



Sunnyvale

2024 Recycled Water Master Plan Update

Study Issue ESD 22-01

Environmental Services Department

September 24, 2024



Agenda

- 1 Background
- 2 2024 RWMP Update
- 3 Recommendations
- 4 Q&A



Sunnyvale Recycled Water Policy

Policy EM-1.2

Maximize recycled water use for all approved purposes both within and in areas adjacent to the City, where feasible.

Moffett Park Specific Plan Area

New public and private streets are required to provide recycled water infrastructure, and new developments will be required to tie into the recycled water system.

Recycled Water Pump Station (RWPS)

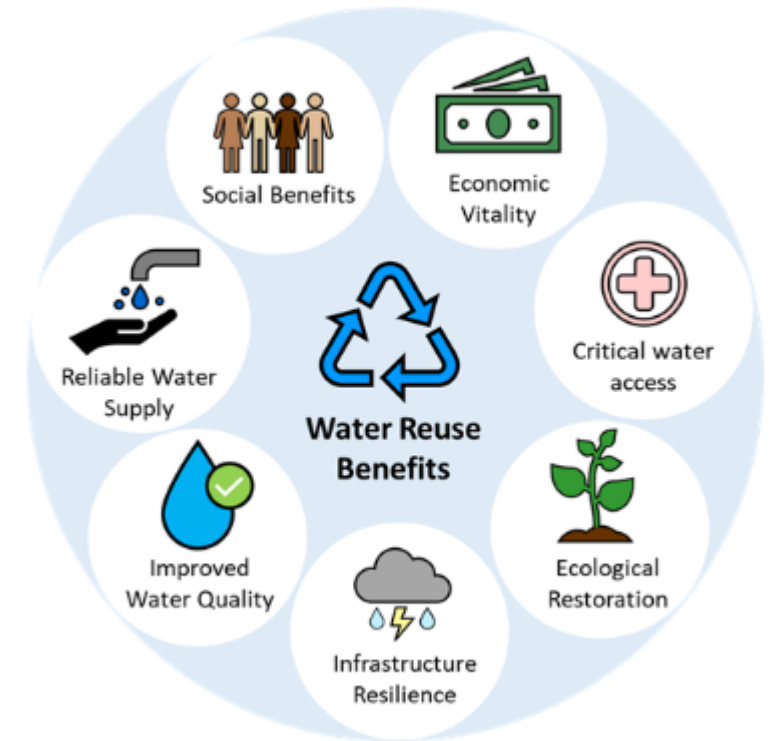


San Lucar Pump Station (SLPS)



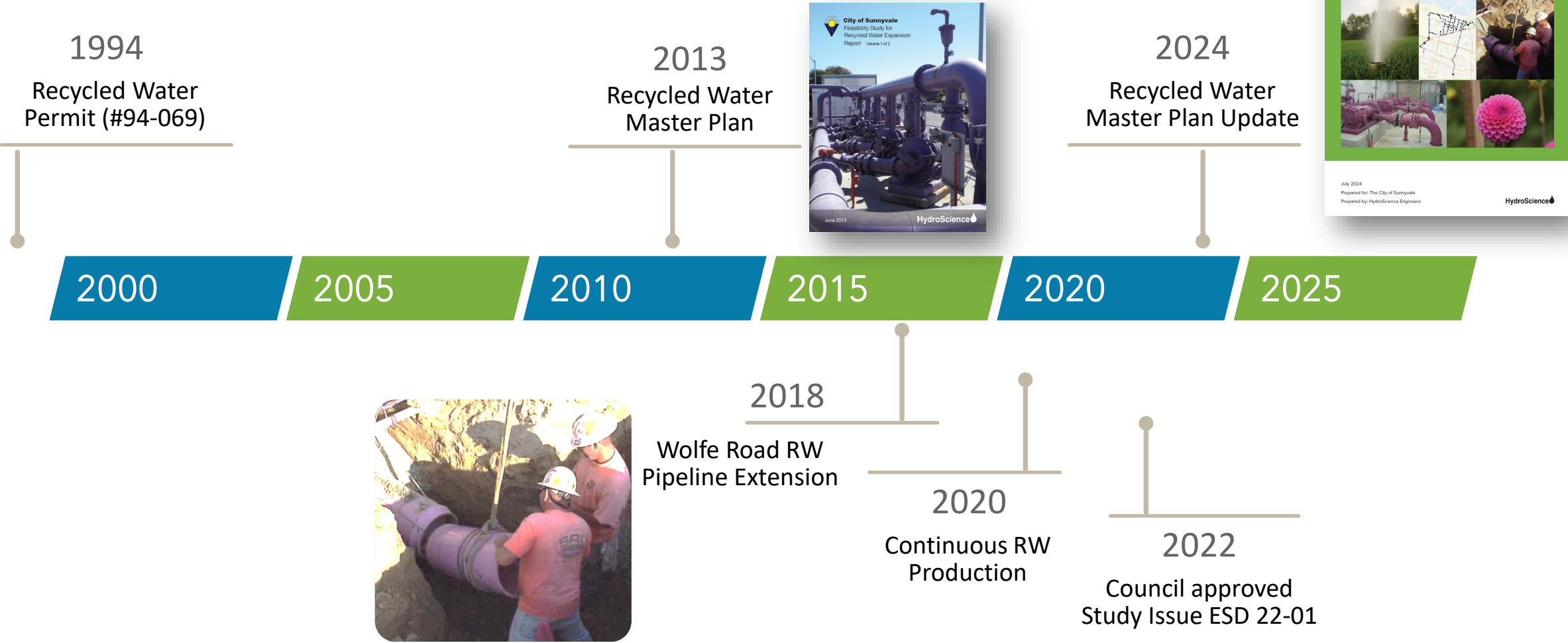
Recycled Water Benefits

- Sustainable water source
- Reduces nutrients to the South Bay
- Desirable for customers pursuing green options
- Promotes regional water resiliency
- Expanding/Improving existing system maximizes use of existing assets



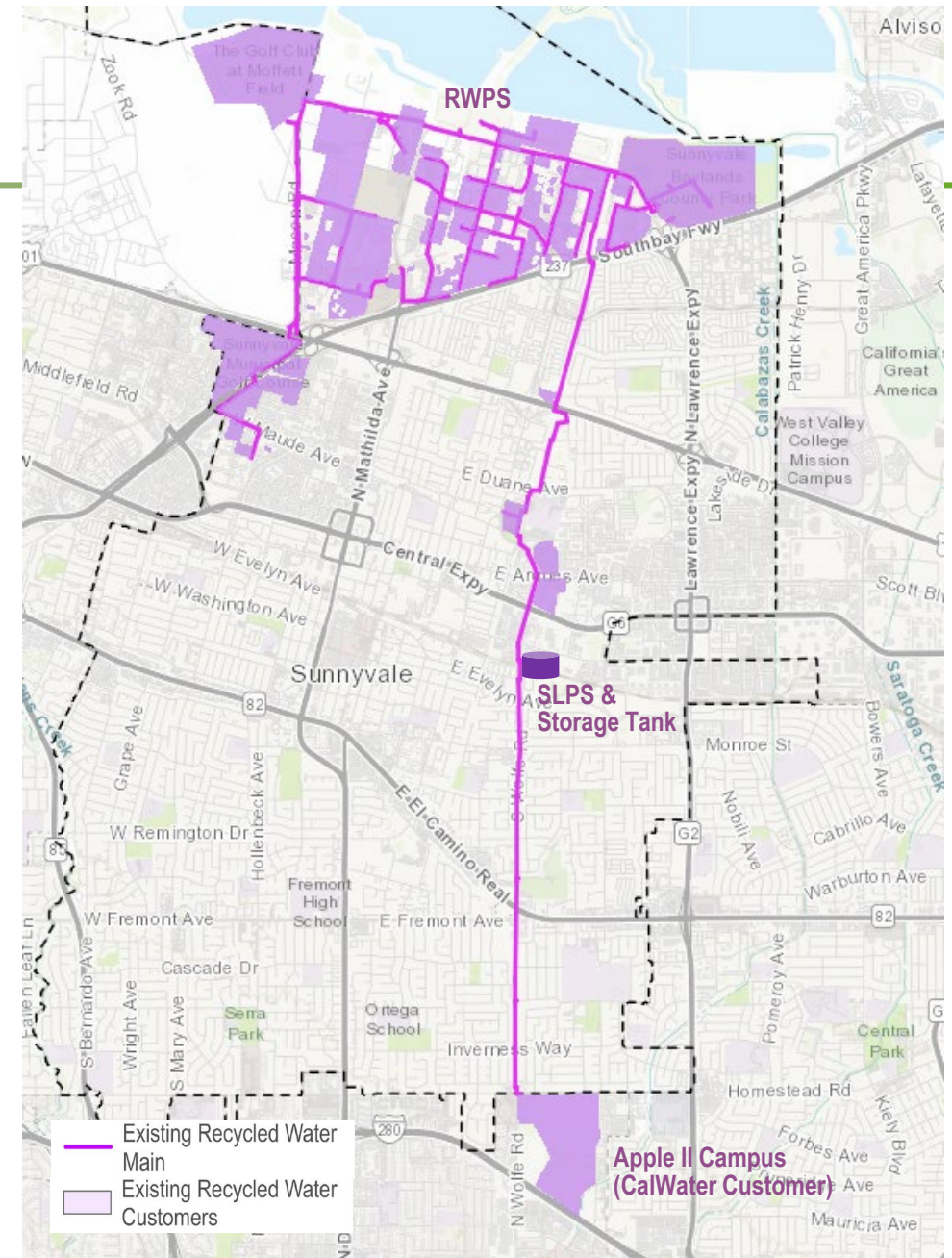
Source: USEPA

Recycled Water in Sunnyvale



Recycled Water System Overview

- 22 miles of recycled water mains (8" to 36")
- 2 Pump Stations
 - Recycled Water Pump Station (RWPS): 5.4 Million Gallons per Day (MGD)
 - San Lucar Pump Station (SLPS): 8.2 MGD
- 1 Storage Tank
 - San Lucar Storage Tank: 1.5 MG storage capacity
- 120 customers
 - Most are located north of Hwy 237 and use recycled water for landscape irrigation
 - 11 active dual-plumbing sites
- Recycled water priced at 90% of potable water
- Average annual demand: 1.04 MGD
- Peak summer day demand: 2.42 MGD



Major Recycled Water Customers

Sunnyvale SMaRT Station



Google Campus



Apple Campus



Juniper Network Campus



Foothill College



Amazon Campus

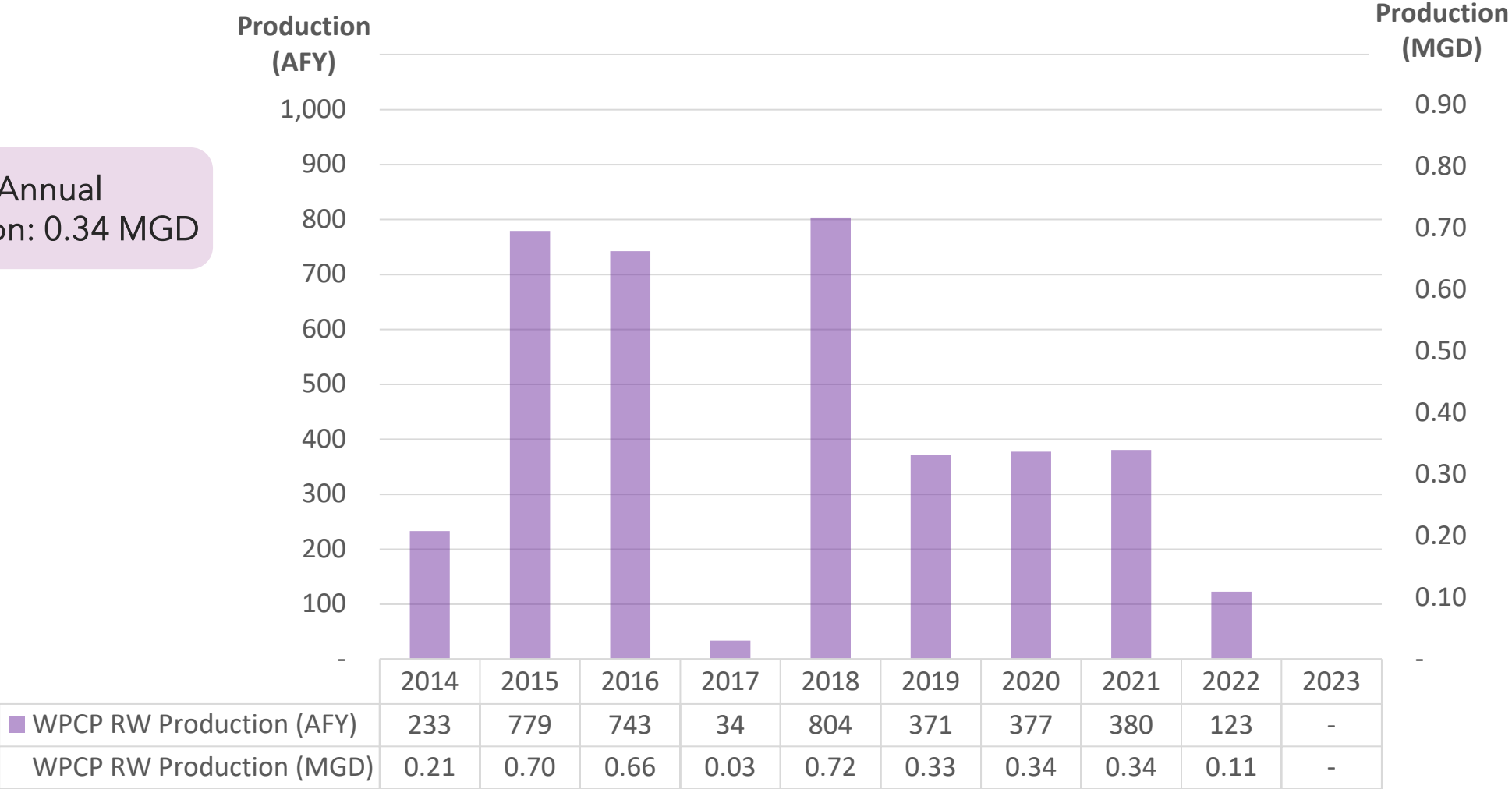


Sunnyvale Muni Golf Course



Historical Recycled Water Production (2014-2023)

Average Annual
Production: 0.34 MGD



Why 2024 RWMP Update?

2020:

Valley Water delayed partnership discussions with Sunnyvale about expanding advanced purified water use until 2028.

2022:

Council approved Study Issue ESD 22-01 to evaluate opportunities to expand recycled water use in the City.



2024 RWMP Update Overview

System Expansion

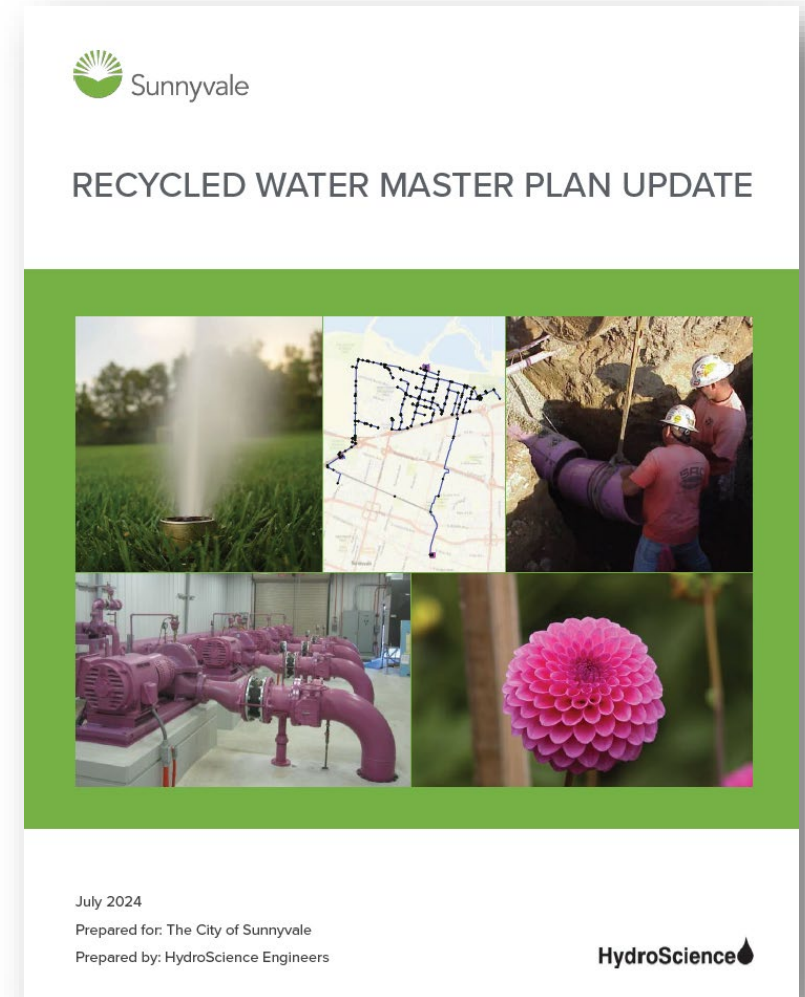
- Identified four alternatives to expand the recycled water system
- Total potential new demands: 1,176 AFY (1.05 MGD)
- Total estimated capital cost: \$140.5M

Challenges

- Water Quality (Total Dissolved Solids)
- Cost

Opportunities

- Grant Funding
- Customer Contributions
- Utility funding
- Regional Partnership



System Expansion

Alternative 1 – Existing System

- Improve existing system with minor dead-end extensions
- Improve water quality

Alternative 2 – Infill Connections

- Pursue 10 potential customers located in the vicinity of the existing system

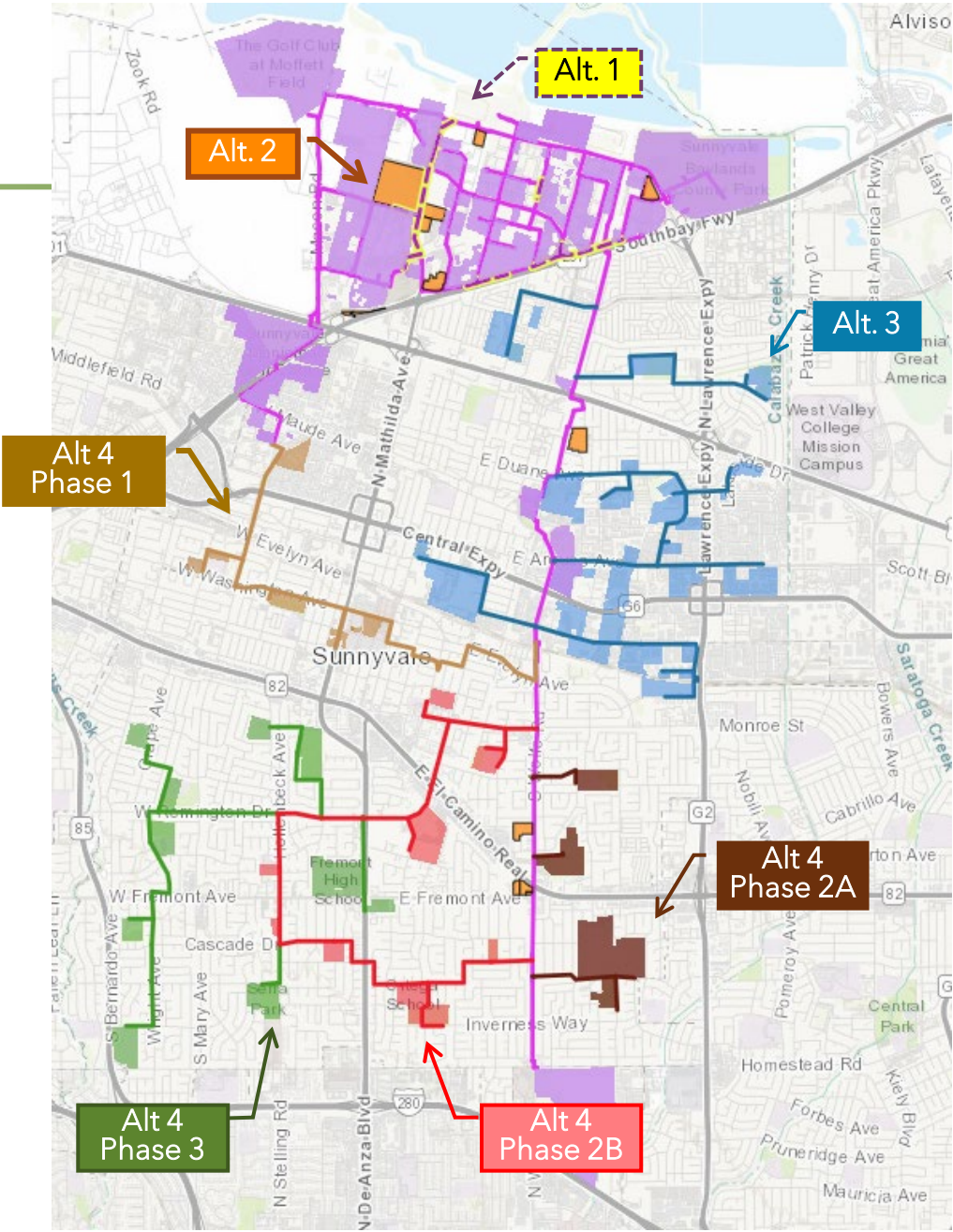
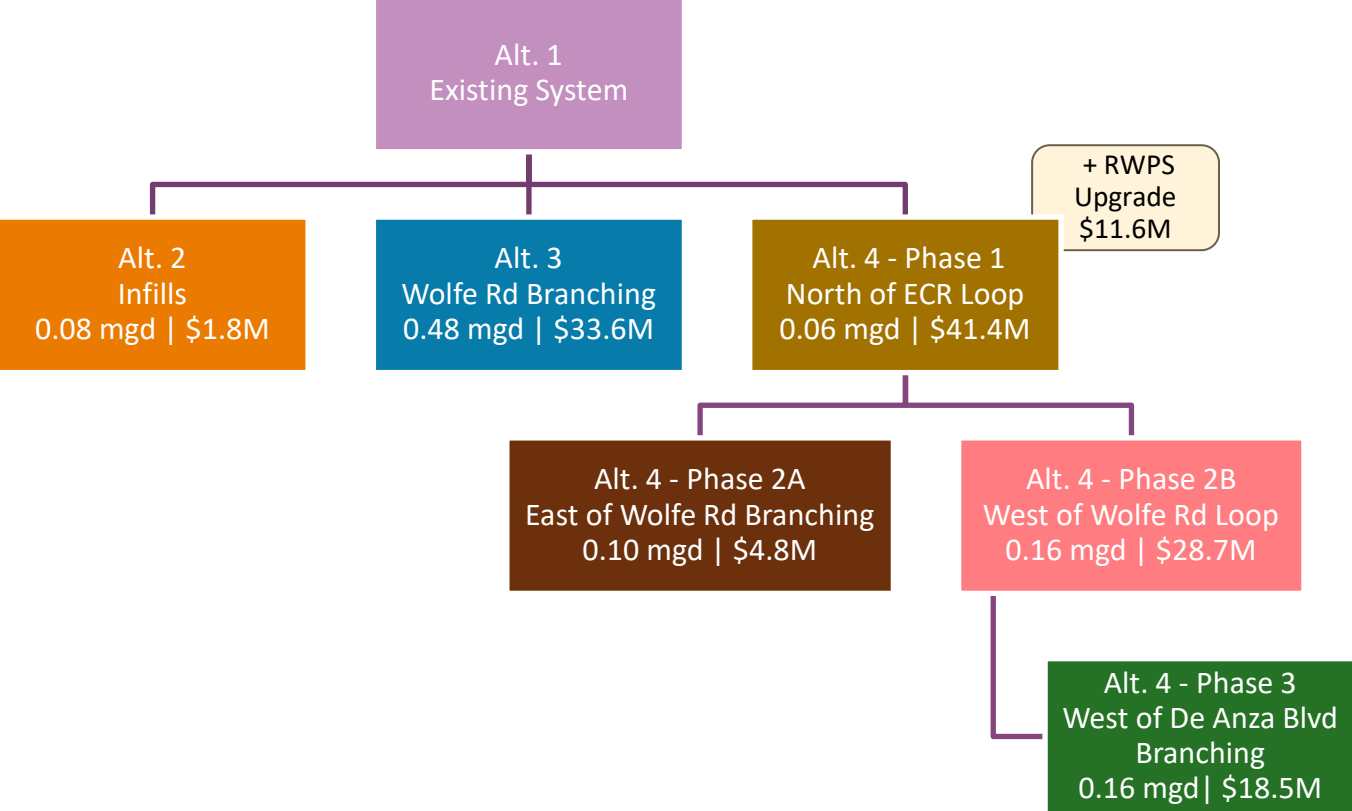
Alternative 3 – Maximize Existing System

- Install approx. 8.4 miles of new mains to unlock new demands along Wolfe Rd

Alternative 4 – Full Buildout

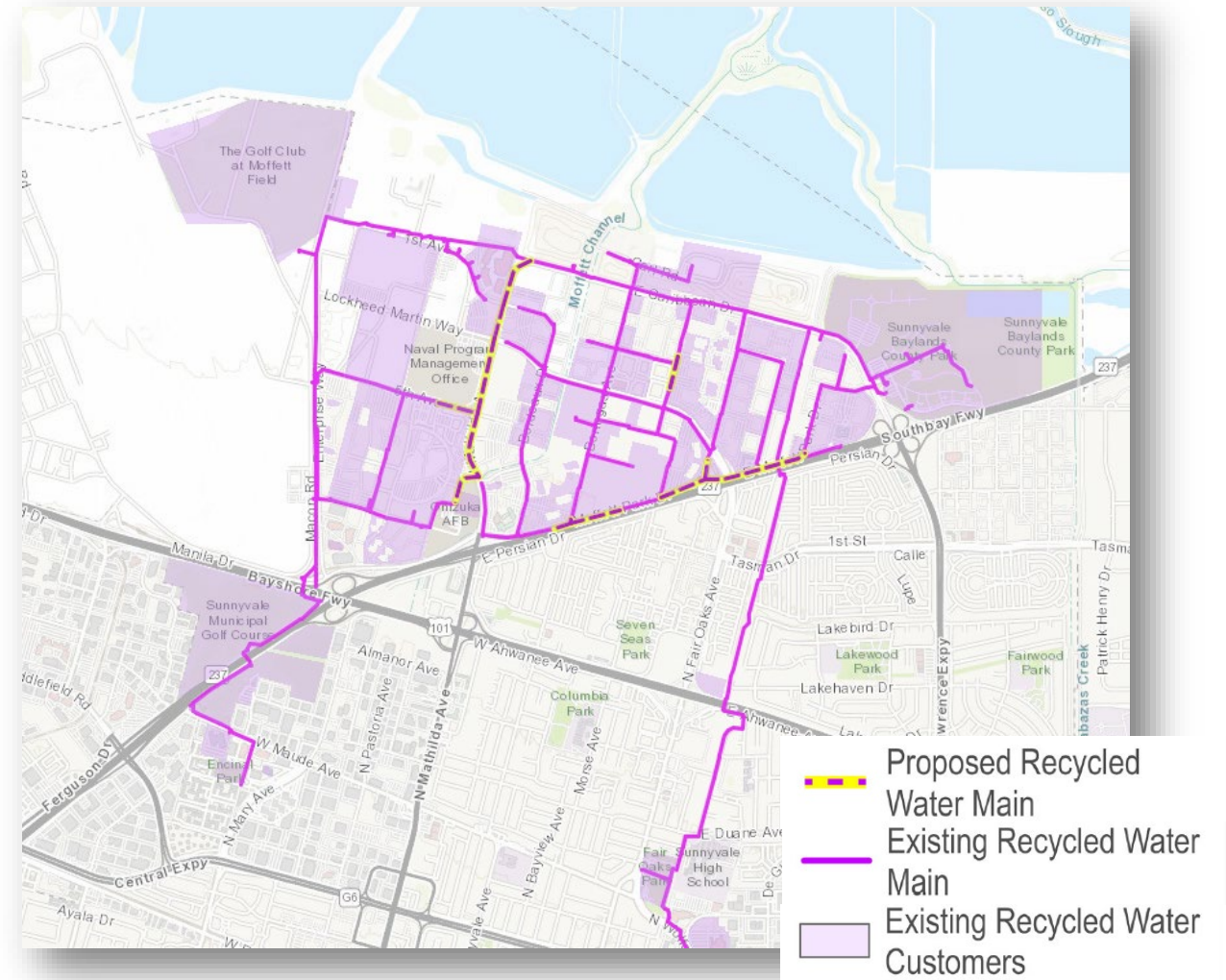
- Install new storage tank and pump station
- Upgrade RWPS once new demand exceeds 0.65 MGD
- Install approx. 5.9 miles of new mains to unlock new demands in the upper pressure zone

System Expansion



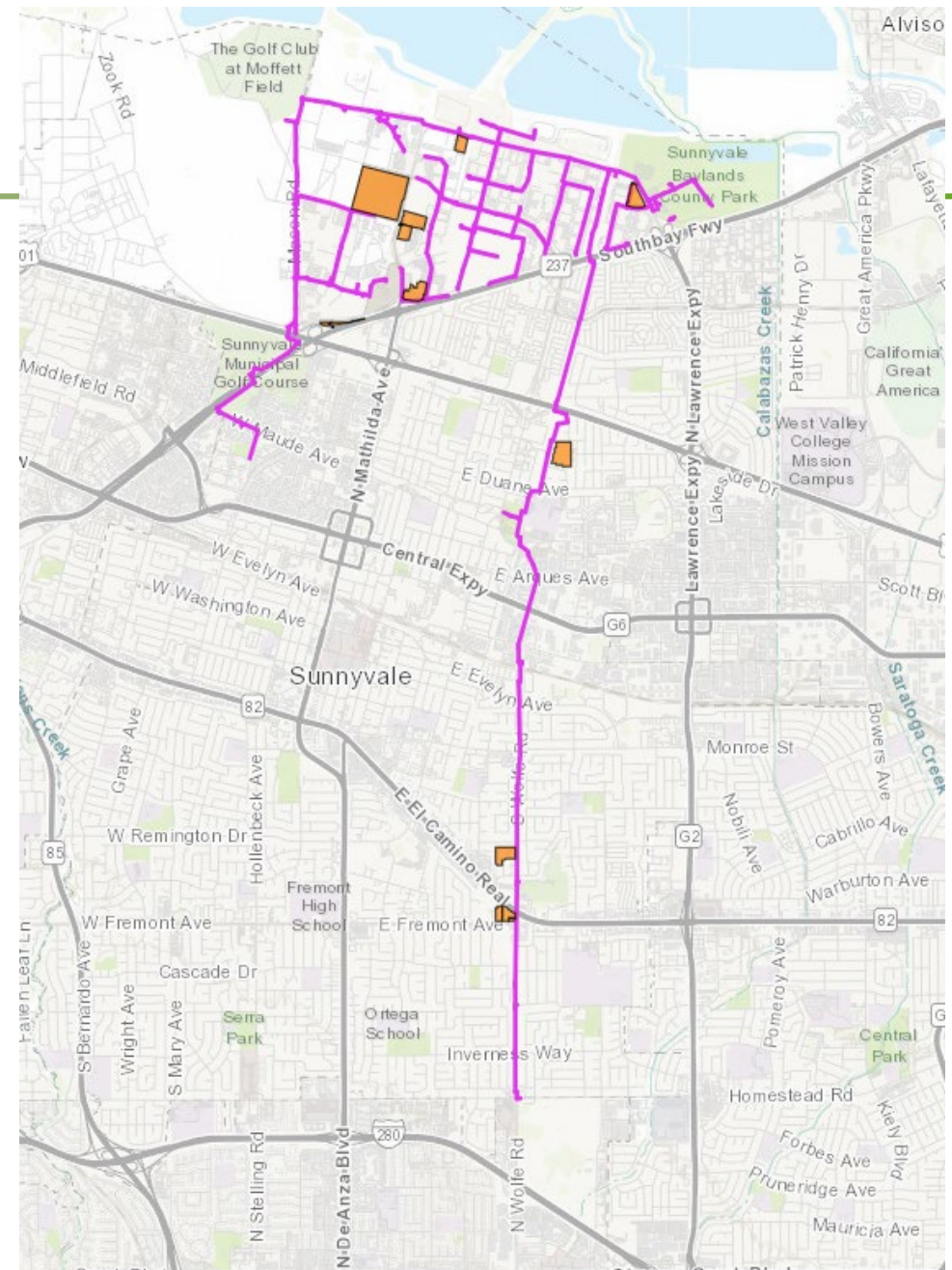
Alternative 1 – Existing System

- Improve Existing System
 - Improve system reliability with minor dead-end extensions
 - Install approx. 2.1 miles of recycled water mains (already in CIP budget)
- New Moffett Park Specific Plan customers
- Improve Water Quality
 - Install a new recycled water treatment plant
 - Reduce TDS to below 500 PPM
 - Capital Cost of \$75 M (Not in CIP Budget)



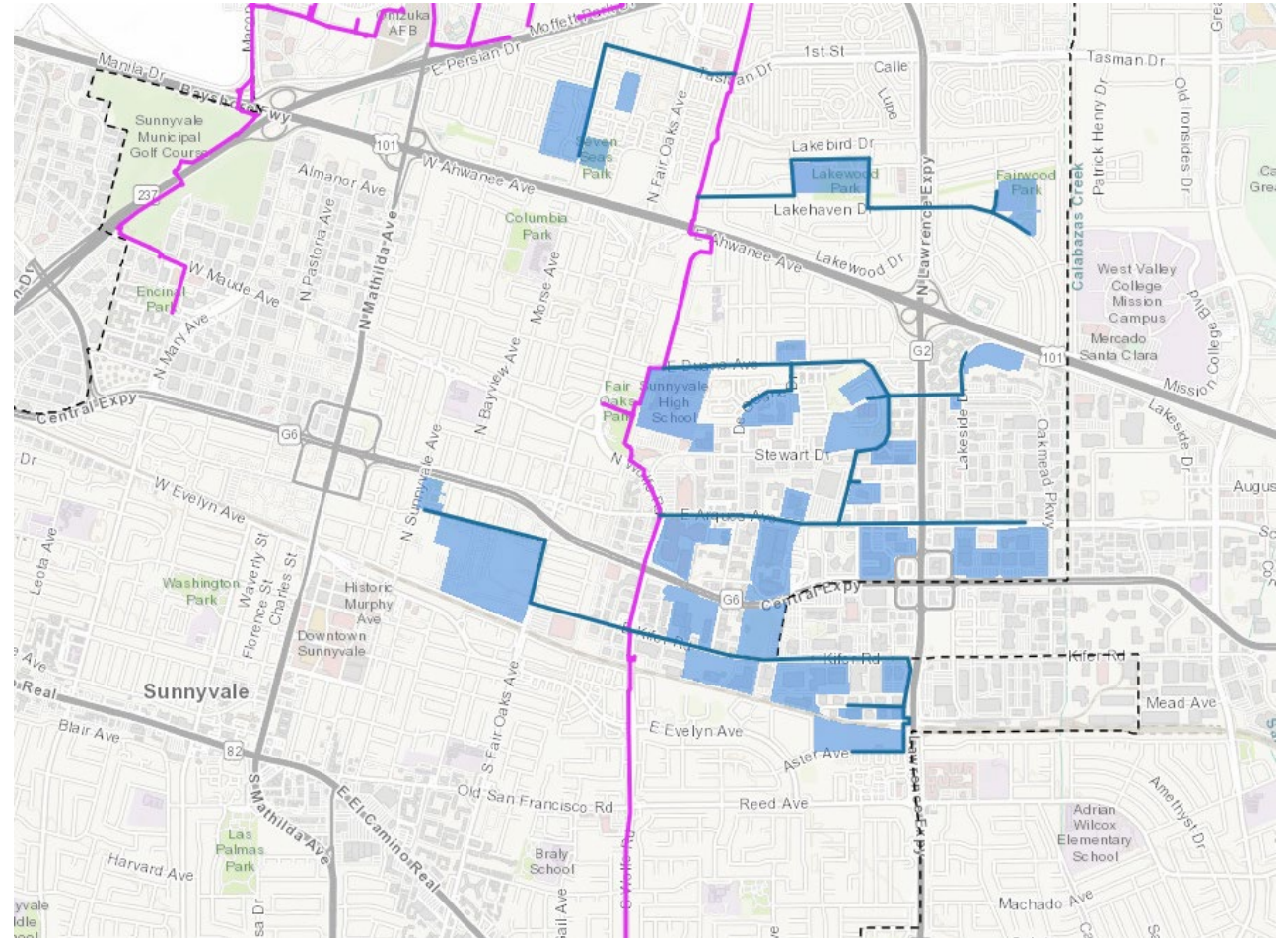
Alternative 2 – Infill Connections

- Connect low-hanging fruit
 - Pursue 10 potential customers located near the existing system
 - Potential New Demands: 0.08 MGD
- Estimated Capital Cost: \$1.8 M
- Major Potential New Customers:
 - Lockheed Martin Site
 - Hwy 237 Landscaping Irrigation
 - San Miguel Elementary School



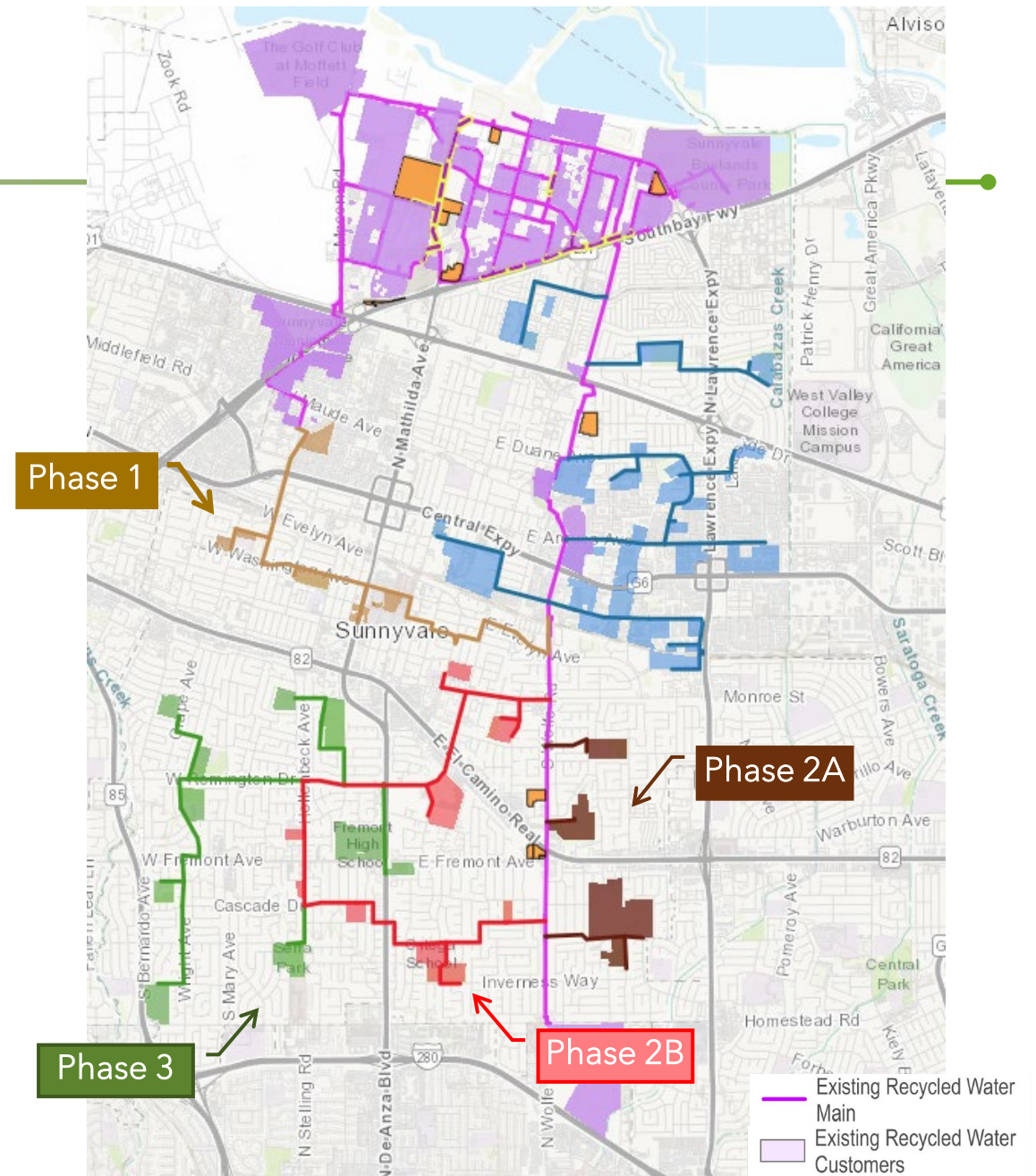
Alternative 3 - Maximize Existing System

- **Expand Network to Reach New Customers**
 - Install approx. 8.4 miles of new mains
 - Potential New Demands: 0.48 MGD
- **Estimated Capital Cost: \$33.6 M**
- **Major Potential New Customers:**
 - Applied Materials
 - Lakewood Park and Fairwood Park



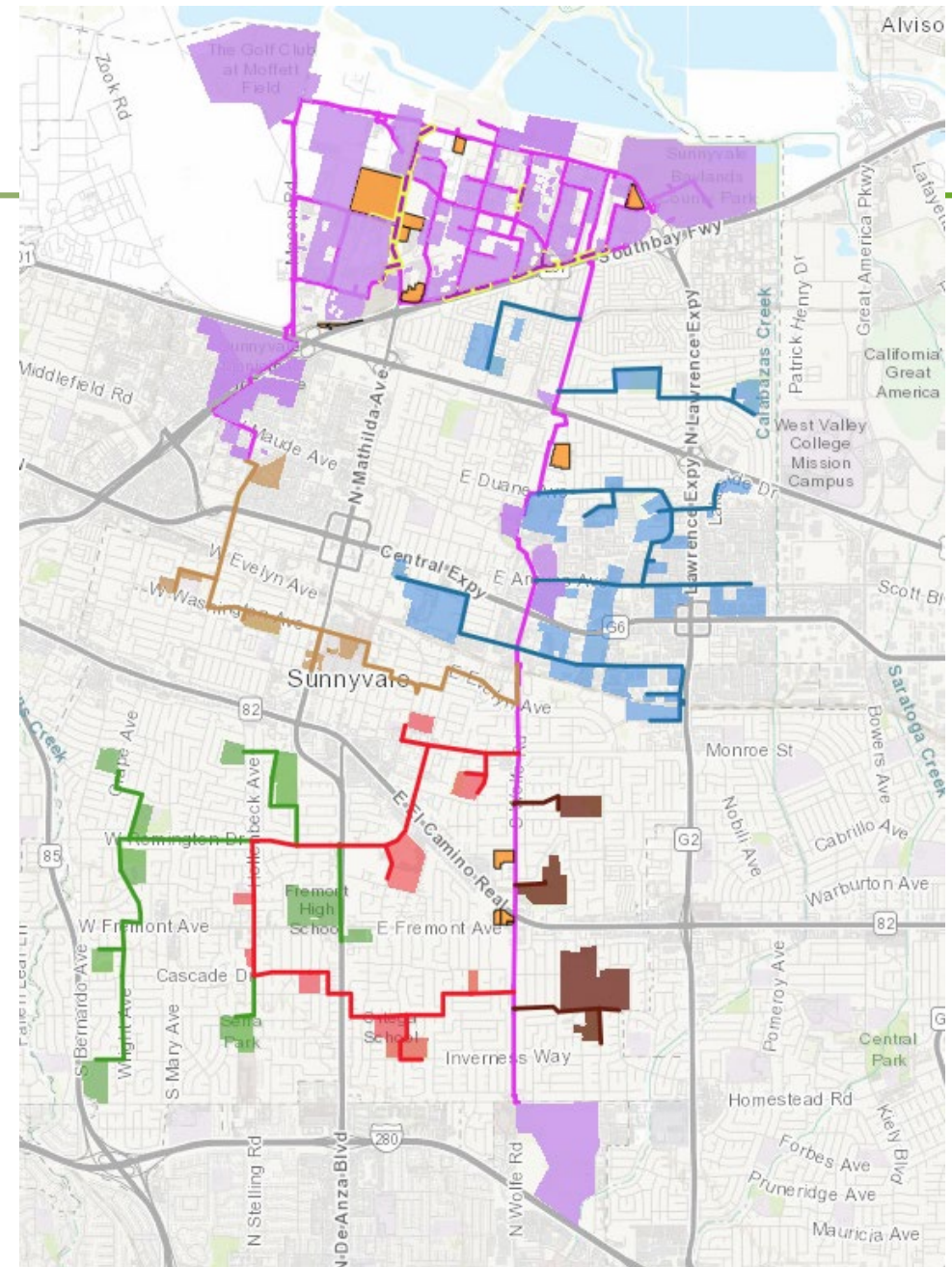
Alternative 4 – Full Buildout

- **Four Phases.** Each phase is a prerequisite to unlocking more customers in the following phases
- **Total Potential New Demand: 0.49 MGD**
- **Total Estimated Capital Cost: \$105.0 M**
 - Pipeline Alignments: \$79.5 M
 - New Storage Tank and PS: \$13.9 M
 - RWPS Upgrades: \$11.6M (if/when new demand exceeds 0.65 MGD)



System Expansion Summary (All 4 Alts.)

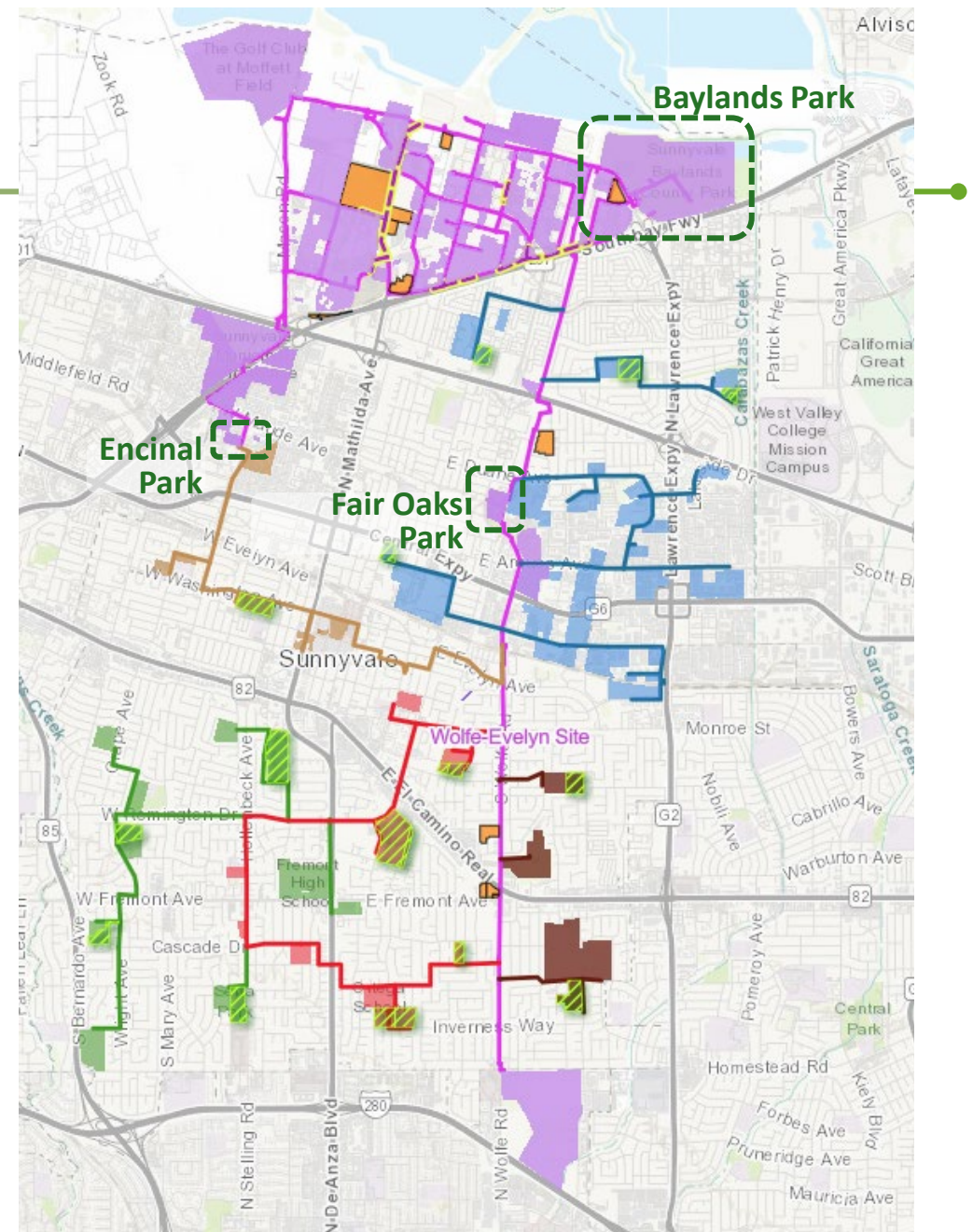
- Total Potential New Demand: 1.05 MGD
- Total Estimated Capital Cost: \$140.5 M
 - New Pipelines: \$115.0 M
 - New Storage Tank and Pump Station: \$ 13.9M
 - RWPS Upgrades: \$11.6 M



City Parks

- Parks Course already Connected to RW
 - Fair Oaks Park (Athletic Field not Connected)
 - Baylands Park
 - Encinal Park
- Potential New Connections: 15 Parks
 - Total New Demand: 0.3 MGD
 - Total Estimated Capital Cost: \$104.1 M
 - Parks with Athletic Fields: Lakewood, Washington, Ortega
 - Total New Demand: 0.084 MGD
 - Total Estimated Capital Cost: \$29.0 M

*System Expansion of all 4 Alts already included connections to Parks & Athletic fields. The costs shown are not additional costs.

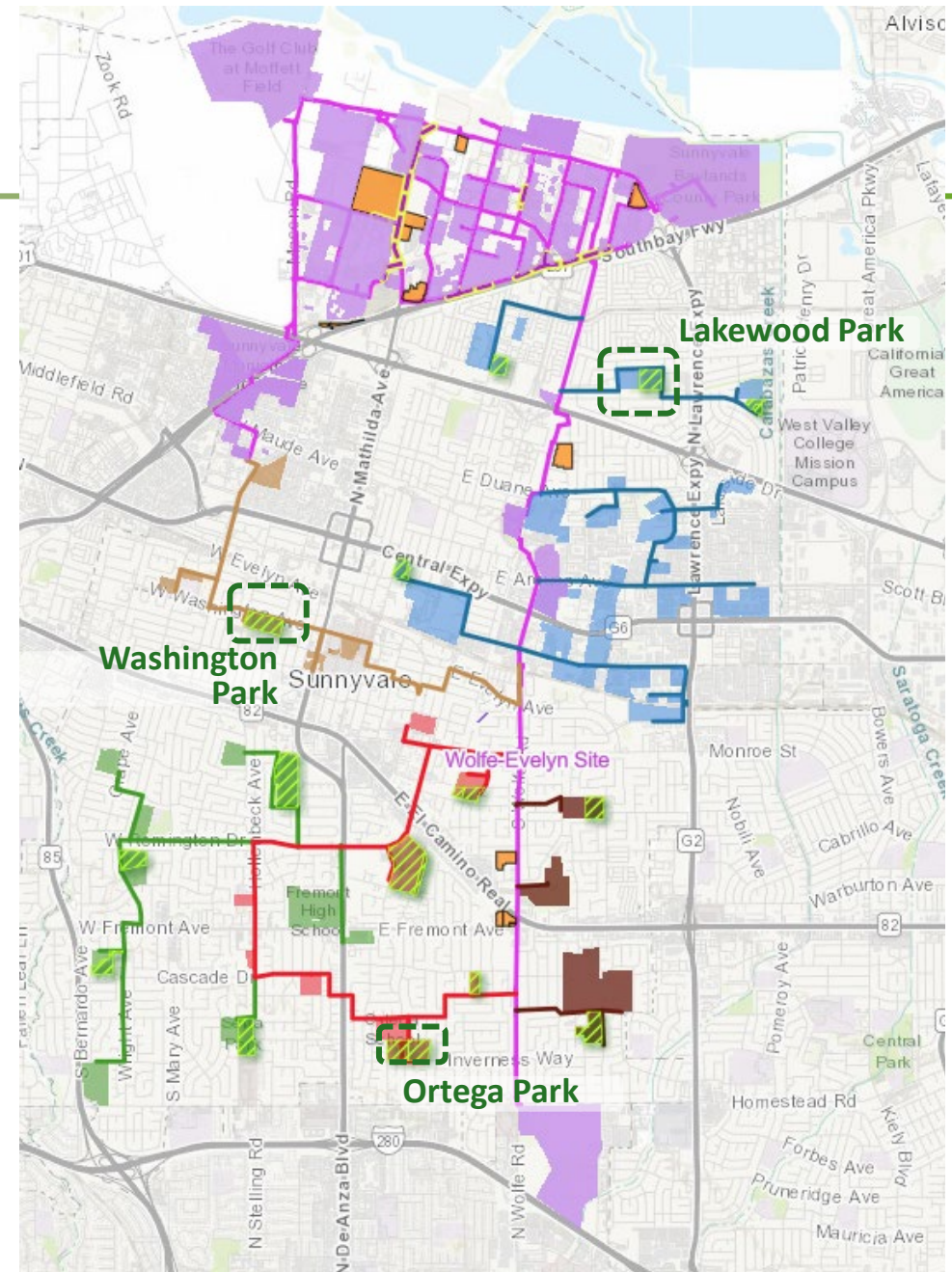


Potential New Park Connections

Alternative	City Parks	New Demand (AFY)	New Demand (MGD)	Alignment Cost **
Alt 3 - Lower PZ Branching	Lakewood*, Seven Seas, Fair Wood, Murphy	50	0.045	\$19,101,000
Alt 4 - Phase 1 Lower PZ Loop	Washington*	40	0.036	\$41,308,000
Alt 4 - Phase 2A Upper PZ Branching	Raynor, Ponderosa	48	0.043	\$4,004,000
Alt 4 - Phase 2B Upper PZ Loop	Ortega*, Braly, Panama, Orchard Heritage	120	0.11	\$28,663,000
Alt 4 - Phase 3 Expansion Branching	Las Palmas, Serra, San Antonio, De Anza	73	0.07	\$11,066,000
	Total:	331	0.30	\$104,142,000

* Large parks with athletic fields

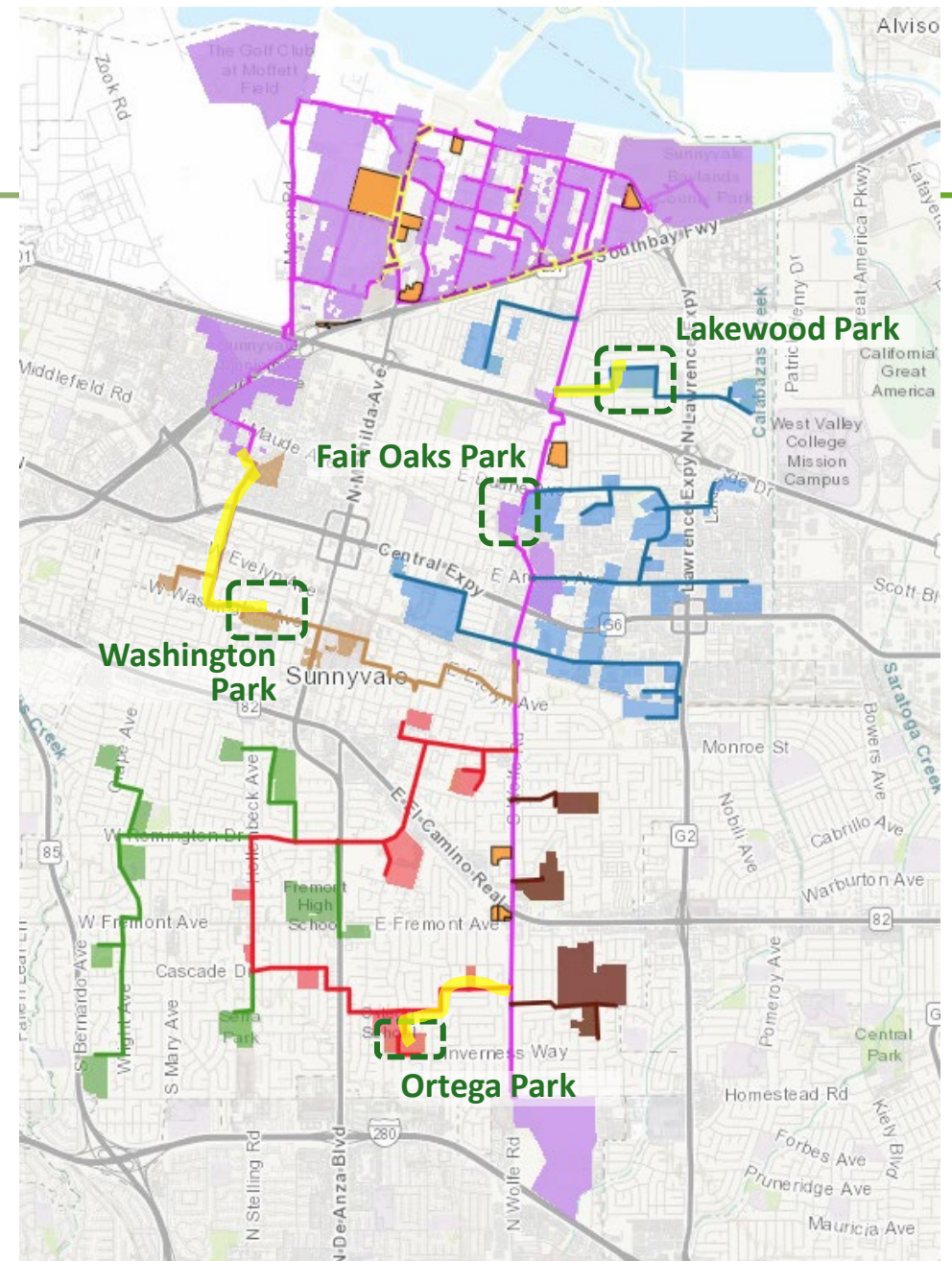
** System Expansion of all 4 Alts already included connections to Parks & Athletic fields.
The costs shown are not additional costs.



City Parks with Athletic Fields

Alternative	City Parks	New Demand (AFY)	New Demand (MGD)	Alignment Cost *
Alt 1 Existing System	Fair Oaks Park	--	--	--
Alt 3 Lakewood Dr.	Lakewood Park	18	0.016	\$2,000,000
Alt 4 - Phase 1 Lower PZ Loop	Washington Park	40	0.036	\$20,000,000
Alt 4 - Phase 2B Upper PZ Loop	Ortega Park	37	0.033	\$7,000,000
	Total:	95	0.084	\$29,000,000

* System Expansion of all 4 Alts already included connections to Parks & Athletic fields. The costs shown are not additional costs.



Opportunities and Challenges

Opportunities

New Customers

Customer Contributions

Grant Funding

Regional Partnership

Challenges

Cost

Water Quality (mainly TDS)

Regulatory Requirements

Current Challenges to Expanding Recycled Water Use

Water Quality

- Total Dissolved solids (TDS) runs on average 1,200 parts per million (ppm)
- Water from SFPUC runs between 65-95 ppm
- Current TDS levels are detrimental to internal metallic plumbing fixtures and pipes.
- Retrofitting cooling towers with RW at current quality will require additional treatment and higher water consumption
- Athletic Fields will also need higher quality RW
- Estimated advanced treatment cost: \$75M



Treatment Alternatives (from Clean Water Master Plan Update)

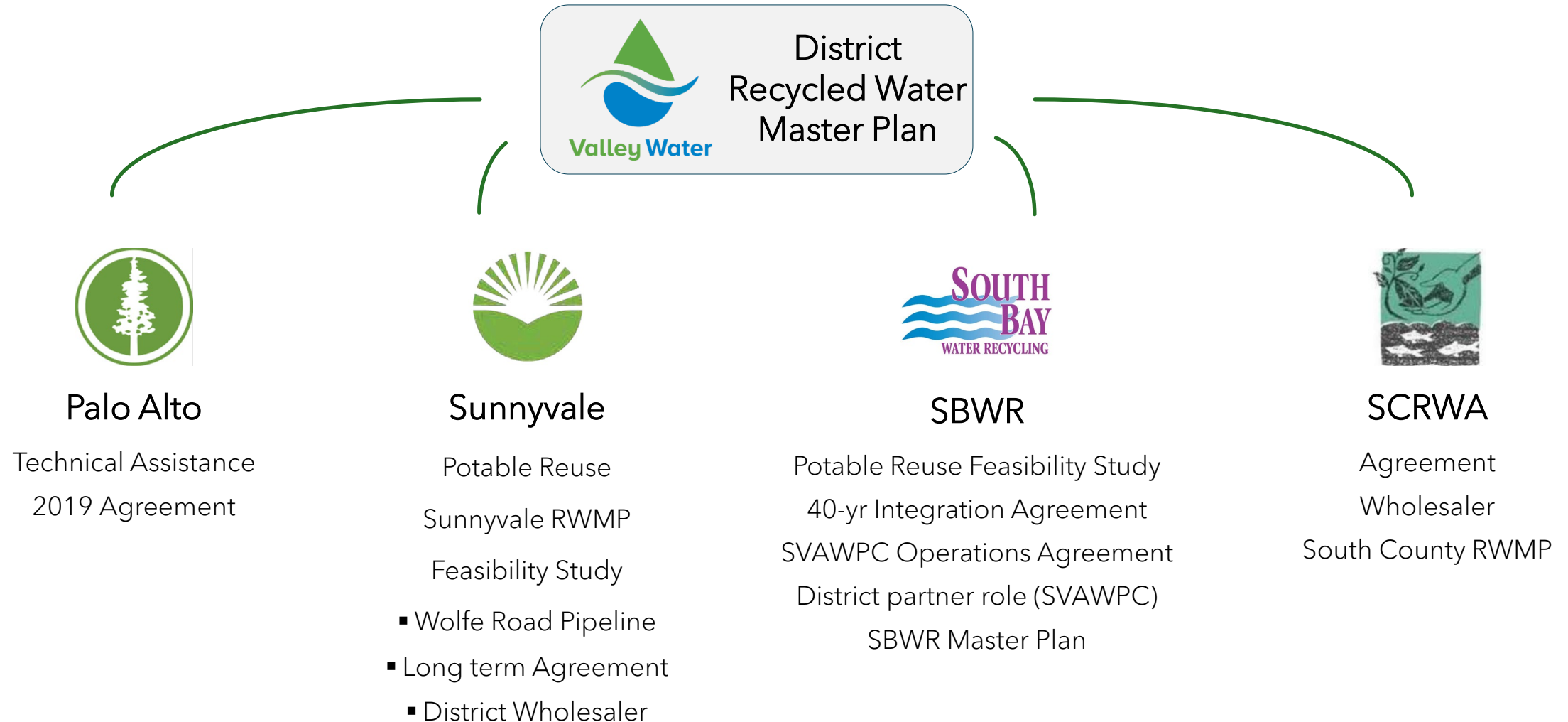
- Alternative 1: Blending with potable water (existing)
- Alternative 2: Microfiltration
- Alternative 3: Microfiltration with Reverse Osmosis
- Alternative 4: Membrane Bio-Reactor (with or without Reverse Osmosis)

Microfiltration & RO System
at the South Bay Water
Recycling (SBWR) Facility



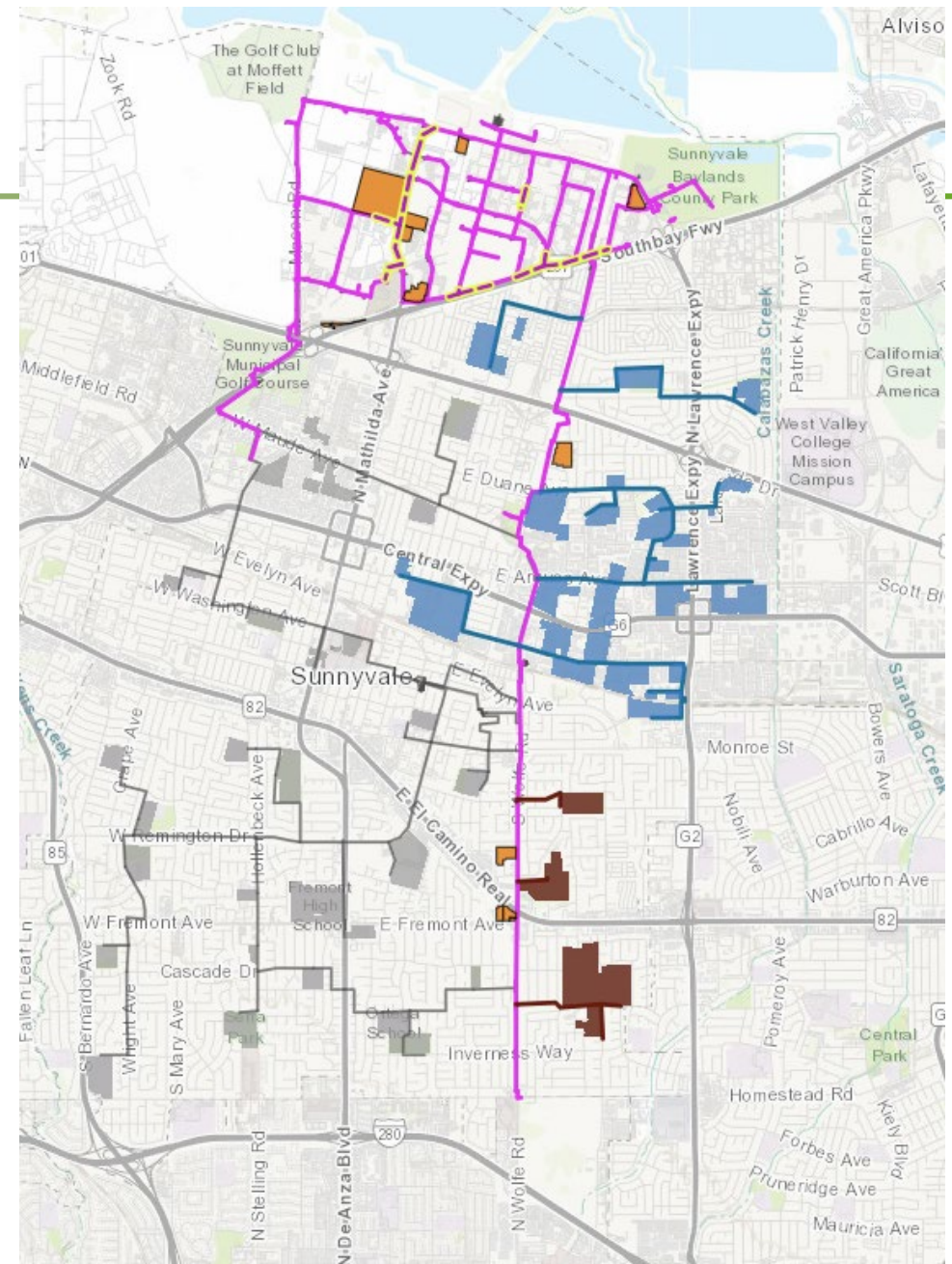
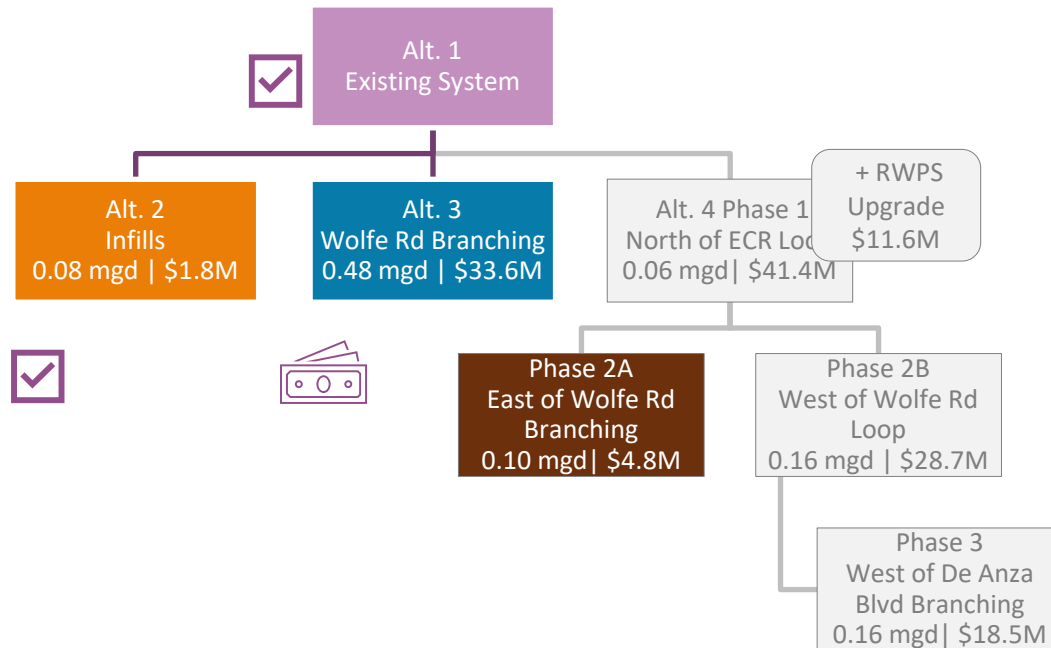
Membrane Bio-Reactor
System

Continue to Pursue Regional Partnerships



Recommendations

- Implement Alt. 1 (\$75 M) and Alt. 2 (\$1.8 M)
- Explore opportunities to update policies to require RW use for new customers and provide financial incentives to attract new customers
- Initiate design for Alt. 3 and Phase 2A of Alternative 4, and seek grant funding/ Customer Contributions & CIP for implementation





Questions Discussion and Feedback