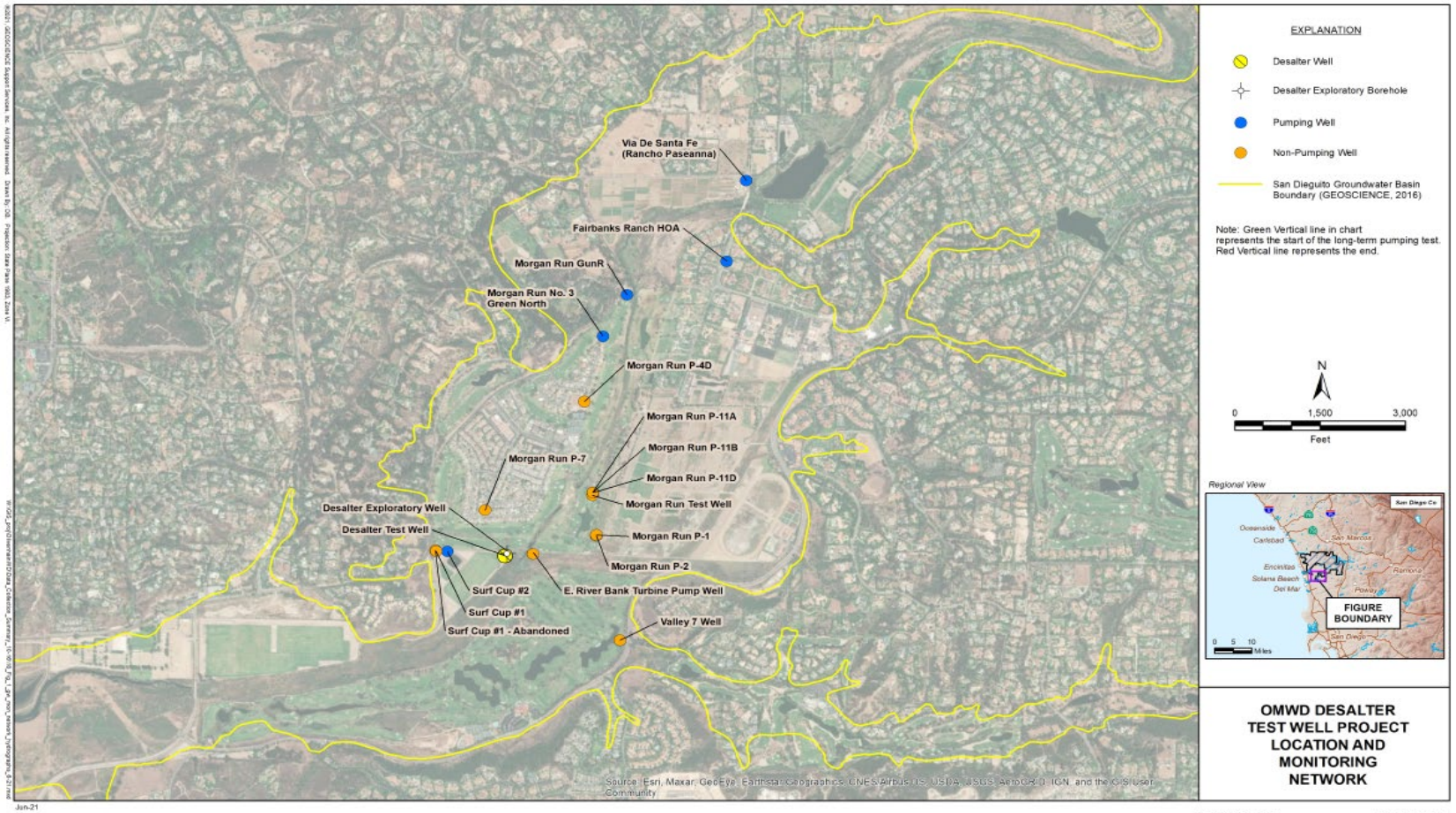
Agenda

- San Dieguito Project Background – OMWD Staff
- Hydrogeology – Consulting Engineer
  - Board Q & A
- Economic Analysis – Gillingham Water
  - Board Q & A
- Next Steps – OMWD Staff
  - FY 2024 Investigations
  - 5-Year Schedule & Budget
  - Questions March 30, 2022
  - Board Q & A
- Closed Session

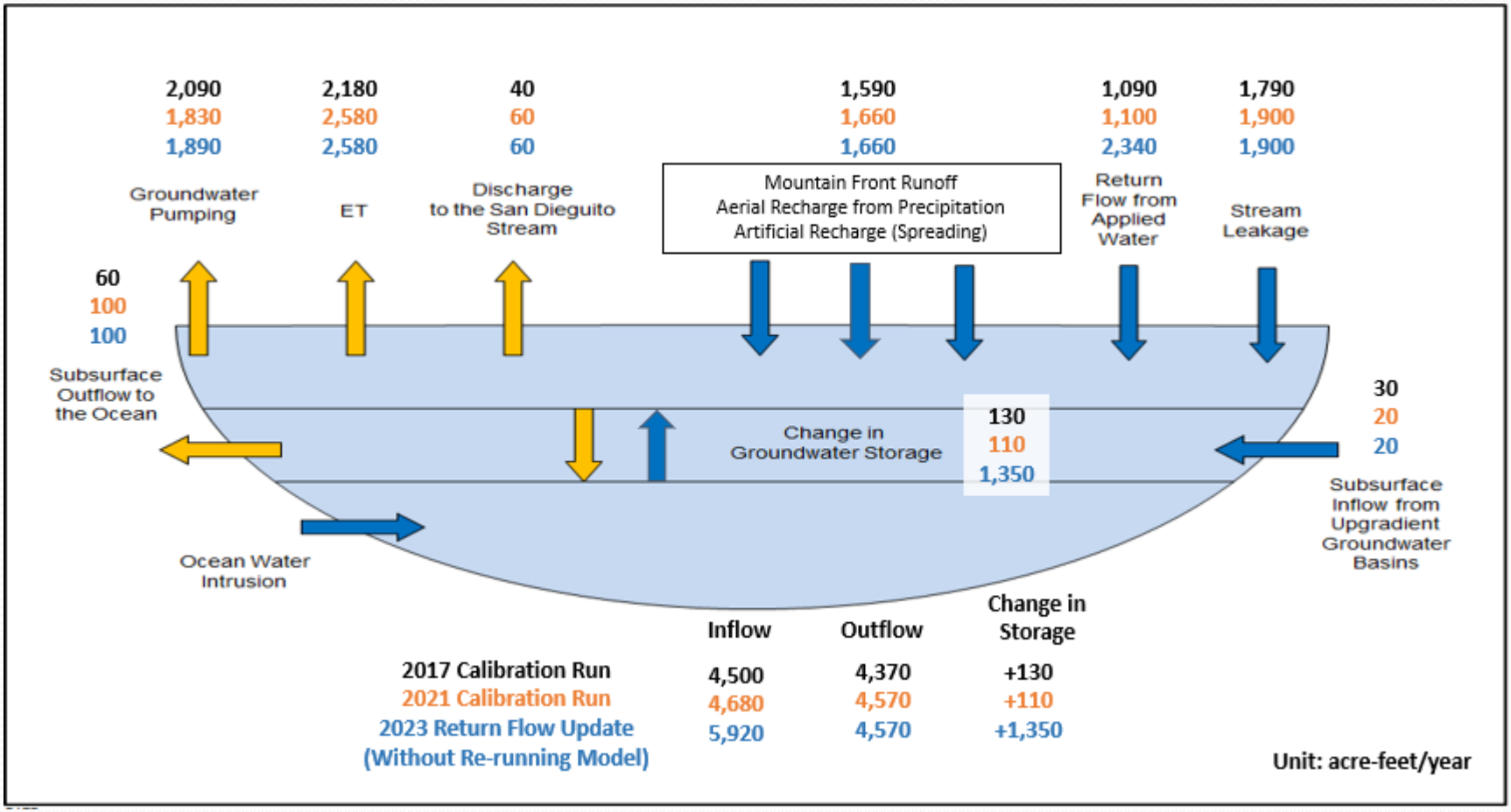
FY 2023 Hydrogeologic Program

- Continued water level monitoring
- Studies and investigations – optimal well sites
  - Geophysical work in progress
  - Complete early in FY 2024
- Estimate return flow
  - That portion of imported water supplied by OMWD, SFID, San Diego, and Del Mar to their customers, that flows past the landscape root zone and recharges the groundwater.
  - Agencies have the right to recover.
  - A portion of the project supply.

Groundwater Level, Quality, and Flow

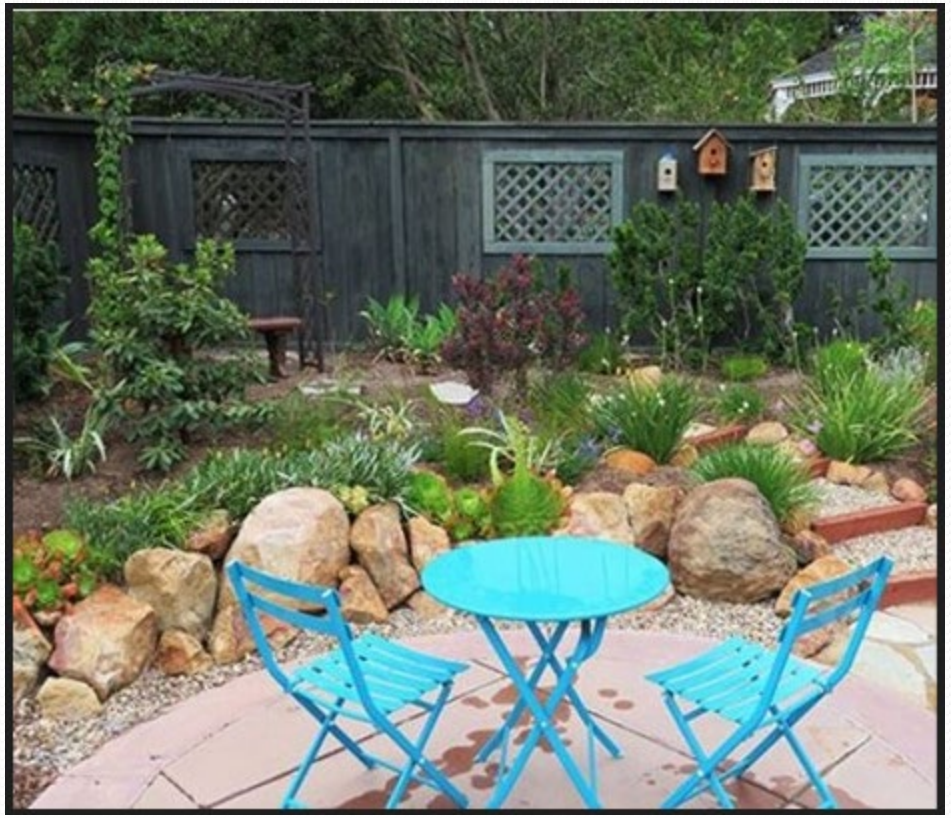


Water Balance Components

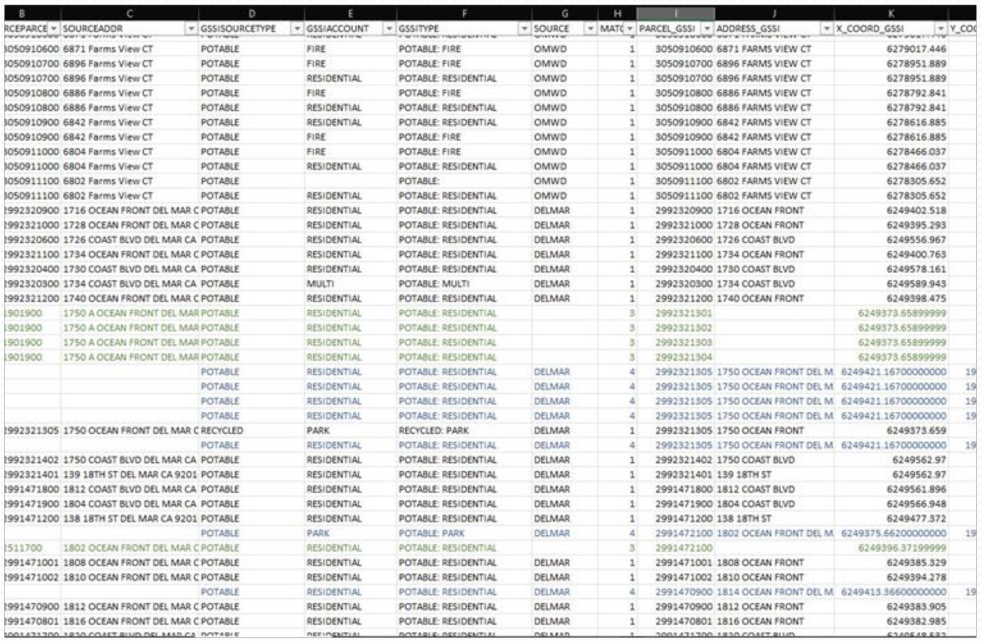


Return Flow Methodology

- Applied to Temecula Creek and Santa Margarita River Area
- Rancho California WD, Fallbrook PUD, Camp Pendleton
- Closely scrutinized, accepted, defendable
- Checked using local water meter records
- Adjust for declining demands



Data Collection



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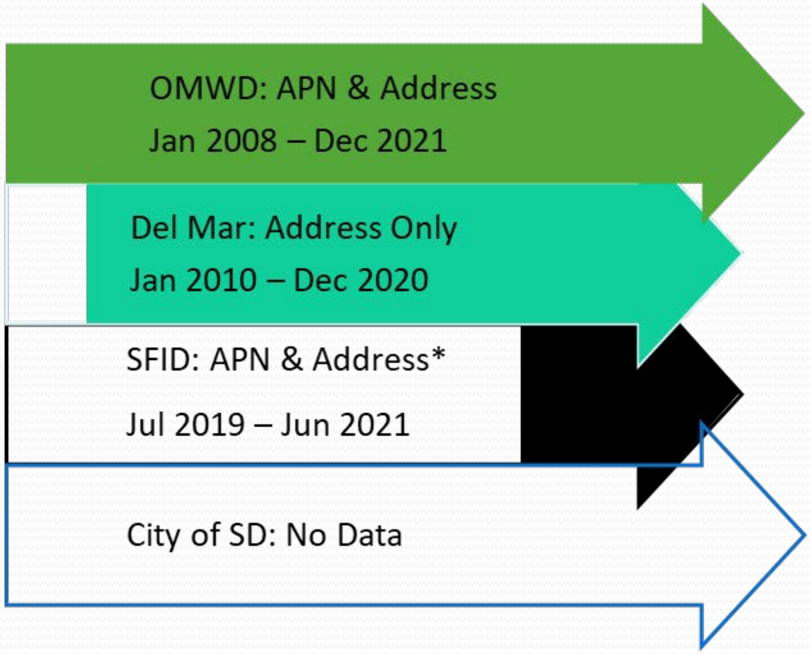
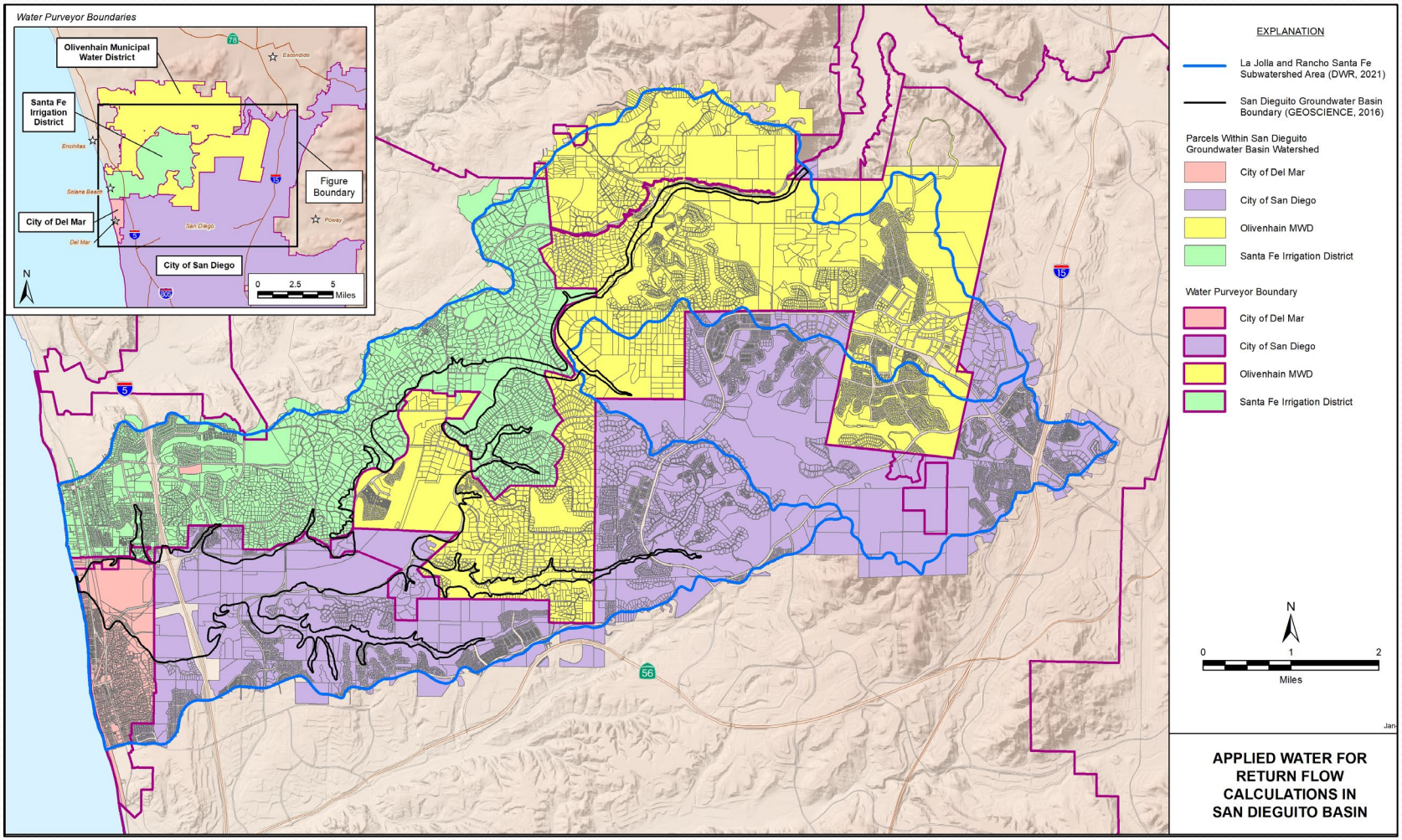
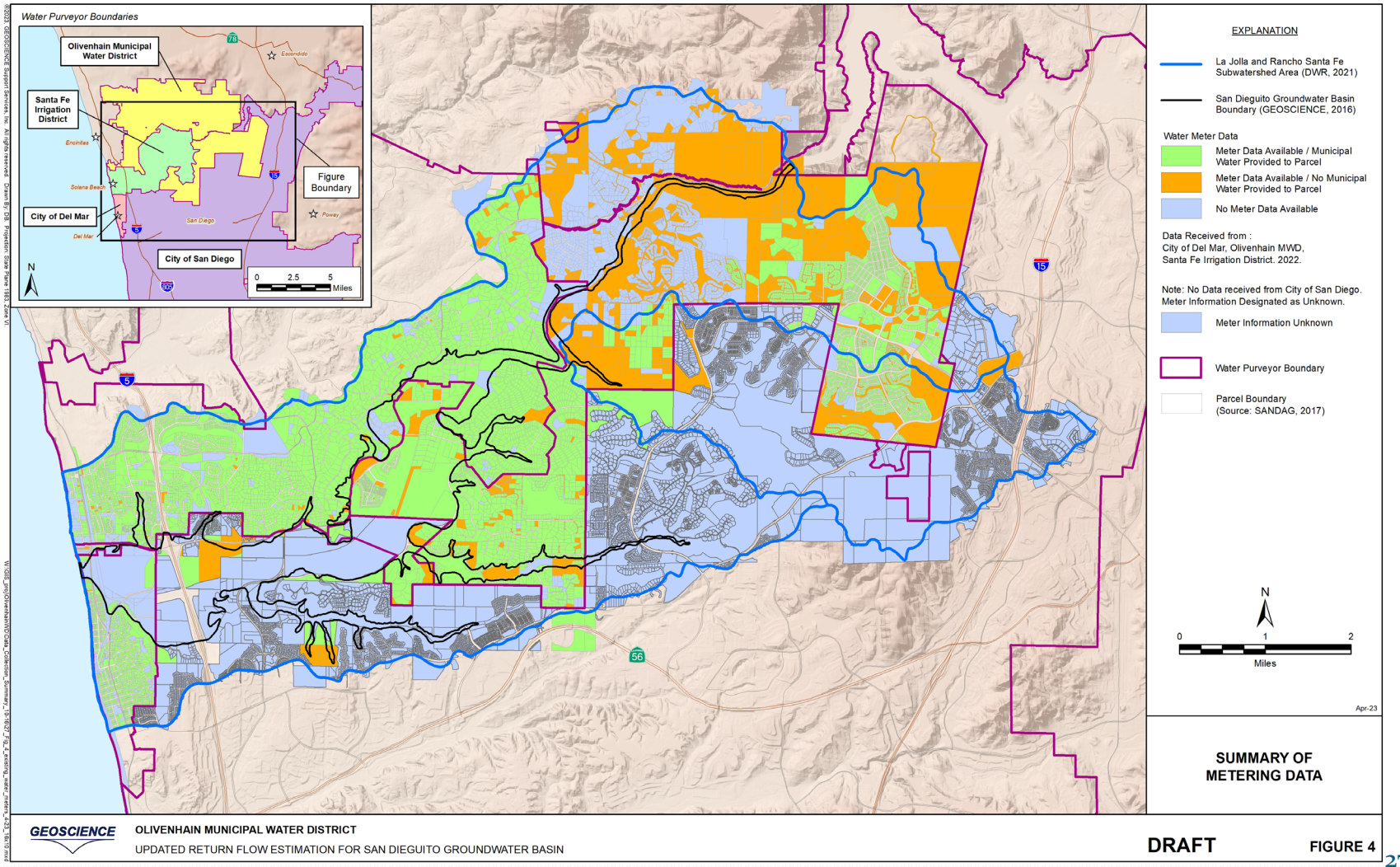


	OMWD	City of Del Mar	SFID	City of SD	Total
Watershed Area	37.9%	3.4%	19.6%	39.1%	37,750 parcels
Total Metered Parcels	5,871	1,474	4,427	-	11,563
Total Metered w/ Non-Zero Data	5,870	1,474	4,424	-	11,556

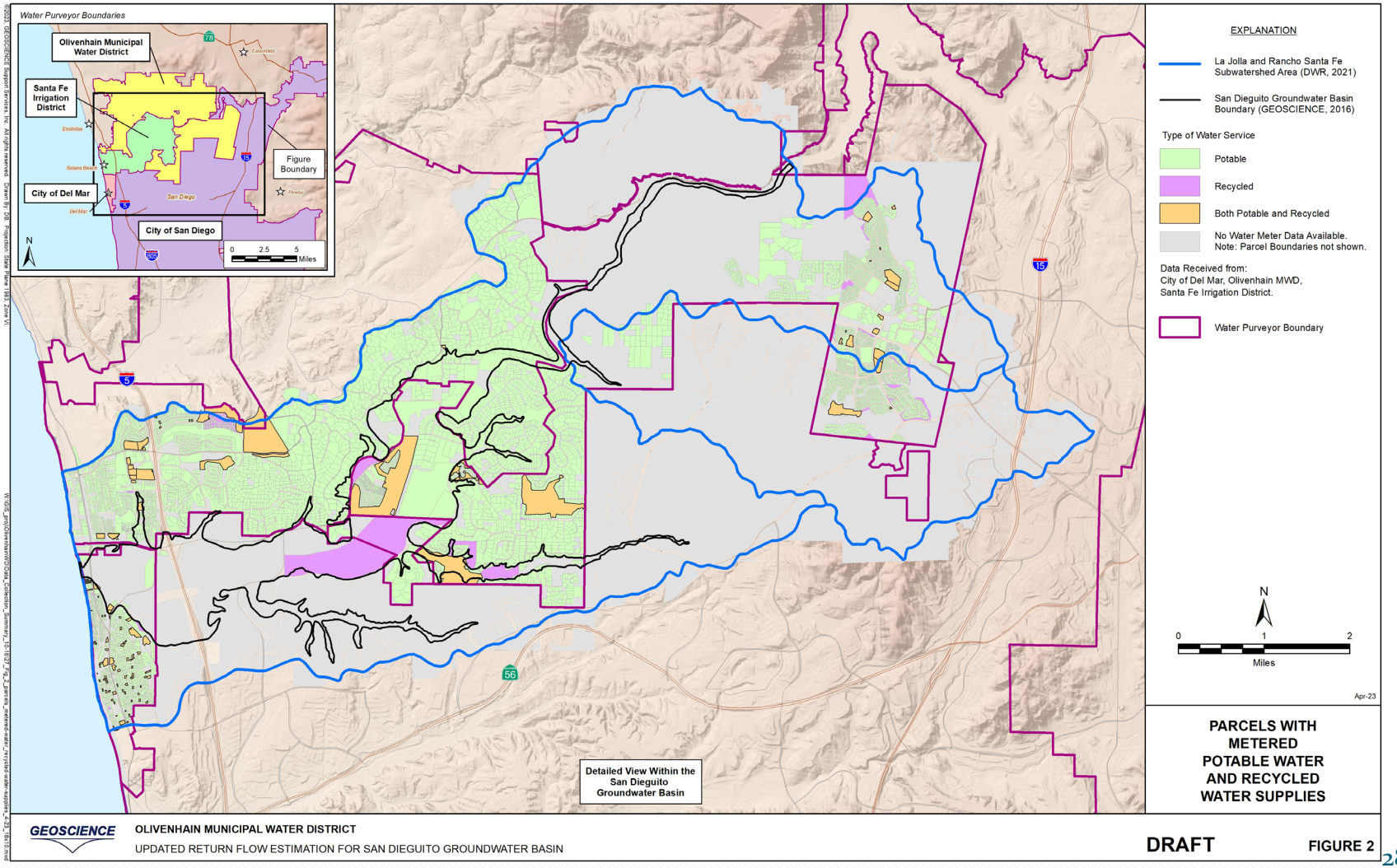
Summary of Data Collection – Service Area



Summary of Data Collection – Metering Data



Summary of Data Collection – Water Type



Return Flow Assumptions

Table D1 2005 Return Flow Application Rate

	Indoor (%)	Outdoor (%)	WUF (AF/AC)	Adjusted WUF for 5.3% System Loss (AF/AC)	% Not Consumed (%)	Available for Recovery (AF/AC)	75% Return to GW (AF/AC)	25% Return to SW (AF/AC)	12.5% loss of SW (AF/AC)	Total Return Flow (AF/AC)	Total Return Flow as % Applied (%)
Agricultural	0	100	2.31	2.43	20	0.49	0.36	0.12	-0.06	0.43	18%
Residential	47	53	1.50	1.58	25	0.21	0.16	0.05	-0.03	0.18	12%
Commercial	41	59	1.29	1.36	25	0.20	0.15	0.05	-0.03	0.18	14%
Multi-Family	57	43	4.27	4.50	25	0.48	0.36	0.12	-0.06	0.42	10%
Parks/Golf	0	100	3.01	3.17	20	0.63	0.48	0.16	-0.08	0.55	18%

Table D2 2006 Return Flow Application Rate

	Indoor (%)	Outdoor (%)	WUF (AF/AC)	Adjusted WUF for 4.6% System Loss (AF/AC)	% Not Consumed (%)	Available for Recovery (AF/AC)	75% Return to GW (AF/AC)	25% Return to SW (AF/AC)	12.5% loss of SW (AF/AC)	Total Return Flow (AF/AC)	Total Return Flow as % Applied (%)
Agricultural	0	100	2.47	2.58	20	0.52	0.39	0.13	-0.06	0.45	18%
Residential	43	57	1.57	1.64	25	0.23	0.18	0.06	-0.03	0.20	13%
Commercial	40	60	1.32	1.38	25	0.21	0.16	0.05	-0.03	0.18	14%
Multi-Family	53	47	4.39	4.59	25	0.54	0.40	0.13	-0.07	0.47	11%
Parks/Golf	0	100	3.58	3.74	20	0.75	0.56	0.19	-0.09	0.66	18%

Table D3 2007 Return Flow Application Rate

	Indoor (%)	Outdoor (%)	WUF (AF/AC)	WUF for 6.9% System Loss (AF/AC)	% Not Consumed (%)	Available for Recovery (AF/AC)	75% Return to GW (AF/AC)	25% Return to SW (AF/AC)	12.5% loss of SW (AF/AC)	Total Return Flow (AF/AC)	Total Return Flow as % Applied (%)
Agricultural	0	100	2.79	2.98	20	0.60	0.45	0.15	-0.07	0.52	19%
Residential	39	61	1.68	1.80	25	0.27	0.21	0.07	-0.03	0.24	14%
Commercial	37	63	1.32	1.41	25	0.22	0.17	0.06	-0.03	0.19	15%
Multi-Family	49	51	4.63	4.95	25	0.63	0.47	0.16	-0.08	0.55	12%
Parks/Golf	0	100	3.94	4.21	20	0.84	0.63	0.21	-0.11	0.74	19%

Table D9 2013 Return Flow Application Rate

	Indoor (%)	Outdoor (%)	WUF (AF/AC)	Adjusted WUF for 5.6% System Loss (AF/AC)	% Not Consumed (%)	Available for Recovery (AF/AC)	75% Return to GW (AF/AC)	25% Return to SW (AF/AC)	12.5% loss of SW (AF/AC)	Total Return Flow (AF/AC)	Total Return Flow as % Applied (%)
Agricultural	0	100	1.90	2.01	20	0.40	0.30	0.10	-0.05	0.35	18%
Residential	51	49	1.30	1.37	25	0.17	0.13	0.04	-0.02	0.15	11%
Commercial	41	59	1.01	1.07	25	0.16	0.12	0.04	-0.02	0.14	14%
Multi-Family	61	39	4.50	4.75	25	0.46	0.35	0.12	-0.06	0.41	9%
Parks/Golf	0	100	2.57	2.71	20	0.54	0.41	0.14	-0.07	0.47	18%

Table D10 2014 Return Flow Application Rate

	Indoor (%)	Outdoor (%)	WUF (AF/AC)	Adjusted WUF for 3.9% System Loss (AF/AC)	% Not Consumed (%)	Available for Recovery (AF/AC)	75% Return to GW (AF/AC)	25% Return to SW (AF/AC)	12.5% loss of SW (AF/AC)	Total Return Flow (AF/AC)	Total Return Flow as % Applied (%)
Agricultural	0	100	2.08	2.16	20	0.43	0.32	0.11	-0.05	0.38	18%
Residential	50	50	1.32	1.37	25	0.17	0.13	0.04	-0.02	0.15	11%
Commercial	42	58	1.06	1.10	25	0.16	0.12	0.04	-0.02	0.14	13%
Multi-Family	60	40	4.74	4.92	25	0.49	0.37	0.12	-0.06	0.43	9%
Parks/Golf	0	100	2.65	2.75	20	0.55	0.41	0.14	-0.07	0.48	18%

Table D11 2015 Return Flow Application Rate

	Indoor (%)	Outdoor (%)	WUF (AF/AC)	Adjusted WUF for 2.6% System Loss (AF/AC)	% Not Consumed (%)	Available for Recovery (AF/AC)	75% Return to GW (AF/AC)	25% Return to SW (AF/AC)	12.5% loss of SW (AF/AC)	Total Return Flow (AF/AC)	Total Return Flow as % Applied (%)
Agricultural	0	100	1.56	1.60	20	0.32	0.24	0.08	-0.04	0.28	18%
Residential	66	34	0.91	0.93	25	0.08	0.06	0.02	-0.01	0.07	8%
Commercial	53	47	0.83	0.85	25	0.10	0.08	0.03	-0.01	0.09	11%
Multi-Family	76	24	3.70	3.80	25	0.23	0.17	0.06	-0.03	0.20	5%
Parks/Golf	0	100	2.05	2.10	20	0.42	0.32	0.11	-0.05	0.37	18%

Agricultural: 18% - 19%

Residential: 8% - 14%

Commercial/Industrial: 11% - 15%

Multi-Family: 5% - 12%

Parks/Golf Course: 18% - 19%

Return Flow Calculations

Land Use	OMWD (Jan 2008 - Dec 2021)	City of Del Mar (Jan 2010 - Dec 2020)	SFID (July 2019 - Jun 2021)	City of San Diego	TOTAL
			Return Flow (acre-ft/year)		
Agricultural	33	2	31	38	104
Residential	538	40	567	135	1,280
Commercial	105	28	49	83	265
Multi-Family	3	7	25	54	89
Parks/Golf	366	18	132	83	599
TOTAL	**1,044**	**95**	**804**	**393**	**2,337**
			Average Return Flow Factors (Return Flow / Applied Water)		
	12%	**11%**	**9%**	**11%**	**11%**

Note: The return flow was calculated based on metered applied water and estimated applied water for unmetered parcels.

FY 2023 Geophysical Program

- Non-invasive
- Vertical and horizontal extent of the basin
- Seismic reflection
- Sting electrical resistivity tomography

Board Questions, Discussion, Input

OLIVENHAIN
Municipal Water District
A Public Agency

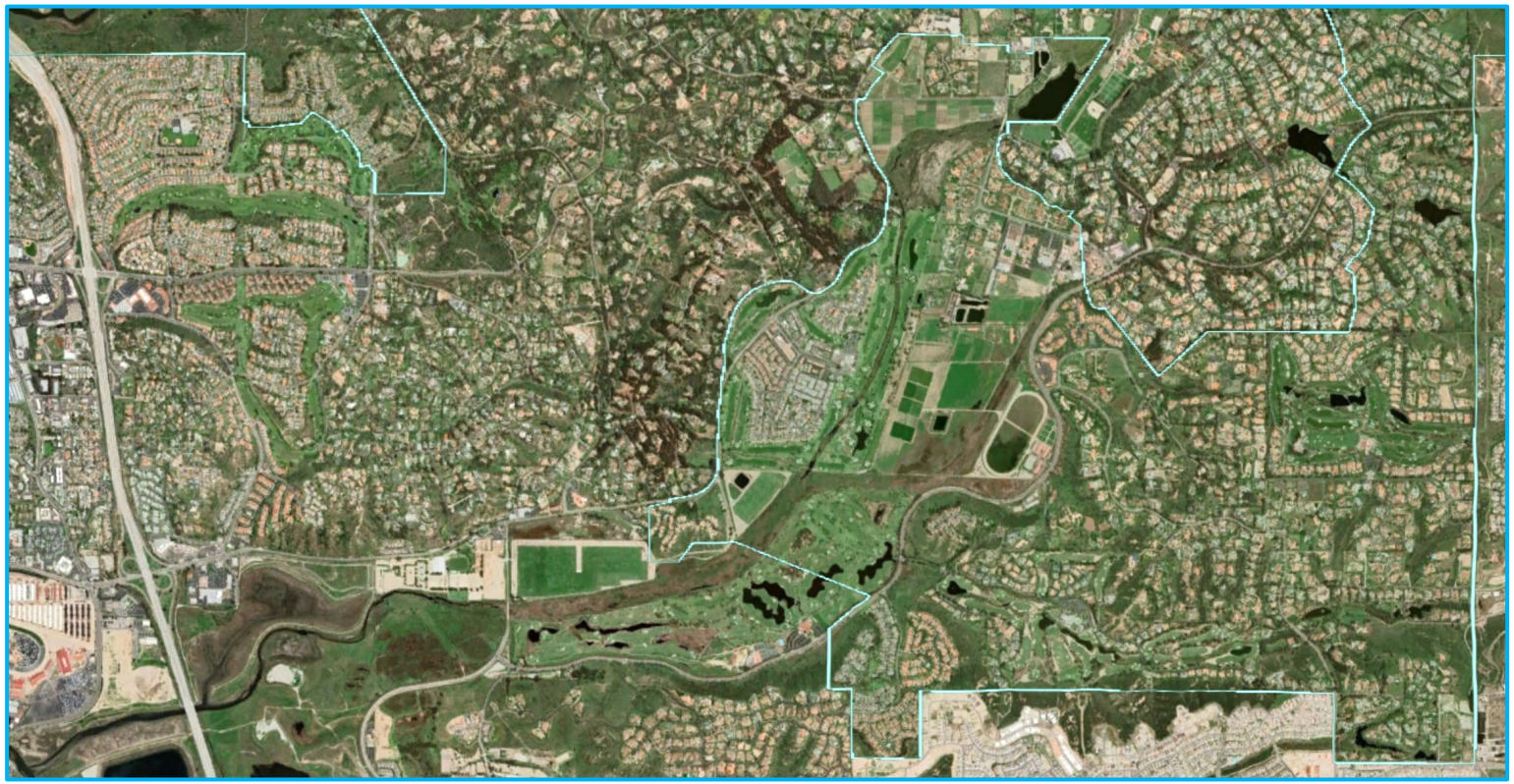
Agenda

- San Dieguito Project Background – OMWD Staff
- Hydrogeology – Consulting Engineer
  - Board Q & A
- Economic Analysis – Gillingham Water
  - Board Q & A
- Next Steps – OMWD Staff
  - FY 2024 Investigations
  - 5-Year Schedule & Budget
  - Questions March 30, 2022
  - Board Q & A
- Closed Session

Charting Local Waters:
San Dieguito Groundwater Study
An OMWD Sustainable Supplies Project

OLIVENHAIN
Municipal Water District

Feasibility Assessment (Economics and More)



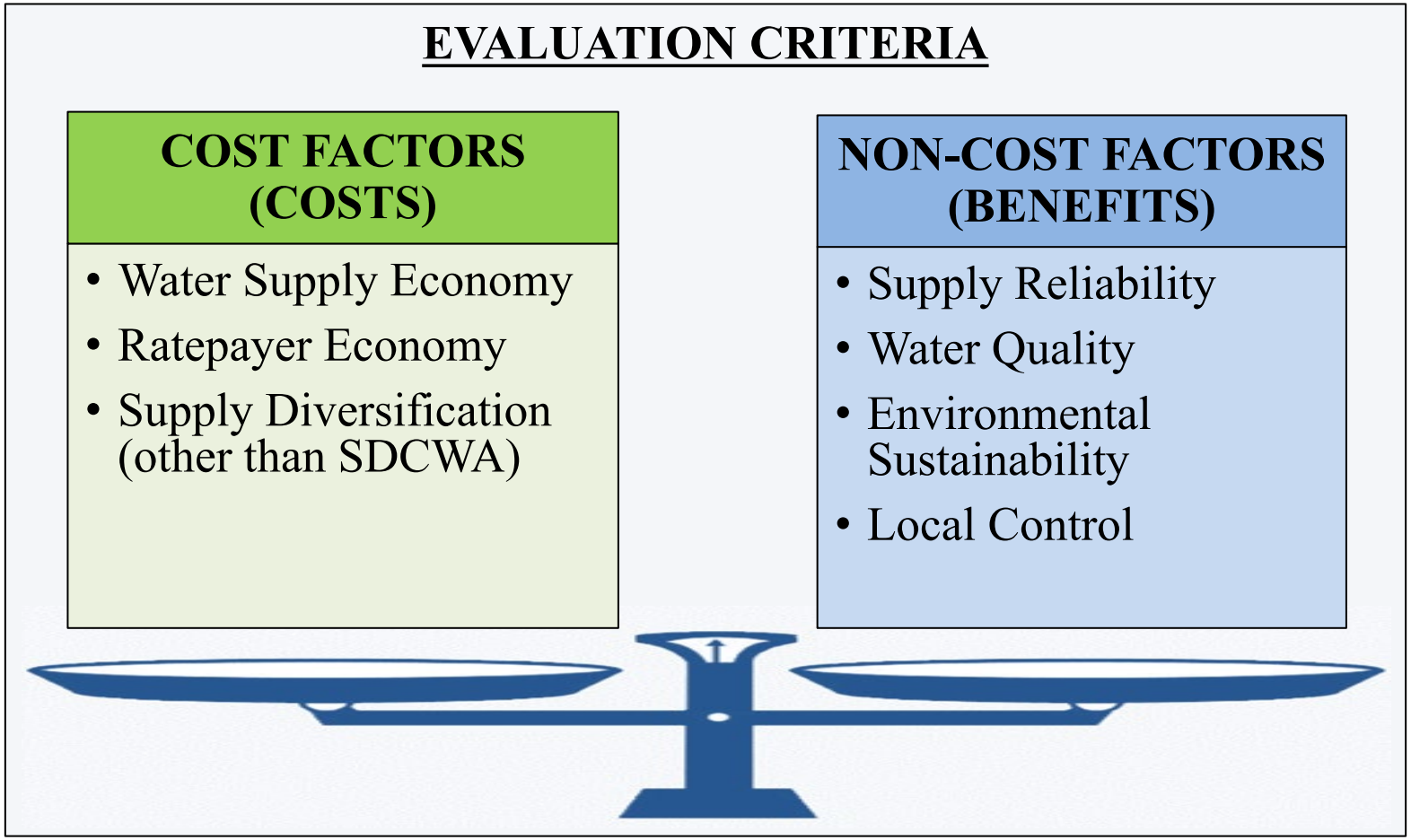
GILLINGHAM WATER
Gillingham Water Planning and Engineering, Inc.

Point of Comparison: Weigh project costs and benefits against those of the No Project alternative

PROJECT vs. NO PROJECT

PROJECT	NO PROJECT
	

Evaluation Criteria: Consider both cost and non-cost factors

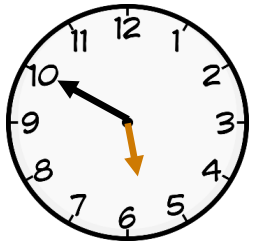


AGENDA:

1. **Non-Cost Factors:** The project provides improved supply reliability, environmental sustainability, and local control

2. **Cost Factors:** With reasonable assumptions, the project is significantly less costly than the No Project alternative over a 30 period of analysis

3. **Next Steps:** The findings support advancing the project into preliminary design and environmental documentation



Non-Cost Factors: The Project fares very well

CRITERIA	Project vs. No Project
• Supply Reliability	↑
• Water Quality	→
• Local Control	↑↑
• Environmental Sustainability	↑
• Reduced Bay-Delta Reliance	↑
• Reduced Colorado River Reliance	↑
• Reduced Energy Footprint / GHG	↑

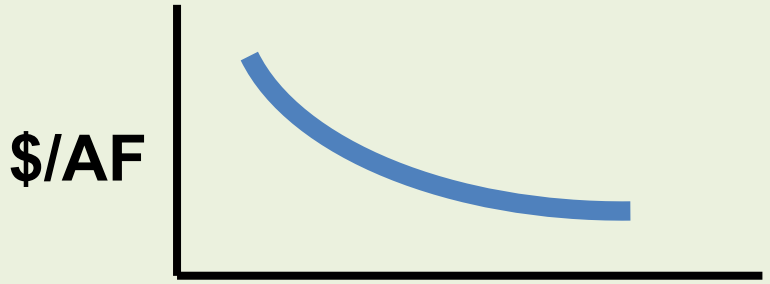
Legend: Better: ↑ Neutral: → Worse: ↓

Economic Analysis: Anticipated costs have increased. So have anticipated benefits . . . and by a bigger margin.

Capacity	Adopted Budget (1.0 MGD)	Anticipated Budget (2027 $)	Increase
1.0 mgd	$42.8M	$4.6M + $46.4M = $51.2M	$8.4M
1.5 mgd	$42.8M	$4.6M + $54.0M = $58.6M	$15.8M

Benefits

CY2024 + 13%



Economic Analysis: 30-Year Net Present Value

(1.5 MGD Plant producing 1,600 AF/yr of treated water)

NPV Cost Summary -- Project vs. No Project, in 2023 Dollars

PROJECT	NO PROJECT	
	Cost Component	**NPV**
	SDCWA Purchases (raw)	$105M
	Incremental Treatment Costs	$5M
	TOTAL (Rounded)	**$109M**

Economic Analysis: 30-Year Net Present Value

(1.5 MGD Plant producing 1,600 AF/yr of treated water)

NPV Cost Summary -- Project vs. No Project, in 2023 Dollars

PROJECT	
Cost Component	**NPV**
Capital Cost	$51M
Grant Funding	-$13M
O&M Cost	$44M
LRP Funding	-$4M
TOTAL (Rounded)	**$78M**

NO PROJECT

Economic Analysis: 30-Year Net Present Value

(1.5 MGD Plant producing 1,600 AF/yr of treated water)

NPV Cost Summary -- Project vs. No Project, in 2023 Dollars

PROJECT	
Cost Component	**NPV**
Capital Cost	$51M
Grant Funding	-$13M
O&M Cost	$44M
LRP Funding	-$4M
TOTAL (Rounded)	**$78M**

NO PROJECT	
Cost Component	**NPV**
SDCWA Purchases (raw)	$105M
Incremental Treatment Costs	$5M
TOTAL (Rounded)	**$109M**

Project Cost Advantage = **$31M**

The Project fares very well

Economic Analysis: Key Assumptions – Yield

User Inputs

Project Sizing and Production Capacity

Production Capacity Plant design capacity	1.5 MGD
Plant Capacity Factor (On-line time) Default = 94%	94%
Production Volume at specified Plant Capacity Factor	1,580 AF/yr
Groundwater Pumping Pumping needed to support production volume	1,980 AF/yr

- Project costs exhibit strong economies of scale. 1.5 MGD fares better than 1.3 MGD, which fared better than 1.0 MGD.
- 1.8 MGD would fare even better, but would require pumping of 2,400 AF/yr, and likely would require a project partner

Economic Analysis: Key Assumptions – SDCWA

User Inputs

SDCWA Rate Escalation

Escalation Scenario (See SDCWA worksheet)	Mid-Range
Rate Cap (Raw) (2023 $) (See SDCWA worksheet)	$2,500/AF

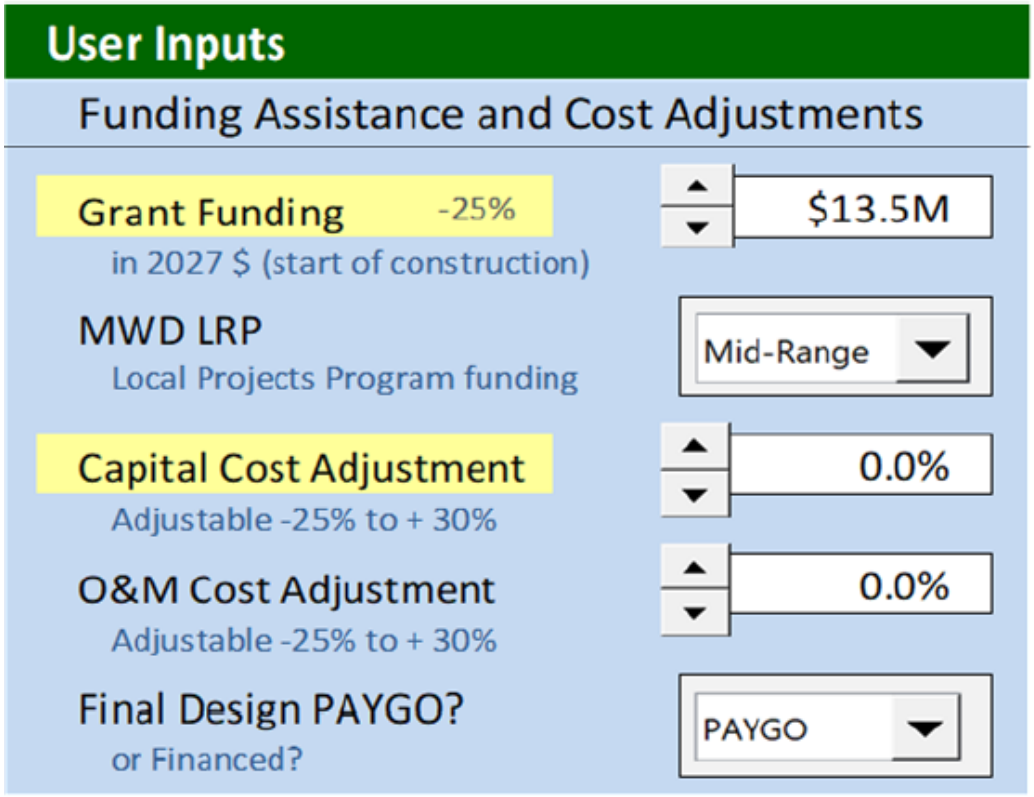
- SDCWA draft projected CY24 All-In raw water rate = **$1,784/AF**
- **+13%**

"All-In" Rate Adjustments

	CY '23	CY '24	CY '25	CY '26	CY '27	CY '28	CY '29	CY '30	CY '31	10 Yr CAGR
2D - High	11.3%	9.7%	10.3%	7.5%	6.4%	5.2%	4.8%	4.4%	4.4%	7.07%
2D - Low	5.9%	3.7%	5.3%	4.5%	3.0%	3.5%	2.6%	2.7%	4.1%	3.91%

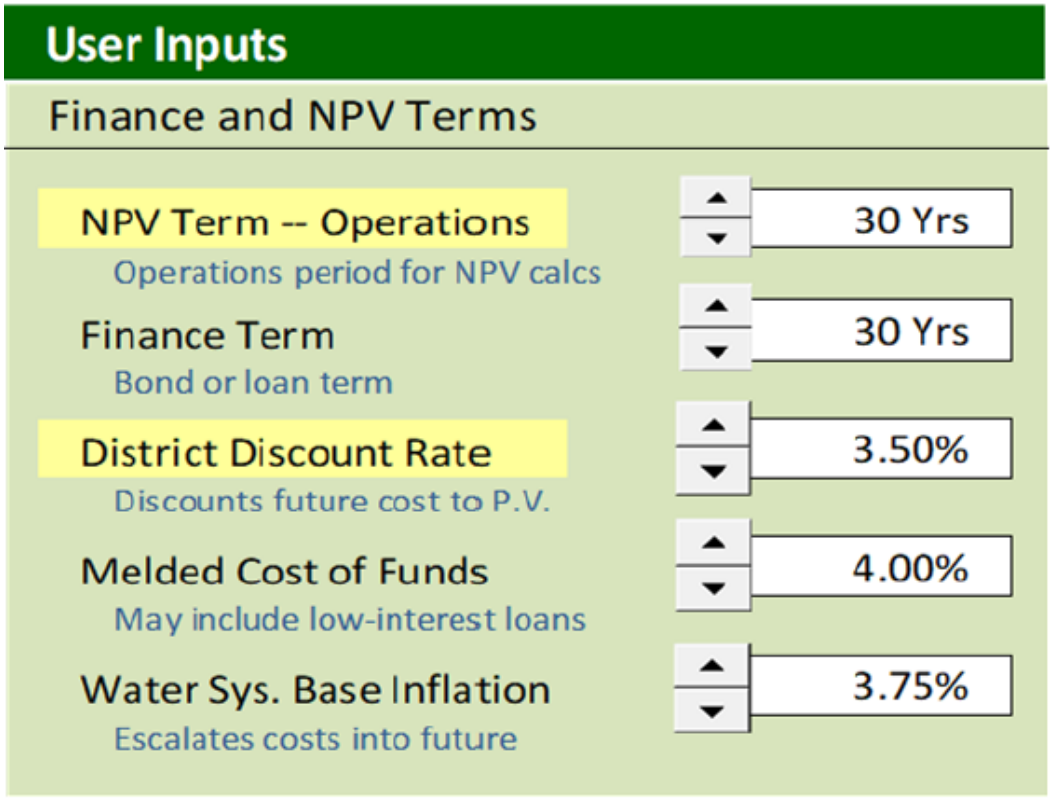
- Through CY2031 we have used SDCWA Low, Mid, and High forecasts.
- Post 2031 we assume only water system inflation plus 0.0% for Low, 0.5% for Mid-Range, and 1.0% for High escalation scenarios

Economic Analysis: Key Assumptions – Funding



- GRANT FUNDING: Project is very well positioned. Funding at 25 percent of capital is a reasonable mid-range assumption.
- MWD LPP: Our mid-range assumption is the LPP subsidy amount is cut in half.

Economic Analysis: Key Assumptions – Finance



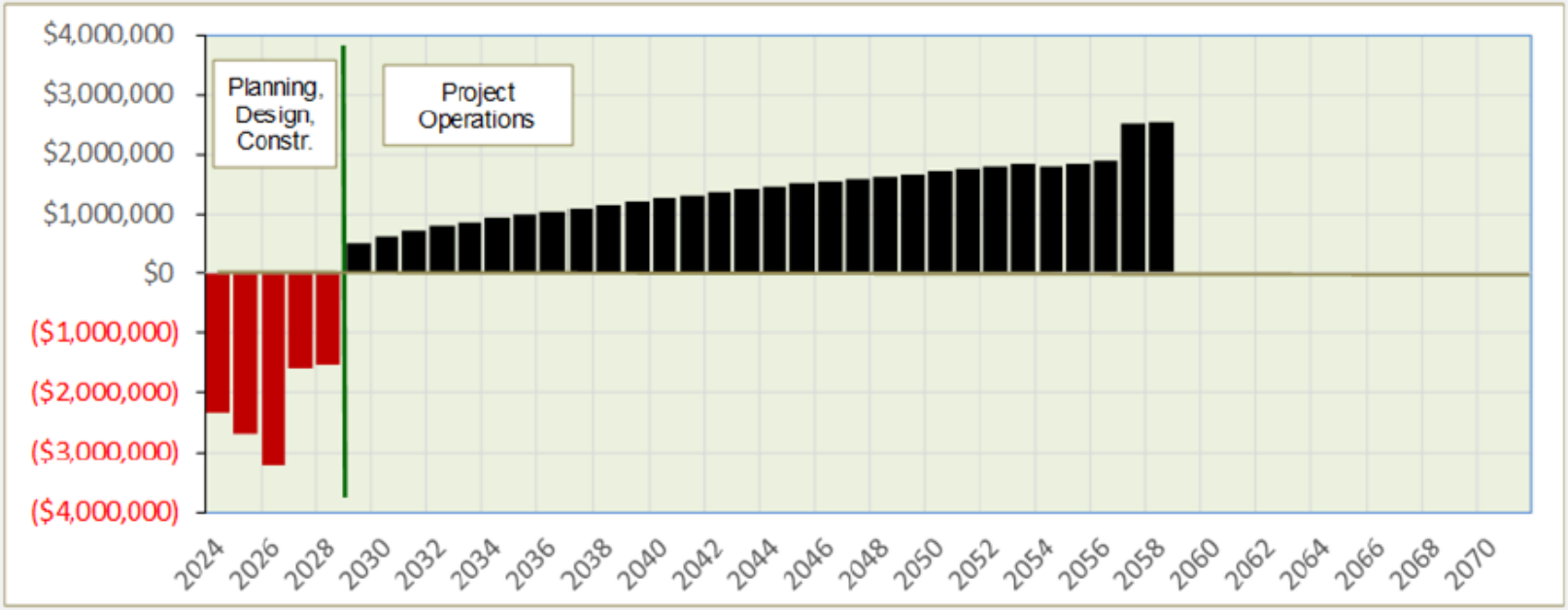
- NPV TERM: 30 years is common but not etched in stone. Longer terms produce greater NPV benefits
- RATE FACTORS: Mostly move in common with inflation. Discount rate is analogous to minimum Rate of Return on investments.

Economic Analysis: Costs and Benefits Over Time

Capacity	SDCWA Rates	Grants	NPV Term	Discount Rate	Capacity *f*
1.5 MGD	Mid-Range	$13.5M	30 Yrs	3.50%	94%

NPV Annual Cost Differential in 2023 Dollars -- Project vs. No Project

Bond Issue: 2027	Ops. Start: 2029	Cross-over: 2029	Break-even: 2042	Payback pd.: 15 Yrs



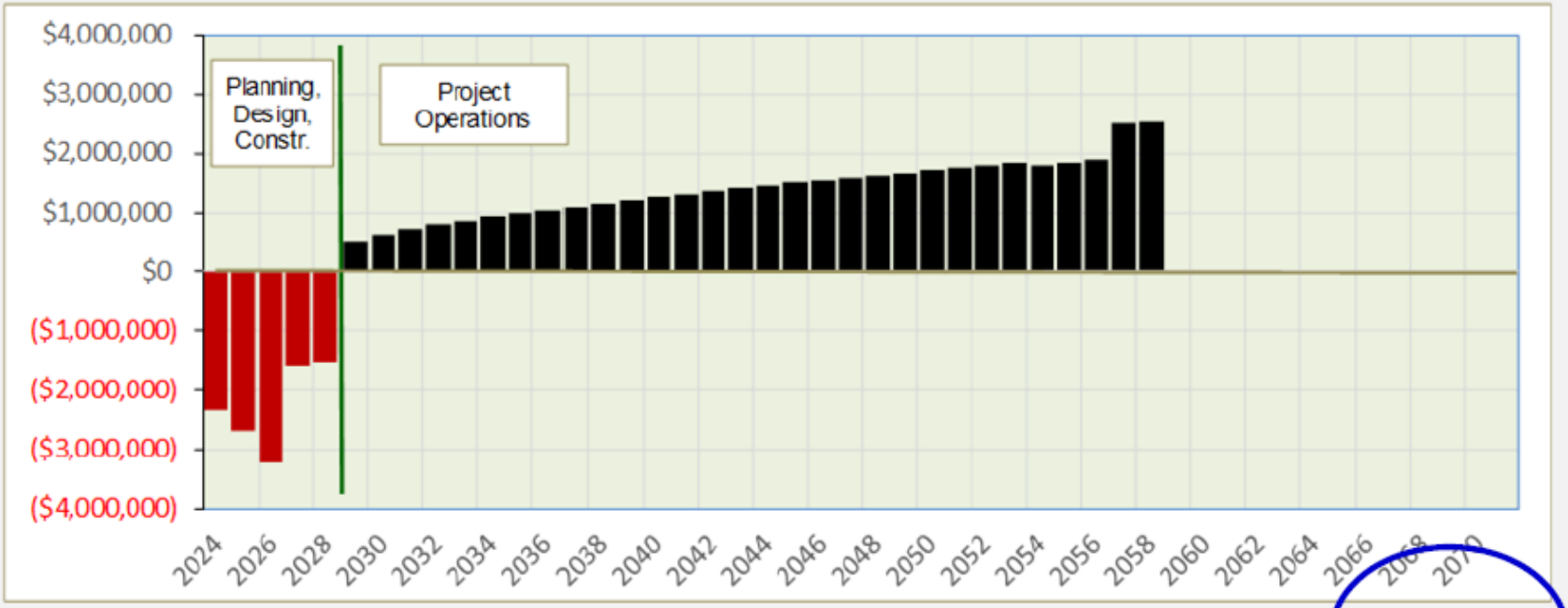
Total Red: $11M	Total Black: $42M	Advantage: $31M

Economic Analysis: Sensitivity Testing

Capacity	SDCWA Rates	Grants	NPV Term	Discount Rate	Capacity *f*
1.5 MGD	Mid-Range	$13.5M	30 Yrs	3.50%	94%

NPV Annual Cost Differential in 2023 Dollars -- Project vs. No Project

Bond Issue: 2027	Ops. Start: 2029	Cross-over: 2029	Break-even: 2042	Payback pd.: 15 Yrs



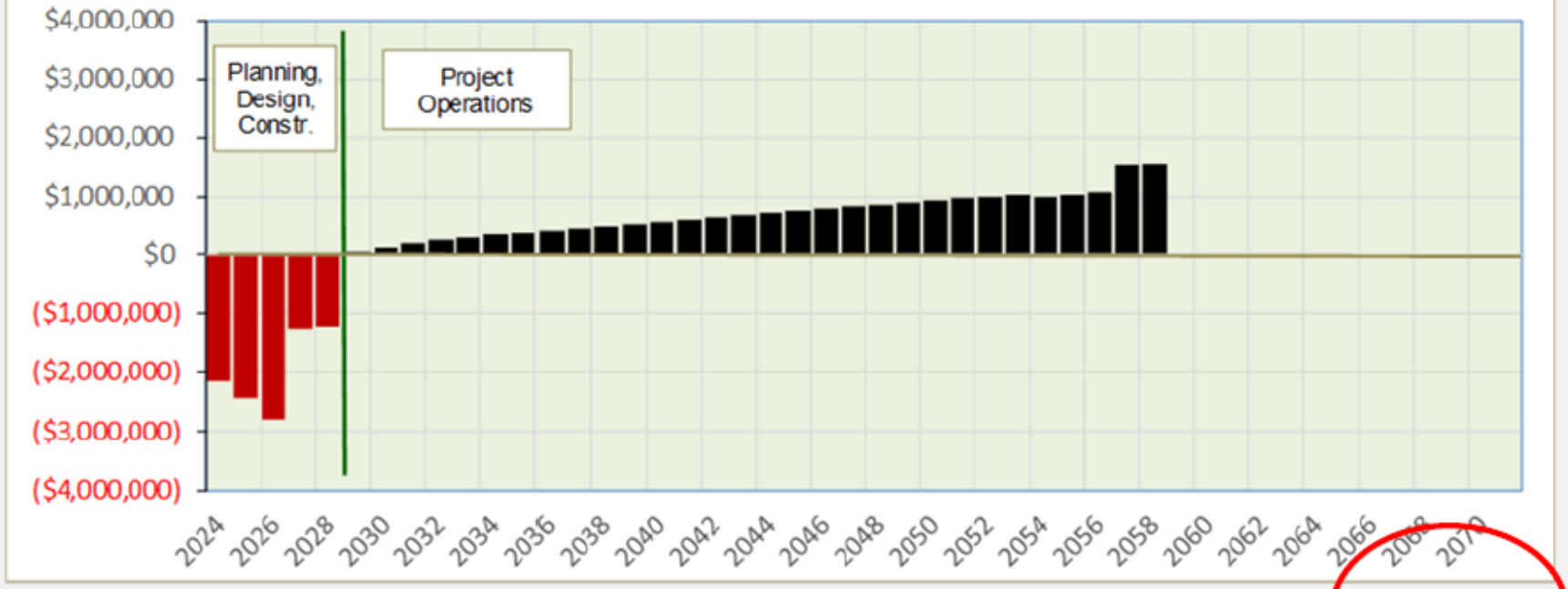
Total Red: $11M	Total Black: $42M	Advantage: $31M

Economic Analysis: Sensitivity Testing

Capacity	SDCWA Rates	Grants	NPV Term	Discount Rate	Capacity *f*
1.0 MGD	Mid-Range	$13.5M	30 Yrs	3.50%	94%

NPV Annual Cost Differential in 2023 Dollars -- Project vs. No Project

Bond Issue: 2027	Ops. Start: 2029	Cross-over: 2029	Break-even: 2049	Payback pd.: 22 Yrs



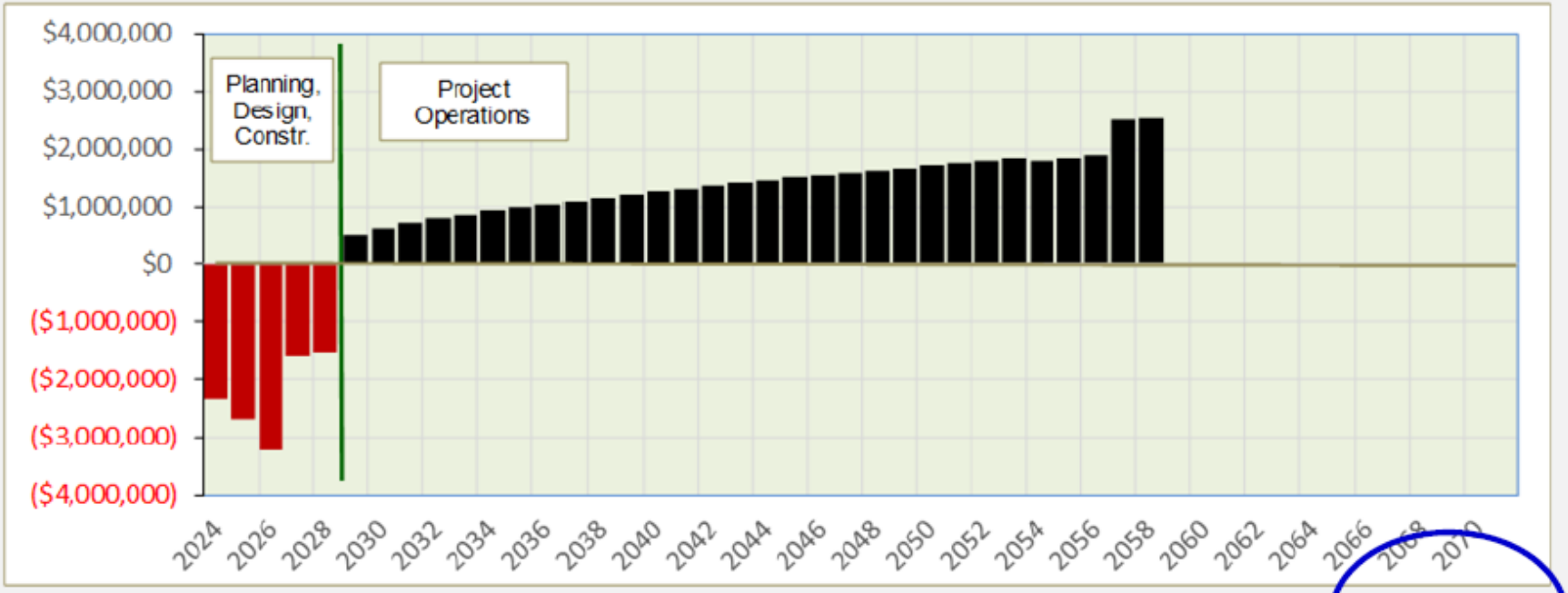
Total Red: $10M	Total Black: $21M	Advantage: $11M

Economic Analysis: Sensitivity Testing

Capacity	SDCWA Rates	Grants	NPV Term	Discount Rate	Capacity *f*
1.5 MGD	Mid-Range	$13.5M	30 Yrs	3.50%	94%

NPV Annual Cost Differential in 2023 Dollars -- Project vs. No Project

Bond Issue: 2027	Ops. Start: 2029	Cross-over: 2029	Break-even: 2042	Payback pd.: 15 Yrs



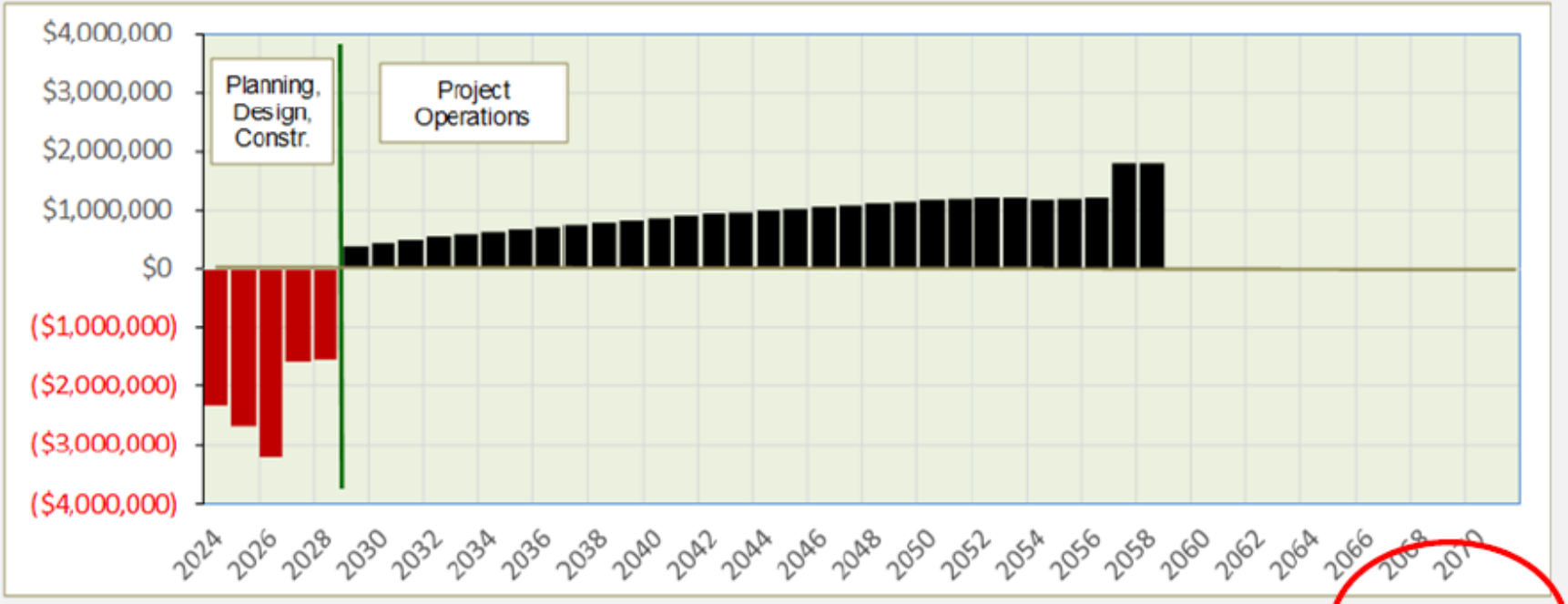
Total Red: $11M	Total Black: $42M	Advantage: $31M

Economic Analysis: Sensitivity Testing

Capacity	SDCWA Rates	Grants	NPV Term	Discount Rate	Capacity *f*
1.5 MGD	Low	$13.5M	30 Yrs	3.50%	94%

NPV Annual Cost Differential in 2023 Dollars -- Project vs. No Project

Bond Issue: 2027	Ops. Start: 2029	Cross-over: 2029	Break-even: 2045	Payback pd.: 18 Yrs



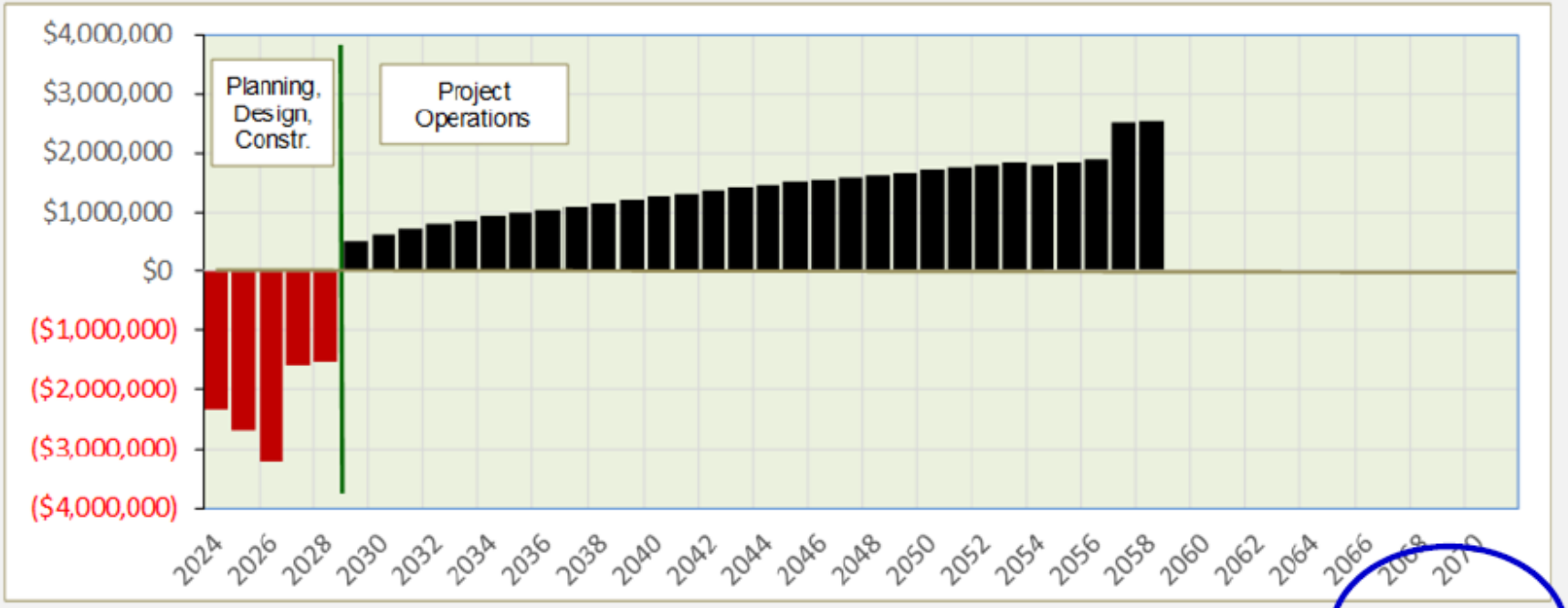
Total Red: $11M	Total Black: $29M	Advantage: $17M

Economic Analysis: Sensitivity Testing

Capacity	SDCWA Rates	Grants	NPV Term	Discount Rate	Capacity *f*
1.5 MGD	Mid-Range	$13.5M	30 Yrs	3.50%	94%

NPV Annual Cost Differential in 2023 Dollars -- Project vs. No Project

Bond Issue: 2027	Ops. Start: 2029	Cross-over: 2029	Break-even: 2042	Payback pd.: 15 Yrs



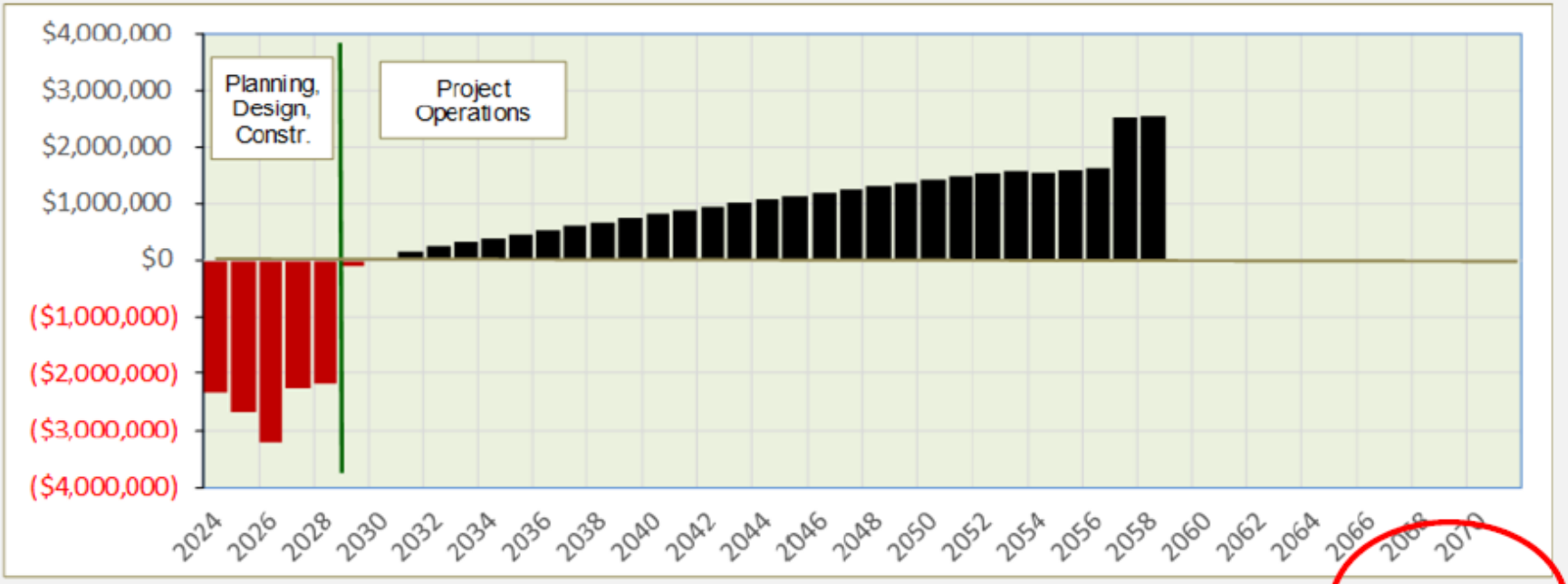
Total Red: $11M	Total Black: $42M	Advantage: $31M

Economic Analysis: Sensitivity Testing

Capacity	SDCWA Rates	Grants	NPV Term	Discount Rate	Capacity *f*
1.5 MGD	Mid-Range	$0.0M	30 Yrs	3.50%	94%

NPV Annual Cost Differential in 2023 Dollars -- Project vs. No Project

Bond Issue: 2027	Ops. Start: 2029	Cross-over: 2030	Break-even: 2049	Payback pd.: 22 Yrs



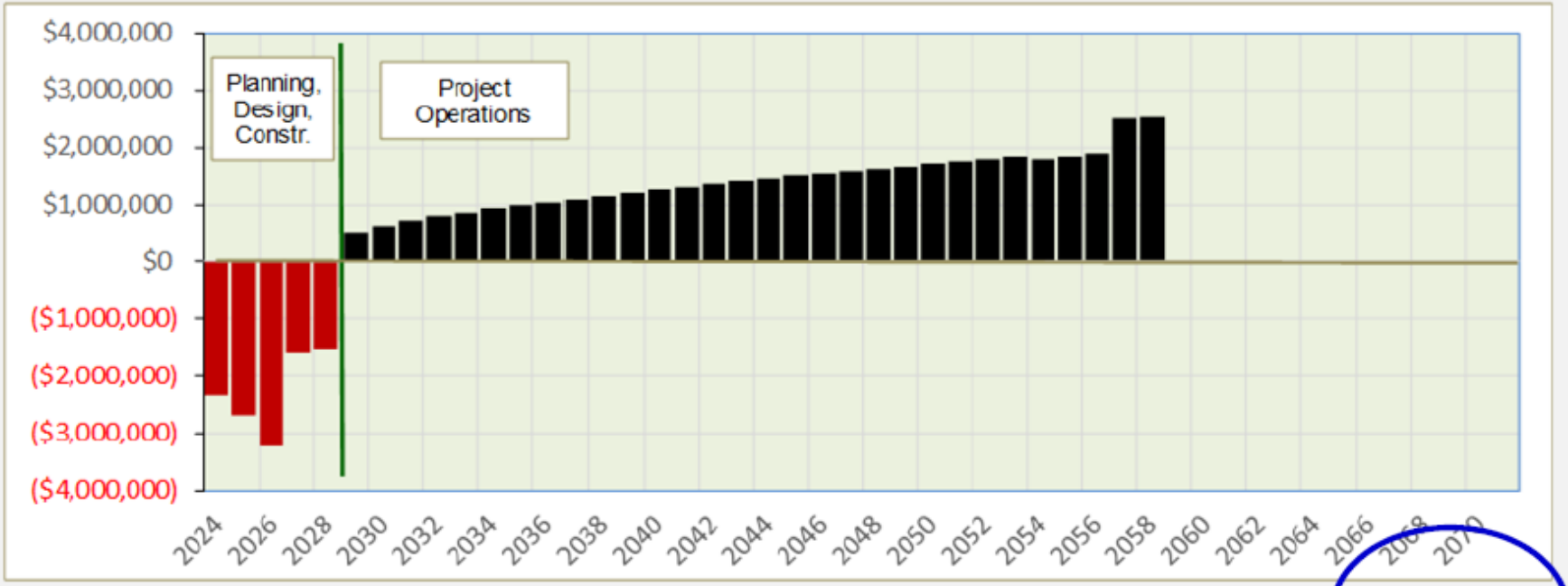
Total Red: $13M	Total Black: $31M	Advantage: $18M

Economic Analysis: Sensitivity Testing

Capacity	SDCWA Rates	Grants	NPV Term	Discount Rate	Capacity *f*
1.5 MGD	Mid-Range	$13.5M	30 Yrs	3.50%	94%

NPV Annual Cost Differential in 2023 Dollars -- Project vs. No Project

Bond Issue: 2027	Ops. Start: 2029	Cross-over: 2029	Break-even: 2042	Payback pd.: 15 Yrs



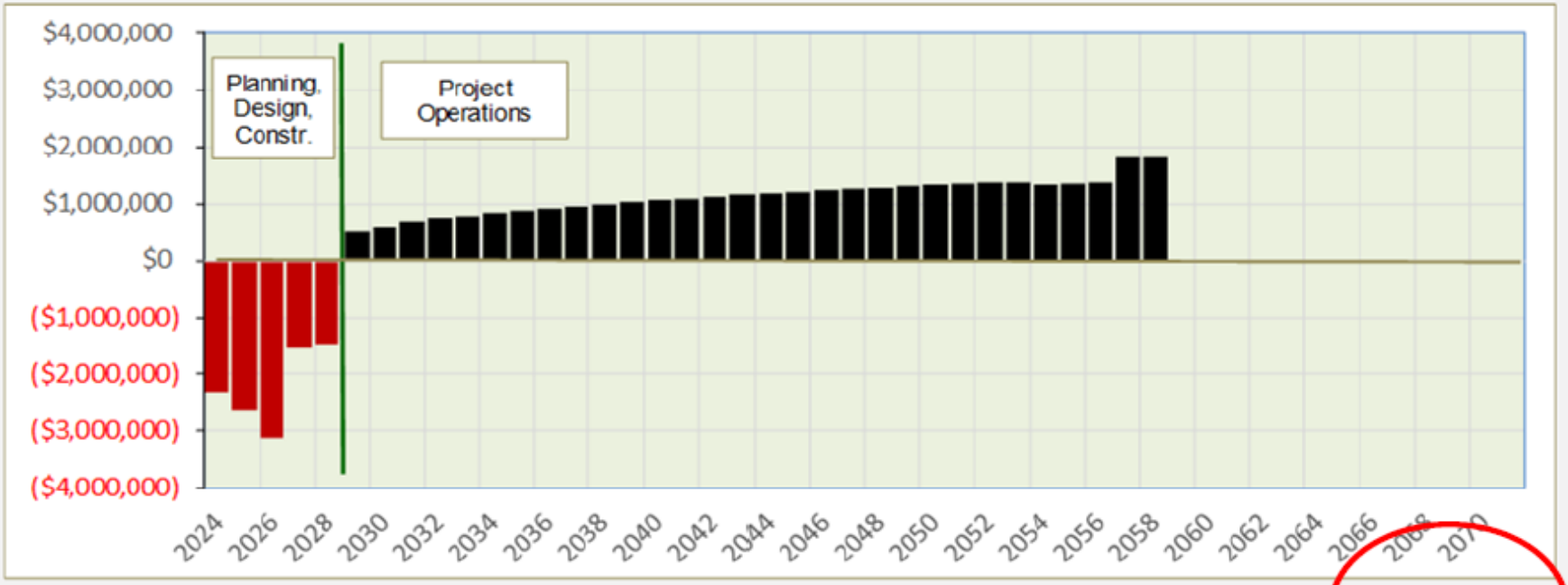
Total Red: $11M	Total Black: $42M	Advantage: $31M

Economic Analysis: Sensitivity Testing

Capacity	SDCWA Rates	Grants	NPV Term	Discount Rate	Capacity *f*
1.5 MGD	Mid-Range	$13.5M	30 Yrs	4.50%	94%

NPV Annual Cost Differential in 2023 Dollars -- Project vs. No Project

Bond Issue: 2027	Ops. Start: 2029	Cross-over: 2029	Break-even: 2043	Payback pd.: 16 Yrs



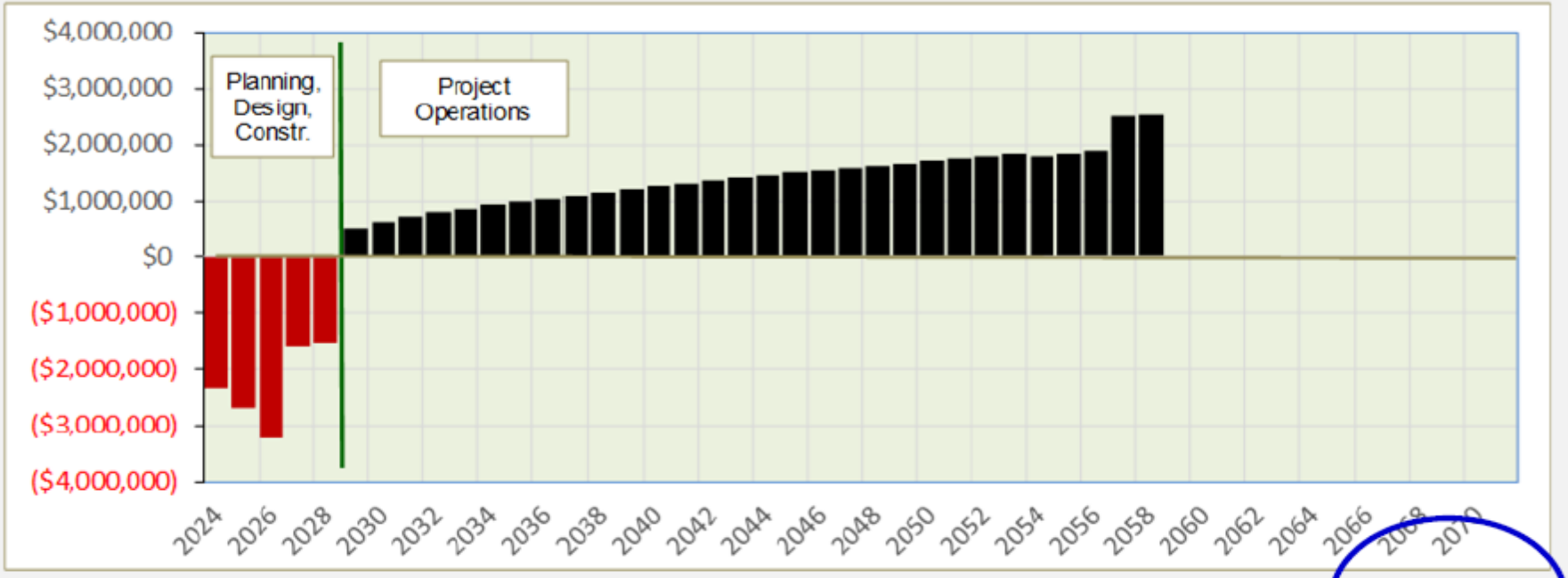
Total Red: $11M	Total Black: $34M	Advantage: $23M

Economic Analysis: Sensitivity Testing

Capacity	SDCWA Rates	Grants	NPV Term	Discount Rate	Capacity *f*
1.5 MGD	Mid-Range	$13.5M	30 Yrs	3.50%	94%

NPV Annual Cost Differential in 2023 Dollars -- Project vs. No Project

Bond Issue: 2027	Ops. Start: 2029	Cross-over: 2029	Break-even: 2042	Payback pd.: 15 Yrs



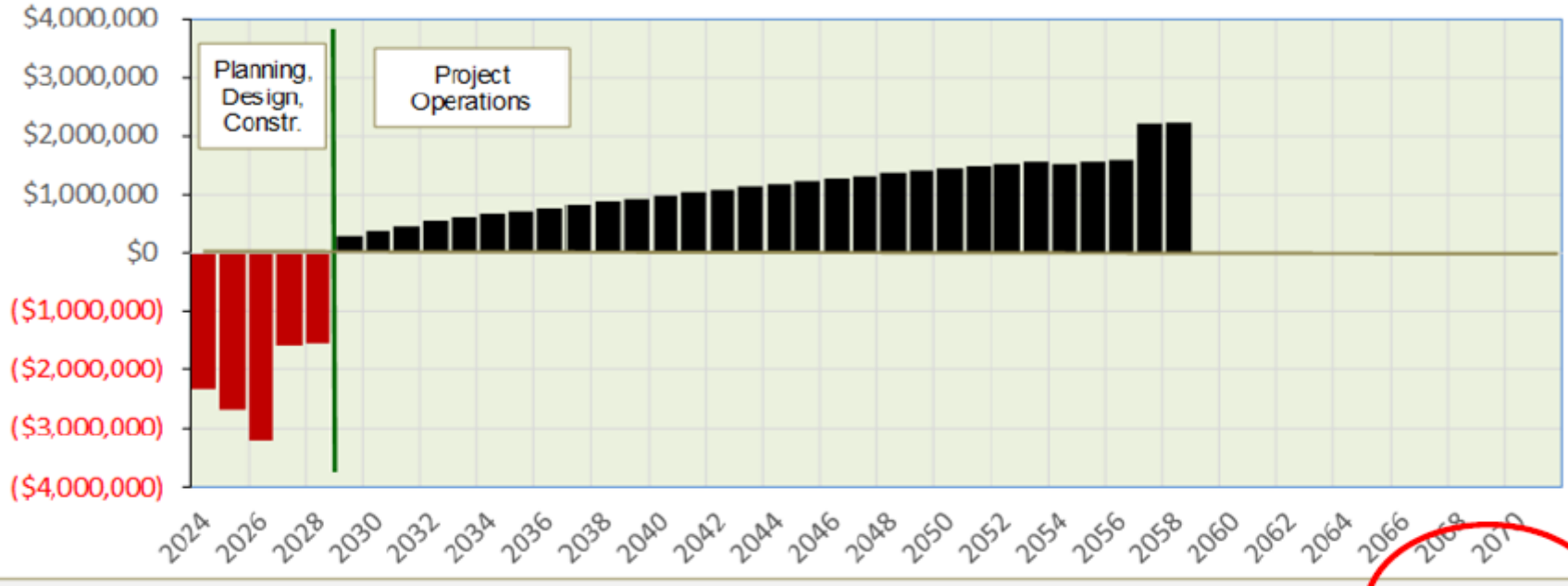
Total Red: $11M	Total Black: $42M	Advantage: $31M

Economic Analysis: Sensitivity Testing

Capacity	SDCWA Rates	Grants	NPV Term	Discount Rate	Capacity *f*
1.5 MGD	Mid-Range	$13.5M	30 Yrs	3.50%	83%

NPV Annual Cost Differential in 2023 Dollars -- Project vs. No Project

Bond Issue: 2027	Ops. Start: 2029	Cross-over: 2029	Break-even: 2045	Payback pd.: 18 Yrs



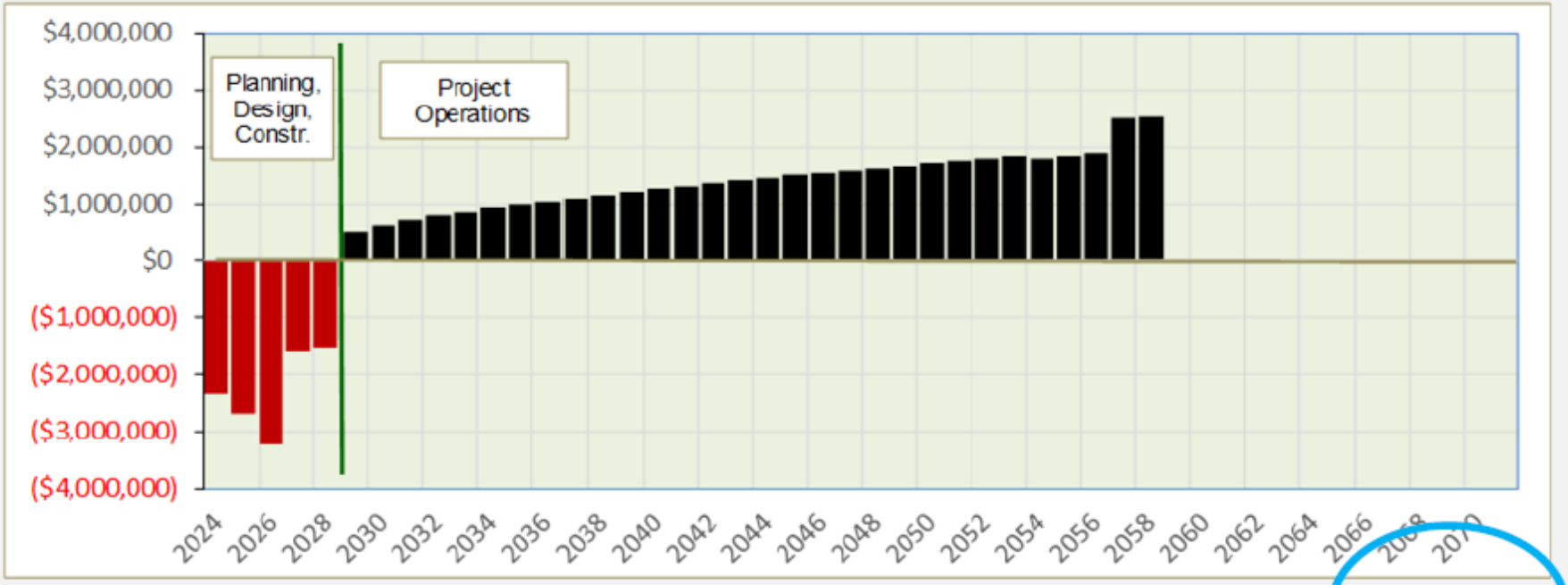
Total Red: $11M	Total Black: $34M	Advantage: $23M

Economic Analysis: Sensitivity Testing

Capacity	SDCWA Rates	Grants	NPV Term	Discount Rate	Capacity *f*
1.5 MGD	Mid-Range	$13.5M	30 Yrs	3.50%	94%

NPV Annual Cost Differential in 2023 Dollars -- Project vs. No Project

Bond Issue: 2027	Ops. Start: 2029	Cross-over: 2029	Break-even: 2042	Payback pd.: 15 Yrs



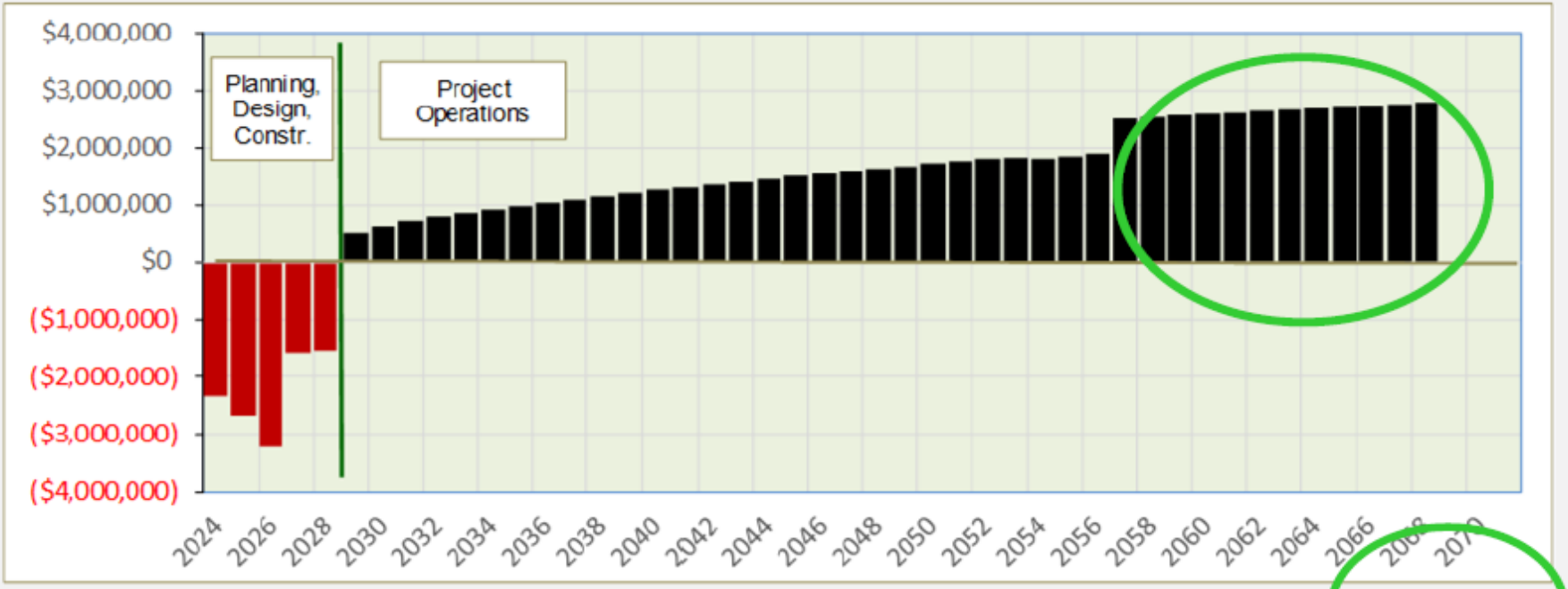
Total Red: $11M	Total Black: $42M	Advantage: $31M

Economic Analysis: Sensitivity Testing

Capacity	SDCWA Rates	Grants	NPV Term	Discount Rate	Capacity *f*
1.5 MGD	Mid-Range	$13.5M	40 Yrs	3.50%	94%

NPV Annual Cost Differential in 2023 Dollars -- Project vs. No Project

Bond Issue: 2027	Ops. Start: 2029	Cross-over: 2029	Break-even: 2042	Payback pd.: 15 Yrs



Total Red: $11M	Total Black: $69M	Advantage: $58M

FINDINGS AND RECOMMENDATIONS:

1. **Non-Cost Factors:** The project provides improved supply reliability, environmental sustainability, and local control

2. **Cost Factors:** With reasonable assumptions, the project is significantly less costly than the No Project alternative over a 30-year period of analysis

3. **Next Steps:** The Non-Cost and Cost findings support advancing the project to final planning and agency coordination (SGMA et. al.)

Board Questions, Discussion, Input

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Municipal Water District
A Public Agency

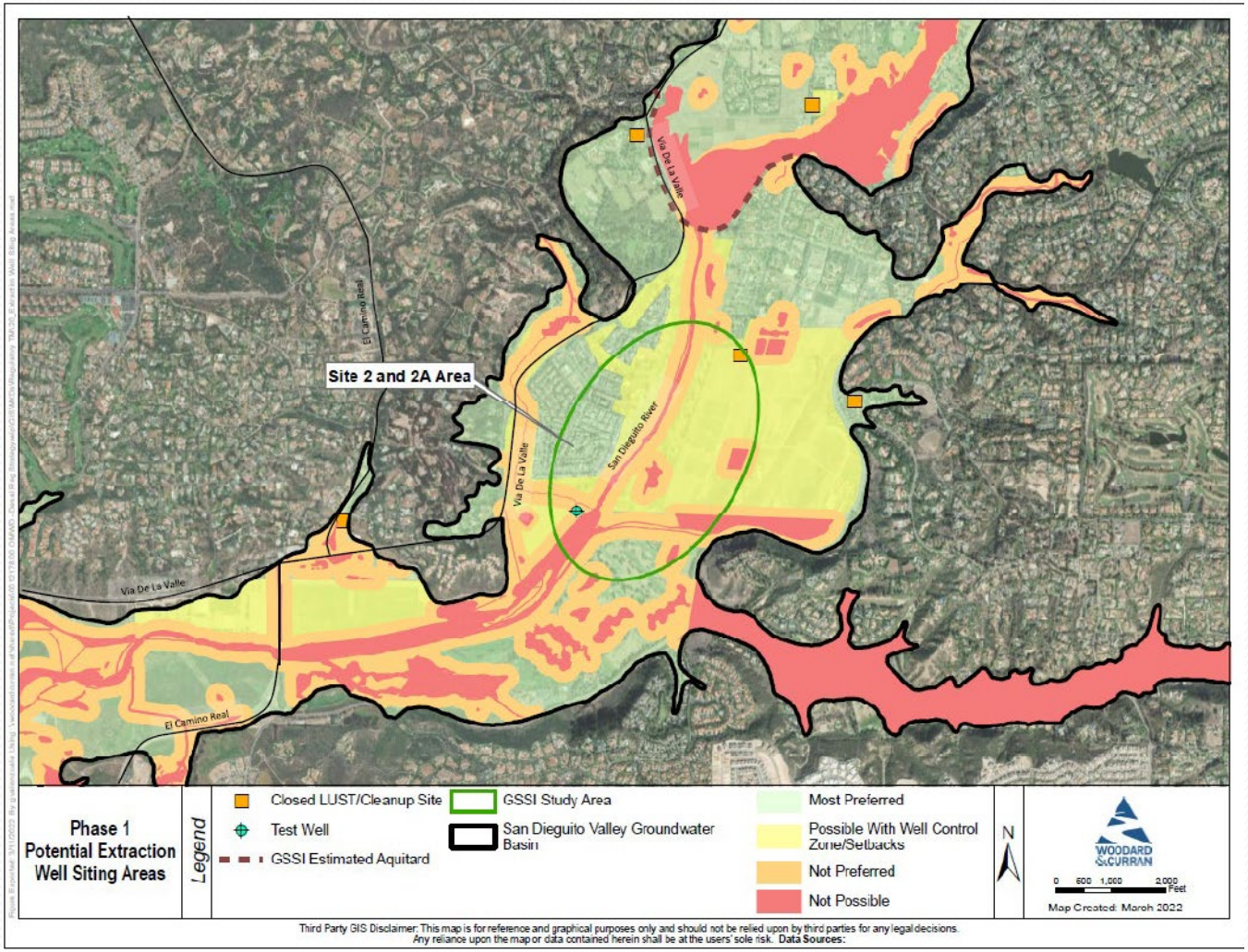
Agenda

- San Dieguito Project Background – OMWD Staff
- Hydrogeology – Consulting Engineer
  - Board Q & A
- Economic Analysis – Gillingham Water
  - Board Q & A
- Next Steps – OMWD Staff
  - Questions March 30, 2022
  - FY 2024 Investigations
  - 5-Year Schedule and Budget
  - Board Q & A
- Closed Session

Board Questions March 2022

- Follow up July 20, 2022 board meeting (consent)
- Provided length of brine pipelines
  - SEJPA 6.4 miles
  - Escondido Outfall 4.8 miles
- Estimated length of project construction – 2 years
- Potential well sites (see map)
- Estimated length of El Camino Real realignment – 3 years
- Project impact on water rates – 2024 Water Cost of Service Study
- Retroactive review of DCMWTP – In Progress

Potential Well Sites



FY 2024 Plan

Improve Certainty of Supply, Start Environmental

- Hydrogeologic analysis
- Water rights
- Updated economic analysis
- Alternative and preliminary design
- If awarded Community Partnership Funding, expedite EIR/EIS as 12-month completion required
- Refine siting study
- Board workshop spring 2024 (or sooner)
- Community outreach

Proposed FY 2024 Budget

Hydrogeologic	$ 600,000
Water rights	$ 100,000
Economic analysis	$ 15,000
Environmental/permits	$ 600,000
Preliminary design	$ 509,000
Monitoring program	$ 45,000
Staff and consultant support	$ 150,000
Total	$ 2,019,000
FY 24 Budget	$ 2,100,000

Five-Year Project Schedule

- FY 2024 — Ongoing hydrogeologic and water rights investigations, partnership explorations, SGMA, alternative studies, preliminary design, and environmental strategy support.
- FY 2025 — Continued hydrogeologic and water rights investigations, partnership explorations, SGMA, alternative studies, preliminary design, environmental and permitting support as well as initial property and easement acquisition reviews.
- FY 2026 — Finish environmental and permitting processes, continue property and easement acquisition efforts, complete design and regulatory approvals.
- FY 2027 — Initiate treatment facility bidding and contract award process, and start construction.
- FY 2028 — Complete construction, startup treatment facility, and monitoring.

Board Approved
Five-Year Capital Spending Plan Budget

• Thru FY 2023	$ 4,562,000
• FY 2024	$ 2,100,000
• FY 2025	$ 2,813,000
• FY 2026	$ 11,345,000
• FY 2027 - 2028	$ 22,017,000
• Total	$ 42,837,000

Estimated*
Five-Year Capital Spending Plan Budget
(Based on 1.5 mgd)

• Thru FY 2023	$ 4,562,000
• FY 2024	$ 2,100,000
• FY 2025	$ 2,813,000
• FY 2026	$ 6,345,000
• FY 2027 - 2028	$ 42,742,000
• Total	$ 58,562,000

**Does not include potential Partner Contribution or Grant Funding*

Board Questions, Discussion, Input

Thank you!

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Supplemental Slides: Detail and Examples

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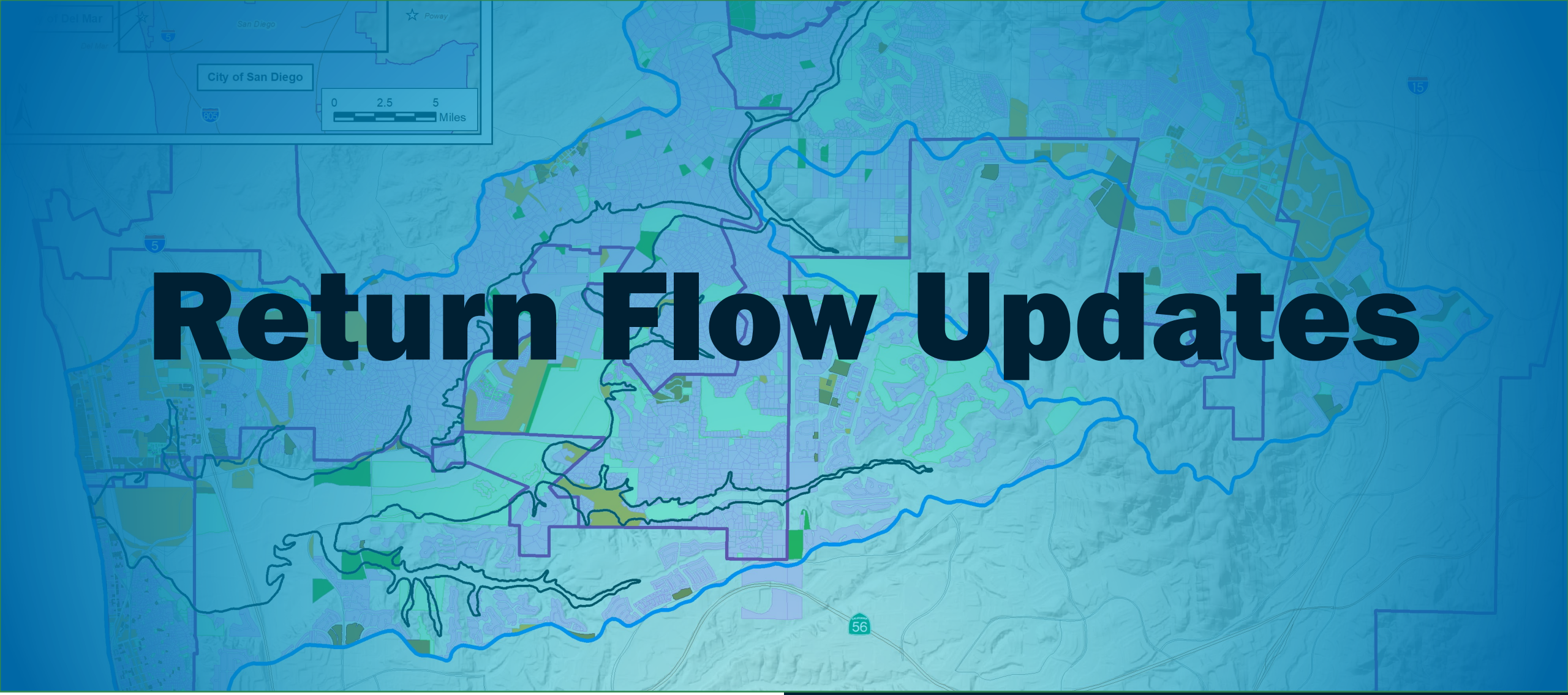

Return Flow Updates

OLIVENHAIN
Municipal Water District

GEOSCIENCE
The First Name in Groundwater

Revised on May 4, 2023

Background and Scope Overview

Background

- Initially estimated as 2,200 AFY based on the 2013 land use map in the 2017 Feasibility Study.
- Reduced to 1,100 AFY during the 2017 model calibration.
- Can not be separated by from imported water or recycled water due to the land use estimation approach.
- Identified the needs to update the return flow during the 2020 modeling effort.

Objectives

- Update and refine the return flow calculations by using the available metered applied water data and latest land use map.
- Separate the updated return flow by from imported water and from recycled water.

SOW

- Data collection & Review
  - metered water data by water type and user type
  - review and match the metered parcels on land use map
  - fill the rest of un-metered area by latest 2017 land use data
- Review and estimate total applied water
- Re-calculate the total return flows and separate by from imported water and recycled water

Data Collection

RCEPARCE	SOURCEADDR	GSSISOURCETYPE	GSSIACCOUNT	GSSITYPE	SOURCE	MATC	PARCEL_GSSI	ADDRESS_GSSI	X_COORD_GSSI	Y_COO
3050910600	6871 Farms View CT	POTABLE	FIRE	POTABLE: FIRE	OMWD	1	3050910600	6871 FARMS VIEW CT	6279017.446	
3050910700	6896 Farms View CT	POTABLE	FIRE	POTABLE: FIRE	OMWD	1	3050910700	6896 FARMS VIEW CT	6278951.889	
3050910700	6896 Farms View CT	POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL	OMWD	1	3050910700	6896 FARMS VIEW CT	6278951.889	
3050910800	6886 Farms View CT	POTABLE	FIRE	POTABLE: FIRE	OMWD	1	3050910800	6886 FARMS VIEW CT	6278792.841	
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3050910900	6842 Farms View CT	POTABLE	FIRE	POTABLE: FIRE	OMWD	1	3050910900	6842 FARMS VIEW CT	6278616.885	
3050911000	6804 Farms View CT	POTABLE	FIRE	POTABLE: FIRE	OMWD	1	3050911000	6804 FARMS VIEW CT	6278466.037	
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2992320900	1716 OCEAN FRONT DEL MAR C	POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL	DELMAR	1	2992320900	1716 OCEAN FRONT	6249402.518	
2992321000	1728 OCEAN FRONT DEL MAR C	POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL	DELMAR	1	2992321000	1728 OCEAN FRONT	6249395.293	
2992320600	1726 COAST BLVD DEL MAR CA	POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL	DELMAR	1	2992320600	1726 COAST BLVD	6249556.967	
2992321100	1734 OCEAN FRONT DEL MAR C	POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL	DELMAR	1	2992321100	1734 OCEAN FRONT	6249400.763	
2992320400	1730 COAST BLVD DEL MAR CA	POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL	DELMAR	1	2992320400	1730 COAST BLVD	6249578.161	
2992320300	1734 COAST BLVD DEL MAR CA	POTABLE	MULTI	POTABLE: MULTI	DELMAR	1	2992320300	1734 COAST BLVD	6249589.943	
2992321200	1740 OCEAN FRONT DEL MAR C	POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL	DELMAR	1	2992321200	1740 OCEAN FRONT	6249398.475	
1901900	1750 A OCEAN FRONT DEL MAR	POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL		3	2992321301		6249373.65899999	
1901900	1750 A OCEAN FRONT DEL MAR	POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL		3	2992321302		6249373.65899999	
1901900	1750 A OCEAN FRONT DEL MAR	POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL		3	2992321303		6249373.65899999	
1901900	1750 A OCEAN FRONT DEL MAR	POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL		3	2992321304		6249373.65899999	
		POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL	DELMAR	4	2992321305	1750 OCEAN FRONT DEL M.	6249421.16700000000	19
		POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL	DELMAR	4	2992321305	1750 OCEAN FRONT DEL M.	6249421.16700000000	19
		POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL	DELMAR	4	2992321305	1750 OCEAN FRONT DEL M.	6249421.16700000000	19
		POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL	DELMAR	4	2992321305	1750 OCEAN FRONT DEL M.	6249421.16700000000	19
2992321305	1750 OCEAN FRONT DEL MAR C	RECYCLED	PARK	RECYCLED: PARK	DELMAR	1	2992321305	1750 OCEAN FRONT	6249373.659	
		POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL	DELMAR	4	2992321305	1750 OCEAN FRONT DEL M.	6249421.16700000000	19
2992321402	1750 COAST BLVD DEL MAR CA	POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL	DELMAR	1	2992321402	1750 COAST BLVD	6249562.97	
2992321401	139 18TH ST DEL MAR CA 9201	POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL	DELMAR	1	2992321401	139 18TH ST	6249562.97	
2991471800	1812 COAST BLVD DEL MAR CA	POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL	DELMAR	1	2991471800	1812 COAST BLVD	6249561.896	
2991471900	1804 COAST BLVD DEL MAR CA	POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL	DELMAR	1	2991471900	1804 COAST BLVD	6249566.948	
2991471200	138 18TH ST DEL MAR CA 9201	POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL	DELMAR	1	2991471200	138 18TH ST	6249477.372	
		POTABLE	PARK	POTABLE: PARK	DELMAR	4	2991472100	1802 OCEAN FRONT DEL M.	6249375.66200000000	19
2511700	1802 OCEAN FRONT DEL MAR C	POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL		3	2991472100		6249396.37199999	
2991471001	1808 OCEAN FRONT DEL MAR C	POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL	DELMAR	1	2991471001	1808 OCEAN FRONT	6249385.329	
2991471002	1810 OCEAN FRONT DEL MAR C	POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL	DELMAR	1	2991471002	1810 OCEAN FRONT	6249394.278	
		POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL	DELMAR	4	2991470900	1814 OCEAN FRONT DEL M.	6249413.36600000000	19
2991470900	1812 OCEAN FRONT DEL MAR C	POTABLE	RESIDENTIAL	POTABLE: RESIDENTIAL	DELMAR	1	2991470900	1812 OCEAN FRONT	6249383.905	
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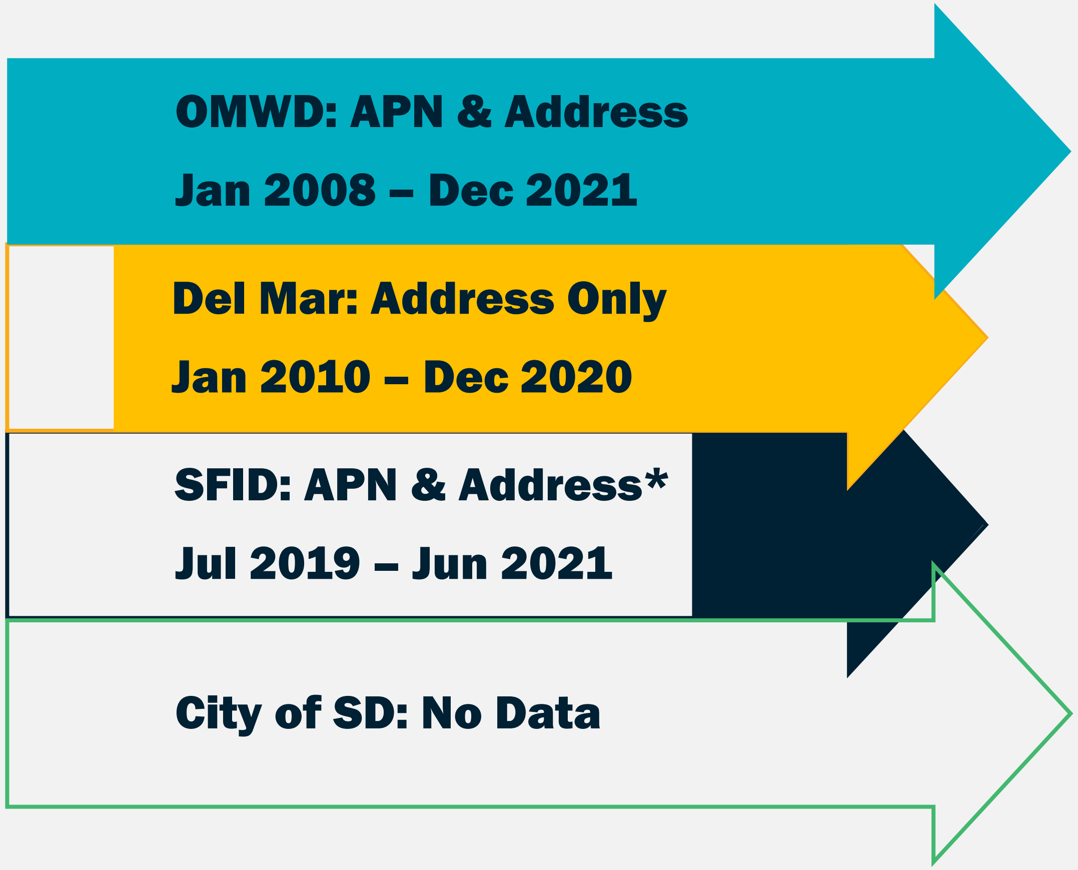
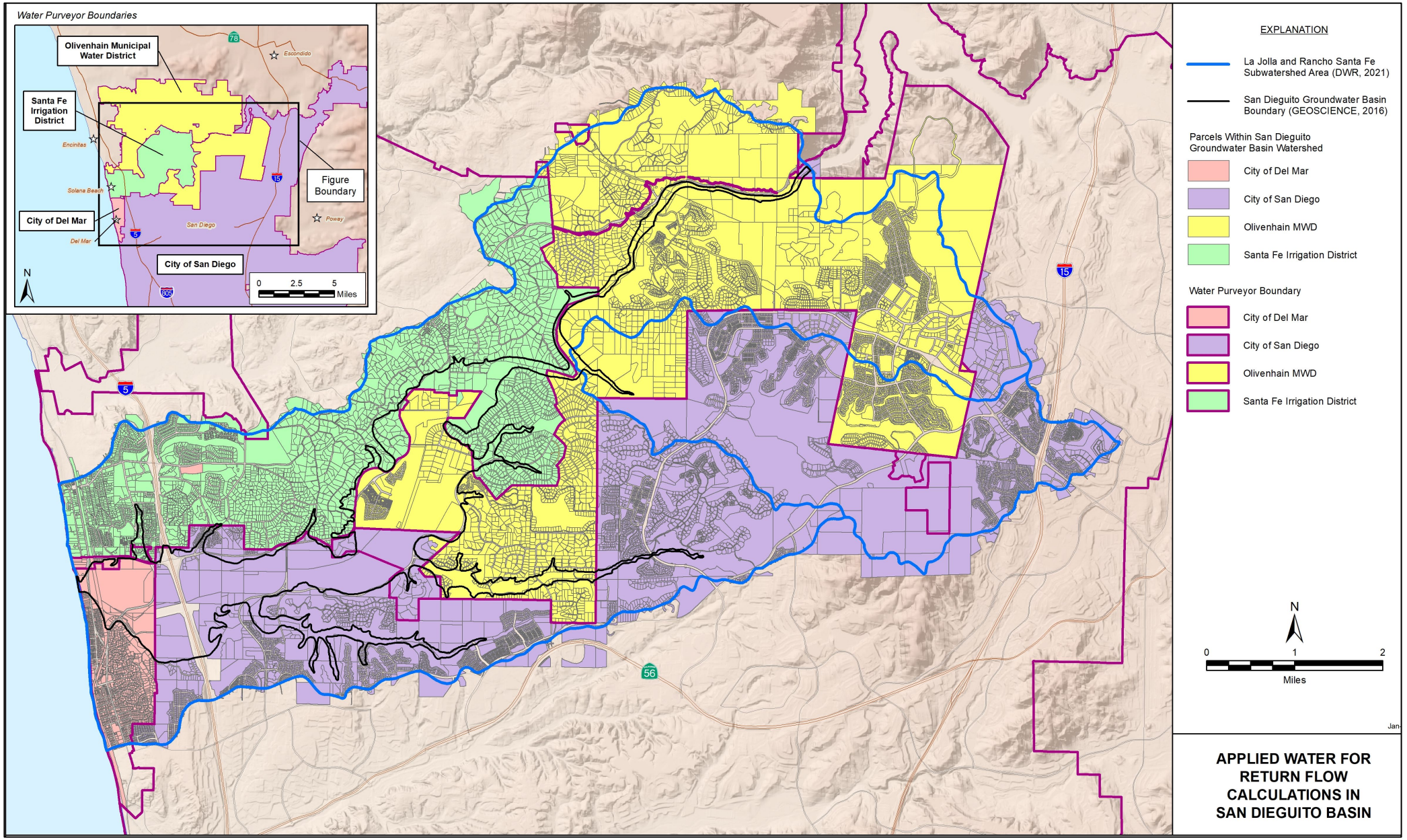
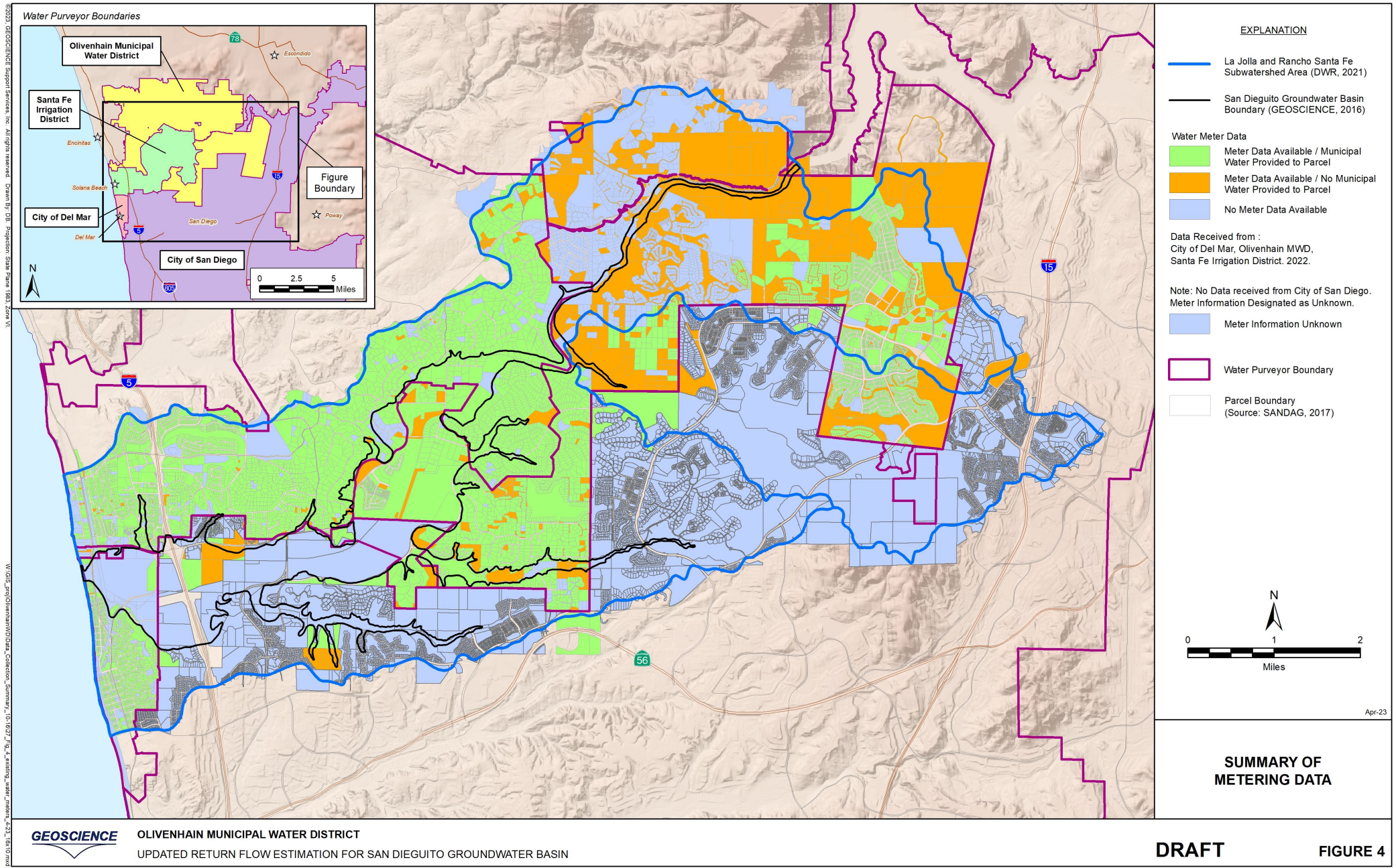


	OMWD	City of Del Mar	SFID	City of SD	Total
Watershed Area	37.9%	3.4%	19.6%	39.1%	37,750 parcels
Total Metered Parcels	5,871	1,474	4,427	-	11,563
Total Metered w/ Non-Zero Data	5,870	1,474	4,424	-	11,556

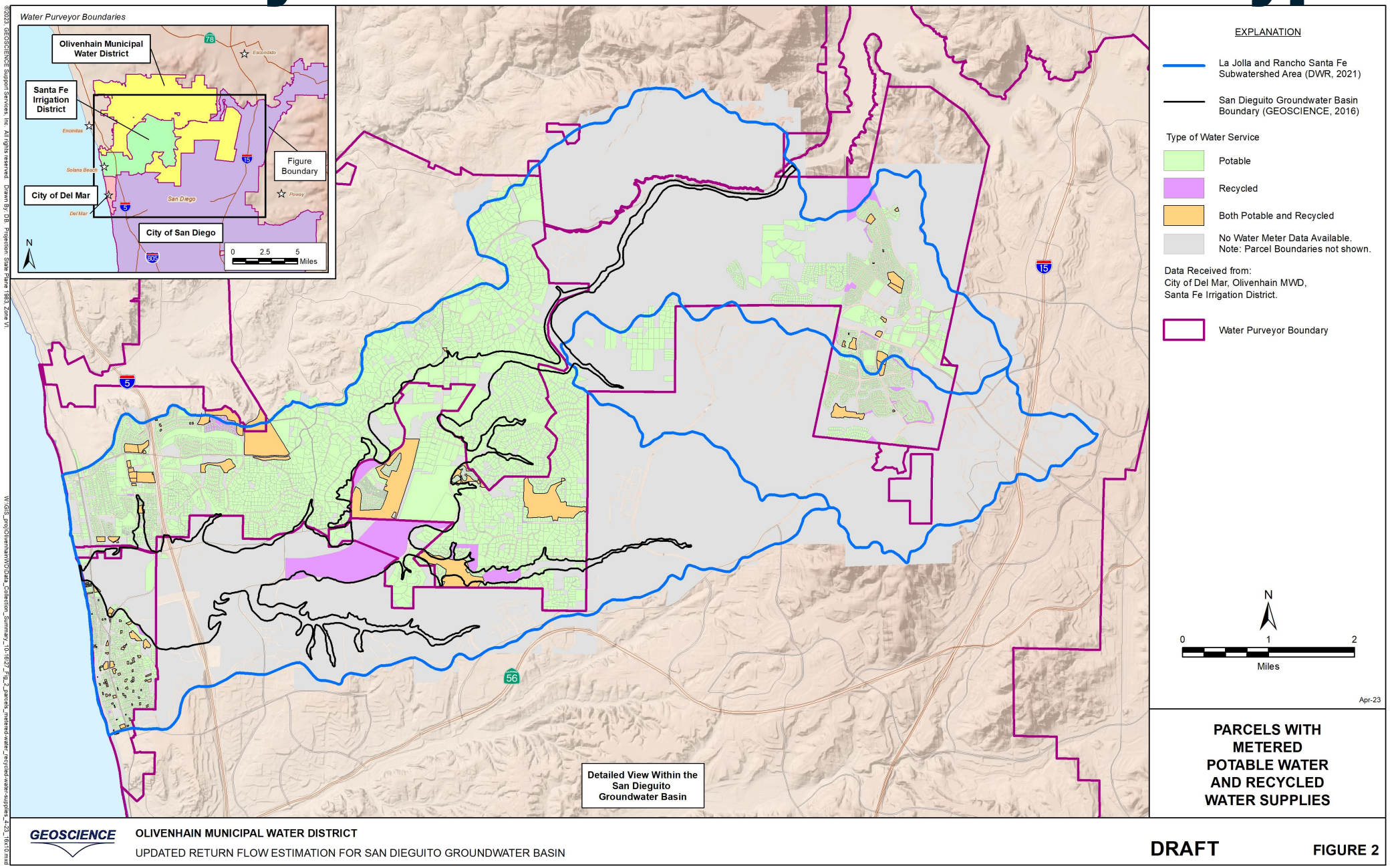
Summary of Data Collection – Service Area



Summary of Data Collection – Metering Data



Summary of Data Collection – Water Type



Drawn By: DB Projection: State Plane 1983, Zone VI
W:\GIS_proj\OlivenhainWD\Data_Collection_Summary_10-16\27_Fig_2_parcels_metered-water_recycled-water-supplies_4-23_16x10.mxd

GEOSCIENCE

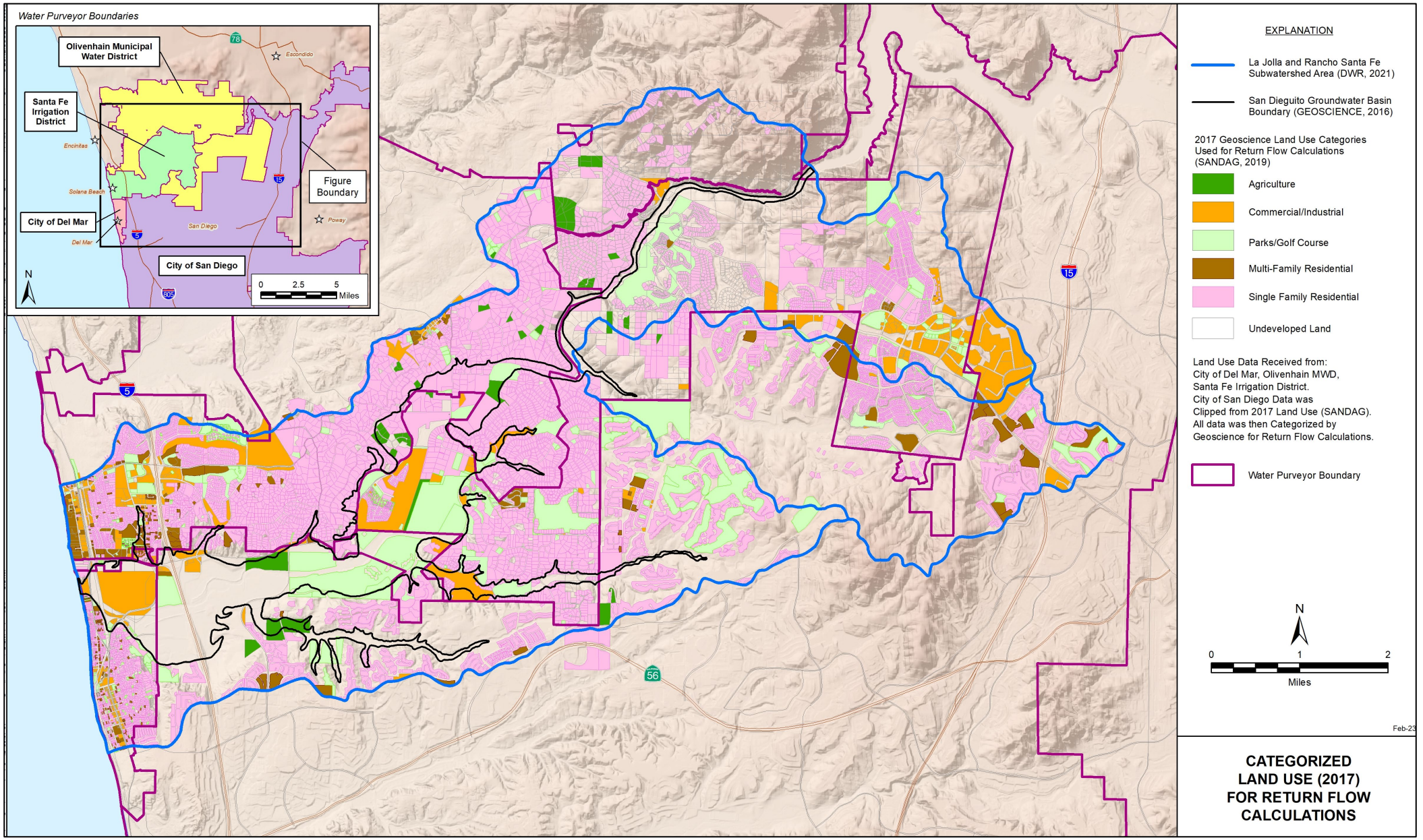
OLIVENHAIN MUNICIPAL WATER DISTRICT

UPDATED RETURN FLOW ESTIMATION FOR SAN DIEGUITO GROUNDWATER BASIN

DRAFT

FIGURE 2

Summary of Data Collection – Land Use



Assumptions for Applied Water Estimation

TABLE 7- ANNUAL WUF BY LAND USE CLASS
(Acre-Feet per Year per Acre)

Source: Stetson Engineers, 2016

LAND USE CLASS	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average
Agricultural	2.31	2.47	2.79	1.9	2.04	1.60	1.73	1.99	1.90	2.08	1.56	2.03
Residential	1.50	1.57	1.68	1.52	1.40	1.21	1.21	1.29	1.30	1.32	0.91	1.36
Commercial	1.29	1.32	1.32	1.30	1.09	0.99	1.01	1.05	1.01	1.06	0.83	1.12
Multi	4.27	4.39	4.63	4.66	4.22	4.39	4.39	4.72	4.50	4.74	3.70	4.42
Park/Golf	3.01	3.58	3.94	3.27	2.72	2.43	2.28	2.59	2.57	2.65	2.05	2.83
Total[1]	1.82	1.95	2.16	1.77	1.71	1.44	1.45	1.63	1.61	1.71	1.20	

Other References Evaluated:

1. DWR (California Department of Water Resources), 2000. A Guide to Estimating Irrigation Water Needs of Landscape Plantings in California. University of California Cooperative Extension, dated August 2000.
2. County (County of San Diego) Department of Planning and Land Use, 2010. County of San Diego Department of Planning and Land Use General Plan Update Groundwater Study. Dated April 2010.
3. United Conservation District, 2018.

OMWD's metered data was used to double check the assumed WUF, applied water and return flow estimations.

Applied Water Estimation

Land Use	OMWD (Jan 2008 - Dec 2021)	City of Del Mar (Jan 2010 - Dec 2020)	SFID (July 2019 - Jun 2021)	City of San Diego	TOTAL
			Applied Water (acre-ft/year)		
Agricultural	185	11	173	212	581
Residential	5,579	434	7,092	1,406	14,510
Commercial	897	230	447	683	2,256
Multi-Family	37	104	497	770	1,408
Parks/Golf	2,033	99	733	461	3,326
TOTAL	**8,730**	**877**	**8,942**	**3,532**	**22,080**

Note: The estimated applied water includes metered potable water use, metered recycled water use and estimated applied water for unmetered parcels.

Return Flow Assumptions

Table D1 2005 Return Flow Application Rate

	Indoor (%)	Outdoor (%)	WUF (AF/AC)	Adjusted WUF for 5.3% System Loss (AF/AC)	% Not Consumed (%)	Available for Recovery (AF/AC)	75% Return to GW (AF/AC)	25% Return to SW (AF/AC)	12.5% loss of SW (AF/AC)	Total Return Flow (AF/AC)	Total Return Flow as % Applied (%)
Agricultural	0	100	2.31	2.43	20	0.49	0.36	0.12	-0.06	0.43	18%
Residential	47	53	1.50	1.58	25	0.21	0.16	0.05	-0.03	0.18	12%
Commercial	41	59	1.29	1.36	25	0.20	0.15	0.05	-0.03	0.18	14%
Multi-Family	57	43	4.27	4.50	25	0.48	0.36	0.12	-0.06	0.42	10%
Parks/Golf	0	100	3.01	3.17	20	0.63	0.48	0.16	-0.08	0.55	18%

Table D2 2006 Return Flow Application Rate

	Indoor (%)	Outdoor (%)	WUF (AF/AC)	Adjusted WUF for 4.6% System Loss (AF/AC)	% Not Consumed (%)	Available for Recovery (AF/AC)	75% Return to GW (AF/AC)	25% Return to SW (AF/AC)	12.5% loss of SW (AF/AC)	Total Return Flow (AF/AC)	Total Return Flow as % Applied (%)
Agricultural	0	100	2.47	2.58	20	0.52	0.39	0.13	-0.06	0.45	18%
Residential	43	57	1.57	1.64	25	0.23	0.18	0.06	-0.03	0.20	13%
Commercial	40	60	1.32	1.38	25	0.21	0.16	0.05	-0.03	0.18	14%
Multi-Family	53	47	4.39	4.59	25	0.54	0.40	0.13	-0.07	0.47	11%
Parks/Golf	0	100	3.58	3.74	20	0.75	0.56	0.19	-0.09	0.66	18%

Table D3 2007 Return Flow Application Rate

	Indoor (%)	Outdoor (%)	WUF (AF/AC)	WUF for 6.9% System Loss (AF/AC)	% Not Consumed (%)	Available for Recovery (AF/AC)	75% Return to GW (AF/AC)	25% Return to SW (AF/AC)	12.5% loss of SW (AF/AC)	Total Return Flow (AF/AC)	Total Return Flow as % Applied (%)
Agricultural	0	100	2.79	2.98	20	0.60	0.45	0.15	-0.07	0.52	19%
Residential	39	61	1.68	1.80	25	0.27	0.21	0.07	-0.03	0.24	14%
Commercial	37	63	1.32	1.41	25	0.22	0.17	0.06	-0.03	0.19	15%
Multi-Family	49	51	4.63	4.95	25	0.63	0.47	0.16	-0.08	0.55	12%
Parks/Golf	0	100	3.94	4.21	20	0.84	0.63	0.21	-0.11	0.74	19%

Table D9 2013 Return Flow Application Rate

	Indoor (%)	Outdoor (%)	WUF (AF/AC)	Adjusted WUF for 5.6% System Loss (AF/AC)	% Not Consumed (%)	Available for Recovery (AF/AC)	75% Return to GW (AF/AC)	25% Return to SW (AF/AC)	12.5% loss of SW (AF/AC)	Total Return Flow (AF/AC)	Total Return Flow as % Applied (%)
Agricultural	0	100	1.90	2.01	20	0.40	0.30	0.10	-0.05	0.35	18%
Residential	51	49	1.30	1.37	25	0.17	0.13	0.04	-0.02	0.15	11%
Commercial	41	59	1.01	1.07	25	0.16	0.12	0.04	-0.02	0.14	14%
Multi-Family	61	39	4.50	4.75	25	0.46	0.35	0.12	-0.06	0.41	9%
Parks/Golf	0	100	2.57	2.71	20	0.54	0.41	0.14	-0.07	0.47	18%

Table D10 2014 Return Flow Application Rate

	Indoor (%)	Outdoor (%)	WUF (AF/AC)	Adjusted WUF for 3.9% System Loss (AF/AC)	% Not Consumed (%)	Available for Recovery (AF/AC)	75% Return to GW (AF/AC)	25% Return to SW (AF/AC)	12.5% loss of SW (AF/AC)	Total Return Flow (AF/AC)	Total Return Flow as % Applied (%)
Agricultural	0	100	2.08	2.16	20	0.43	0.32	0.11	-0.05	0.38	18%
Residential	50	50	1.32	1.37	25	0.17	0.13	0.04	-0.02	0.15	11%
Commercial	42	58	1.06	1.10	25	0.16	0.12	0.04	-0.02	0.14	13%
Multi-Family	60	40	4.74	4.92	25	0.49	0.37	0.12	-0.06	0.43	9%
Parks/Golf	0	100	2.65	2.75	20	0.55	0.41	0.14	-0.07	0.48	18%

Table D11 2015 Return Flow Application Rate

	Indoor (%)	Outdoor (%)	WUF (AF/AC)	Adjusted WUF for 2.6% System Loss (AF/AC)	% Not Consumed (%)	Available for Recovery (AF/AC)	75% Return to GW (AF/AC)	25% Return to SW (AF/AC)	12.5% loss of SW (AF/AC)	Total Return Flow (AF/AC)	Total Return Flow as % Applied (%)
Agricultural	0	100	1.56	1.60	20	0.32	0.24	0.08	-0.04	0.28	18%
Residential	66	34	0.91	0.93	25	0.08	0.06	0.02	-0.01	0.07	8%
Commercial	53	47	0.83	0.85	25	0.10	0.08	0.03	-0.01	0.09	11%
Multi-Family	76	24	3.70	3.80	25	0.23	0.17	0.06	-0.03	0.20	5%
Parks/Golf	0	100	2.05	2.10	20	0.42	0.32	0.11	-0.05	0.37	18%

Agricultural: 18% - 19%

Residential: 8% - 14%

Commercial/Industrial: 11% - 15%

Multi-Family: 5% - 12%

Parks/Golf Course: 18% - 19%

Return Flow Calculations

Land Use	OMWD (Jan 2008 - Dec 2021)	City of Del Mar (Jan 2010 - Dec 2020)	SFID (July 2019 - Jun 2021)	City of San Diego	TOTAL
			Return Flow (acre-ft/year)		
Agricultural	33	2	31	38	104
Residential	538	40	567	135	1,280
Commercial	105	28	49	83	265
Multi-Family	3	7	25	54	89
Parks/Golf	366	18	132	83	599
TOTAL	**1,044**	**95**	**804**	**393**	**2,337**
			Average Return Flow Factors (Return Flow / Applied Water)		
	12%	**11%**	**9%**	**11%**	**11%**

Note: The return flow was calculated based on metered applied water and estimated applied water for unmetered parcels.

Questions?

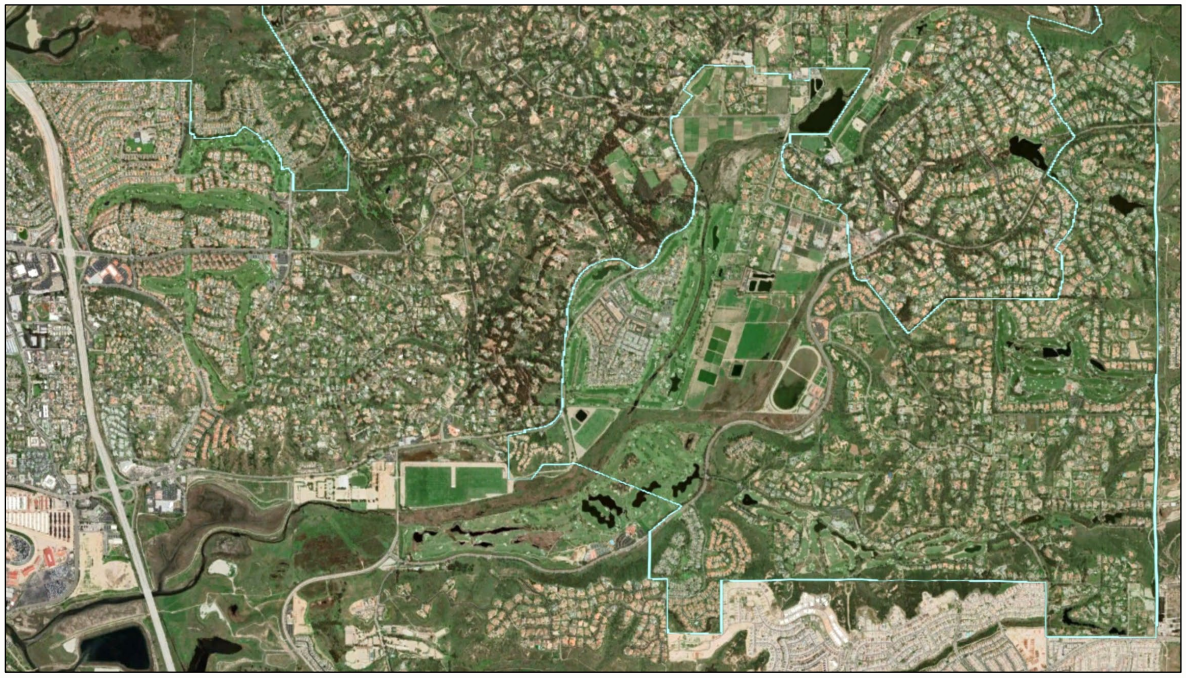
OLIVENHAIN Municipal Water District

Charting Local Waters: San Dieguito Groundwater Study
An OMWD Sustainable Supplies Project

San Dieguito Groundwater Desalination Project Planning

Economic Feasibility Assessment Summary Report

UPDATED May 2023



Prepared by:

GILLINGHAM WATER
Gillingham Water Planning and Engineering, Inc.

ECONOMIC FEASIBILITY PROJECT TEAM

CONSULTANT TEAM

Gillingham Water
Doug Gillingham, P.E.
Principal

Weinberg Water Resources Consulting
Ken Weinberg
Technical Review

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OMWD CONSULTING ENGINEER:
Don MacFarlane, P.E.

DRAFT

Doug Gillingham, P.E.
Project Manager

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Preface to the May 2023 Update

The original version of this report was prepared in March 2022. The purpose of the report was then and is now to support project planning and budgeting decisions by the Olivenhain Municipal Water District concerning the potential for a new potable water supply project, one utilizing surplus groundwater from the San Dieguito Basin.

This new updated version of the report has made modest modifications to the original to incorporate new information and conditions. The most consequential of these are the following:

SUMMARY OF KEY CHANGES IN THE MAY 2023 REPORT UPDATE

Change	Description	Economic Consequence
1) **Increased Production Capacity**	The 2022 report evaluated a project with an assumed projection capacity of 1.3 million gallons per day (mgd). Subsequently, additional hydrogeological investigations undertaken by OMWD indicate a strong likelihood that sustainable groundwater supplies are available to support a project with a production capacity of at least 1.5 mgd. The new report evaluates a project at this larger capacity.	**Positive** The change is significant because the larger project benefits from significant economies-of-scale inherent in the project's conceptual design. This leads to reduced unit costs of production, and to an increase in the project's 30-year Net Present Value (NPV) advantage in comparison to the No Project alternative of continued reliance on purchases from the San Diego County Water Authority (SDCWA).
2) **Additional Facilities Needed` for Product Water Conveyance**	The increase in project capacity requires additional facilities to convey product water into regions of the OMWD distribution system having sufficient demands to utilize the supply consistently.	**Negative** This leads to an increase in costs, but this increase in more than offset by the economies-of-scale noted above.
3) **Higher than Expected SDCWA Rate Increases**	SDCWA's proposed rate increases for its next budget cycle are considerably higher than the rate escalation assumptions utilized in the 2022 Study. The new report updates the rate escalation assumptions accordingly. We continue to believe there is an upper limit to the variable component of SDCWA rates, and our analysis continues to account for that as detailed in the body of the report.	**Positive** The change is significant because the economics of the project are primarily a function of how its long-term costs compare to the long-term costs of purchasing a like amount of water from SDCWA. The change results in an increase in the project's 30-year NPV advantage over the No Project status quo of reliance on SDCWA.
4) Adjusted Capital Cost Escalation	The 2022 report inadvertently over-escalated capital costs to the start of construction. The independent cost estimate was already escalated to 2027 conditions and dollars, but the 2022 economic model treated the costs as being in 2022 dollars, and escalated those to the start of construction. That has now been corrected.	**Positive** The correction reduces the present-worth cost of construction, further advantaging the project in comparison to the No Project status quo of reliance on SDCWA.

The overall effect of the above updates is to increase in the project's 30-year Net Present Value advantage over its No Project alternative, which for this case is continued reliance on purchases from SDCWA. This and other findings are detailed in the body of the report.

Executive Summary

1. The Project: Olivenhain Municipal Water District (OMWD) is investigating the feasibility of developing a San Dieguito Groundwater Desalination project as a new increment of local water supply to serve the long-term needs of its ratepayers.

Previous work by OMWD has evaluated a reasonable range of groundwater project locations and types, and determined the San Dieguito Groundwater Basin (SDGWB) to be the preferred location for more focused studies to assess project feasibility. Engineering and Hydrogeologic investigations have indicated a project is technically feasible, and that OMWD could safely and sustainably pump up to approximately 2,000 acre-feet per year (AF/yr) of surplus groundwater from the basin. Because the groundwater is brackish, desalination via reverse osmosis would be required, and after treatment losses the project would produce approximately **1,600 AF/yr** of new potable supply. The proposed project would have a production capacity of **1.5 million gallons per day (mgd).**

2. The Question: How does the Project fare, in terms of cost and non-cost factors, in comparison to the No Project alternative of continued reliance on the San Diego County Water Authority (SDCWA)?

We have structured our analysis as a comparison between the Project and its No Project alternative, the latter being the status quo of continued reliance on purchases of raw water from SDCWA, and treatment of that water at OMWD's David C. McCollom Water Treatment Plant (McCollom plant). Project vs. No Project.

3. Answer: The Project fares very well.

- **Non-Cost Factors:** The project provides improved supply reliability, environmental sustainability, and local control, helping to reduce OMWD's exposure to the uncertainties and escalating costs associated with imported water supplies.
- **Cost Factors:** With reasonable assumptions, the project provides significant economic advantage in comparison to the No Project alternative on a Net Present Value (NPV) basis. Over a 30 year period of project operations, we estimate present-worth total costs as follows:

30-Year Net Present Value @ 1,600 AF/yr (2023 Dollars)		
PROJECT	**NO PROJECT**	**PROJECT ADVANTAGE**
$78M	$109M	**$31M**

4. Recommendations / Next Steps: The findings are sufficient to warrant continued investment by OMWD in project development.

The potential cost and non-cost advantages of the Project support continuing with project planning, design, permitting, grant funding applications, and more.

1. Introduction

1.1. Project Background: Imported supplies are subject to increasing environmental and economic challenges. Evaluating local water supply development opportunities is prudent.

With imported supplies subject to continuing challenges and growing increasingly expensive, it becomes prudent to examine opportunities to develop additional sources of local supply where feasible. OMWD has investigated a reasonable range of groundwater project locations and types, and determined the SDGWB to be the preferred location for more focused studies to assess project feasibility.

In 2008, OMWD's Board directed staff to investigate brackish groundwater desalination opportunities, instead of purchasing potable water directly from the Carlsbad Seawater Desalination Plant. The direction at that time was to seek brackish desalination opportunities within OMWD's control at cost equal to or less than the cost of Carlsbad desalinated water, which OMWD had been a partner in and could have elected to receive.

Engineering and Hydrogeologic investigations conducted by OMWD to date have indicated a project is technically feasible, and that OMWD could safely and sustainably pump approximately 2,000 acre-feet per year (AF/yr) of surplus groundwater from the basin[1]. Because the groundwater is brackish, desalination via reverse osmosis would be required, and after treatment losses the project would produce approximately 1,600 AF/yr of new potable supply.

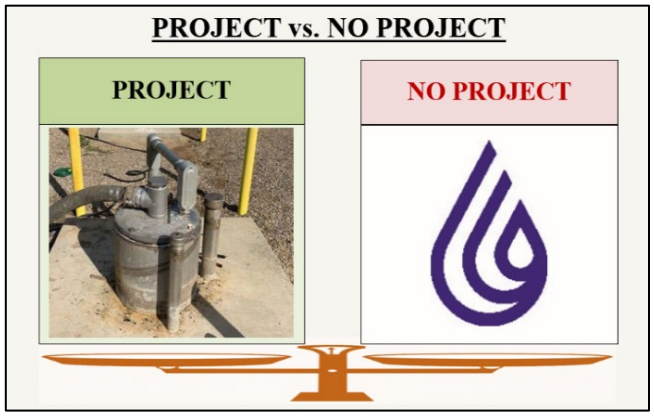
1.2. Economic Feasibility Assessment Purpose: Assess economic feasibility, and provide clear and objective analysis sufficient to support a decision by OMWD on whether to continue investing in project development.

OMWD seeks to manage its ratepayer funds wisely, and to invest those funds only in projects for which probable returns warrant that investment. The costs for project planning and feasibility assessments are by their nature at risk, their potential benefit being contingent on a project advancing to implementation.

With OMWD having already invested funds in studies to date, it is prudent to test each cycle of investment – perhaps each annual budget – against the expectation of return on investment. The economic feasibility assessment presented in this report attempts to meet that challenge.

[1] **Increased Capacity:** The 2022 version of this report evaluated a project with an assumed projection capacity of 1.3 million gallons per day (mgd), supported by groundwater pumping of approximately 1,700 AF/yr. Subsequently, additional hydrogeological investigations undertaken by OMWD indicate a strong likelihood that sustainable groundwater supplies of approximately 2,000 AF/yr are available, sufficient to support a project with a production capacity of at least 1.5 mgd. The new report evaluates a project at this larger capacity.

1.3. Project vs. No Project: The economic point of comparison for the Project is that of the No Project alternative, being the status quo of continued purchases from SDCWA.



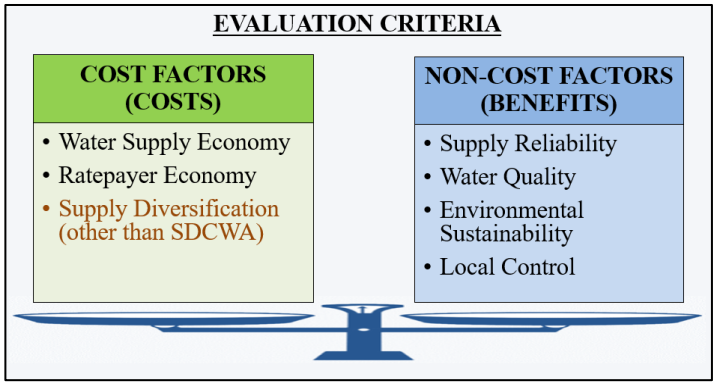
Even though previous Board actions have referenced the costs of water from the Carlsbad Seawater Desalination Plant (Carlsbad Desal), the current analysis draws a different point of comparison more apt for OMWD: it's actual marginal source of supply. While it is true that Carlsbad Desal is a component of SDCWA's supply portfolio, and by far the most expensive component, its costs are melded into SDCWA's overall mix. As such, the cost to OMWD of buying an extra acre-foot from SDCWA, or conversely, the savings of not buying an acre-foot, are those of the melded SDCWA rate structure. Thus the proper economic comparison is between the costs of the Project, and the costs of continuing to purchase the corresponding increment of raw water supply from SDCWA and treating that water at OMWD's McCollom water treatment plant.

1.4. Evaluation Criteria: The assessment considers both Cost and Non-Cost factors.

Evaluation criteria begin with the OMWD's mission statement:

> **OMWD MISSION STATEMENT (WATER):** Providing safe, reliable, high-quality drinking water while exceeding all regulatory requirements in a cost-effective and environmentally responsive manner.

This leads to project goals as follows:



1) Economy: Favor projects that improve water supply economy / rate-payer economy in comparison to a No Project alternative
2) Reliability: Favor projects that improve water supply and delivery reliability to OMWD's customers
3) Water Quality: Favor projects that improve water quality for OMWD's customers
4) Environmental Sustainability: Favor projects that are environmentally sustainable
5) Local Control: Although not stated in the mission statement, this criterium appears of interest to OMWD

Informed investment decisions weigh the benefits of achieving project goals against the cost to do so. There is a reason we call it cost-benefit analysis: these are two sides of a balance scale.

1.5. Document Outline

The remainder of the briefing document is organized into sections as follows:

2. Evaluation of Non-Cost Factors

2.1. By almost any measure, the Project fares very well in a comparison of the Non-Cost factors.

Non-cost factor ratings are summarized in Table 2-1 below:

TABLE 2-1: Evaluation of Non-Cost Factors

Criterion	Notes	Rating
Supply Reliability	Assuming final planning and permitting activities are successful, the project would provide a highly reliable increment of local supply for OMWD's supply portfolio.	↑
Water Quality	Product water quality would be comparable to current treated water.	→
Local Control	The project would provide an increment of supply managed by OMWD and independent of SDCWA and the challenges of imported water supplies.	↑↑
Environmental Sustainability	Environmental studies to date indicate the project can be developed without harming existing users or the environment. Removing salt from the basin is an environmental positive.	↑
• **Reduced Bay-Delta Reliance**	The project advances State of California objectives to reduce reliance on the Sacramento – San Joaquin Bay Delta ecosystem.	↑
• **Reduced Colorado River Reliance**	The project reduces OMWD's reliance on supplies from the Colorado River.	↑
• **Reduced Energy Footprint / GHG**	At an average power consumption of approximately 1,600 kWh/AF, the project would have a smaller energy footprint than existing supplies. (Colorado River Aqueduct: approx. 2,000 kWh/AF; State Water Project: approx. 3,000 kWh/AF, Carlsbad Desal: approx. 4,000 kWh/AF)	↑

Legend: Better: ↑ Neutral: → Worse: ↓

2.2. The project's high ratings for non-cost factors help make it an excellent candidate to receive grant funding.

The non-economic benefits listed above are valuable in their own right, and they also lead to the potential for economic benefit to the project in the form of grant funding. Grant funding programs administered by the U.S. Bureau of Reclamation and the State of California are available to help fund brackish groundwater demineralization projects specifically because these projects provide the types of non-cost benefits listed. As described further in the next section, the project team believes the project will fare very well in competition for grant funding, enough so that it is reasonable to assume grant funding will be awarded to fund at least **25 percent** of the project's capital costs,

3. Evaluation of Cost Factors

3.1. Cost Updates: The project team has prepared an updated estimate of project capital and operating costs.

OMWD commissioned the engineering firm TetraTech to prepare an update of the project's likely construction and operation costs. The update, completed in March of 2022, reflects construction industry inflation that had occurred subsequent to OMWD's previous estimate. The 2022 work also built in conservative estimates of subsequent inflation and price escalation up to an assumed construction date of 2027.

The cost estimate covers a range of project sizes, and indicates considerable economy of scale benefits of larger sized projects. Based on OMWD's most recent hydrogeologic investigations, the economic analysis now assumes the project would be sized at approximately **1.5 million gallons per day (mgd)**, up from the March 2022 assumed capacity of 1.3 mgd, which was up from the original concept size of 1.0 mgd. Accounting for plant maintenance and other downtime, the project would produce approximately **1,600 AF/yr of new potable water supply.**

The updated cost estimates are summarized in **Table 3-1**. For a project sized at 1.5 mgd, the total capital costs in 2027 dollars, exclusive of costs incurred to date, are approximately **$54 million**.

TABLE 3-1: Project Capital Cost Summary in 2027 Dollars[1, 2]

Project Costs Based on Current Supply Conditions	Design Production Capacity		Selected Capacity
	1.0 MGD	2.0 MGD	1.5 MGD
Annual Water Production (af/yr)	1,053 AF/yr	2,106 AF/yr	1,579 AF/yr
Capital Cost			
Final Planning and Environmental	$2,500,000	$2,750,000	$2,625,000
Capital Construction	$34,108,000	$47,179,000	$40,643,500
Wells	*$3,898,000*	*$7,795,000*	*$5,846,500*
Treatment Plant	*$14,163,000*	*$17,165,000*	*$15,664,000*
Pipelines	*$16,047,000*	*$22,219,000*	*$19,133,000*
Brine Line	*$11,473,000*	*$11,998,000*	*$11,735,500*
Supply and Delivery Pipelines	*$4,574,000*	*$10,221,000*	*$7,397,500*
Supply Pipelines	*$1,313,000*	*$1,970,000*	*$1,641,500*
Delivery Pipelines	*$3,261,000*	*$8,251,000*	*$5,756,000*
Design, Administration Permitting & CM	$9,164,000	$10,940,000	$10,052,000
Pre-Design / EIR Support	*$1,584,000*	*$2,093,000*	*$1,838,500*
Final Design and Permitting	*$2,376,000*	*$3,139,000*	*$2,757,500*
Construction Mngt. & Admin.	*$5,204,000*	*$5,708,000*	*$5,456,000*
Property Acquisition	$593,000	$745,000	$669,000
Total Capital Cost (rounded)	**$46,400,000**	**$61,600,000**	**$54,000,000**

1. Costs exclusive of costs incurred to date, and exclusive of bond issuance costs
2. Text in blue designates line item additions or breakouts added by Gillingham Water. The only dollar amount changes we have made to the original TetraTech estimate are 1) the addition of the Final Planning and Environmental line item, and 2) an increase in the product water Delivery Pipeline cost for the project at 2.0 mgd. The latter addition is necessary to deliver the increased production flows into more distant portions of the OMWD delivery system having sufficient demands to accept the flows.

Estimated project operating costs are summarized in **Table 3-2**. For a project sized at 1.5 mgd, operating costs in 2022 dollars total approximately **$1.3 million** per year.

TABLE 3-2: Project Operating Cost Summary

Project Costs Based on Current Supply Conditions	Design Production Capacity		Selected Capacity
	1.0 MGD	2.0 MGD	1.5 MGD
Annual Water Production (af/yr)	1,053 AF/yr	2,106 AF/yr	1,579 AF/yr
O&M Costs ($/yr)			
Sewer Outfall (SEJPA)	$59,000	$118,000	$89,000
Power	$321,000	$619,000	$470,000
Operations Staffing & Testing	$258,000	$325,000	$292,000
Chemicals	$77,000	$154,000	$116,000
Membrane & Filter Replacement	$40,000	$80,000	$60,000
Major Equipment Replacement	$99,000	$120,000	$110,000
Well Rehabilitation	$50,000	$100,000	$75,000
Maintenance & Parts	$35,000	$60,000	$48,000
Well and Environmental Monitoring	$60,000	$80,000	$70,000
Other	$0	$0	$0
Total Annual O&M Cost ($/yr) (rounded)	**$1,000,000**	**$1,660,000**	**$1,330,000**

In 2022 dollars. ENR CCI = 12,791

3.2. Methodology: Economic feasibility can be assessed in different ways. A First-Year Unit Cost assessment is a standard starting point, but does not account for the differential escalation of costs and benefits over time.

Project planners often begin an economic assessment with a First-Year Unit Cost analysis, a simplified snapshot of a project's unit costs that assumes all project costs and benefits occur in the immediate present. Such an analysis, for costs exclusive of any grant funding, is presented for the project in **Table 3-3.**

TABLE 3-3: First-Year Unit Cost Summary (in 2023 Dollars)

Production Capacity: 1.5 MGD	Discounted Production: 1,579 AF/yr	Melded Cost of Funds: 4.00%	Loan Term: 30 Yrs

Cost Component (Present Worth in 2023 Dollars)	Capital Costs ($)	Amortized Capital Costs ($/yr)	O&M Costs ($/yr)	Total Equivalent Annual Costs ($/yr)	Unit cost per AF ($/AF)	% of Capital Costs	% of O&M Costs	% of Total Unit Costs
Construction (exlusive of Brine Line)	$26,700,000	$1,480,000		$1,480,000	**$940**	58%		**38%**
Design/Admin./Permitting	$7,500,000	$420,000		$420,000	**$270**	16%		**11%**
Property Acquisition	$700,000	$40,000		$40,000	**$30**	2%		**1%**
Brine Line / Concentrate Disp.	$10,800,000	$600,000	$90,000	$690,000	**$440**	24%	7%	**18%**
Power			$470,000	$470,000	**$300**		35%	**12%**
Operator Staffing, Testing			$290,000	$290,000	**$180**		22%	**7%**
Other O&M + Relacement			$480,000	$480,000	**$300**		36%	**12%**
Totals (before grant funding)	$45,700,000	$2,540,000	$1,330,000	$3,870,000	**$2,450**	100%	100%	**100%**
Grant Funding 25%	$11,500,000	$640,000						
Totals w/ grant funding	$34,200,000	$1,900,000	$1,330,000	$3,230,000	**$2,040**			

The table presents a projected first-year unit cost of the project of approximately **$2,500/AF**, before grant funding, and approximately **$2,000/AF with grant funding**. These costs are close to but somewhat higher than the average all-in cost for purchase of raw water from SDCWA and treatment at the McCollom plant, currently approximately **$1,900/AF.** (The unit cost does compare favorably with SDCWA's CY 2023 unit cost of Carlsbad Desal water of approximately **$3,300/AF,** but as explained previously this is not our point of comparison.) The table also provides a useful indication of how different capital and operating costs contribute to the overall project cost, most notably showing the significant cost of the project's brine line and concentrate disposal.

However, as an assessment of project economic feasibility, the First-Year Unit Cost methodology in the case of the Project falls considerably short of ideal, failing to account for the differential escalation of costs and benefits over time. For that we need to look at an extended period of Net Present Value analysis.

3.3. Net Present Value Analysis: Costs and benefits are distributed over time, and escalate at different rates. NPV analysis captures this important detail.

NPV analysis entails the scheduling of costs and benefits over time, in this case 30 years or more, and then discounting those future costs and benefits to present value, in 2023 dollars. This allows for a more complete comparison of Project and No Project costs than provided by the First-Year Unit Cost analysis.

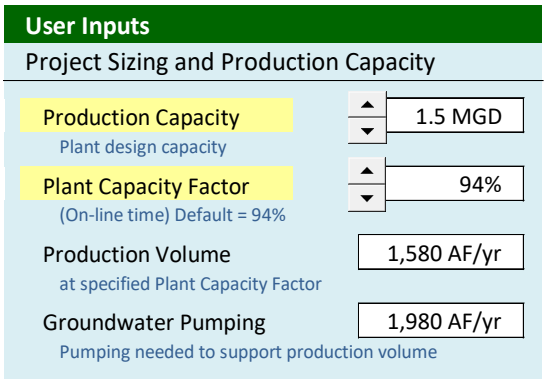
By far the largest direct cost benefit to the Project is that of avoiding purchasing 1,600 AF/yr of raw water from SDCWA over the course of 30 years or longer. Because SDCWA rates are set to escalate at rates greater than inflation for at least the next several years, the cost savings of those avoided purchases will increase. The NPV analysis accounts for this increased benefit.

On the cost side of the ledger, the Project's largest line item is the debt servicing of capital financed via 30-year bonds or other instruments. Assuming level financing, the bond payment remains fixed over time, while all other costs inflate. This means that when discounted to present value in 2023 dollars, the bond payment gradually declines over time, even while project benefits are increasing. The NPV analysis accounts for this important detail. Stay with us and we'll walk you through those inputs and results.

3.4. NPV Inputs: The NPV analysis accounts for four categories of input variables.

The results of the NPV analysis are sensitive to multiple inputs, from interest and discount rates, to SDCWA rate escalation assumptions, to grant funding assumptions, and more. These inputs are described below, with reference to the input screens from our spreadsheet economic model.

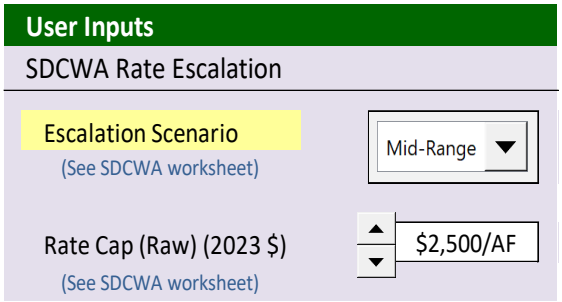
Project Sizing and Production Capacity



- Production Capacity: As noted previously, project costs exhibit very pronounced economies of scale. A project sized at 1.5 mgd is considerably more cost advantageous than one sized at 1.0 mgd, and conversely if the project could be sized even larger, at 2.0 mgd (2,600 AF/yr of groundwater pumping), the Project's advantage would be greater still. The default setting is 1.5 mgd.
- Plant Capacity Factor: The preliminary engineering and cost assumptions assume the project will be operational approximately 94 percent of the time, allowing for approximately three weeks per year of shutdowns for maintenance and other planned and unplanned events. Operating experience from similar projects in southern California supports these assumptions. The Plant Capacity Factor setting can be used to test more conservative assumptions.
- Discounted Production: This is an information box, not a user input to the NPV model. At the specified production capacity and adjustment factors (see above), the project would produce approximately 1,600 AF/yr of treated water.
- Grooundwater Pumping: This too is an information box, not a user input to the NPV model. At the specified inputs, the project would require a groundwater supply of approximately 2,000 AF/yr. This level of pumping is supported by OMWD's latest hydrogeologic investigations.

SDCWA Rate Escalation

- Escalation Scenario: The model allows selection of SDCWA rate escalation at Low, Mid-Range, and High scenarios. SDCWA's new Long-Range Finance Plan, adopted in November 2021, projects rate increases through CY2031 for Low, Mid-Range, and High scenarios. The Low and High scenarios are presented in SDCWA's graphic below; the Mid-Range scenario is the mid-point between these.



"All-In" Rate Adjustments

	CY '23	CY '24	CY '25	CY '26	CY '27	CY '28	CY '29	CY '30	CY '31	10 Yr CAGR
2D - High	11.3%	9.7%	10.3%	7.5%	6.4%	5.2%	4.8%	4.4%	4.4%	7.07%
2D - Low	5.9%	3.7%	5.3%	4.5%	3.0%	3.5%	2.6%	2.7%	4.1%	3.91%

The NPV model begins with SDCWA's draft projected CY2024 All-In raw water rate of $1,784/AF, which if adopted by the SDCWA board in June of this year would represent a 13 percent increase over the CY2023 rate. The model then uses the SDCWA Long-Range Finance Plan's projections for CY2025 through CY2031, and subsequently assumes only a

modest increase over and above the prevailing rate of water system inflation. The escalation inputs for the three scenarios are listed in **Table 3-4**. The default setting used in the NPV model is Mid-Range.

TABLE 3-4: SDCWA Rate Escalation Assumptions

Scenario	Annual Escalation Rate	
	Initial (CY2025 through CY2031)	**Subsequent** (above inflation)
High	6.1%	1.0%
Mid-Range	4.9%	0.5%
Low	3.7%	0.0%

- Rate Cap: The NPV also incorporates an upper limit to SDCWA rate escalation in the form of a rate cap. The rate cap is set in current 2023 dollars, and escalates at the specified rate of water system inflation. The default setting used in the NPV model is $2,500/AF.

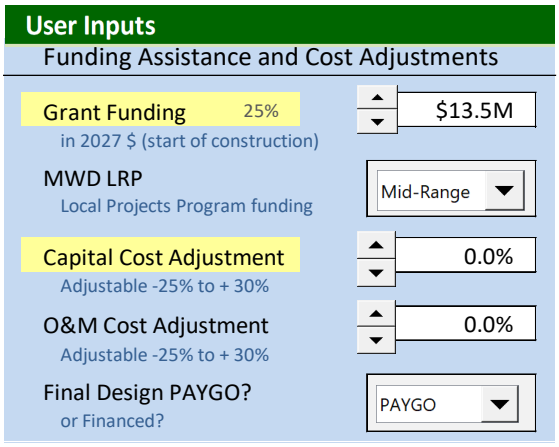
  As SDCWA rates continue to increase relative to inflation, member agencies will have additional economic incentive to develop new increments of local water supply, reducing SDCWA demands. At some point SDCWA will have to limit increases to its variable rate by moving some of its cost recovery to unavoidable fixed charges.

  For the Mid-Range and High escalation conditions, SDCWA treated All-In rates would escalate by 2040, **in constant 2023 dollar terms,** to approximately $2,700/AF and $3,100/AF respectively. We do not know exactly where the upper limit of variable rates lies, but we judge the projected rates for 2040 either at or very close to the limit. Even though the total All-In SDCWA rate will likely continue to increase beyond these projections, the variable component of those rates – the amount OMWD would offset through access to the Project's local water supply – would need to be moderated through the implementation by SDCWA of unavoidable fixed charges.

  At default settings, the cap has no effect on the Low scenario, and kicks modestly into play for the Mid-Range scenario. The cap has a significant limiting effect on the High scenario.

Project Funding Assistance

- Grant Funding: OMWD assesses the project to be very well positioned to receive substantial grand funding, and believes a reasonable mid-range assumption is the project will receive funding equal to 25 percent of project capital costs. Probable sources of grant funding include the U.S. Bureau of Reclamation Title XVI program. The default input to the NPV model is for $13.5 million, which is approximately 25 percent of the project's 2027 capital costs when sized at 1.5 mgd.



- MWD Local Resources Program (LRP): The Metropolitan Water District of Southern California (MWD) provides funding assistance for local project development through its LRP. Projects are eligible for LRP funding to the extent they need assistance to remain cost competitive with benchmark rates established by MWD. Under the current terms of the LRP, the project would be eligible for annual funding assistance at the level of $340/AF and lasting for 25 years. (Other LRP funding options include $475/AF lasting 15 years, and up to $305/AF for 25 years with no annual reassessment.)

  The NPV model allows LRP funding to be set at three levels: Full, being the funding level described above; Mid-Range, in which the funding amount is reduced by half; and None. The default setting used in the NPV model is Mid-Range. This reflects a level of conservatism regarding the ability of MWD to continue funding the LRP given ongoing budget challenges.

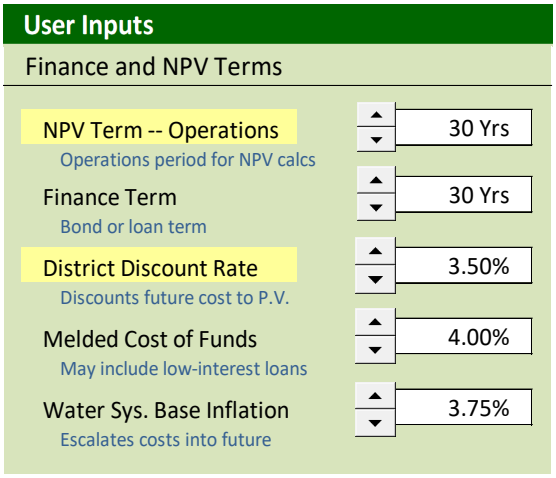
- Capital Cost Adjustment: The model allows the capital cost to be adjusted upwards or downwards on a percentage basis. The default setting is no adjustment (0.00%).

- O&M Cost Adjustment: The model allows the annual operations and maintenance costs to be adjusted upwards or downwards on a percentage basis. The default setting is no adjustment (0.00%).

- Final Design PAYGO: The model allows the user to fund the costs for final design of the project as PAYGO or financed. The default setting is PAYGO.

Finance and NPV Terms

- NPV Term: The NPV term by default is set at 30 years of project operations, and is adjustable by the user. Accounting for perhaps six years for project permitting, design, and construction, the total period of the NPV analysis is actually 36 years, beginning FY2023 and continuing through the end of FY2058.

  The use of a 30 year operations term for NPV analysis is common but not etched in stone. The cost estimates for project O&M include sufficient budget for repair and replacement to keep the treatment plant and other project components in good working order well past 30 years. With capital debt then retired, the annual NPV benefits of the project increase, and every year beyond 30 accumulates substantial additional NPV benefit to the project.

- Finance Term: The term of an OMWD bond issue is set by default at 30 years and is adjustable by the user. Adjusting the term has little effect on the NPV comparison of Project vs. No Project costs.

- Discount, Interest, and Inflation Rates: These three inputs are linked, in that the discount and interest (Melded Cost of Funds) rates move up and down in anticipation of inflation.

- Discount Rate: A capital project involves the upfront investment of funds in the expectation of returns later on. Upfront costs are relatively certain, whereas future benefits are subject to the unknowns of the future. To account for this uncertainty, we discount future benefits at a Discount Rate, as set in the User Inputs. A lower Discount rate reflects optimism about the future and a willingness to "Pay It Forward," whereas a higher Discount rate reflects lower confidence in the future benefits and a desire for a shorter return-on-investment period.

  The Discount Rate is also analogous to the OMWD minimum acceptable Rate of Return on invested capital. If the NPV analysis reports a cost advantage for the project, this means OMWD would be meeting its minimum rate of return, with a bonus benefit on top of that.

- Melded Cost of Funds: This is the anticipated interest rate of an OMWD borrowing used to fund the capital portion of the project, a mix of an OMWD bond issue and low-interest loans through the State Revolving Fund or the Federal WIFIA program. (This is sometimes termed the Weighted Average Cost of Capital, or WACC.)

- Water System Base Inflation: This is the anticipated rate of cost escalation for water system capital projects and project operations.

3.5. Results Item No. 1: Using reasonable mid-range input assumptions, the project produces approximately $31M in NPV cost advantage in comparison to the No Project Alternative.

Using the inputs described in the previous subsection, the project has a significant NPV cost advantage in comparison to the No Project alternative. The results are summarized in **Table 3-5**.

TABLE 3-5: NPV Cost Summary – Project vs. No Project
(1.5 MGD Plant producing 1,600 AF/yr of treated water)

NPV Cost Summary -- Project vs. No Project, in 2023 Dollars

PROJECT	
Cost Component	**NPV**
Capital Cost	$51M
Grant Funding	-$13M
O&M Cost	$44M
LRP Funding	-$4M
TOTAL (Rounded)	**$78M**

NO PROJECT	
Cost Component	**NPV**
SDCWA Purchases (raw water)	$105M
Incremental Treatment Costs	$5M
TOTAL (Rounded)	**$109M**

Project Cost Advantage = $31M

A note about those incremental treatment costs:

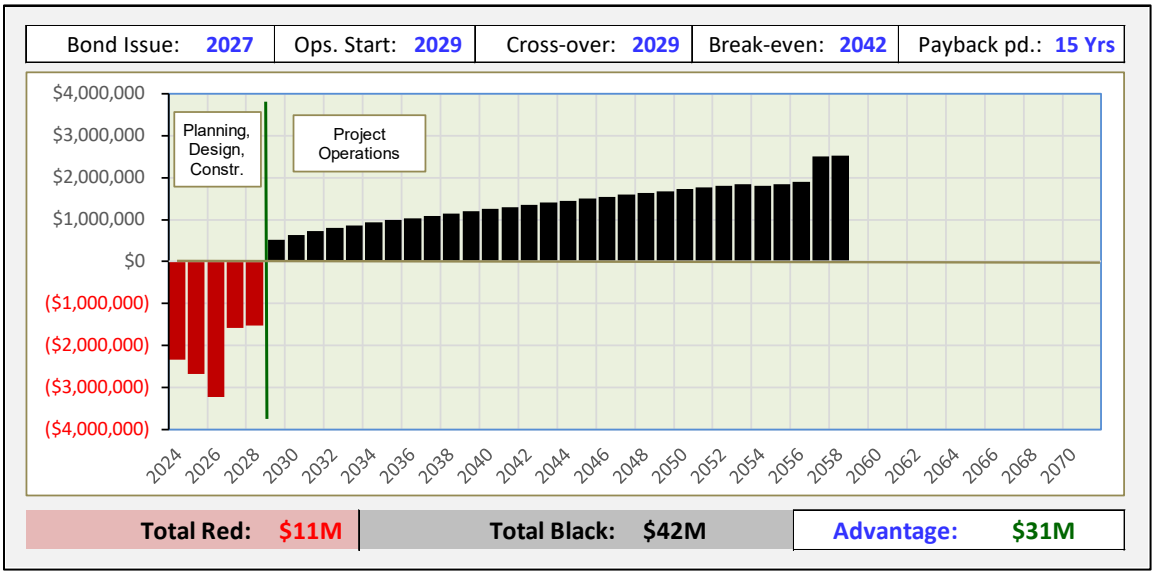
Costs for the No Project alternative arise primarily from the purchase of 1,600 AF/yr of raw water from SDCWA, at escalating prices. The No Project alternative also incurs a modest cost to treat the purchased water at OMWD's McCollom plant. The unit cost applied to this calculation is for only the variable component of plant costs, covering power, chemicals, and other lesser variable cost components, and excluding debt servicing, most labor, and other fixed cost line items. For FY2022, the variable cost of the plant was estimated by OMWD to be approximately $90/AF.

Under the Project alternative, OMWD incurs all the costs for the project, but avoids the costs of the No Project Alternative. At the McCollom plant, OMWD would be treating less water and thereby be incurring lower costs, but with the savings being only for the variable components of plant costs. The plant would continue to incur the same level of fixed costs, and these will now be spread out across a smaller production volume, increasing the AVERAGE unit cost ($/AF) of plant operations. Unit costs per acre-foot would increase, but total costs decrease, and it is total costs that go into the budget.

3.6. Results Item No. 2: Costs and benefits are distributed differently over time. Understanding the annual cash flow picture is instructive.

The same NPV results presented in Table 3-5 are presented below in **Figure 3-1**, but now in the form of red/black annual cashflow differential chart. Using the No Project alternative as the baseline of comparison, the figure displays the net annual cost or benefit of the Project alternative in 2022 dollars.

FIGURE 3-1: NPV Annual Cost Differential – Project vs. No Project
-- in 2023 dollars --



Costs for Total Red, Total Black, and Advantage are rounded and may not sum precisely.

The notes below describe the different areas of the figure:

- Red Bars: These are the additional costs OMWD would incur over the next four years to permit and design the project, plus payment of capital debt service during two years of project construction and ahead of the plant becoming operational. These costs are at risk, although the risk diminishes as the project advances and certainty of success increases.

- Black Bars: These are the NPV of benefits in excess of costs. The bars jump up the last two years of the 30-year NPV term because the debt service ends two years prior, having begun two years prior to the beginning of operations.

- Total Red / Total Black / Project Advantage: These indicate the cumulative total of the red and black bars, and the resulting NPV advantage of the Project in Comparison to the No Project alternative. As previously noted, capital projects entail the investment of ratepayer funds in anticipation of future benefits. The red bars and black bars together demonstrate how that plays out over time.

- Upper Bar Dates: The upper bar above the graph displays key dates in the NPV analysis. The Crossover date is the year when the annual cost difference of the Project vs. No Project alternative first moves from red to black. The Break-even date is the year in which all of the upfront red bar costs have been offset, in present value, by the accumulation of black bars.

  Lastly, the Payback Period indicates the number of years between the issuance of bonds and the Breakeven point. If the discount rate used in the analysis accurately reflects OMWD's time preference for money, then the Payback Period is the date when all of the Project's upfront cost have been paid off, with interest, and all of the annual black-bar benefits subsequent to that are pure benefit.

3.7. Sensitivity Analysis Part 1: The project retains its NPV cost advantage even if key individual inputs are adjusted to pessimistic levels.

The Project vs. No Project cost comparisons presented in Subsections 3.5 and 3.6 utilize the Mid--Range estimates for all cost components and financing terms. The Mid-Range assumptions reflect the project team's best estimates and professional judgements; we think those are the best numbers to use for the current planning purposes. Nevertheless, we recognize that our estimates and assumptions about future conditions are imperfect, and that actual costs and actual future conditions could vary. Having demonstrated the economic advantage of the Project option using the Mid-Range estimates, it is prudent then to consider the sensitivity of that advantage to changes in the assumptions.

Table 3-6 summarizes the effects on the thirty-year NPV comparison of making one-at-a-time changes to key individual input assumptions. The table presents only changes made in the direction of advantaging the No Project option over the Project option. Keep in mind though that for every changed assumption presented in the direction of advantaging the No Project option, there is an equal and opposite change that would further advantage the Project option.

TABLE 3-6: Sensitivity Analysis for Changes Favoring No Project Option

Cost Variable	Assumption	Effect	Project Cost[1] Advantage
Baseline Condition	Baseline costs using all Mid-Range assumptions		**$31M**
1. Project Capacity	Project capacity is reduced from 1.5 mgd down to 1.3 mgd	Project costs decrease, but No Project costs decrease more, narrowing the Project's cost advantage	**$23M** ⇩ $8M
2. SDCWA Rate Escalation	Reduce escalation rate from Mid-Range to Low, per Table 3.4	Reduces costs for the No Project option, narrowing the Project's cost advantage	**$17M** ⇩ $14M
3. Project Costs	Increase project capital and annual costs by 20%	Increases costs for the Project option, narrowing its cost advantage	**$12M** ⇩ $19M
4. Grant Funding	Assume grant funding is zero instead of 25%	Increases OMWD costs for the Project option, narrowing its cost advantage	**$18M** ⇩ $13M
5. Discount Rate	Increase discount rate from 3.5% to 4.5%, reflecting preference for higher rate of return on investments	Present value of costs for Both Project and No Project alternatives decline; more so for No Project	**$23M** ⇩ $8M

1. 30-Year NPV Costs in 2023 dollars

It is apparent from the table that the long-term cost advantages of the Project option are robust, in that changes to individual assumptions alone are not sufficient to eliminate its cost advantage over the No Project option. Multiple of the mid-range assumptions would need to be wrong, and wrong in the direction favoring the No Project option, before the Project option would lose its advantage.

3.8. Sensitivity Analysis Part 2: The project's NPV cost advantage increases further if key individual inputs are adjusted to optimistic levels.

The sensitivity analysis works in both direction. If we instead adjusted the sensitivity variables in the other direction, in favor of the Project alternative, the results would be as presented in the **Table 3-7**.

TABLE 3-7: Sensitivity Analysis for Changes Favoring Project Option

Cost Variable	Assumption	Effect	Project Cost[1] Advantage
Baseline Condition	Baseline costs using all Mid-Range assumptions		**$31M**
1. Project Capacity	Project capacity is increased from 1.5 mgd up to 1.8 mgd	Project costs increase, but No Project costs increase more, expanding the Project's cost advantage	**$42M** ⇧ $11M
2. SDCWA Rate Escalation	Reduce escalation rate from Mid-Range to High, per Table 3.4	Increases costs for the No Project option, expanding the Project's cost advantage. (Cost increase is tempered by the Variable Rate Cap)	**$43M** ⇧ $12M
3. Project Costs	Reduce project capital and annual costs by 15%	Reduces costs for the Project option, expanding its cost advantage	**$43M** ⇧ $12M
4. Grant Funding	Assume grant funding is 40% instead of 25%	Reduces OMWD costs for the Project option, expanding its cost advantage	**$38M** ⇧ $7M
5. Discount Rate	Decrease discount rate from 3.5% to 2.5%, reflecting preference advantaging future generations	Present value of costs for Both Project and No Project alternatives increase; more so for the Project option	**$42M** ⇧ $11M

1. 30-Year NPV Costs in 2023 dollars

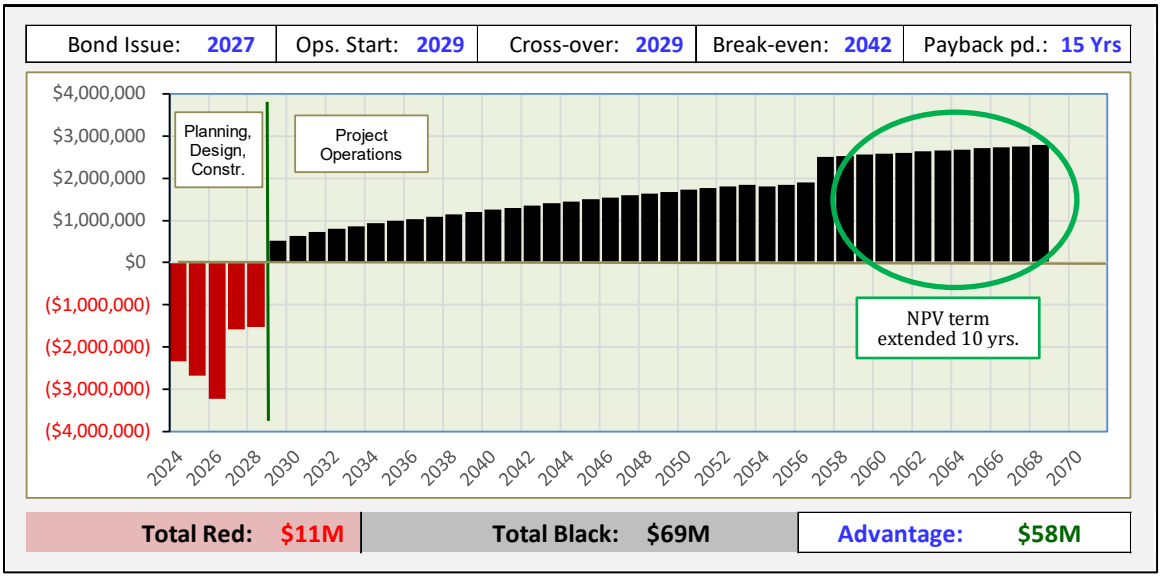
3.9. More Sensitivity Analysis: Longer NPV terms increase project benefits.

The term period of NPV analysis is commonly set at the same duration as for a project's capital financing, which for OMWD would typically be 30 years. This approach reflects in part an expectation that those paying for the project – ratepayers paying off the bonds through their water bills – should receive a reasonable return on their investment. As noted previously, 30 years is common, but not etched in stone.

Longer NPV terms produce greater NPV benefits. The Project budget for long-term operations, maintenance, replacement, and repair is designed to keep all of the project physical components in good working order well past 30 years, providing a reasonable expectation that project benefits will continue well past the date when the bonds used for capital financing are retired.

Figure 3-2 presents the same Project vs. No Project annual cashflow differential as in Figure 3-1, but with the NPV term extended from 30 years to 40. The additional 10 years of black bars add $27 million in project benefits, increasing the Project's cost advantage over the No Project alternative to $58 million.

FIGURE 3-2: NPV Annual Cost Differential with Extended NPV Term
-- in 2023 dollars --



Costs for Total Red, Total Black, and Advantage are rounded and may not sum precisely.

There is not a single correct answer as to the appropriate term of an NPV analysis. We tend to favor keeping the term at the more conservative 30 year duration, being cognizant of the uncertainty of the future, and adhering to the alignment of the NPV term with the finance term. If a project is cost preferred over a 30 year NPV term, then any additional benefits accruing after the end of the term are icing on the cake.

4. Findings and Recommendations

4.1. Findings: The Project provides the opportunity for both cost and non-cost advantage in comparison to the No Project alternative.

As an independent source of new local water supply, the Project provides OMWD with the non-cost advantages of supply reliability, local control, and environmental sustainability. And with reasonable assumptions as to SDCWA rate escalation, grant funding availability, and other inputs, the Project appears capable of providing significant net present value cost advantage as well when compared with the status quo of the No Project alternative.

4.2. Recommendations: The potential project advantages warrant continued investment by OMWD in project development.

OMWD's investigations to date have refined the hydrogeologic and water rights bases for the project, advanced conceptual level design, and developed planning-level cost estimates for the project. Based on that work to date, this report documents the economic feasibility of the project, and supports continued investment by OMWD in the next phase of project development.

The project is now ready to begin preliminary design and permitting, and to begin work on the regulatory and institutional, and legal frameworks that will be necessary to assure the certainty of the groundwater as a source of supply to the project over 30 years or longer, to fine-tune project cost estimates, and more. OMWD staff will report on a proposed workplan for consideration as part of the FY2024 budget review process.

Memo

To: Olivenhain Municipal Water District Board of Directors

Subject: CONSIDER PUBLIC COMMENTS

There may be public comments before the Board meeting is adjourned.

Memo

To: Olivenhain Municipal Water District Board of Directors

Subject: CLOSED SESSION

It may be necessary to go into Closed Session.

Memo

To: Olivenhain Municipal Water District Board of Directors

Subject: ADJOURNMENT

We are adjourned.