Valley Water's Plans for Potable Reuse (Near-Term IPR and Long-Term DPR)

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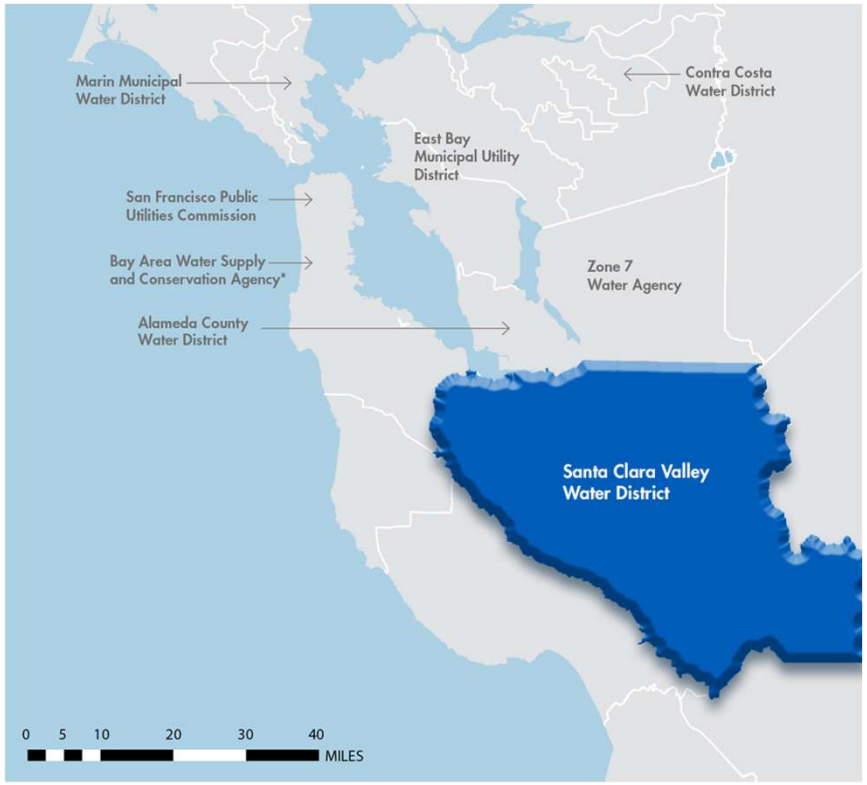
Valley Water

Valley Water

WateReuse NORTHERN CALIFORNIA

Santa Clara Valley Water District (Valley Water)



275
miles owned out of 800 miles of streams in Santa Clara County

10
dams and surface water reservoirs

3
water treatment plants

1
advanced water purification center

1
state-of-the-art water quality laboratory

142
miles of pipelines

102
groundwater recharge ponds covering 277 acres

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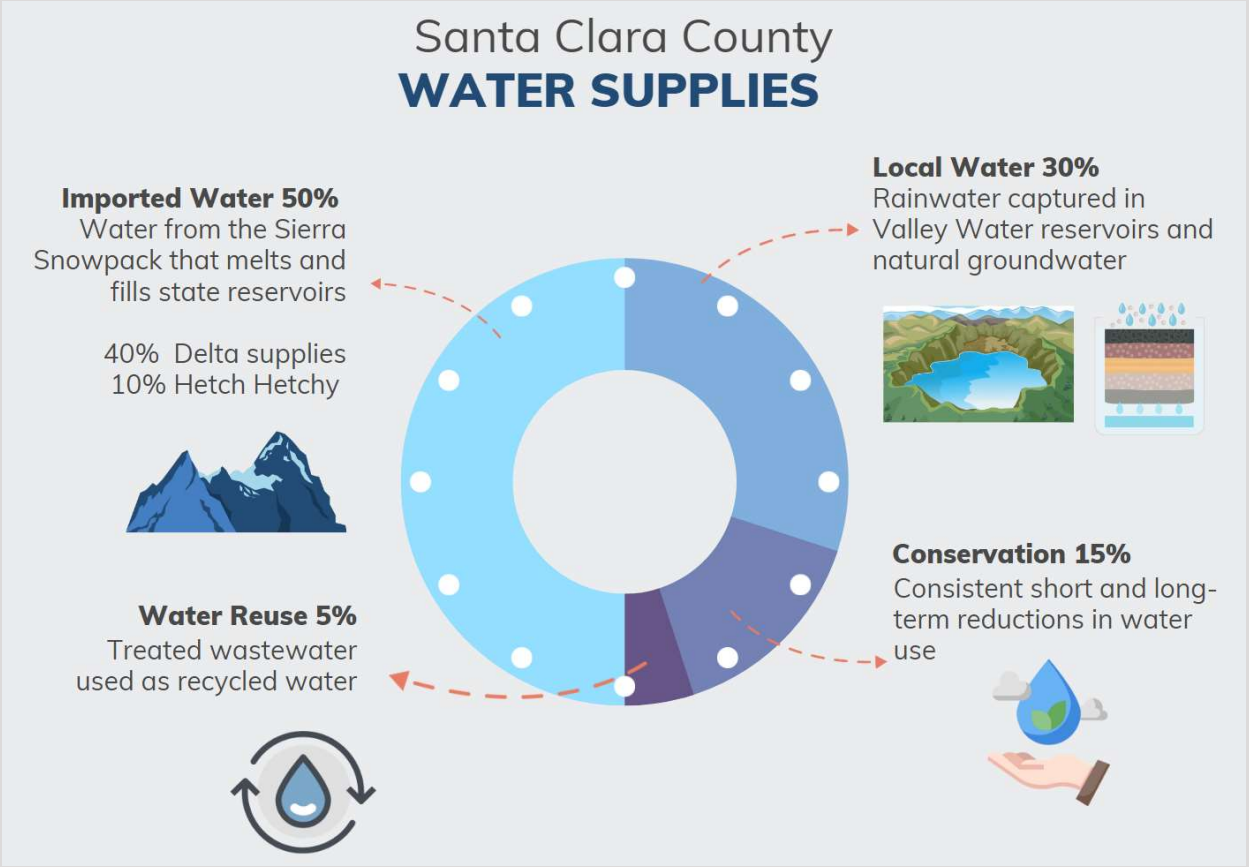
Water Supply Breakdown

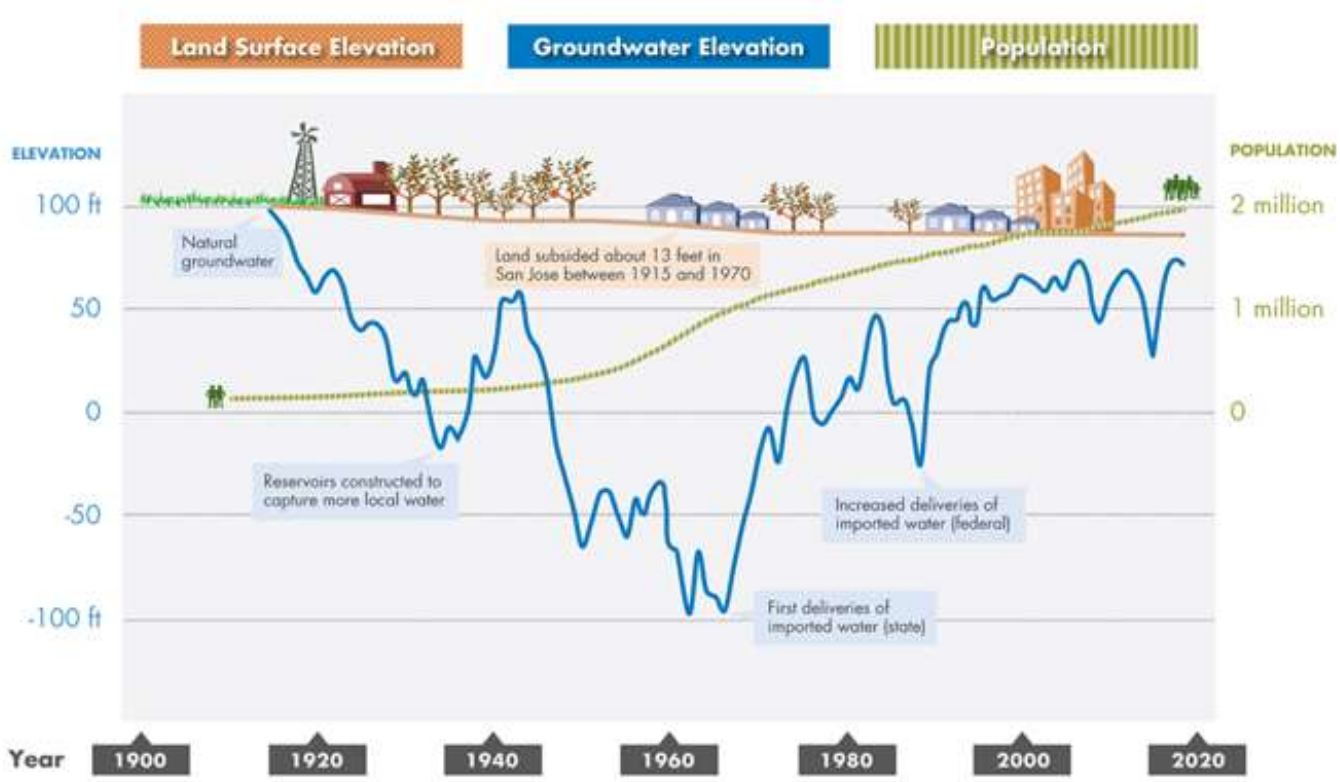


Impacts of Unreliable Water Supplies and Droughts

Drought realities

Economic impacts

Land subsidence risk



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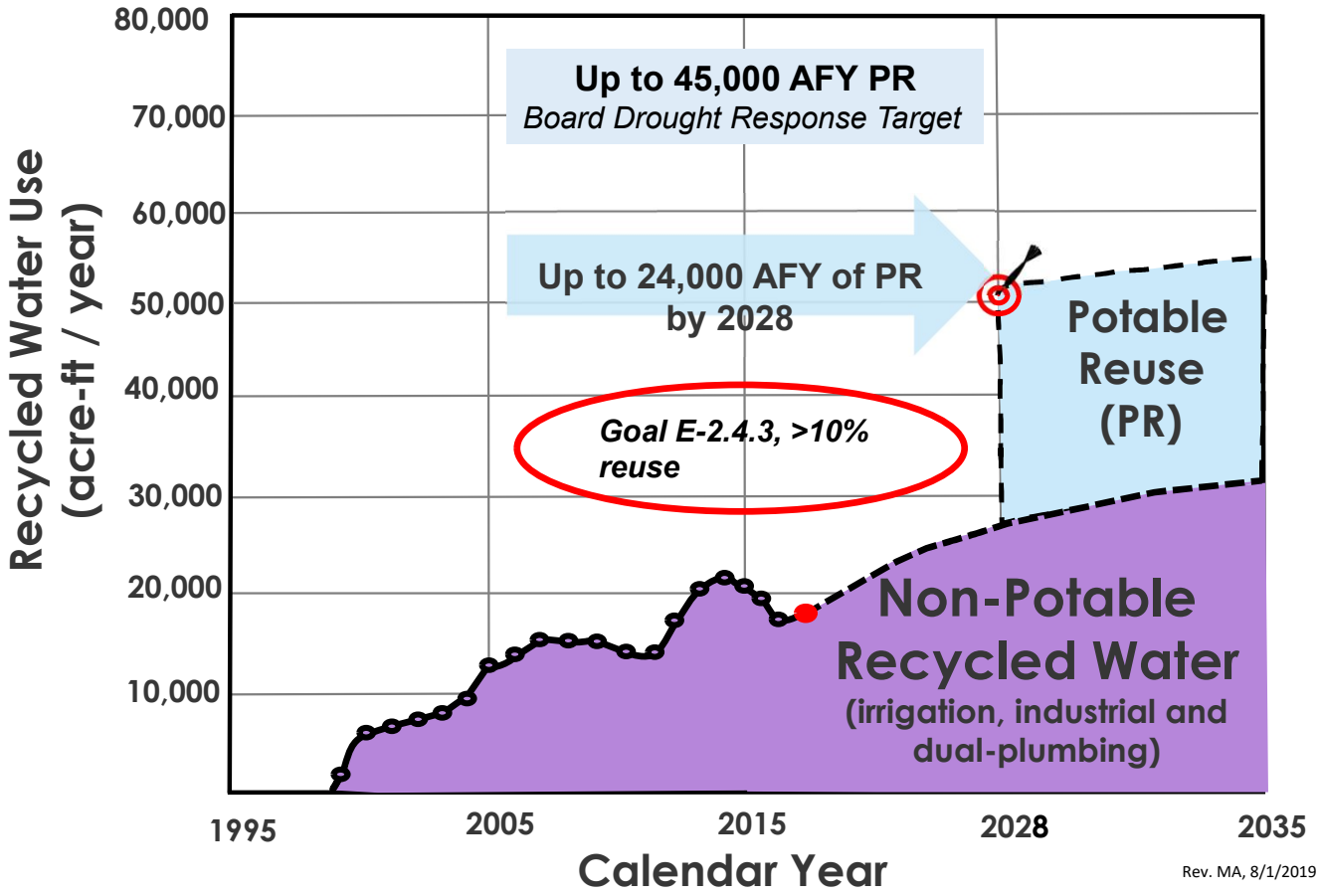
Potable and Non-Potable Goals



Rev. MA, 8/1/2019

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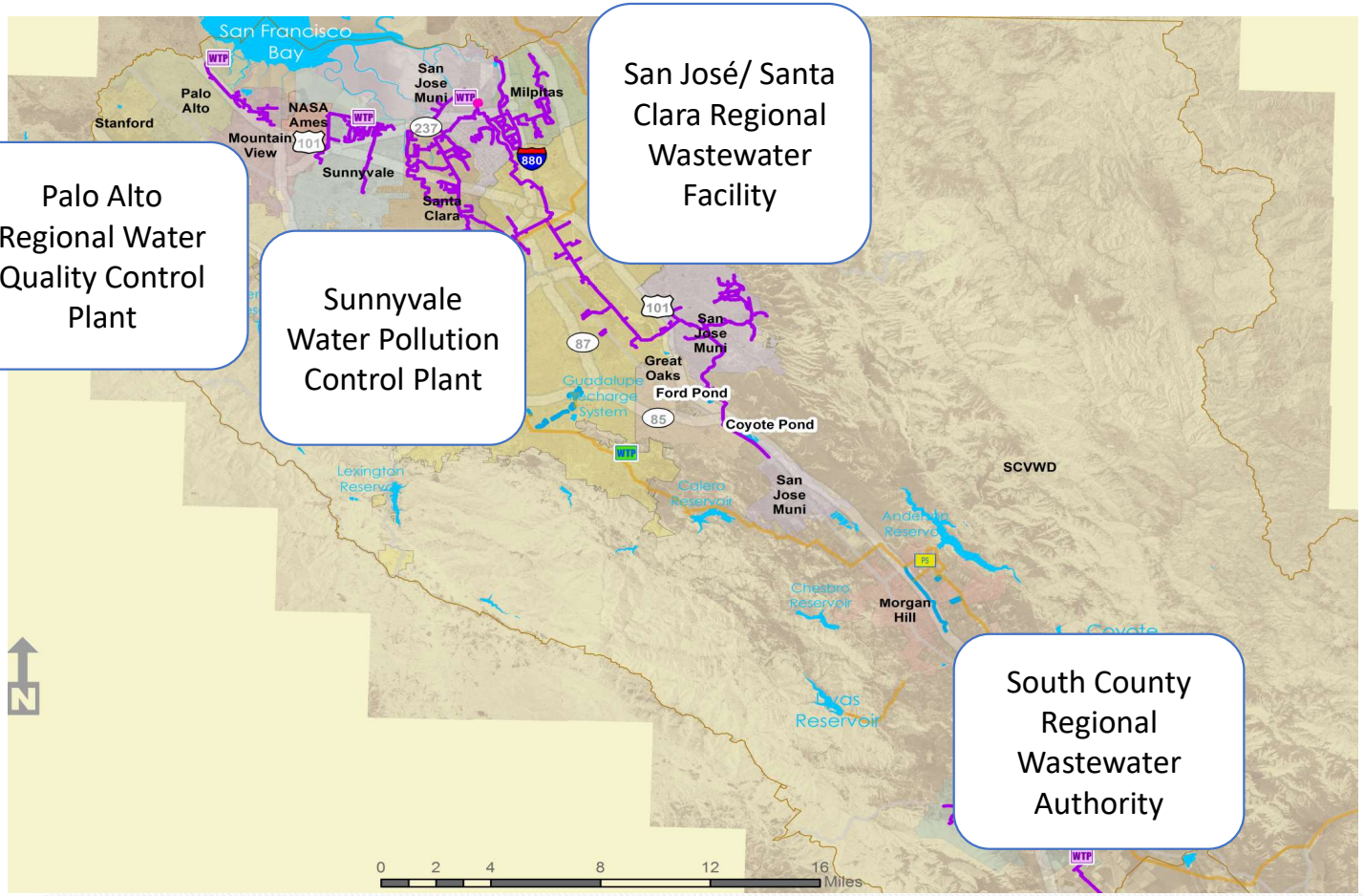
Partnership Opportunities and Challenges



Palo Alto Regional Water Quality Control Plant

Sunnyvale Water Pollution Control Plant

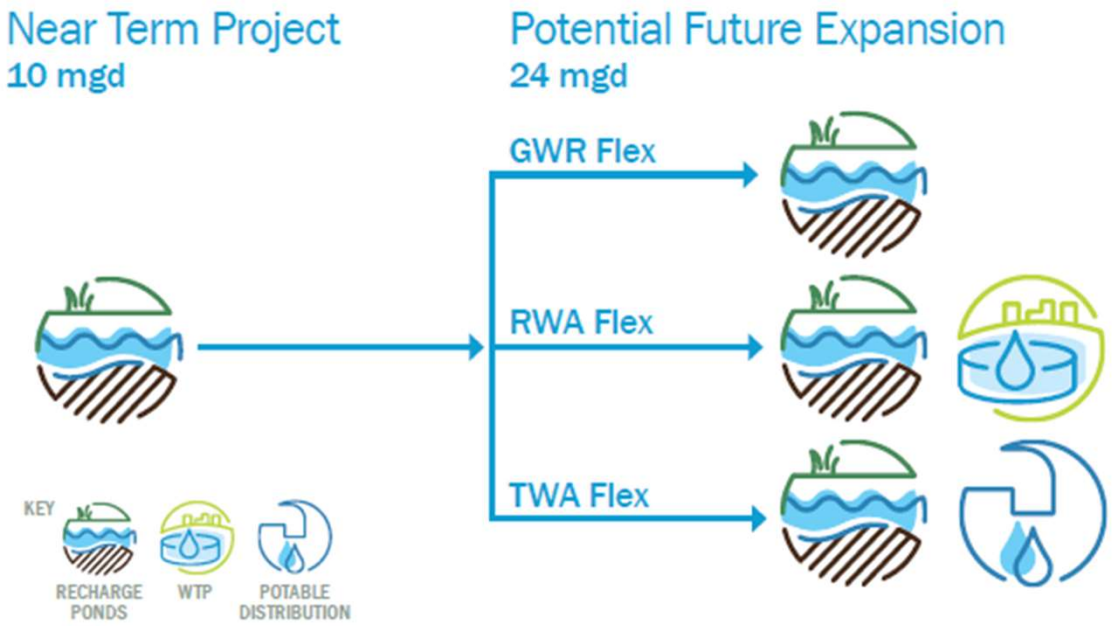
San José/ Santa Clara Regional Wastewater Facility

South County Regional Wastewater Authority

Valley Water

CoRe Plan Flex

- Near IPR project (Palo Alto AWPF)
- DPR portfolios for future reuse expansion (e.g., San Jose)



Silicon Valley Advanced Water Purification Center (SVAWPC)

- Great example of partnership between City of San Jose and Valley Water
- Feedwater to SVAWPC is Secondary Treated Wastewater from San Jose/Santa Clara Regional Wastewater Facility
- Largest advanced water purification plant in Northern California, 8MGD
- Enhancement of water quality for approximately 1000 recycle water users in Santa Clara county
- Produced over 7.3 billion gallons of highly purified water since operation began in 2014 (e.g., TDS ~ 40 mg/lit)

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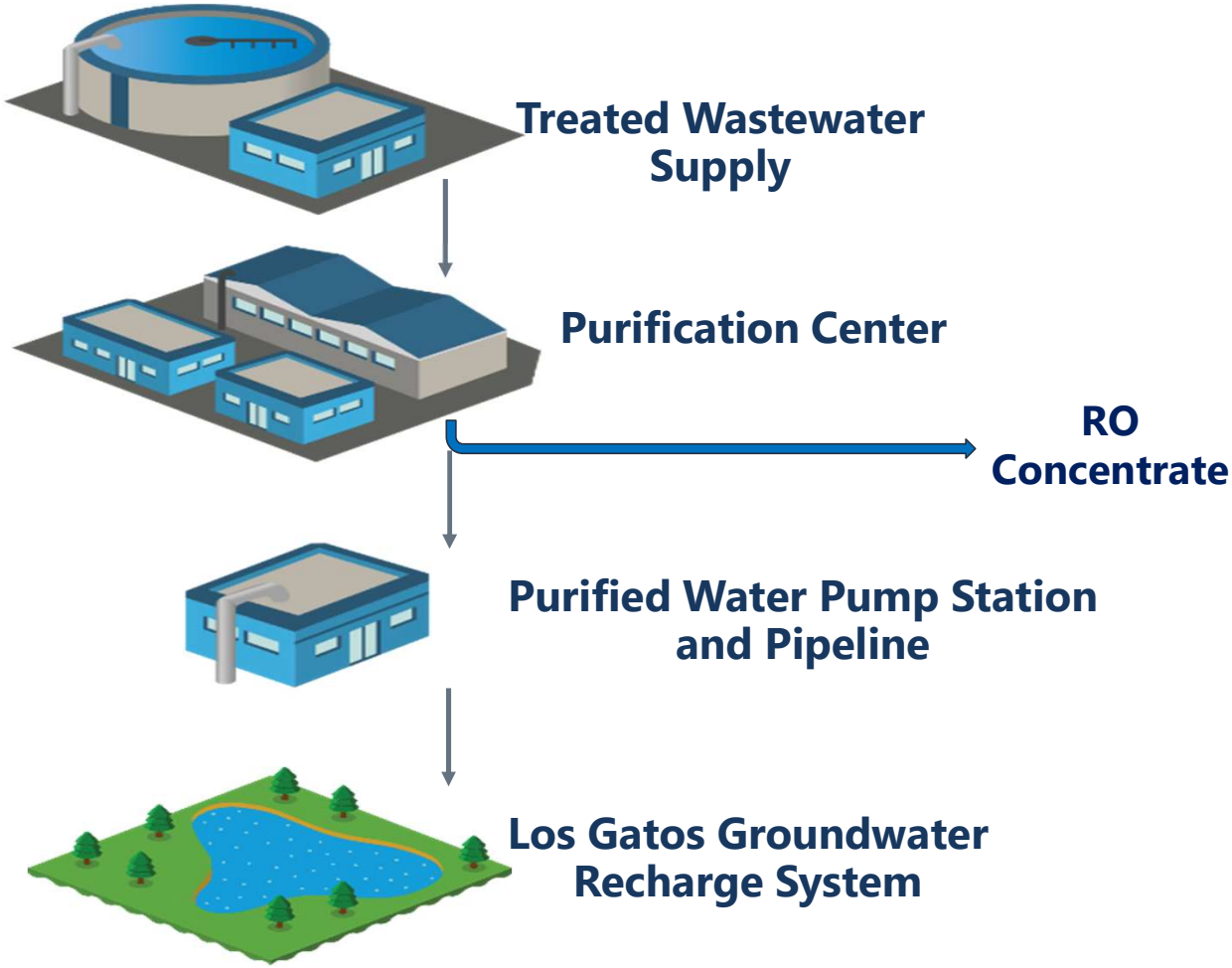
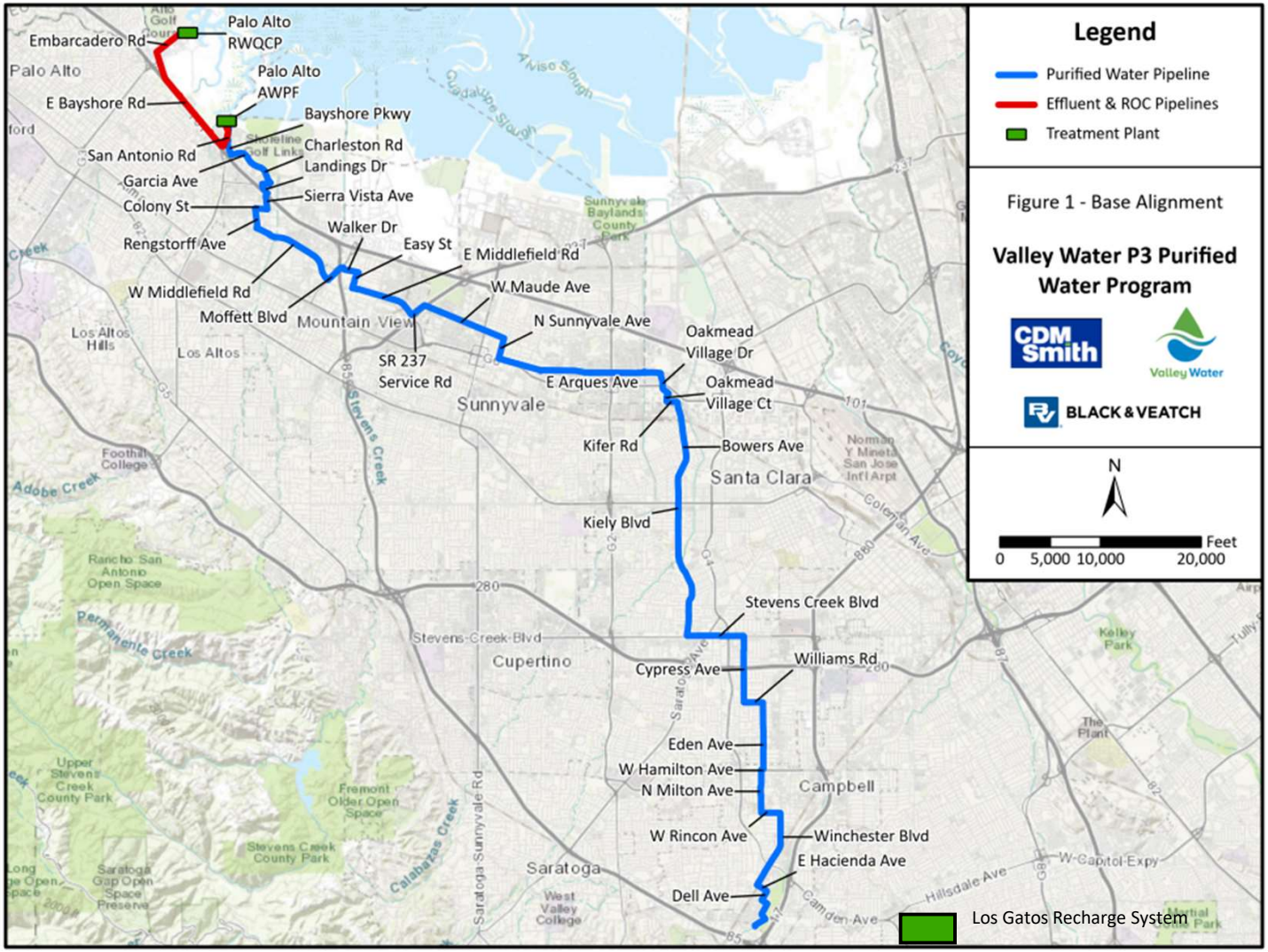
Major Elements of the Purified Water Project



Purified Water Project Overview



ADVANCED WATER PURIFICATION PROCESS

HIGHLY TREATED WASTEWATER

This water originally comes from the drains of homes and businesses and is treated three times at a wastewater facility.

#1 MICROFILTRATION

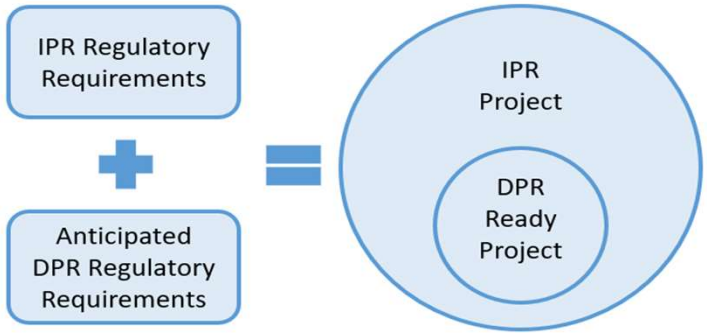
#2 REVERSE OSMOSIS

#3 UV LIGHT DISINFECTION AND ADVANCED OXIDATION

Palo Alto AWPF Rendering

Strategic Planning and Tactics

- Flex hybrid scenarios
- Potential future expansion
- Considerations when moving from IPR to DPR
  - Heeding anticipated DPR regulatory requirements
  - Provisioning for additional treatment trains at the IPR facility
  - Analyzing utilization rates and connection points to the existing system for RWA and TWA scenarios



Planning for the Future

- Specify “DPR” elements for the IPR project
  - NSF 60/61
  - Design conveyance pipelines to meet potable pipeline separation requirements
  - Space for future treatment processes

Existing 2019 Partnership Agreement to Advance Resilient Water Reuse Programs

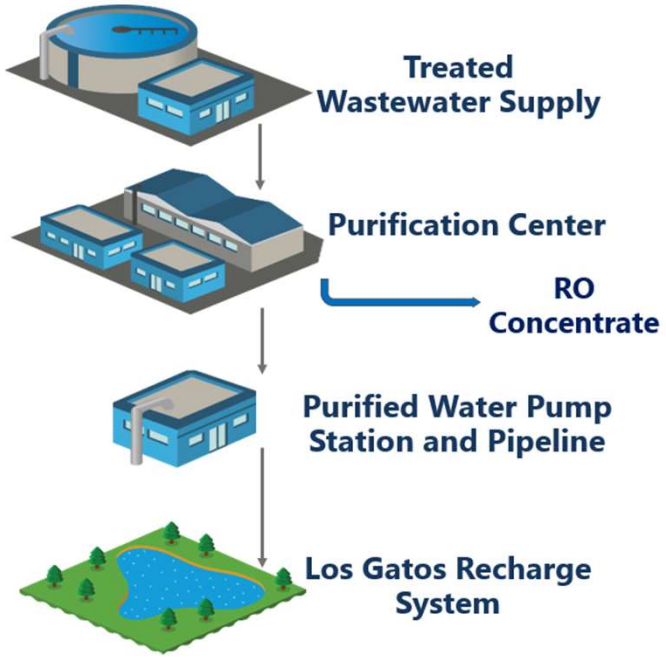
- Valley Water funding of $16 million (for local salt removal facility or other water related projects)
- Effluent transfer option to Valley Water for a regional purification facility ($0.2M/yr →$1M/yr when exercised)
- Water supply option for the Cities of Palo Alto and Mountain View

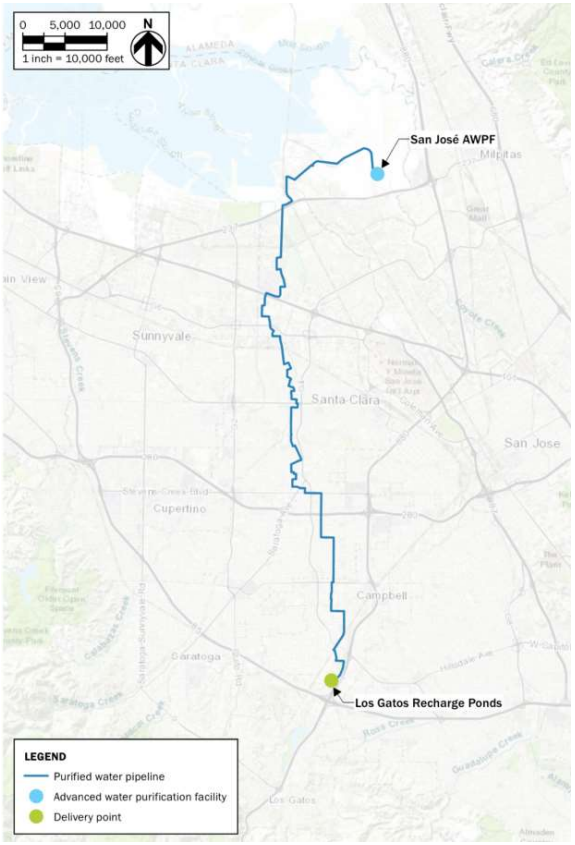
Project Delivery Method

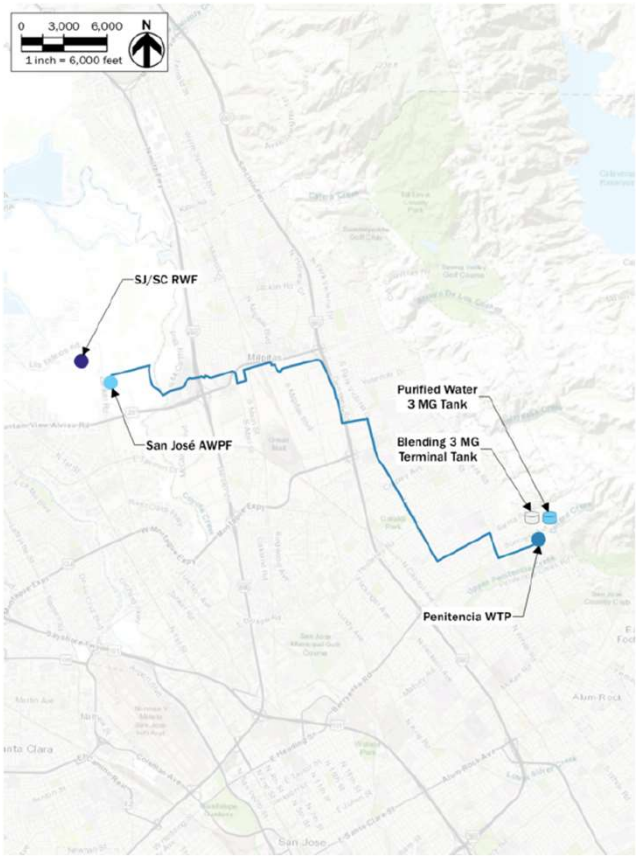
- Using Design-Build-Finance-Operate-Maintain (DBFOM) Delivery Method
  - A private entity delivers the project,
  - Valley Water retains ownership
  - Valley Water partners with the private entity
- Currently preparing a concept level design to include in the upcoming RFP (2024)
- Estimated project cost: $1.2B

(P3) Public Private Partnership

Purified Water Project (San Jose)







San Jose/Santa Clara

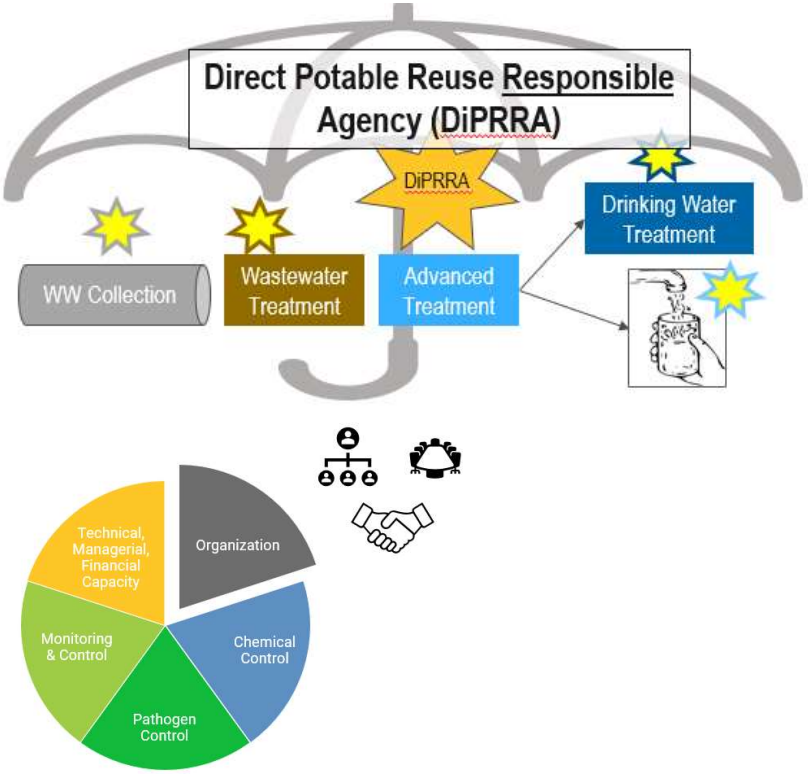
Valley Water

DPR Regulations, Partnerships, and Agreements

Potential DPR Project

- City of San Jose, City of Santa Clara, Valley Water, and other tributaries to SJ/SC RWF
- New Regional Supply
- Benefits Region & State

- **Responsible Agency (DiPPRA)**
  - Complex requirements
  - One Agency Responsible per Reg's (e.g., Valley Water)
  - Wastewater Agreement
  - Water Quality and Source Control
  - O&M Agreement for the future AWPF
  - RO Concentrate Management



Images: WateReuse CA, DPR Regulations: Update on Final Draft, August 2023

Pathway to Potable Reuse (DPR)

- Silicon Valley Advanced Water Purification Center enhances non-potable system
- Direct Potable Reuse allows greatest flexibility for water supply
- New regulations will require additional treatment processes and new institutional arrangements
- Demonstration facility is necessary first step to a full-scale project

Benefits:

Regulatory Permitting

Interagency Agreements

Train Operators

Operational and Technical Studies

Outreach and Public Perception

Example Demonstration Facilities

City of San Diego Pure Water Program

Metropolitan Water District of Southern California

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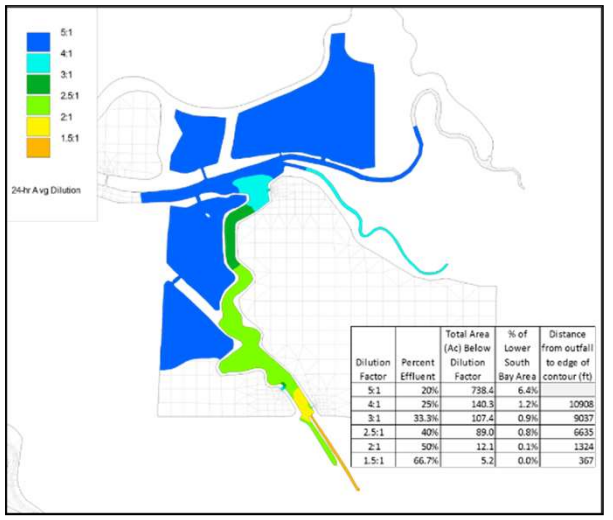
DPR Demonstration Project

- Collaboration between Valley Water and the Cities of San José and Santa Clara
- Need to develop agreements to build the DPR facility
- Collaboration on education and public outreach for acceptance of DPR
- Prepare for implementation of the future full-scale DPR facility

ROC studies to support NPDES revisions and reissuance (Palo Alto)

- Hydrodynamic Modeling

SFEI-DFM model used for performing the ROC dilution studies in the Lower South Bay



Dilution Factor	Percent Effluent	Total Area (Ac) Below Dilution Factor	% of Lower South Bay Area	Distance from outfall to edge of contour (ft)
5:1	20%	738.4	6.4%	
4:1	25%	140.3	1.2%	10908
3:1	33.3%	107.4	0.9%	9037
2.5:1	40%	89.0	0.8%	6635
2:1	50%	12.1	0.1%	1324
1.5:1	66.7%	5.2	0.0%	367

- Reasonable Potential Analysis

Identified constituents that would require NPDES permit limits for Palo Alto

- Mass Balance and Effluent Limits Analysis

Identified dilutions needed for the constituents identified under RPA (Copper, Nickle, Selenium, Zinc, Cyanide)

- Toxicity Analysis

3 species selected to be tested quarterly for 1 year (Topsmelt, Mussel, and Giant kelp)

- Constituents of Emerging Concerns (CECs)

Monitor and analyze selected CECs

Valley Water Nature Based Solution

- Engineered Treatment Cells / Open Water Wetland

July 2017/ 2019

- Floating Wetland Treatment

July 2020/ Ongoing

- Oro Loma Sanitary District Horizontal Levee

October 2019/ Ongoing

Demonstrate various degrees of reduction of nutrients, metals and CEC's present in ROC

Have great potential as an alternative for treatment of ROC

Valley Water

Intrinsyx Environmental

Berkeley UNIVERSITY OF CALIFORNIA

Stanford University

ORO LOMA SANITARY DISTRICT

HUMBOLDT STATE UNIVERSITY FOUNDED 1913

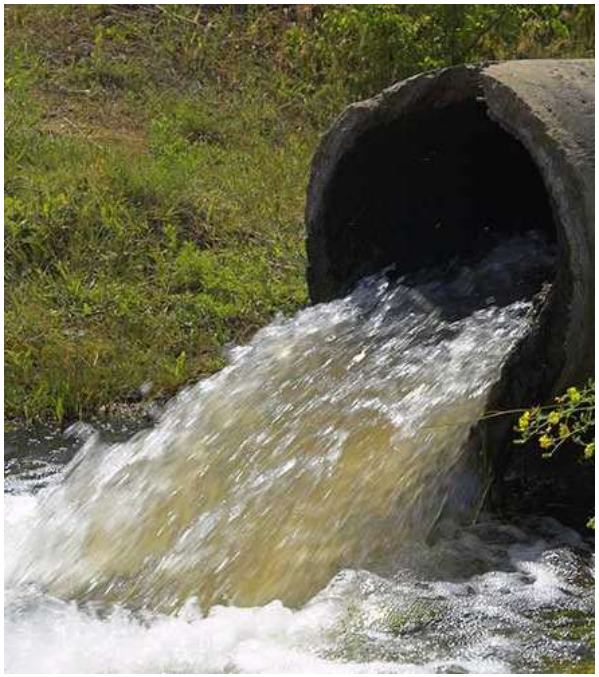
SFEI AQUATIC SCIENCE CENTER

SAN FRANCISCO ESTUARY INSTITUTE & THE AQUATIC SCIENCE CENTER

Path Ahead

Presentation Snapshot

- Produce drought resistance water supply
- Support future increases
- Bring some relief to California water shortage challenges in a relatively short time
- Flexible implementation approach
- Expedited potable reuse projects by 2028
- Phased IPR and DPR



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