December 1, 2023

# Exploring Potable Reuse on the SF-Peninsula

WateReuse NorCal Chapter



### The Road to Regional Reuse

- SF-Peninsula Regional PureWater (SPRP) Project
- Delivery to SFPUC Regional Water System
- Evolution of Partnerships
- Governance Models
- Public Engagement





# **SPRP** Overview

- 3 Phases (2016-2021) •
- Basis of Design Report • (BODR) (2023)
- **CEQA Ready Project** • (2023)







#### **PARTNERSHIPS SPAN BOUNDARIES AND SERVICE AREAS**









#### Phase 1 IPR to Phase 2 Local DPR





#### **Treatment Train for ResWA & TDWA**









### **Major Facilities**

#### Legend

- Tertiary Alignment
- Purified Transmission Pipeline : Option 1
- Purified Distribution Pipeline: Option 1
- Purified Transmission Pipeline: Option 2
- Purified Distribution Pipeline: Option 2
- Purified Transmission Pipeline: Option 3
- Purified Distribution Pipeline: Option 3
- AWPF Site Near SVCW

- Repurposed Pipeline Segment
- Pulgas Tunnel
- Potential Locations for New Pump Station or Booster Pump Stations
- Potential point of connection to local drinking water distributions systems
- Potential Breakpoint Chlorination Facility



## **PROGRAM STATS**

**PURIFIED WATER** 

- Advanced Treatment O3/BAC + MF/RO + UV/AOP + CL2
- 12 mgd of purified water production meeting DPR standards



COSTS

- Capital Costs ~ \$1B in 2023 dollars
- Life Cycle Unit Costs ~\$5,000/AFY



#### **MAJOR FACILITIES**

- 20+ miles of pipelines
- 3-5 Pump Stations
- 4-6 DWDS Tie-ins





### **POTENTIAL TIMELINE**

ACTIVITY	<b>'22</b>	'23	'24	'25	'26	<b>'2</b> 7	'28	'29	'30	'31	'32	'33	'34	'35	'36	'37	'38	'39	'40	'41	'42	'43
Preliminary Design and Strategy																						
Basis of Design Report		CEQA Ready																				
Environmental / Permitting																						
Regulatory / Independent Advisory Panel																						
Institutional Agreements and Partnerships																						
Stakeholder Strategy / Public Outreach																						
Implementation																						
Design				AAR /	Pilot / 3	30%	Pł	hase 1										Ph	ase 2			
Piloting / Tracer Study					Pilo Trac	t / cer											Pi	ot				
Phase 1 ResWA Construction									Pc	tential	for Mu	ulti-Pac	kage /	'Alt De	elivery							
Phase 1 ResWA Startup & Commissioning																						
Phase 2 TWA Construction																				Expa	and	
Phase 2 TWA Startup & Commissioning																						



# **Delivery to** SFPUC Regional Water System

- SFPUC led study alternative to the ٠ **SPRP** Project
- 12 MGD purified water delivered to • Regional Water System (RWS)
- 3 Potential connection points •





### **Delivery to SFPUC Regional Water System**





### **DPR Delivery Connection Considerations**

Connection Considerations	Ravenswood Valve Lot	Redwood City Valve Lot	Pulgas Valve Lot
Length of Pipeline from AWPF to Point of Connection	11 miles (fewer utilities, flat)	8 miles (more utilities)	9 miles (more utilities, most static lift)
Connections to BDPL	1, 2, 5	1, 2, 5	1, 2, 3, 4, 5
Space for Booster Pump Station & Tank	Yes	No	Yes
Nearby Sewer for Discharge	No	Yes	No
Other Considerations	Wetlands	Existing Utility Conflicts	No new point of connection to Pulgas



### **DPR Delivery Connection Considerations**

Connection Location	Ravenswood Valve Lot	Redwood City Valve Lot	Pulgas Valve Lot
# of Turnouts/Customers Served (Cumulative, downstream)	30 Turnouts 10 Customers	21 Turnouts 9 Customers	2 Turnouts 3 Customers
Wholesale Customers	City of East Palo Alto City of Palo Alto City of Redwood City City of Menlo Park Cal Water - Bear Gulch Cal Water - Mid Peninsula Stanford University Mid-Peninsula Water District Filoli San Francisco	City of Palo Alto City of Redwood City City of Menlo Park Cal Water - Bear Gulch Cal Water - Mid Peninsula Stanford University Mid-Peninsula Water District Filoli San Francisco	Mid-Peninsula Water District Filoli San Francisco
Distance to Nearest Downstream Turnout (ft)	3,260 (East Palo Alto)	550 (Redwood City/Palo Alto)	8,000
DPR/Potable Ratio – Summer Conditions	10.9%	10.8%	7.1%
DPR/Potable Ratio – Winter Conditions	15.6%	15.4%	9.2%





# **Benefits/Challenges of Regional DPR**

Benefits	Challenges
Higher potential to deliver to broader base of customers	Lack of environmental buffer
Potential for increased equity of distribution of purified water (depending on connection point selected)	No opportunity to acclimate to potable reuse
No impacts to Crystal Springs Reservoir operations	Complex construction for pipeline alignment (8 to 11 miles of 24" pipeline) and intermediate tank and pump station
No Impact to Pulgas Operations	High conveyance costs (capital and O&M) but lower than conveyance to CSR





# **Benefits/Challenges for ResWA at CSR**

Benefits	Challenges
Large Environmental Buffer	Crystal Springs Reservoir operational and water quality challenges
Validation of Treatment Processes	Reduced flexibility for Regional Water System Operations
First step to acclimate to potable reuse	Impacts to Pulgas operations
	Siting pump stations in silicon valley (2-3 Boosters PS)
	Complex construction for pipeline alignment across Silicon Valley (10 to 16 miles)
	High conveyance costs (capital and O&M)
	Equity of distribution to San Francisco given planned local purified water projects
	High percentage blending in reservoir
	Smaller customer base for DPR phase





#### **Evolution of Partnerships**



Prep Parties	Phase 1	Phase 2	Phase 3	BODR
SVCW	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
San Mateo		$\checkmark$	$\checkmark$	$\checkmark$
BAWSCA		$\checkmark$	$\checkmark$	$\checkmark$
Cal Water	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Redwood City		$\checkmark$	$\checkmark$	$\checkmark$
SFPUC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
MPWD				$\checkmark$
Legend Mid-Peninsula   1 Alameda County Water District 13 Mid-Peninsula   2 City of Brisbane 14 City of Milpito   3 City of Burlingame 15 City of Mulpito   4a CWS – Bear Gulch 16 City of Mount   4b CWS – Mid-Peninsula 17 North Coast C   4c CWS – South San Francisco 18 City of Palo A   5 Coastide County Water District 19 Purissima Hills   6 City of Daly City 20 City of San Br   8 Estero Municipal Improvement District 22 San Jose Muni   9 Guadalupe Valley MID 23 City of San Br   10 City of Hayward 24 Stanford Univer   11 Town of Hillsborough 25 City of Sonnyu   12 City of Menlo Park 26 Westborough   12 City of Menlo Park 26 Westborough		Peninsula Water District of Millbrae of Millpitas of Mountain View h Coast County Water Distr of Palo Alto sima Hills Water District of Redwood City of San Bruno Jose Municipal Water Syste of Santa Clara ford University of Sunnyvale tborough Water District	ict	

Map source: BAWSCA Member Agencies





## Finding the Right Governance Model

- Contract Relationships
  - e.g. specific operating contracts, MOAs
- Non-Profit Corporation
  - e.g. Bay Area Water Users Association (BAWUA)
- New Government Agency
  - Joint Powers Authority (JPA) e.g. Silicon Valley Clean Water (SVCW)
  - Special District Mid Peninsula Water District (MPWD)





## **Getting Ready for Public Engagement**

- In-depth interviews with key stakeholders
- SPRP Initial Strategic Outreach Plan Key Components





#### **Next Steps**

- BODR Draft (Nov 2023), Final early 2024
- Regional DPR Draft (Jan 2024), Final spring 2024
- Governance and Agreements (Initial discussions)
- Public Outreach Strategy Implementation (Initial Steps)











#### **AWPF**







#### **Purified Water Transmission and Distribution Pipelines (Option 1)**



J'Arthur Y

San Mateo

AWPF Site

Near SVCW

Bird Island

#### **Purified Water Transmission and Distribution Pipelines (Option 2)**



#### **Purified Water Transmission and Distribution Pipelines (Option 3)**



J Arthur?

Bird Island

AWPF Site

#### Summary of Construction Costs

Cost Component	Phase 1 ResWA	Phase 2 TWA Expansion	TOTAL
Construction Costs	(\$M)	(\$M)	(\$M)
AWPF	\$515	\$150	\$665
Tertiary Pump Station and Pipeline	\$94	\$1	\$95
Breakpoint Chlorination Facility	\$1	\$3	\$4
Purified Conveyance Option (ave)	\$258	\$59	\$317
Average Construction Cost	\$868	\$212	\$1,080





#### Summary of Life Cycle Unit Costs

Purified Water Delivered	Phase 1	Total Phase 1 and 2
Flow Delivered (MGD)	6	12
Flow Delivered (AFY)	6720	13440
Annualized Unit Construction Cost	(\$/AFY)	(\$/AFY)
AWPF	\$2,830	\$1,930
Conveyance	\$1,680	\$990
Annual Unit O&M Cost	(\$/AFY)	(\$/AFY)
AWPF	\$1,170	\$1,080
Conveyance	\$680	\$780
Life Cycle Unit Cost	(\$/AFY)	(\$/AFY)
AWPF	\$4,000	\$3,010
Conveyance	\$2,360	\$1,770
Total Life Cycle Unit Costs	\$6,360	\$4,780



