

COUNTY OF SANTA BARBARA  
PUBLIC WORKS DEPARTMENT – WATER RESOURCES DIVISION – WATER AGENCY



Countywide Potable  
Reuse Evaluation

FINAL / October 2023



LAGUNA COUNTY SANITATION DISTRICT



Groundwater Recharge Evaluation

FINAL / August 2023



February 6, 2024

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# Presentation Outline

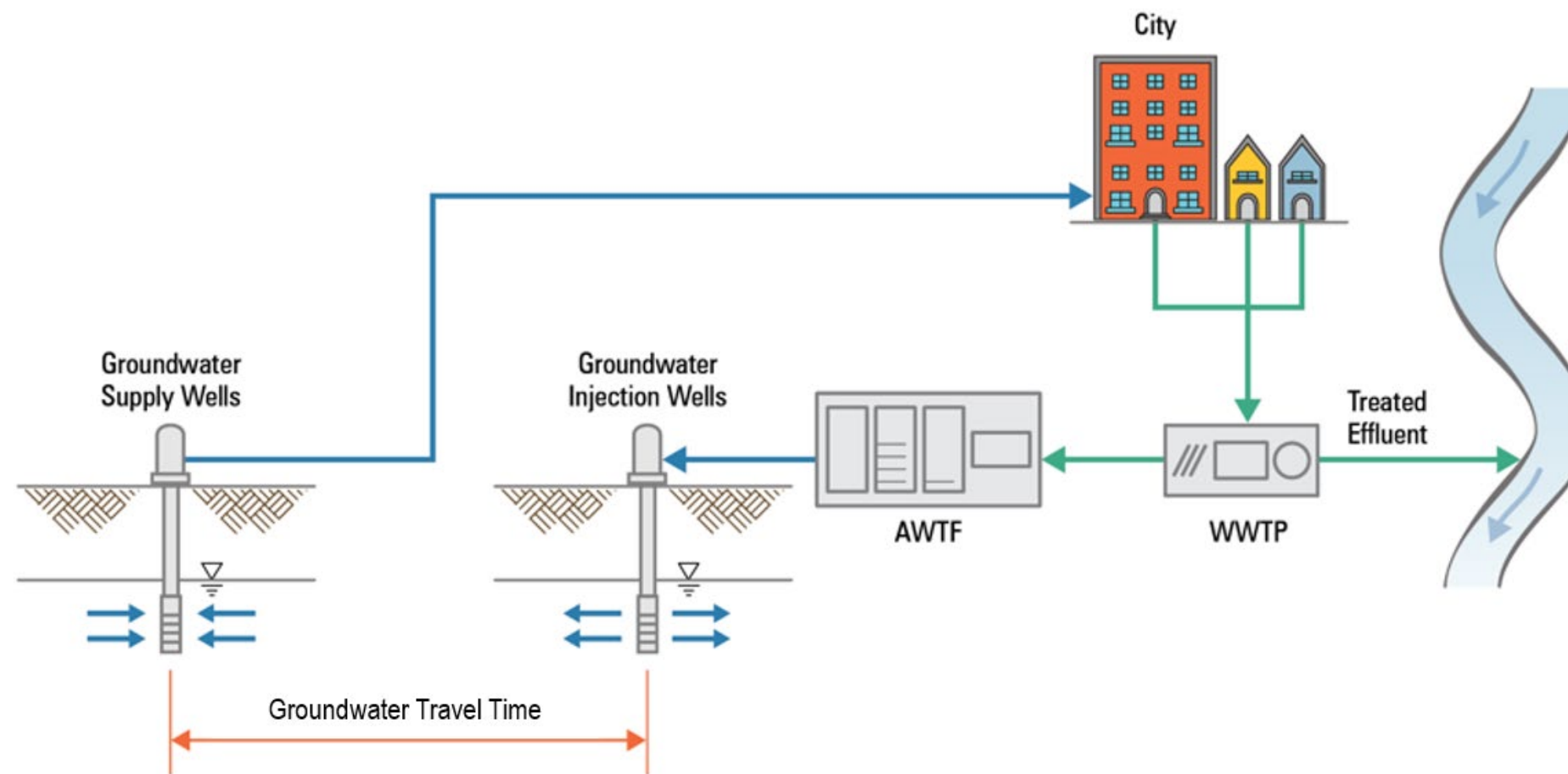
Purpose: Evaluate opportunities for potable reuse of wastewater both at County-operated facilities and countywide

1. Countywide Potable Reuse Evaluation (Water Agency)
2. Laguna County Sanitation District Groundwater Recharge Evaluation

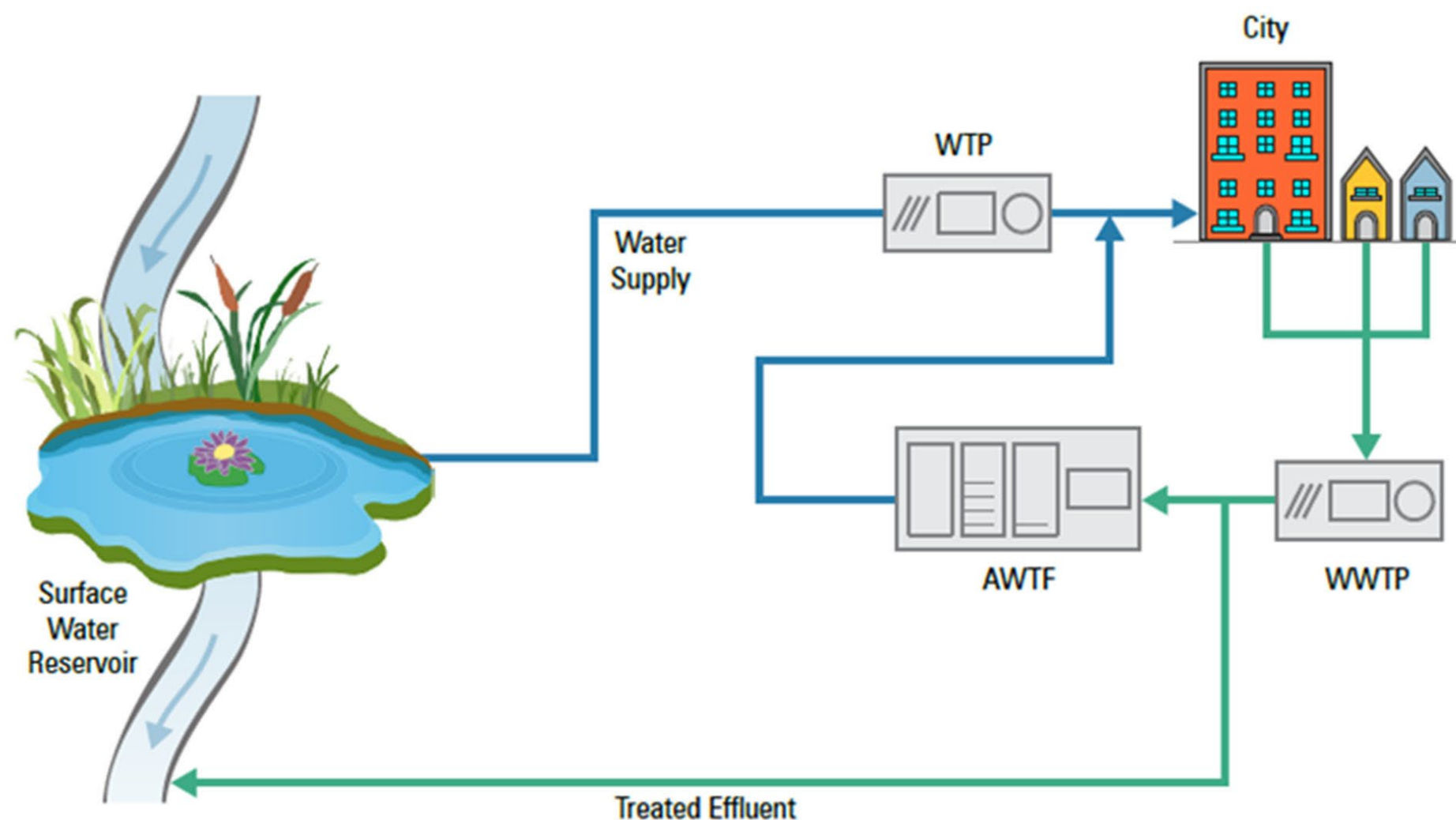


# Potable Reuse

- Indirect potable reuse (IPR): Injection to groundwater basins as potable supply



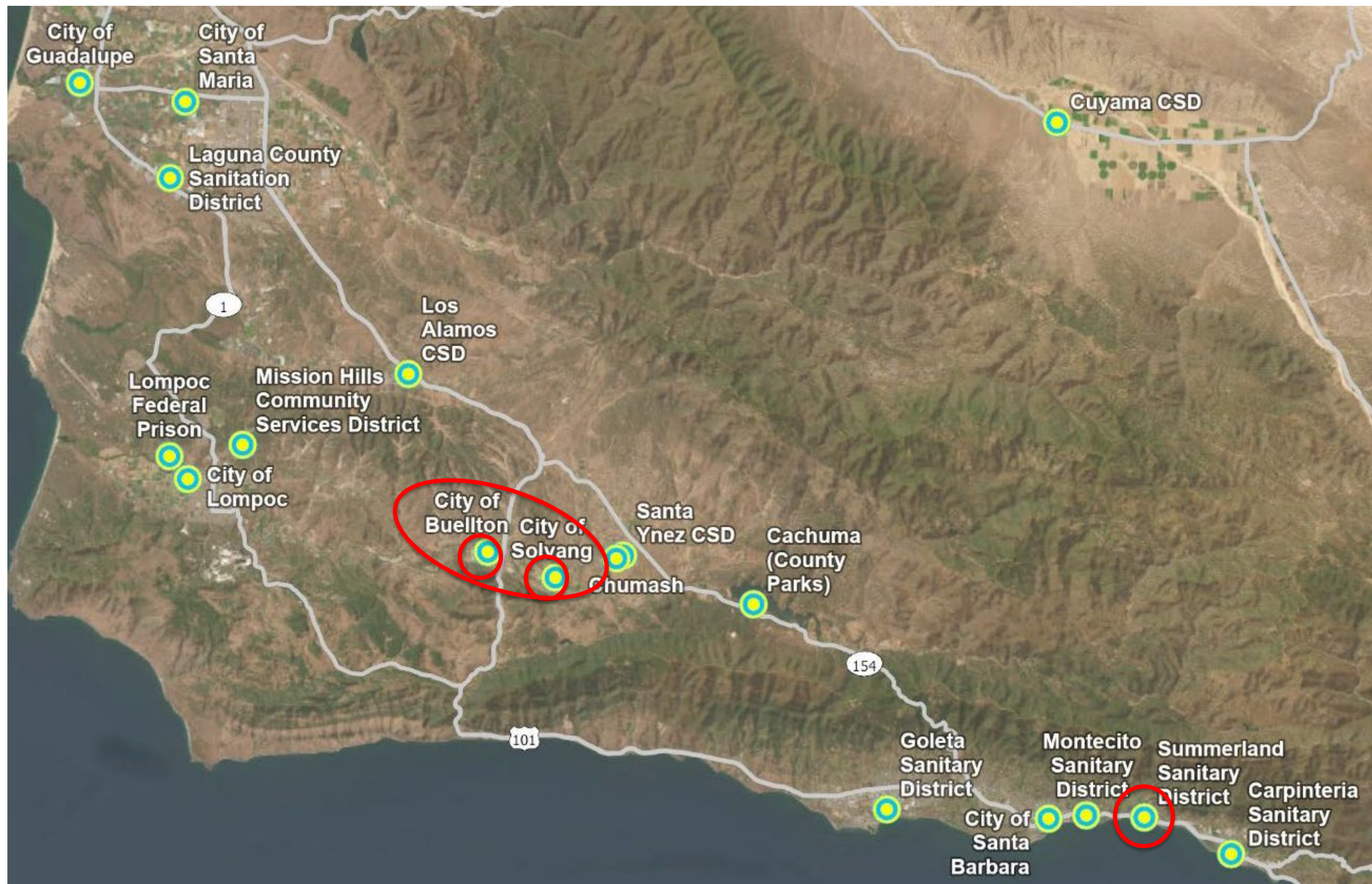
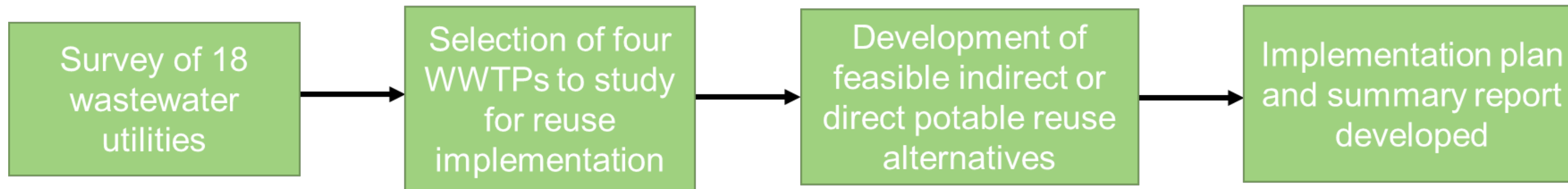
- Direct potable reuse (DPR): direct delivery of treated wastewater through potable system



# Potable Reuse Project Overview and Purpose

## PURPOSE

To document and summarize ongoing wastewater treatment and water reuse in the County in order to develop recommendations for increased potable reuse implementation

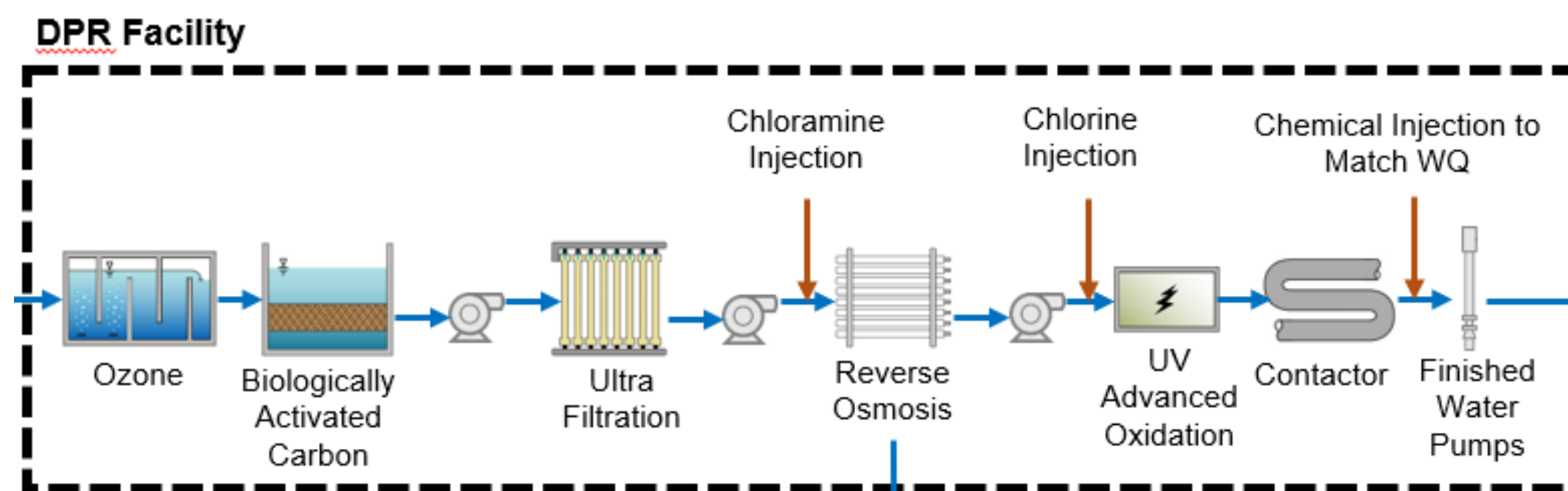


# Evaluation of End Use and Infrastructure

- Evaluation performed for the four selected facilities
  - Buellton, Solvang, Buellton/Solvang combined facility, Summerland Sanitary District
- WHERE purified water can be discharged for use
  - Direct to distribution system (DPR)
  - Surface water augmentation
  - Groundwater injection
- WHAT infrastructure is needed to implement potable reuse

## Summary of Treatment and Regulatory Requirements

- Document current regulatory requirements
- Develop conceptual process flow diagrams
- Develop planning level cost estimates for each treatment plant



# Buellton/Solvang Advanced Water Purification Facility Example

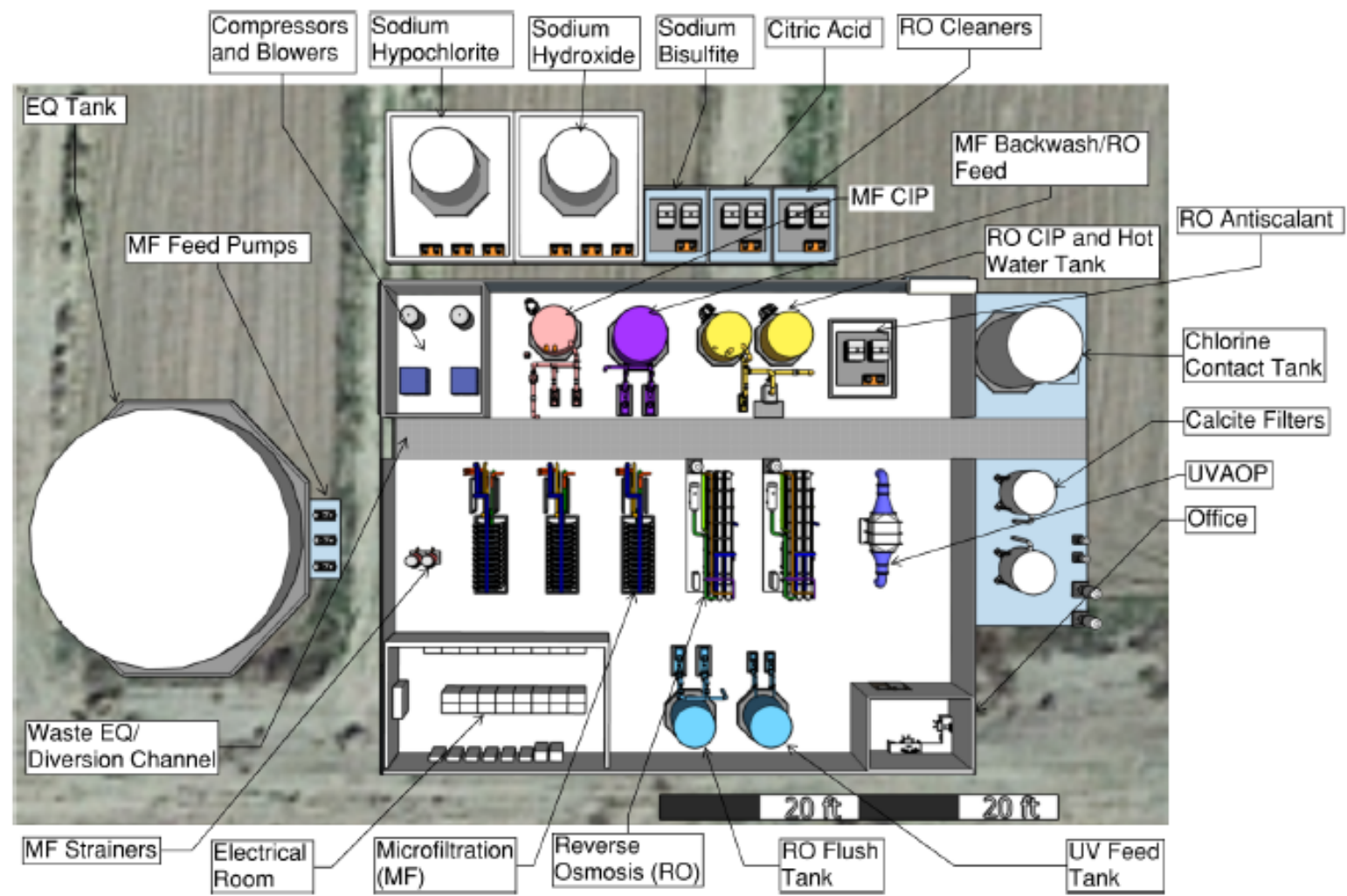


Figure 4.13 IPR AWP Zoom-In Site Plan of Buellton and Solvang Combination for 0.78-mgd Production

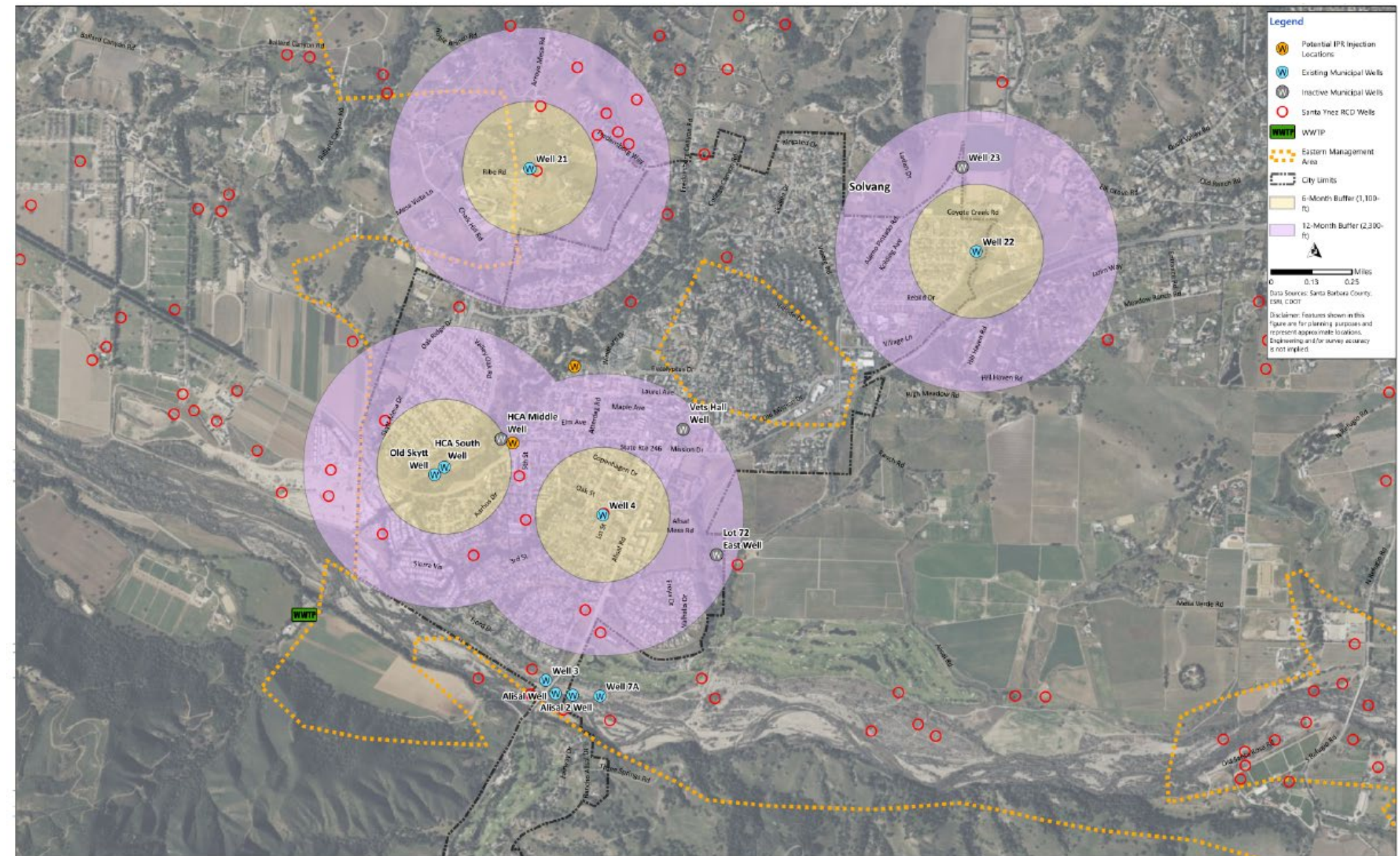


Figure 5.3 Solvang IPR Preliminary Injection Well Siting



# Buellton and Solvang Advanced Water Purification Facilities Planning Level Capital Costs

Table ES.4 Solvang and Buellton AWWP Capital Cost Estimates

| Project                        | Cost Item  | Total Project Cost                |                                    |                      |
|--------------------------------|--|-----------------------------------|------------------------------------|----------------------|
|                                |  | IPR (6 Month Conveyance Pipeline) | IPR (12 Month Conveyance Pipeline) | DPR                  |
| Solvang AWWP                   | Infrastructure                                     | \$38,460,000                      | \$42,300,000                       | \$23,660,000         |
|                                | Treatment  | \$136,670,000                     | \$136,670,000                      | \$175,130,000        |
|                                | <b>Total Project Capital Cost</b>                  | <b>\$175,130,000</b>              | <b>\$178,970,000</b>               | <b>\$199,360,000</b> |
|                                | <b>Annualized Total Project Cost<sup>(1)</sup></b> | <b>\$9,522,000</b>                | <b>\$9,731,000</b>                 | <b>\$10,839,000</b>  |
| Buellton AWWP                  | Infrastructure                                     | \$22,170,000                      | \$23,820,000                       | \$16,460,000         |
|                                | Treatment  | \$47,910,000                      | \$47,910,000                       | \$75,420,000         |
|                                | <b>Total Project Capital Cost</b>                  | <b>\$70,080,000</b>               | <b>\$71,730,000</b>                | <b>\$91,880,000</b>  |
|                                | <b>Annualized Total Project Cost<sup>(1)</sup></b> | <b>\$3,810,000</b>                | <b>\$3,900,000</b>                 | <b>\$4,996,000</b>   |
| Solvang/Buellton Combined AWWP | Infrastructure                                     | \$59,930,000                      | \$61,880,000                       | \$41,150,000         |
|                                | Treatment  | \$137,760,000                     | \$137,760,000                      | \$177,990,000        |
|                                | <b>Total Project Capital Cost</b>                  | <b>\$197,690,000</b>              | <b>\$199,640,000</b>               | <b>\$219,140,000</b> |
|                                | <b>Annualized Total Project Cost<sup>(1)</sup></b> | <b>\$10,749,000</b>               | <b>\$10,855,000</b>                | <b>\$11,915,000</b>  |

Notes:

(1) Calculated assuming an interest rate of 3.5 percent and annualized over 30 years.



# Buellton and Solvang Advanced Water Purification Facilities Planning Level O&M Costs and Unit Costs

Table ES.6 Solvang and Buellton Annual O&M Cost Estimates

| Project                        | Cost Item                   | Annual O&M Cost                   |                                    |                    |
|--------------------------------|-----------------------------|-----------------------------------|------------------------------------|--------------------|
|                                |                             | IPR (6 Month Conveyance Pipeline) | IPR (12 Month Conveyance Pipeline) | DPR                |
| Solvang AWWP                   | Annual Infrastructure O&M   | \$422,000                         | \$442,000                          | \$291,000          |
|                                | Annual Treatment O&M        | \$1,087,000                       | \$1,087,000                        | \$1,540,000        |
|                                | <b>Total Annual O&amp;M</b> | <b>\$1,509,000</b>                | <b>\$1,529,000</b>                 | <b>\$1,831,000</b> |
| Buellton AWWP                  | Annual Infrastructure O&M   | \$169,000                         | \$177,000                          | \$117,000          |
|                                | Annual Treatment O&M        | \$870,000                         | \$870,000                          | \$1,371,000        |
|                                | <b>Total Annual O&amp;M</b> | <b>\$1,037,000</b>                | <b>\$1,047,000</b>                 | <b>\$1,488,000</b> |
| Solvang/Buellton Combined AWWP | Annual Infrastructure O&M   | \$587,000                         | \$596,000                          | \$436,000          |
|                                | Annual Treatment O&M        | \$1,310,000                       | \$1,310,000                        | \$1,864,000        |
|                                | <b>Total Annual O&amp;M</b> | <b>\$1,897,000</b>                | <b>\$1,906,000</b>                 | <b>\$2,300,000</b> |

Table ES.8 Solvang and Buellton AWWP Unit Cost Estimates

| Project                        | Cost Item | Unit Cost <sup>(1)</sup>          |                                    |          |
|--------------------------------|-----------|-----------------------------------|------------------------------------|----------|
|                                |           | IPR (6 Month Conveyance Pipeline) | IPR (12 Month Conveyance Pipeline) | DPR      |
| Solvang AWWP                   | \$/ac-ft  | \$21,500                          | \$21,900                           | \$26,400 |
|                                | \$/MG     | \$65,800                          | \$67,100                           | \$80,800 |
| Buellton AWWP                  | \$/ac-ft  | \$13,200                          | \$13,400                           | \$18,700 |
|                                | \$/MG     | \$40,300                          | \$41,100                           | \$57,300 |
| Solvang/Buellton Combined AWWP | \$/ac-ft  | \$14,500                          | \$14,700                           | \$17,400 |
|                                | \$/MG     | \$44,500                          | \$44,900                           | \$53,400 |

Notes:  
(1) Calculated using the annualized capital cost, annual O&M cost, and assuming the facility is running at capacity 365 days per year.





# Summerland Sanitary District (SSD) to Carpinteria Sanitary District (CSD)

- Transport raw wastewater from the existing SSD system to the CSD for treatment and subsequent advanced treatment as a part of the planned Carpinteria Advanced Purification Project.

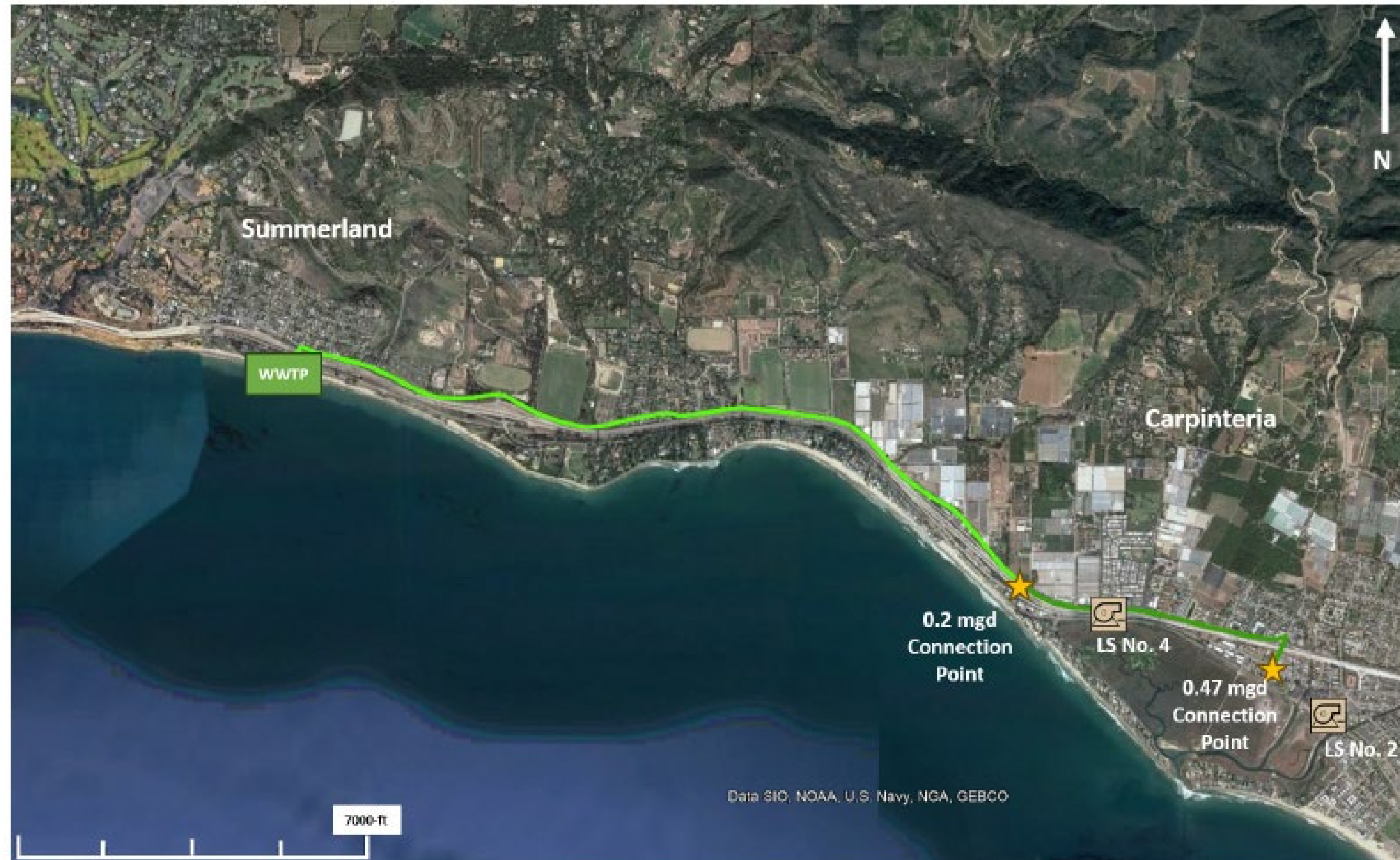


Figure 5.15 Untreated Wastewater Feedwater Preliminary Pipe Alignment From SSD to CSD



# Summerland Sanitary District to Carpinteria Sanitary District Planning Level Costs

Table ES.5 SSD Capital Cost Estimates

| Cost Item                        | Total Project Cost            |                                |
|----------------------------------|-------------------------------|--------------------------------|
|                                  | 0.2 mgd Equalized Flow to CSD | 0.47 mgd Equalized Flow to CSD |
| New Pipe From SSD to CSD         | \$6,591,000                   | \$9,434,000                    |
| Upsized CSD Piping               | \$151,000                     | \$644,000                      |
| Pump Station                     | \$1,469,000                   | \$3,996,000                    |
| New 0.47 MG EQ Basin             | \$9,120,000                   | -                              |
| Rehab Existing EQ Basin          | -                             | \$441,000                      |
| Odor Control System              | \$869,000                     | \$623,000                      |
| Screenings and Conveyor Facility | \$1,679,000                   | \$1,679,000                    |
| <b>Total</b>                     | <b>\$19,880,000</b>           | <b>\$16,820,000</b>            |

Table ES.7 SSD Annual O&M Cost Estimates

| Cost Item                         | Annual O&M Cost                         |  |
|-----------------------------------|---|--|
|                                   | 0.2 mgd Equalized Flow to CSD (\$/year) | 0.47 mgd Equalized Flow to CSD (\$/year) |
| Power                             | \$73,000                                | \$153,000                                |
| Annual Maintenance <sup>(1)</sup> | \$99,000                                | \$84,000                                 |
| Odor Control Media Replacement    | \$5,000                                 | \$1,000                                  |
| <b>Total</b>                      | <b>\$177,000</b>                        | <b>\$238,000</b>                         |

Notes:

(1) Annual maintenance estimated as 0.5 percent of total capital costs.

\$ - dollars



## Next Steps

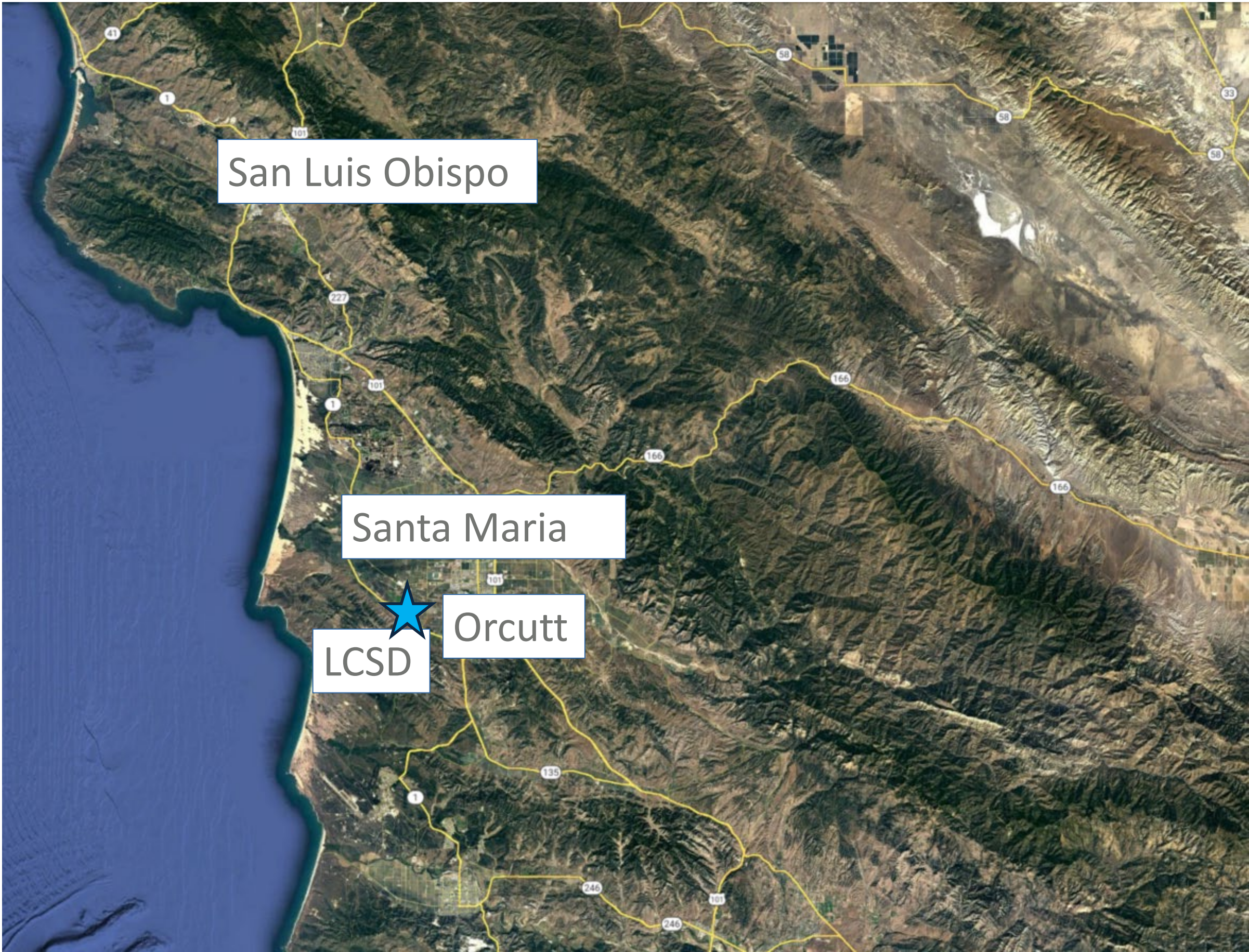
- Summerland Sanitary District
  - SSD, the County Water Agency, Montecito Water District, and Montecito Sanitary District follow-on study on options for sending raw SSD wastewater to Montecito compared to Carpinteria
- Solvang/Buellton
  - A number of technical, legal, and regulatory next steps are identified in the report for these projects to proceed.
  - Discharge permitting considerations (currently in process) will drive the ultimate size/cost of these facilities



# Laguna County Sanitation District (LCSD) Project Overview and Purpose

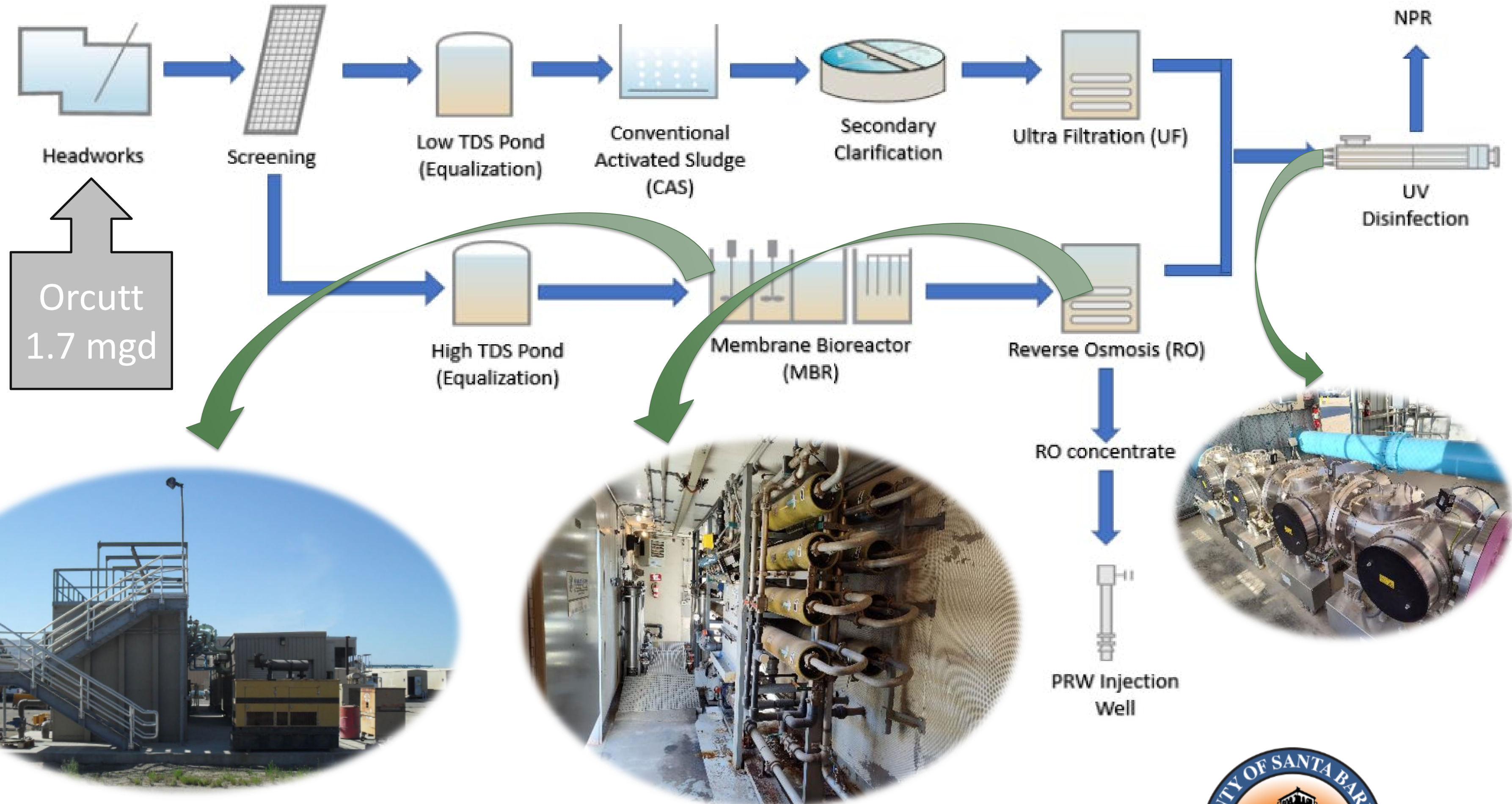
## PURPOSE

Define planning level costs, opportunities, and challenges of implementing IPR for the LCSD wastewater treatment plant in the Santa Maria Valley area



# Overview of Current LCSD Plant

Waller Park  
SMPAD ag  
North Branch County Jail  
Agricultural pastures

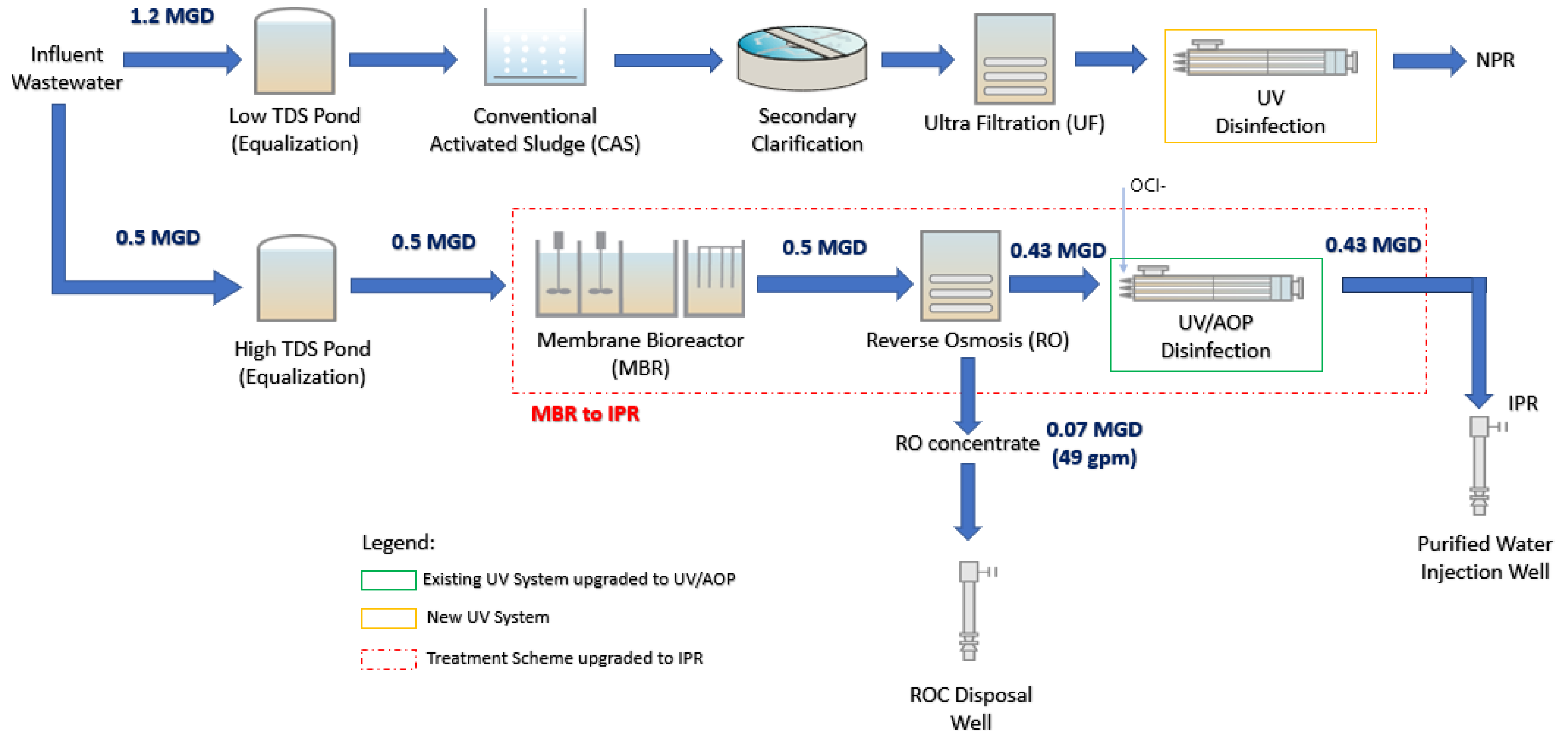


# Overview of Current LCSD Plant



# Potential Potable Reuse Treatment Configuration

## Project 1: Fast Track Project



**Pros:** Implement most immediately (minimal modifications required)

Allows for potential expansion to even larger size

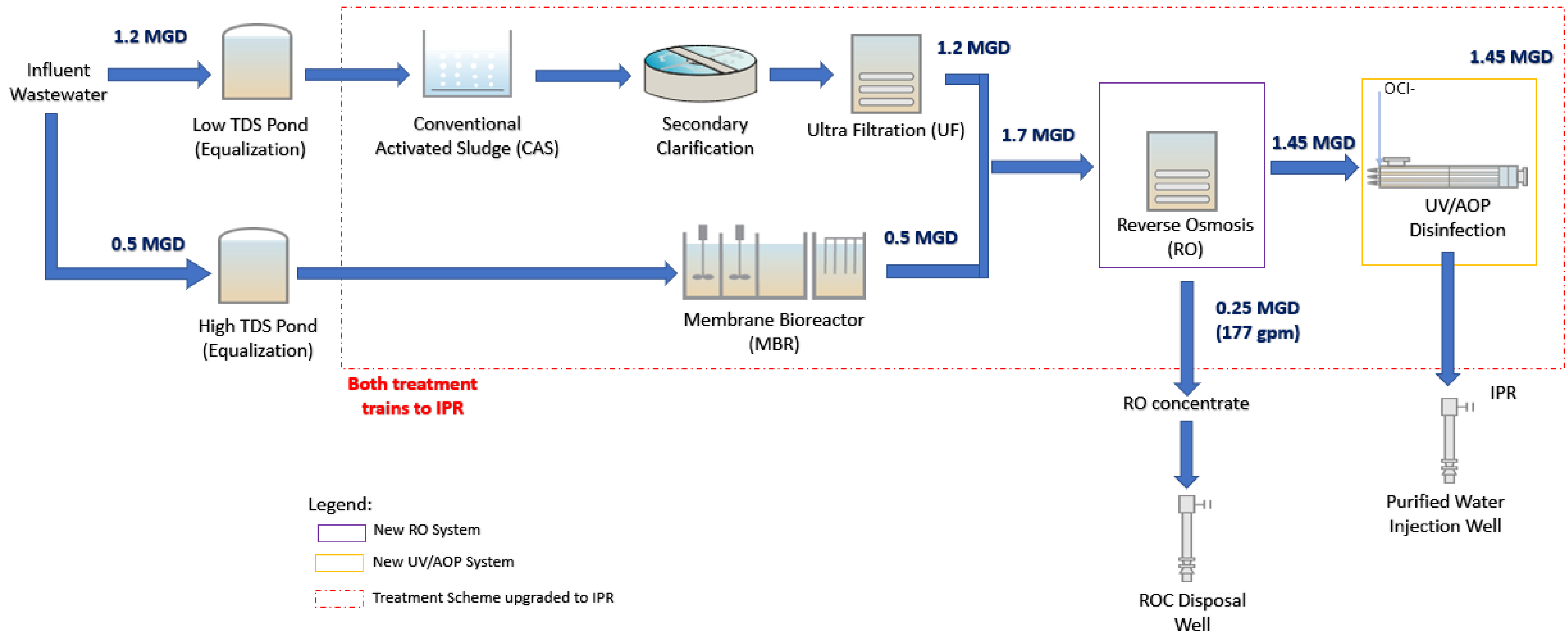
No need to upsize existing RO concentrate pipeline

**Cons:** Does not produce as much product water as project 2



# Potential Potable Reuse Treatment Configuration

## Project 2: Full IPR Implementation Project



**Pros:** Produces the most product water (full current flow)

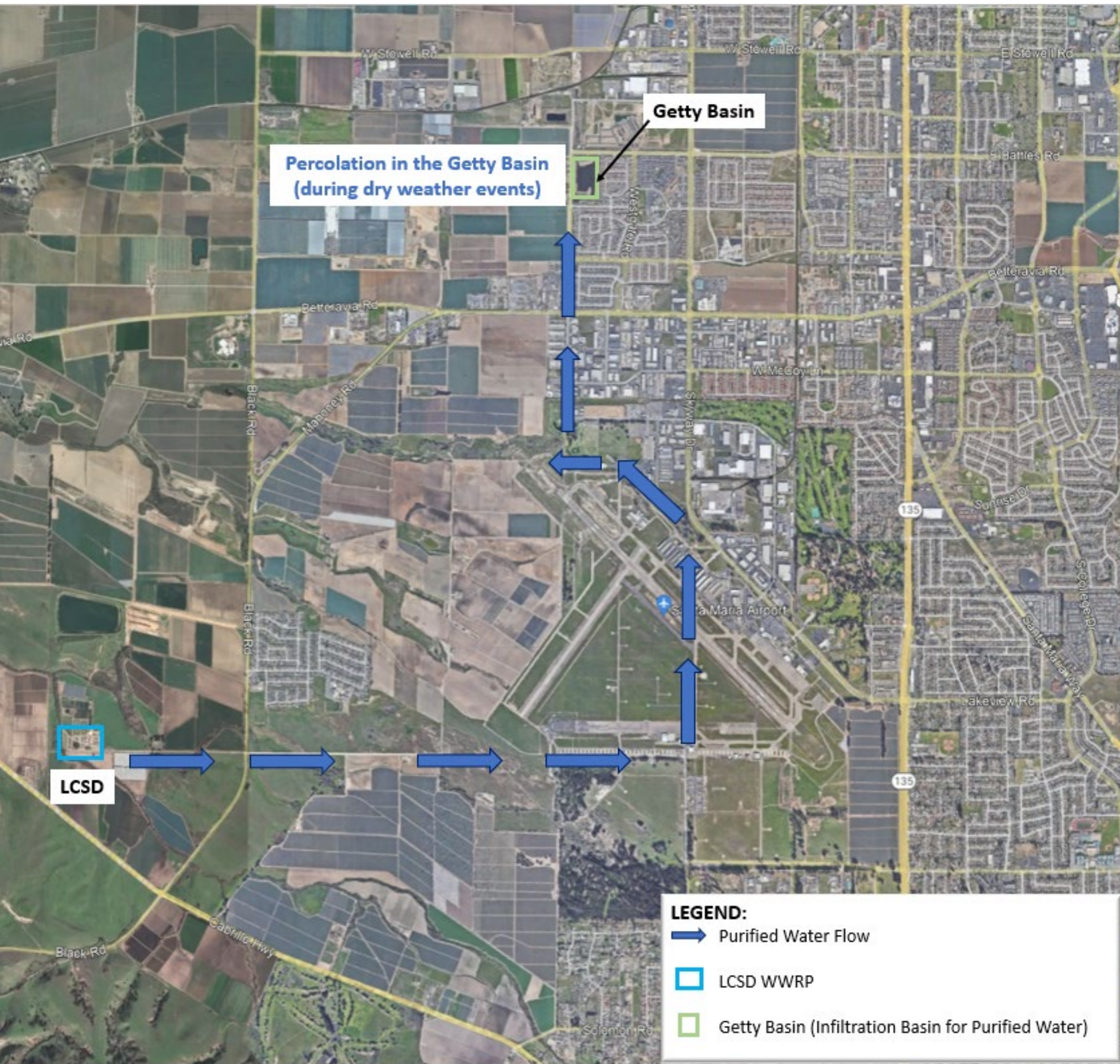
**Cons:** More modifications required

Need to upsize existing RO concentrate pipeline and exceeds current disposal well permitted capacity

**Note:** Future buildout in this configuration could accommodate up to 3.5 mgd



# Purified Water Injection Strategy



**Option 1:** Inject purified water near the Getty Basin.

Pros: Use of existing Flood Control District infrastructure.

Cons: Complexity of coordinating with another District and seasonal use



# Purified Water Injection Strategy



**Option 2:** Inject purified water northwest of the WRP

Pros: Not limited by Flood Control District

Allows for year-round injection

Cons: Will require new infrastructure

This is the preferred alternative.



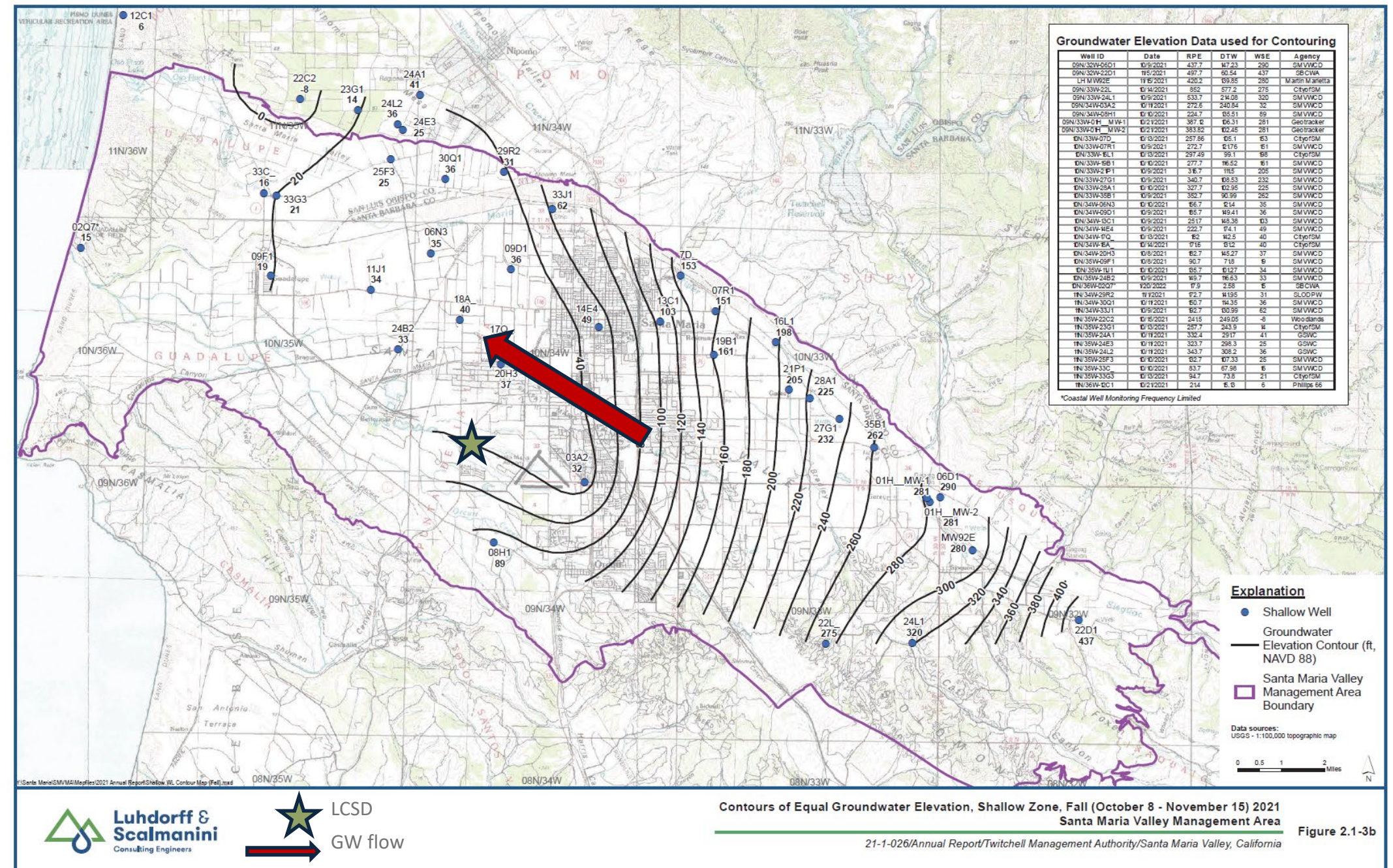
# Santa Maria Valley Groundwater Basin

## Proposed Injection Location

- Sits within the Santa Maria Valley Groundwater Basin (SMVGB).
- Wells generally pull from deep aquifer (250 -2,200 feet below ground surface).

## Groundwater Basin Directional Flow

- West-Northwest towards the ocean.



# Santa Maria Valley Groundwater Basin Analysis

## Groundwater Velocity

- Estimated travel time of injected water to nearby wells.
- Preliminary analysis indicates sufficient travel time for IPR regulations.
- Additional groundwater modeling currently underway.



| Location          | Groundwater Aquifer Zone | Velocity   | Time Period | Travel Distance |
|-------------------|--------------------------|------------|-------------|-----------------|
| Northwest of LCSD | Deep                     | 0.5 ft/day | 6 months    | 100 feet        |
|                   |                          |            | 12 months   | 200 feet        |



# Additional Regulatory Considerations

- Basin plan requirements: Boron is a constituent of concern.

## Current Boron Concentrations

| Parameter     | Basin Objective | Estimated Basin Concentration | Estimated Concentration in Purified Water |
|---------------|-----------------|-------------------------------|---|
| Boron, (mg/L) | 0.2             | 0.19                          | 0.18-0.24                                 |

- Proposed Regulatory Pathways:
  - » **Source Control:** Managing boron from the source.
  - » **Intake Credit:** Accounting for boron already present in drinking water.
  - » **Assimilative Capacity:** Accounting for ability of groundwater basin to dilute boron.



# Project Cost Estimates

*Class 5 Planning-Level Estimates  
Expected Accuracy -50% to +100%*

| Project                            | Feed Flow | Treatment Costs | New Infrastructure Costs | Total Capital Costs | Annualized (1) Project Cost (Infrastructure & Treatment) | Annual Operations & Maintenance Costs | Total Cost per Acre-Foot |
|------------------------------------|-----------|-----------------|--------------------------|---------------------|--|---------------------------------------|--------------------------|
| Project 1: Fast Track              | 0.5 mgd   | \$12.9 M        | \$8.4 M                  | \$21.3 M            | \$1.1 M  | \$1.2 M                               | \$4,950                  |
| Project 2: Full IPR Implementation | 1.7 mgd   | \$46.6 M        | \$32 M                   | \$78.6 M            | \$4.3 M  | \$2.4 M                               | \$4,130                  |

Notes:

(1) Annualized project costs assume a 30-year loan with a 3.5% interest rate.



# Implementation and Next Phase Schedule

| Project Phase  | Year |   |    |   |   |   |
|--|------|---|----|---|---|---|
|  | 1    | 2 | 3* | 4 | 5 | 6 |
| <b>Planning</b>  |      |   |    |   |   |   |
| Define a financial model and governing approach for a future potable reuse program                         |      |   |    |   |   |   |
| Identify, apply for, and understand requirements for Grant funding programs                                |      |   |    |   |   |   |
| Coordinate with agencies regarding the Boron Regulatory Pathway  |      |   |    |   |   |   |
| Produce reports needed for project progression & project financing (e.g. Feasibility Study for USBR Grant) |      |   |    |   |   |   |
| <b>Demonstration</b>   |      |   |    |   |   |   |
| Conduct groundwater modeling   |      |   |    |   |   |   |
| Conduct testing of the RO and UV systems to ensure upgrades can meet IPR requirements.                     |      |   |    |   |   |   |
| Produce the Basis of Design Report   |      |   |    |   |   |   |
| Perform operator training  |      |   |    |   |   |   |
| Engage the public  |      |   |    |   |   |   |
| <b>Implementation*</b>   |      |   |    |   |   |   |
| Permitting   |      |   |    |   |   |   |
| Design   |      |   |    |   |   |   |
| Procurement  |      |   |    |   |   |   |
| Construction   |      |   |    |   |   |   |



## Recommended Actions

- That the Board of Directors of the Santa Barbara County Water Agency and the Board of Directors of the Laguna County Sanitation District:
  - Receive and file two potable reuse studies entitled Countywide Potable Reuse Evaluation dated October 2023, and Groundwater Recharge Evaluation prepared by Carollo Engineers dated August 2023; and,
  - Find that the proposed action does not constitute a “Project” within the meaning of the California Environmental Quality Act, pursuant to 14 CCR 15378 (b)(5), in that it is a government administrative activity that will not result in direct or indirect changes in the environment.







## Questions?

Santa Barbara County Water Agency Information:  
<https://www.countyofsb.org/2510/Water-Agency>

Laguna County Sanitation District Information:  
<https://www.countyofsb.org/1355/Laguna-County-Sanitation-District>

