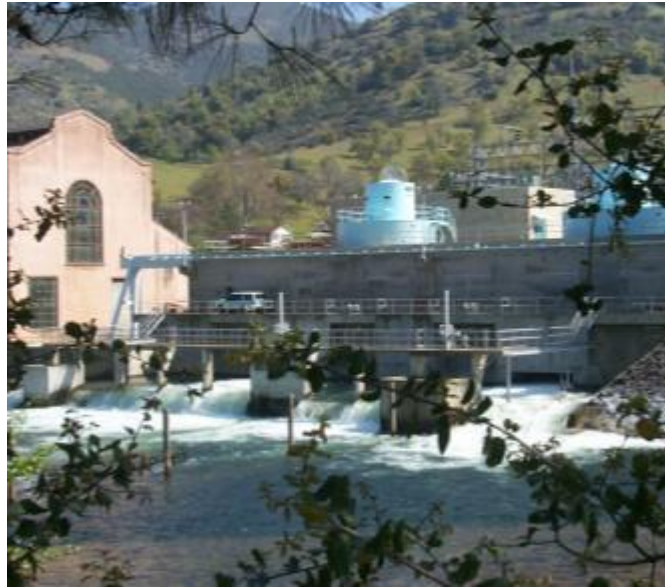




San Francisco Public Utilities Commission



*Water: Delivering high quality
water every day*



*Power: Generating clean
energy for vital City services*



*Sewer: Protecting public health
and the environment*

Our Mission

To provide our customers with high-quality, efficient, and reliable water, power, and wastewater services in a manner that values environmental and community interests and sustains the resources entrusted to our care.



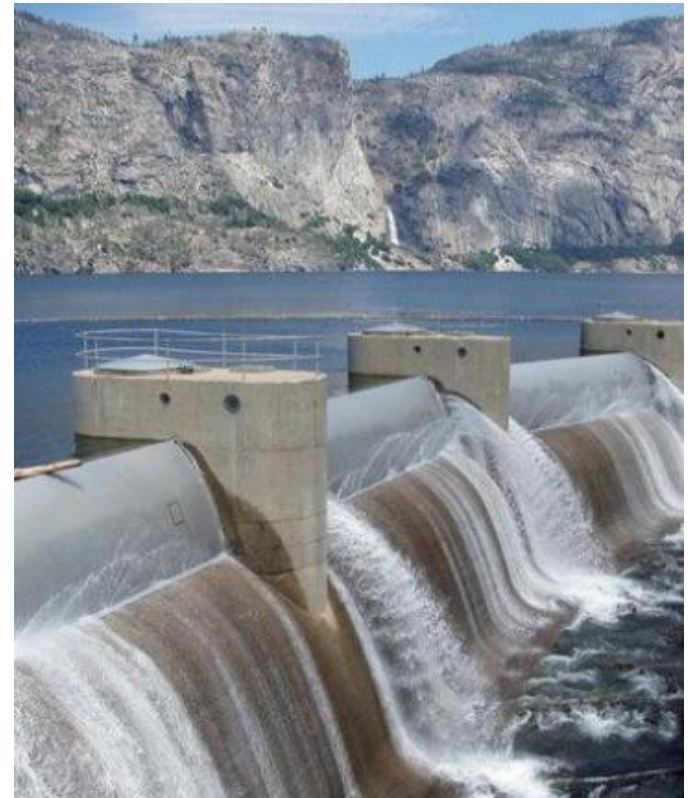
Our Hetch Hetchy Regional Water & Power System

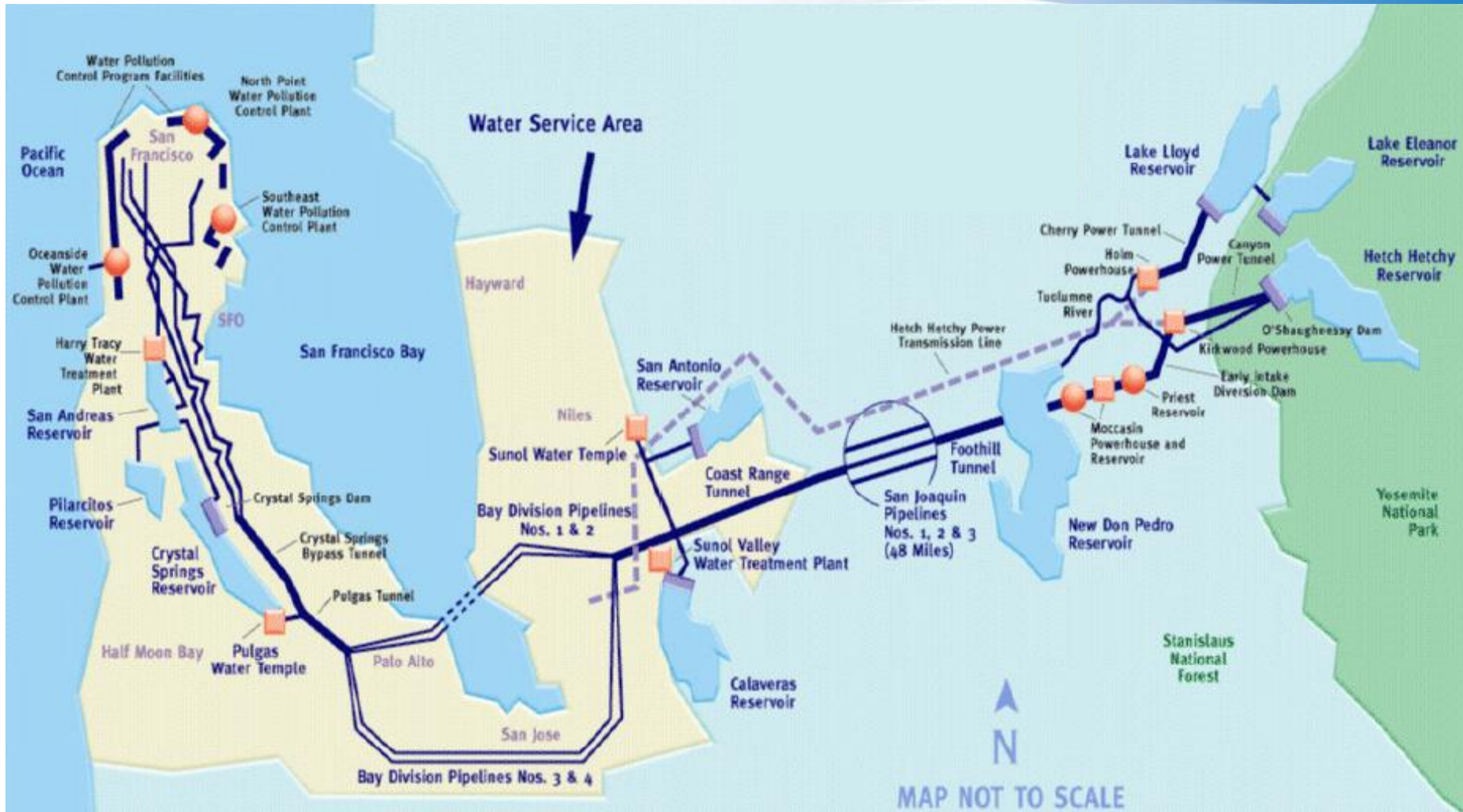
Provides high-quality water for
2.6 million people

197 million gallons per day

Gravity-fed engineering
marvel

Generates clean energy for
the City's vital services





Water System Improvement Program



San Francisco
Water Power Sewer

- 4.8 Billion Dollar Program
- Multi-Year Capital Program to Upgrade SFPUC's Regional and Local Water Systems
- 83 Projects
- San Francisco Groundwater Supply Project
- Regional Groundwater Storage and Recovery Project



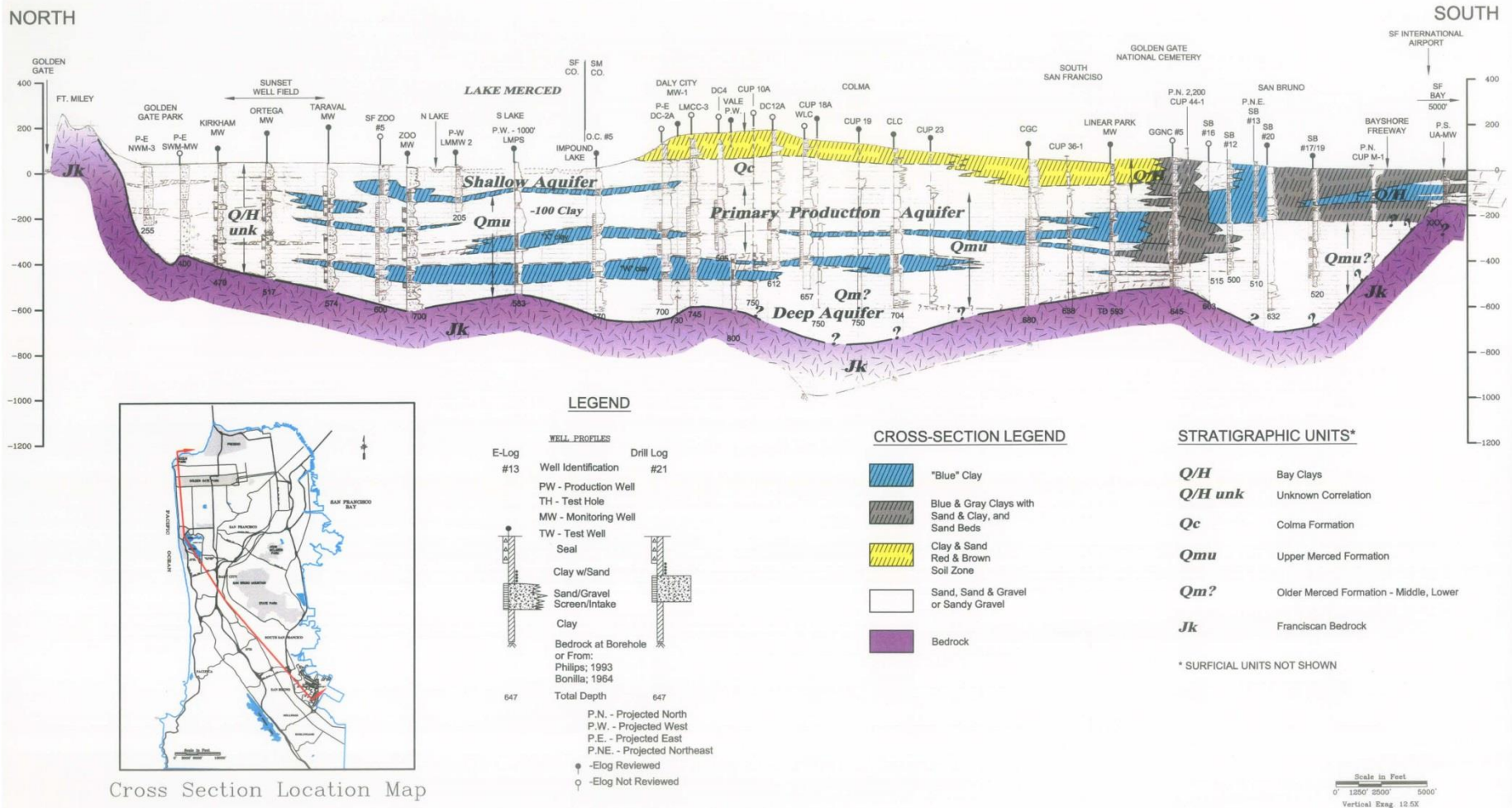
Westside Groundwater Basin





San Francisco
Water
Power
Sewer

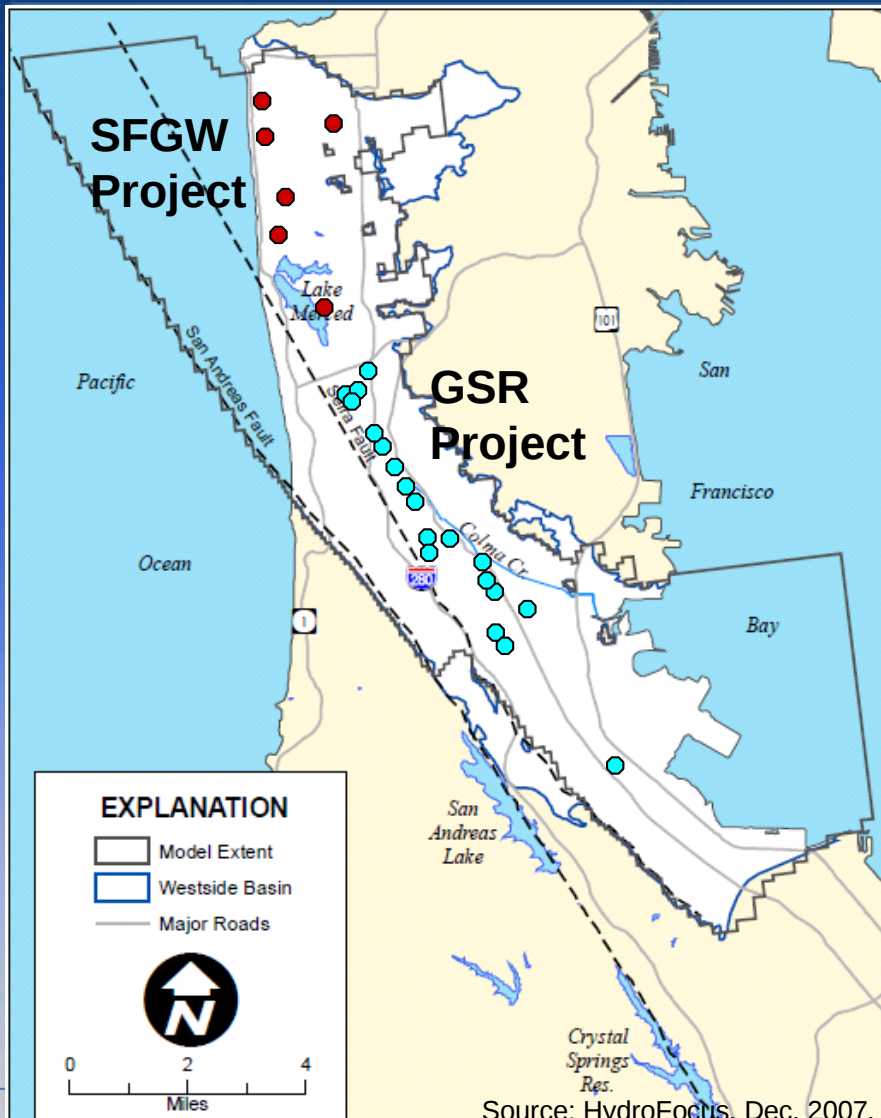
North-South Geologic Cross Section



2014 Sustainable Groundwater Management Act

- Emphasis on Local Control
- 20 Years to Obtain Sustainability Goals
- SGMA Requirements:
 - Local Agencies form a Local Groundwater Sustainability Agencies (GSAs)
 - High and Medium-Priority Basins must adopt Groundwater Sustainability Plans (GSPs)

SFPUC Groundwater Projects



- **San Francisco Groundwater Supply (SFGW) Project**
 - Additional water supply
 - 4 MGD Pumping
 - Continuous
- **Regional Groundwater Storage and Recovery (GSR) Project**
 - Put/Take/Hold Sequence
 - Design Capacity is 7.2 MGD over a 7.5 year drought
 - Full SFPUC Storage Account of 60,500 acre-feet

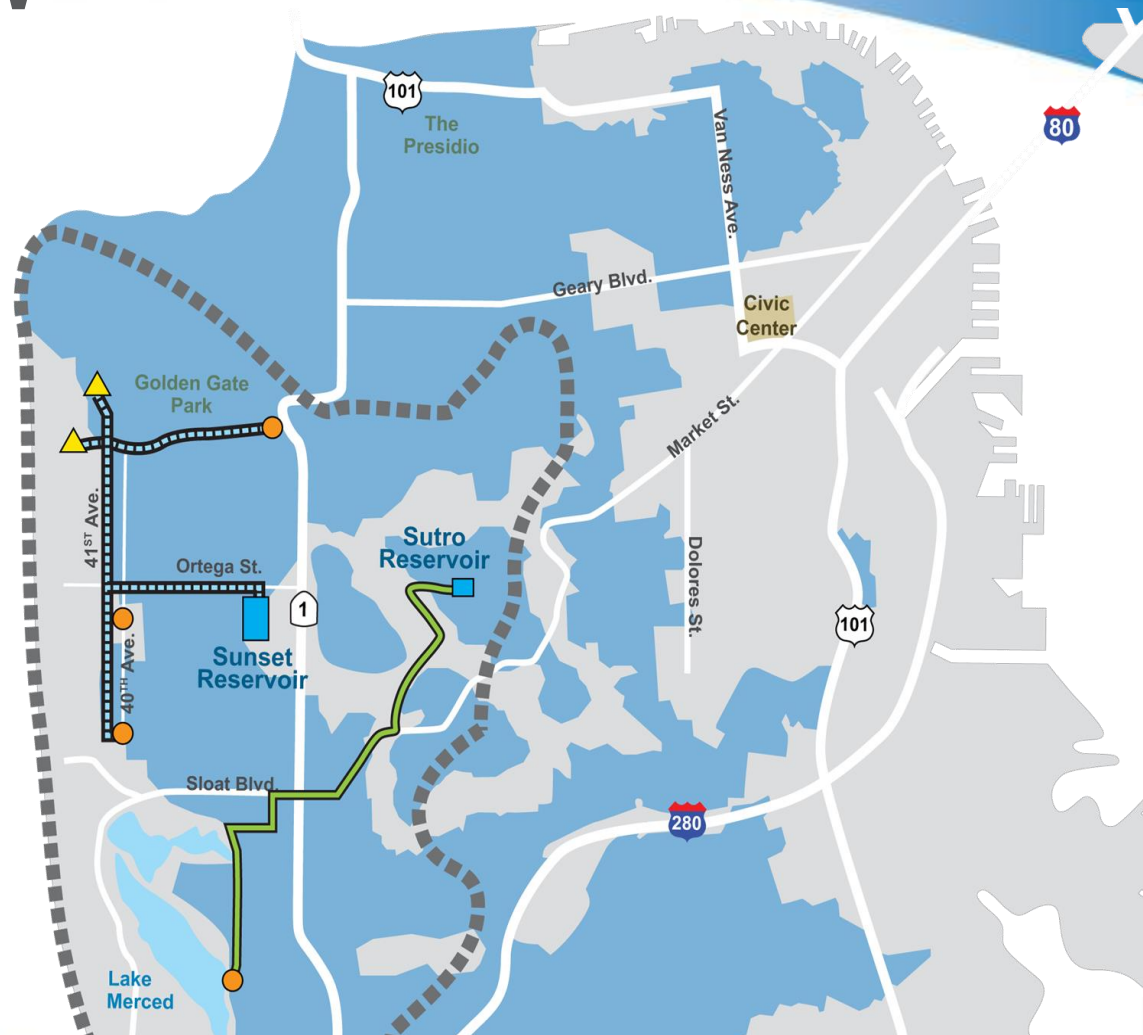
SF Groundwater Supply Project Overview



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Project includes installation of:

- 6 drinking water wells
- 5 miles of new pipelines
- Pumping will start at 1 mgd and slowly ramp up by approximately 1 mgd/yr
- Groundwater will be blended with SFPUC regional water supplies at 2 reservoirs
- Blended water will be distributed throughout the City



Groundwater Blend Distribution Areas

Existing Water Reservoir

Phase I Groundwater Well

Phase II Groundwater Well

Sutro Pipeline (Existing)

Proposed Groundwater Pipeline

Westside Groundwater Basin

Well Station Overview



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Water Power Sewer



SFGW Well Treatment

Table 4: SFGW Well Treatment Provided

Well Name/ Number	Site Name	Chlorination	Chromium VI Blending	Nitrate Blending	pH Adjustment	Manganese Blending
South Sunset	GGP/Sunset Well Field	X	X		X	X
West Sunset	GGP/Sunset Well Field	X	X		X	
GGP Central	GGP/Sunset Well Field	X	X	X	X	
South Windmill Replacement	GGP/Sunset Well Field	X	X		X	
North Lake	GGP/Sunset Well Field	X	X		X	
Lake Merced	Lake Merced	X			X	

Notes: GGP = Golden Gate Park

Adaptive Management Approach to Project Operations

- Pumping will start at 1 mgd and ramp up by approximately 1 mgd per year
- We will closely monitor how Lake Merced and the groundwater basin respond
- Pumping rates will be adjusted, as needed, to maintain:
 - ◆ Health of Lake Merced
 - ◆ Appropriate groundwater levels
 - ◆ Groundwater quality in coastal monitoring wells



Community Outreach

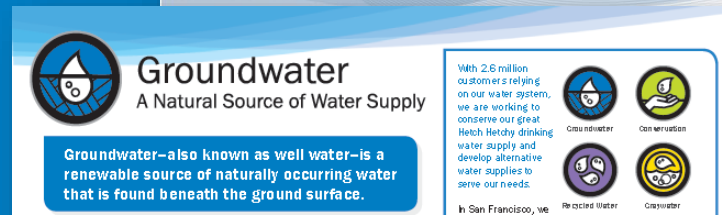
- Direct interactions at various venues with over 700 Participants
- Sampling of Groundwater Blend

Media Coverage (print/TV/radio stories)

Currents/Digital Currents (utility bill inserts/newsletter)

Planning Dept. mailings

Fact Sheets



Regional Groundwater Storage and Recovery Project



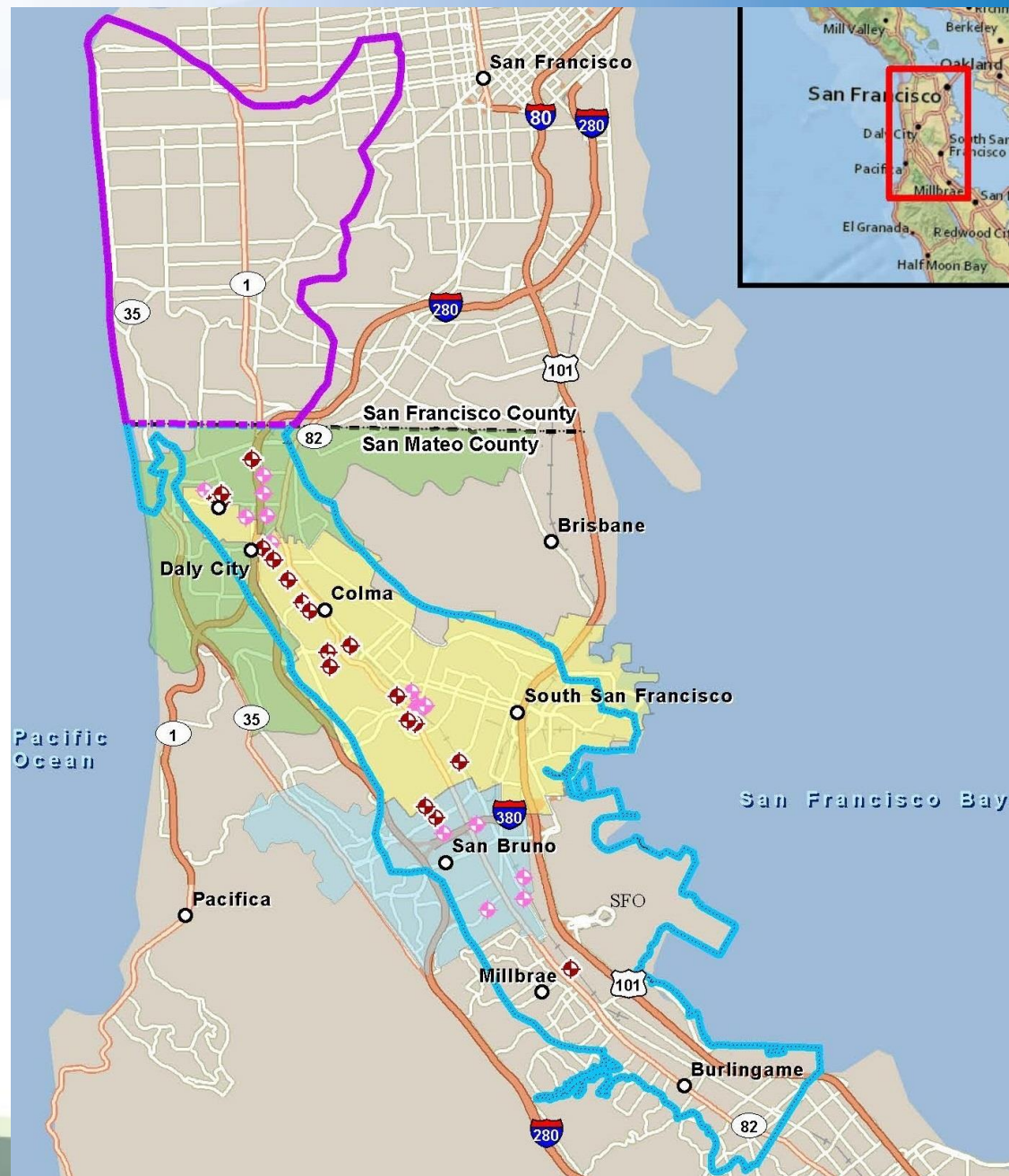
San Francisco
Water Power Sewer

- Conjunctive Use Project
- Partner Agencies:
 - City of Daly City (6 wells)
 - California Water Service (6 wells)
 - City of San Bruno (4 wells)
- 7.2 MGD dry year supply over 7.5 years
- 60,500 acre feet water savings account – similar in volume to Crystal Springs Reservoir

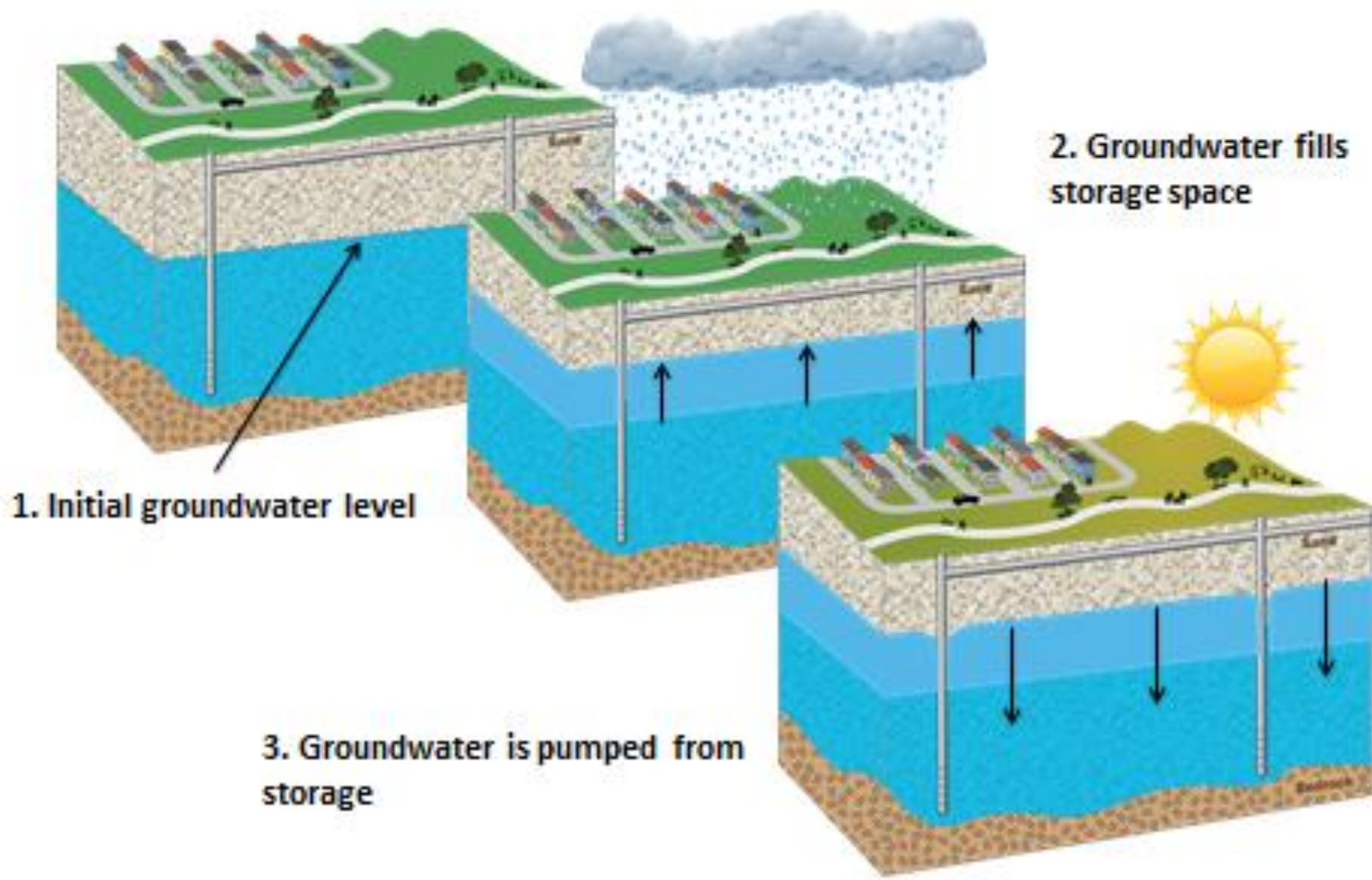
Project Vicinity Map

Legend

-  Partner Agency Wells
-  Proposed Project Well Facility Sites
-  County Boundary
-  Cal Water Service Co. Service Area
-  Daly City Water Service Area
-  San Bruno Water Service Area
-  North Westside Groundwater Basin¹
-  South Westside Groundwater Basin¹



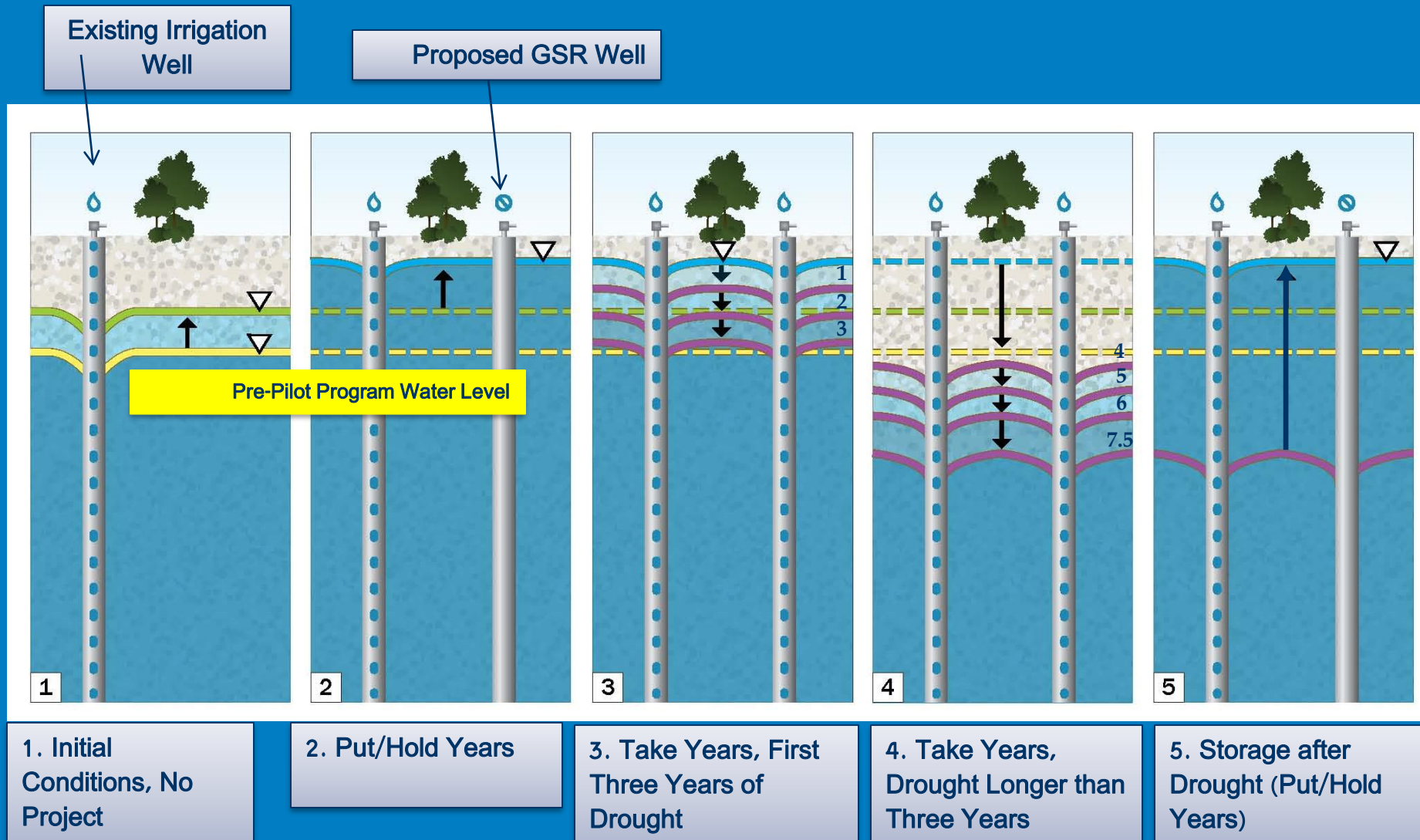
Water Savings Account is Created by Storing Water in Wet Years, and Pumping in Dry Years



GSR Operating Agreement

- In-Lieu Water Delivery in Wet and Normal Years
- Water Bill credits for In-Lieu Water Delivered
- GSR Project Pumping in Drought Years
- Emergency Use
- GSR Storage Account – accounting for basin losses

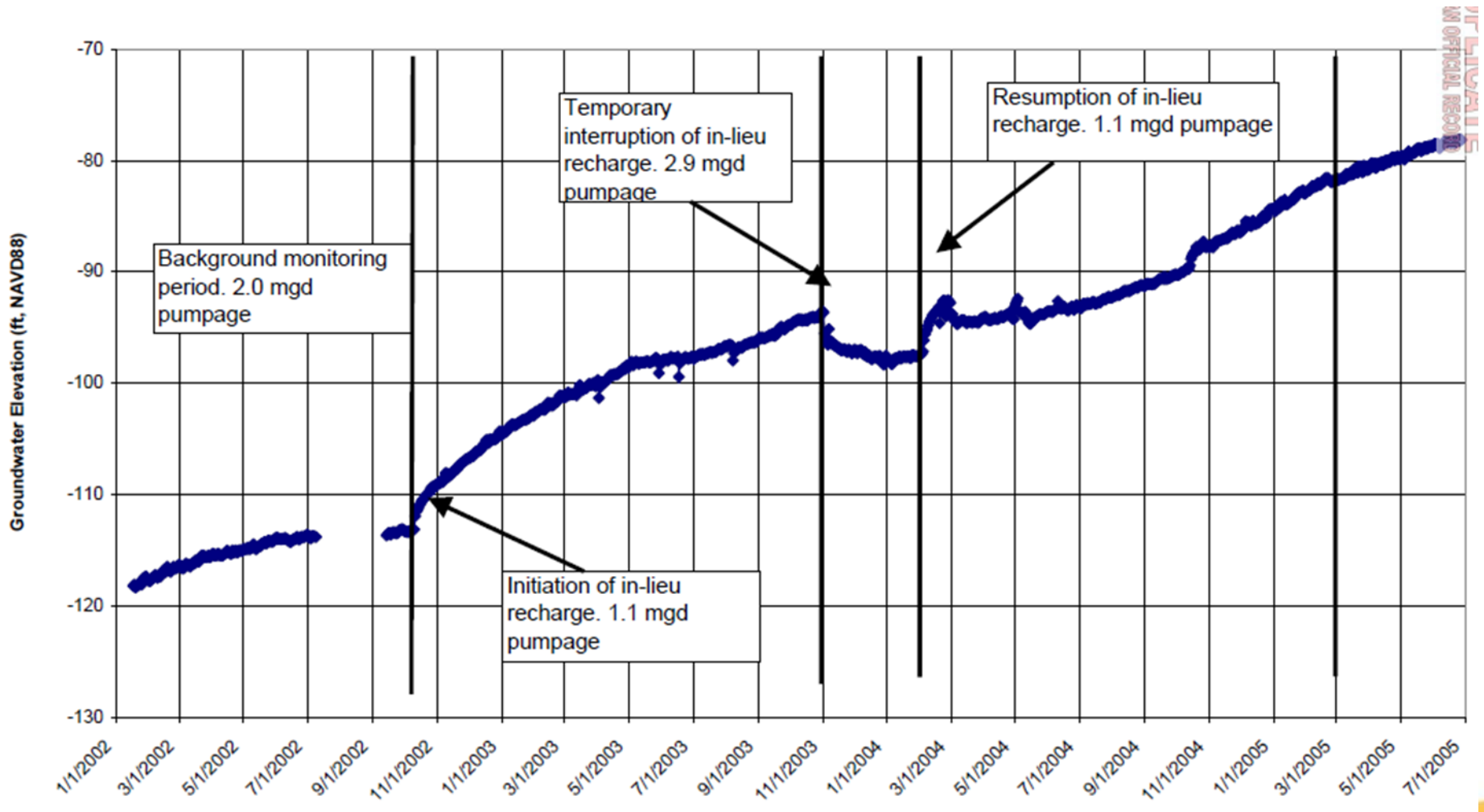
Groundwater Level Responses



In-Lieu Recharge Works in the South Westside Basin



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GSR Wells Connecting to SFPUC Regional Water System

Pipeline	No. of Wells Connecting
SAPL2	5
SAPL3	1
CSPL2	2
SSPL	1
TOTAL	9



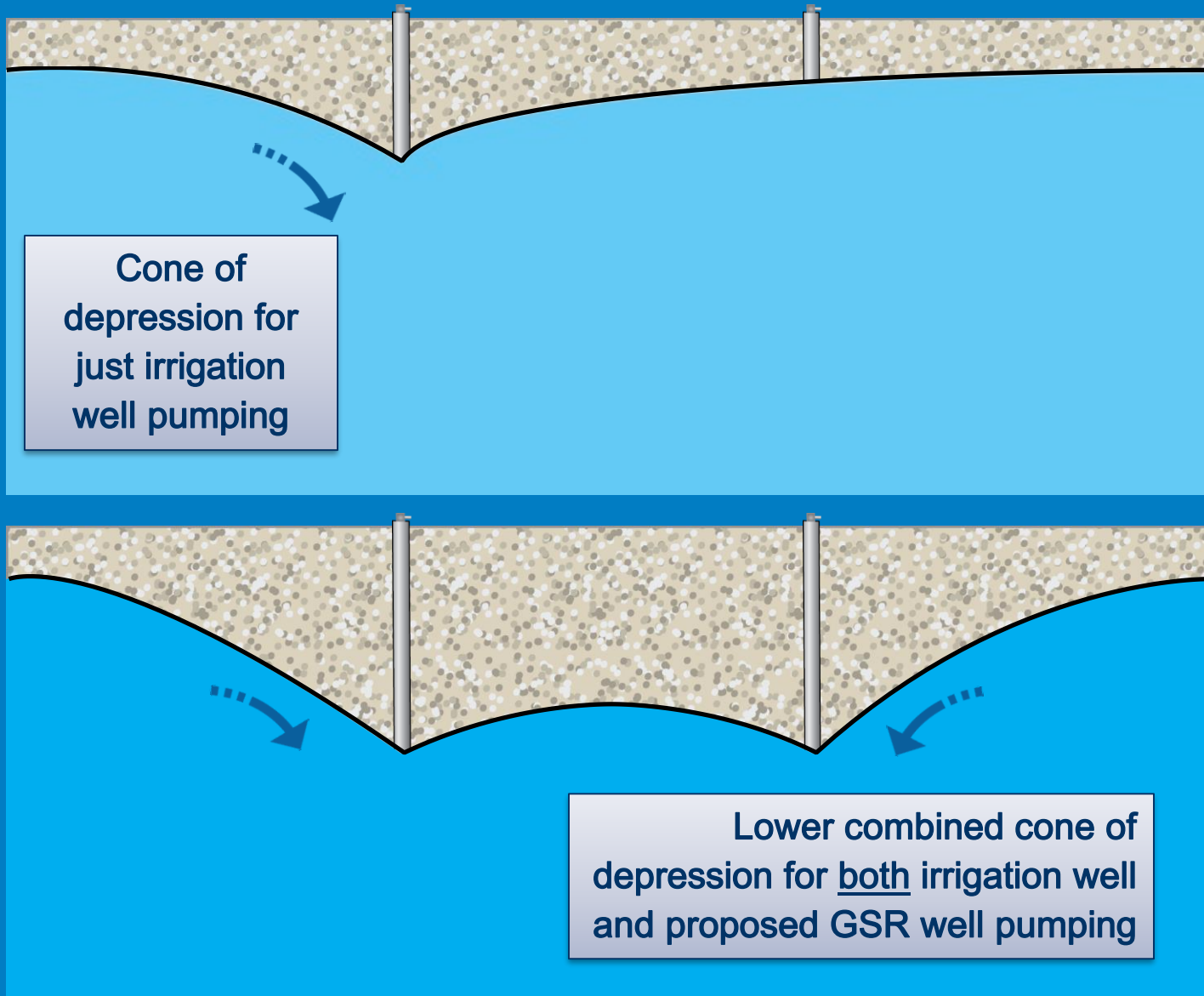
Irrigation Well Locations



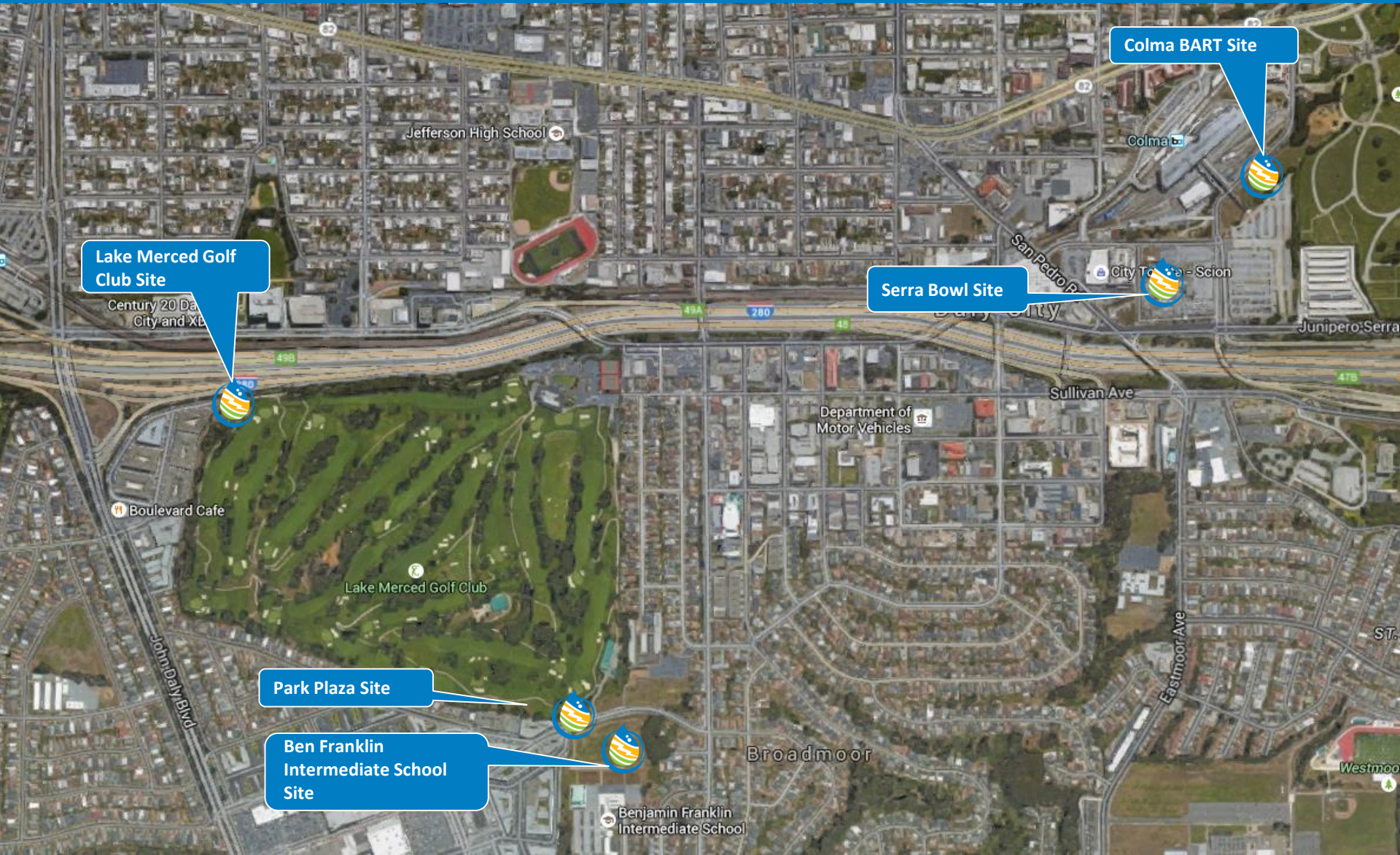


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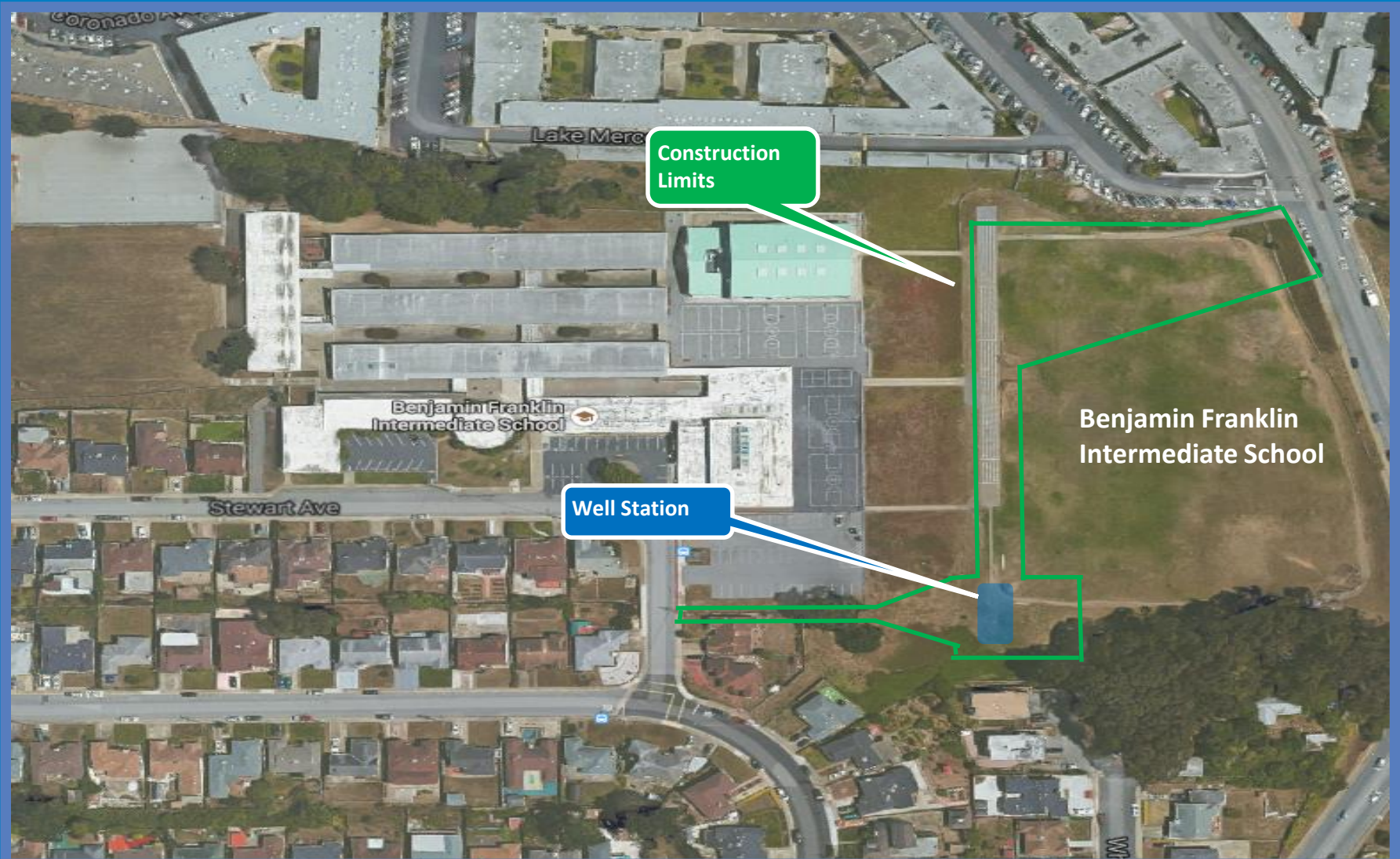
Wells Pumping in Close Vicinity Can Affect Groundwater Levels



GSR Project Sites in Daly City



GSR Project Sites in Daly City: Benjamin Franklin Intermediate School Site



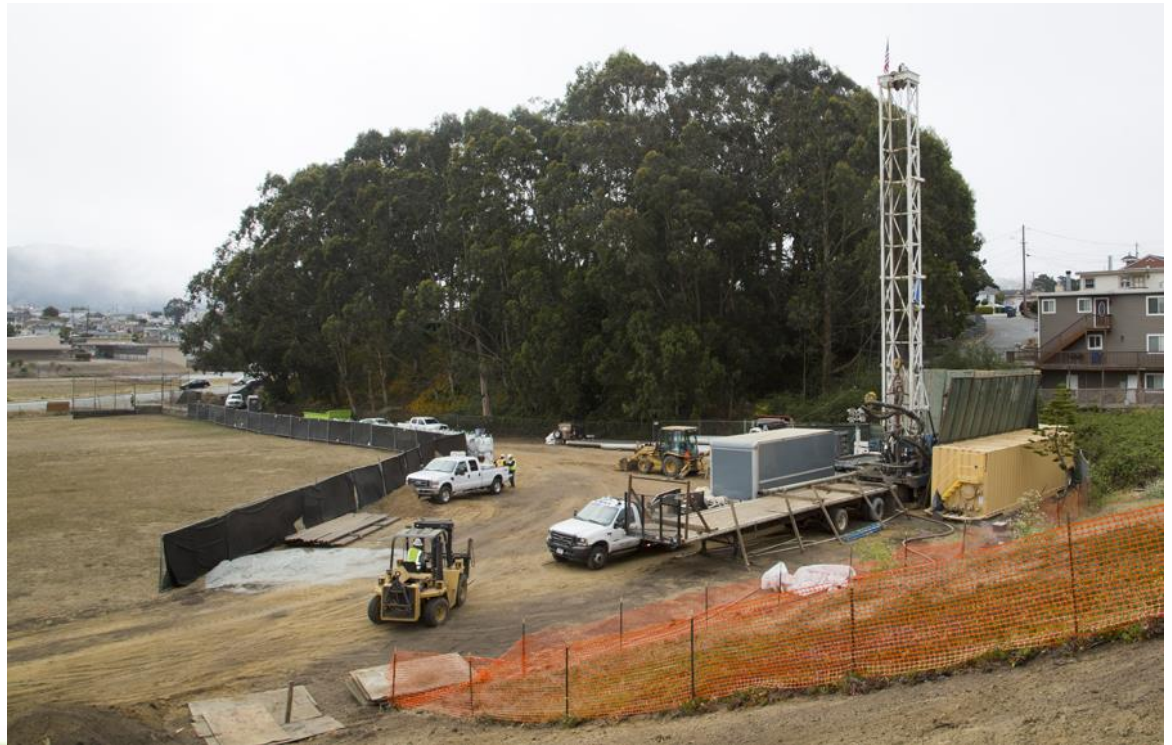
GSR Project Sites in Colma: Serramonte Boulevard



Ben Franklin Site in Daly City

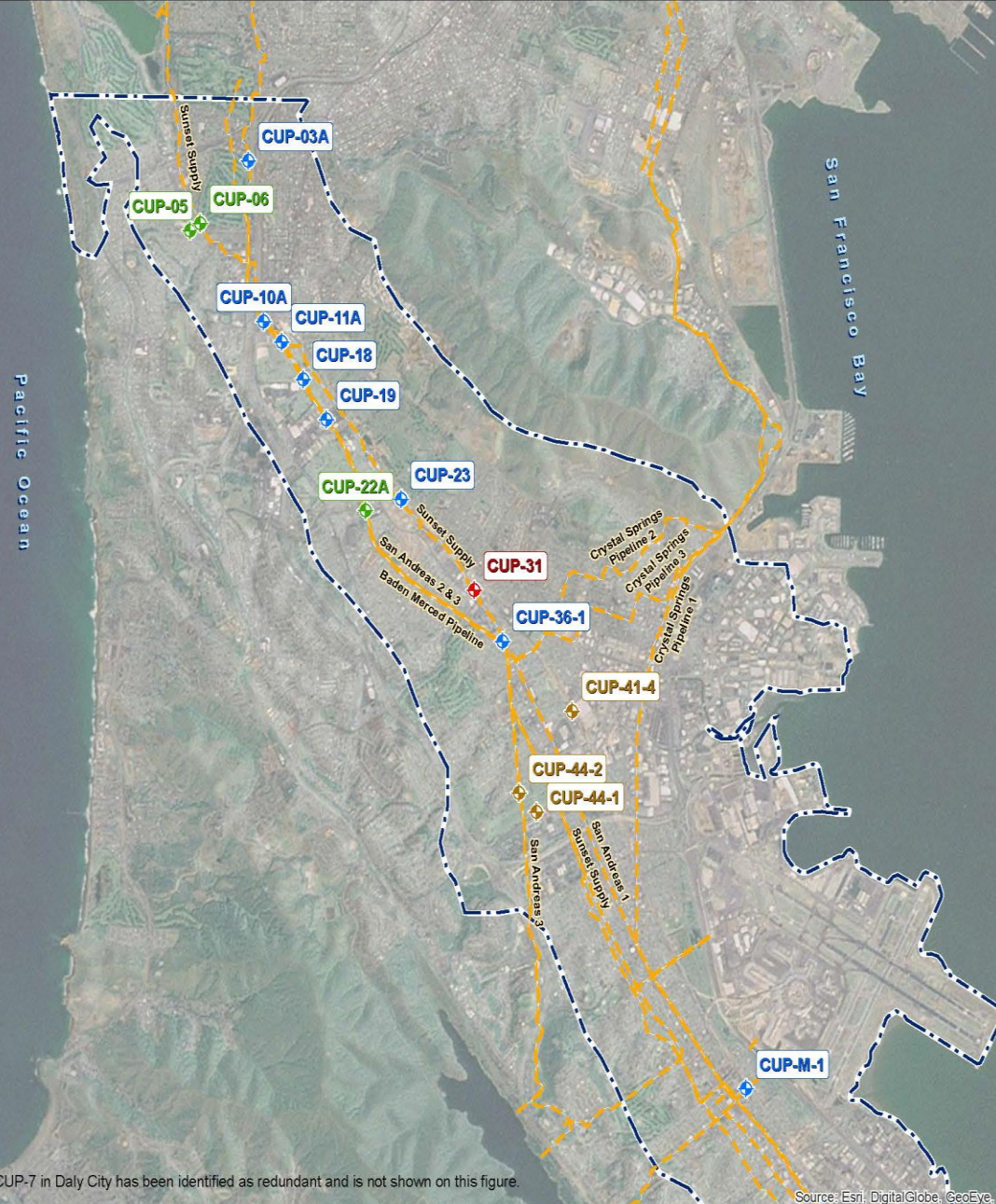


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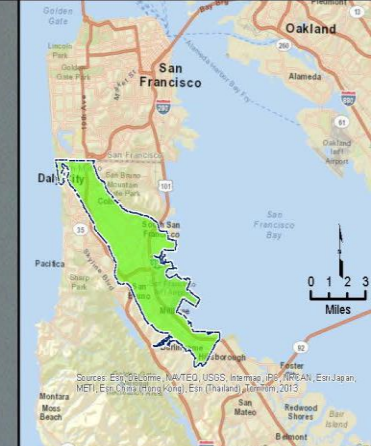
Linear Park Site in South San Francisco





Note: Well CUP-7 in Daly City has been identified as redundant and is not shown on this figure.

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

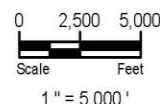


Legend

- ◆ SFPUC Production Well
- ◆ Partner Agency Production Well – Daly City
- ◆ Partner Agency Production Well – San Bruno
- ◆ Partner Agency Production Well – Cal Water

- Transmission Pipeline
- South Westside Groundwater Basin

Note:
Well CUP-19 may serve SFPUC or Cal Water (to be determined)



CITY AND COUNTY OF SAN FRANCISCO WATER POWER SEWER

Kennedy/Jenks Consultants
303 Second Street, Suite 300 South
San Francisco, CA 94107

**SFPUC Groundwater Storage &
Recovery (GSR) Water Supply
Production Wells**

FIGURE

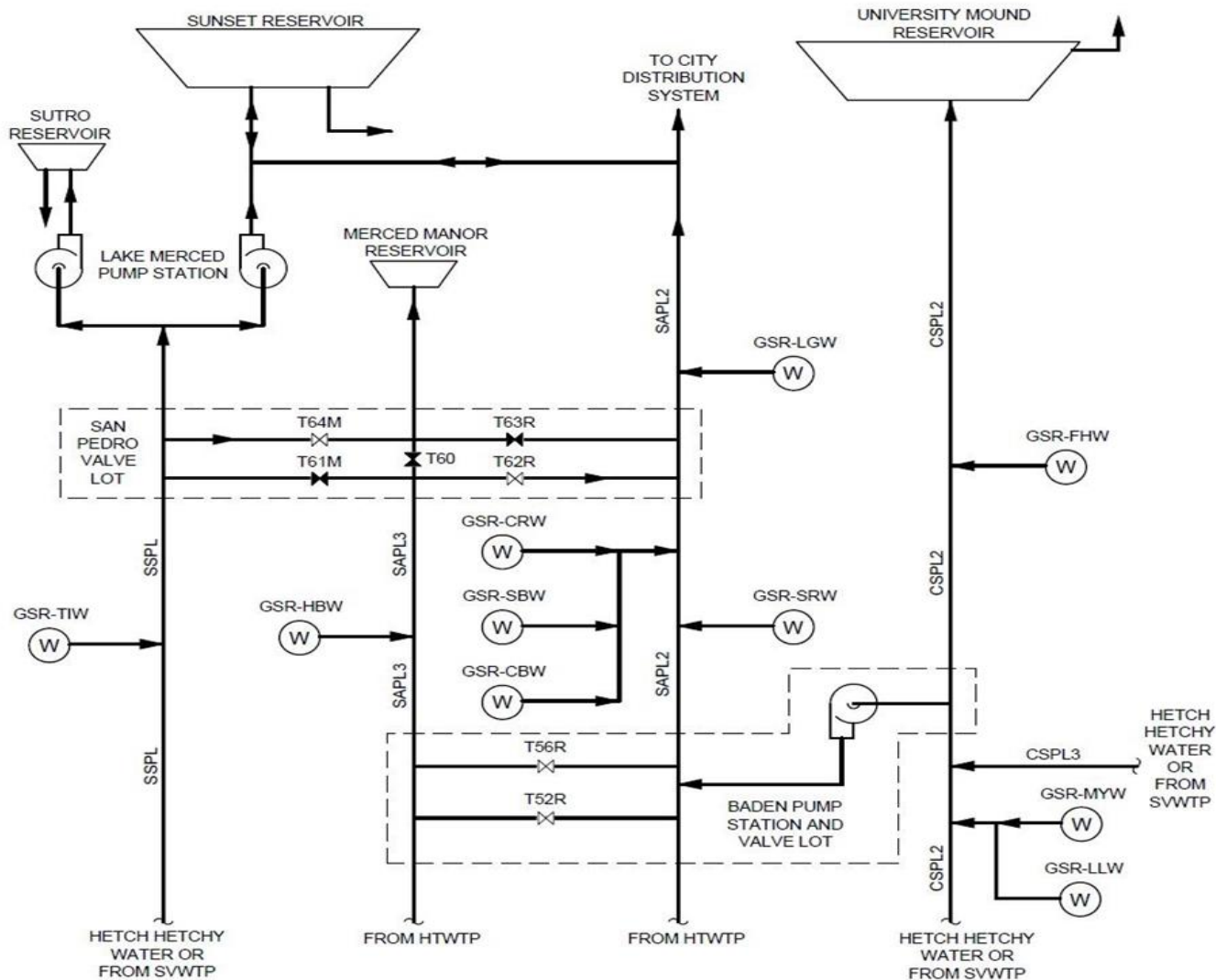
1

DATE
4/24/2015

Simplified Overall GRS Well Station System Configuration



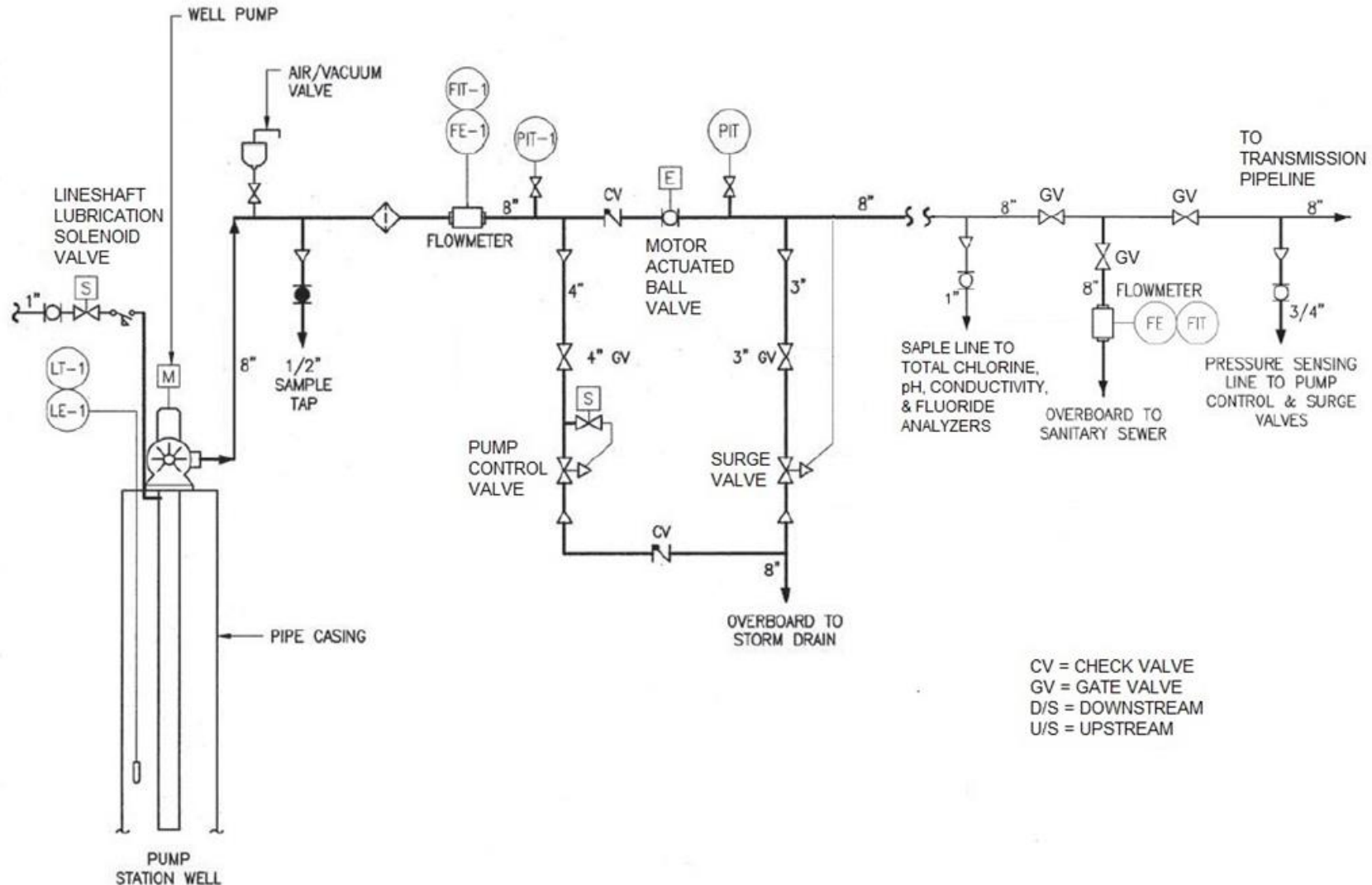
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Typical Individual Well Station Configuration



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GSR Well Treatment Summary



SFRWS-GSR Well Station	Well ID	Chloramination	pH Adjustment	Fluoridation	Manganese Treatment	Chromium VI Treatment	Nitrate Treatment
Lake Merced GC	GSR-LGW	X	X	X		X	
Colma BART	GSR-SBW GSR-CRW GSR-CBW	X	X	X	Provision for Future Filtration	X	X
Serramonte	GSR-SRW	X	X	X	Provision for Future Filtration	X	
Hickey	GSR-HBW	X	X	X	Provision for Future Filtration	X	
TI Trailer Court	GSR-TIW	X	X	X	X		X
Funeral Home	GSR-FHW	X	X		X (Blending Treatment)		
Millbrae Yard	GSR-MYW GSR-LLW	X	X	X		X	

Blending Operations Strategy

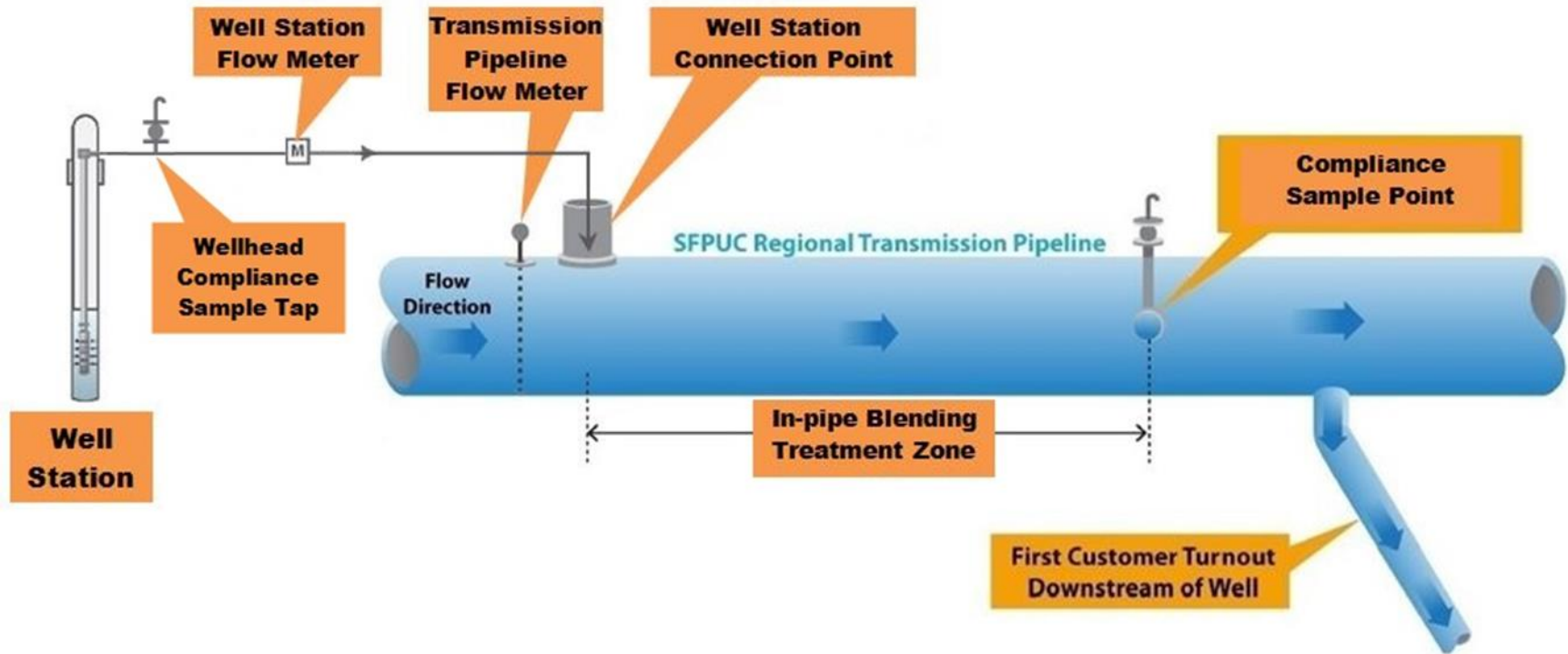
Approved by SWRCB

- In-line volumetric blending
- Flow meters in transmission pipelines will verify minimum surface water flow is maintained
- If minimum flow is not achieved, well will automatically be shut down
- Periodic WQ sampling will confirm blending meets MCLs

Chrome 6 Blending Treatment in the Regional Transmission Pipelines



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GSR Operational Monitoring



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Operational Monitoring	Sample	Frequency	Operational Target	Operational Notification Setpoints	DDW Violation Notification Levels
Free Chlorine in GW	Online	-	2.5 mg/L	Lo = 2.0 mg/L Hi = 4.0 mg/L	>4.0 mg/L (in BW)
	Grab*	Weekly			
Total Chlorine in GW	Online	-	2.2 – 2.8 mg/L	Lo = 2.0 mg/L Hi = 4.0 mg/L	>4.0 mg/L (in BW)
	Grab*	Weekly			
Fluoride in GW	Online	-	0.7 mg/L	Lo = 0.6 mg/L Hi = 1.5 mg/L	>10 mg/L (in BW)
	Grab*	Weekly			
Manganese in GW	Grab	Weekly	<0.015 mg/L	Hi = 0.03 mg/L	>0.05 mg/L (in BW)
Chrome-6 in BW	Calculated	-	<4 µg/L	Hi = 4 µg/L Hi-Hi = 5 µg/L	>10 µg/L (in BW)
	Grab*	Weekly			
Nitrate in BW	Calculated	-	<4 mg/L	Hi = 4 mg/L Hi-Hi = 5 mg/L	>10 mg/L (in BW)
	Grab*	Weekly			
pH in BW	Grab	Bi-Weekly	8.6 – 9.8	Lo = 8.4 Hi = 10.0	<8.2 (in BW)

Example at CCP with Variable SAPL2 Flow Rates

