

Groundwater Reliability Partnership for the San Mateo Plain Sub-basin

April 19, 2016

BAWSCA

“A multicounty agency authorized to plan for and acquire supplemental water supplies, encourage water conservation and use of recycled water on a regional basis.”

[Bay Area Water Supply and Conservation Agency Act, AB2058(Papan-2002)]





Welcome!

- Agenda for today's meeting:
 - Welcome and introductions
 - Summary of previous meetings
 - Groundwater 101 – Shallow groundwater
 - Use and management of basins adjacent to the San Mateo Plain Sub-basin
 - The Niles Cone Sub-Basin
 - West Bay Sanitary District's Recycled Project – Sharon Heights Golf Course
 - Activities in the San Mateo Plain Sub-basin
 - Next Steps



Agenda

- **Welcome and introductions – Michael Hurley, Water Resources Manager, BAWSCA**
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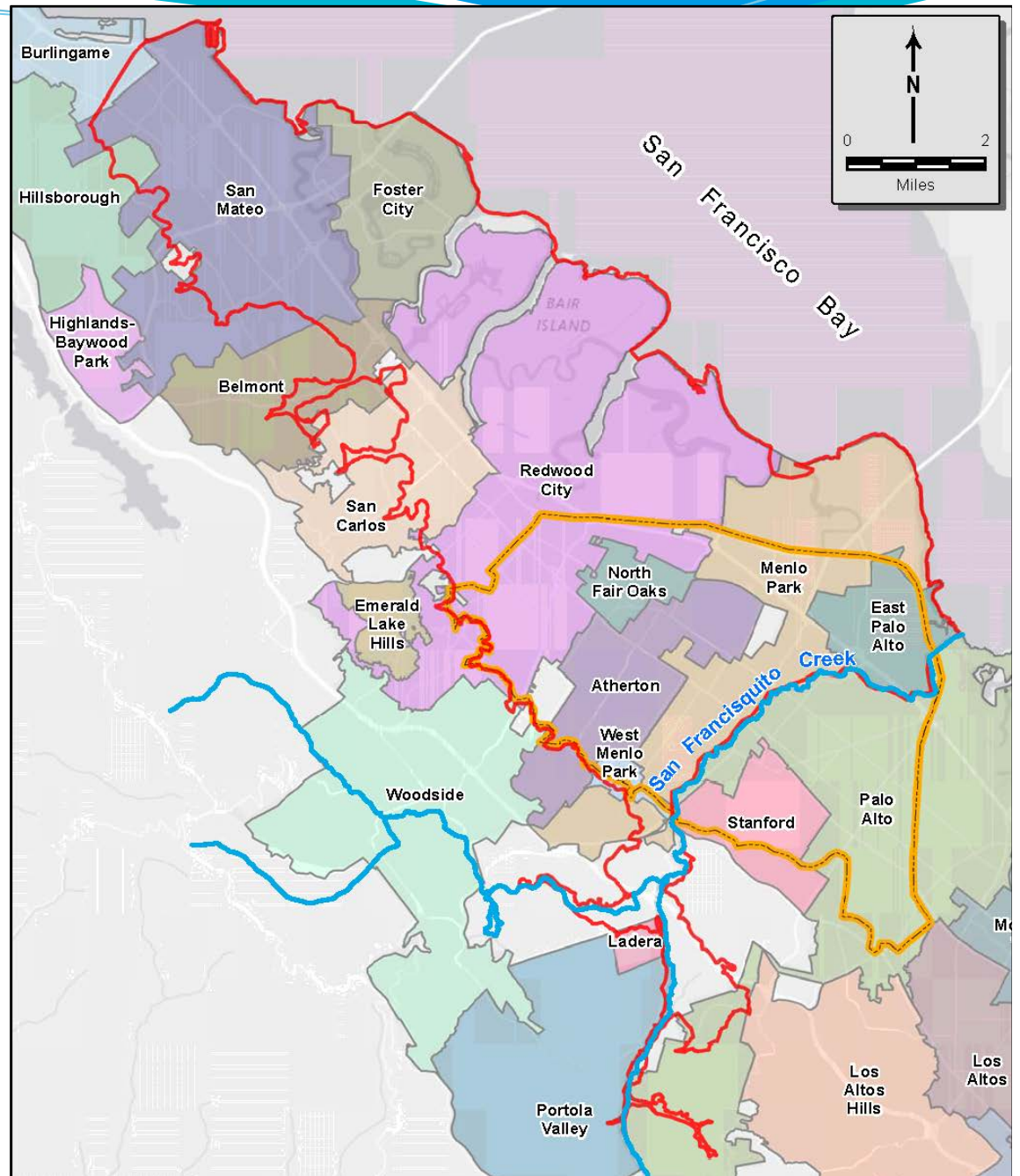


Agenda

- Welcome and introductions
- **Summary of previous meetings – Adrienne Carr, Senior Water Resources Specialist, BAWSCA**
- Groundwater 101 – Shallow groundwater
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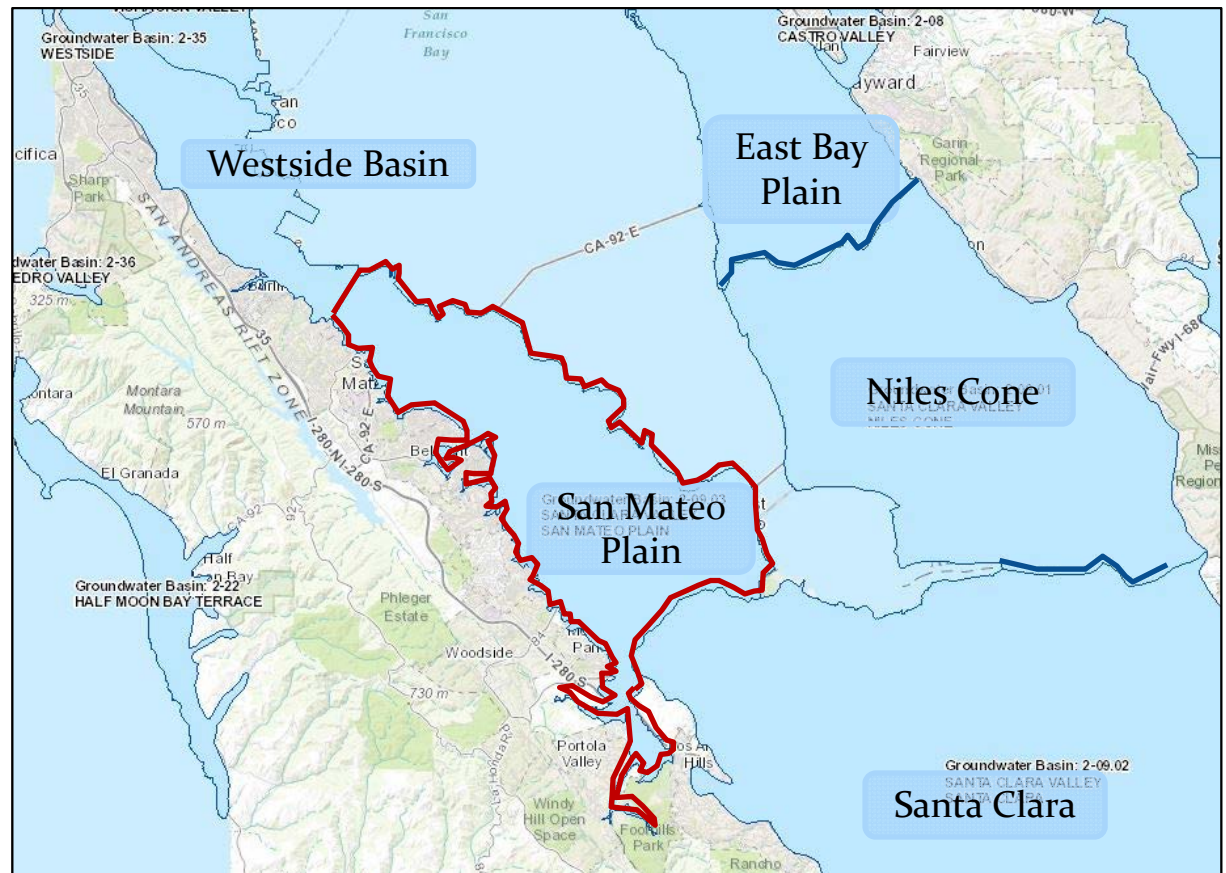
Where is the San Mateo Plain Sub-basin?

- Many cities and communities overlie the basin
- Many water agencies overlie the basin
- The USGS defines a different basin: the San Francisquito Cone



What Basins are Adjacent to the San Mateo Plain Sub-basin?

- San Mateo Plain Sub-basin is a part of the Santa Clara Valley Basin
 - Santa Clara
 - Niles Cone
 - East Bay Plain
- Degree of connectivity between all sub-basins not well understood
- Westside basin to north, connectivity not known



Meetings Have Provided a Forum for Information Sharing and Learning

- October 19th, 2015 meeting
 - Presentations included BAWSCA, San Mateo County, City of East Palo Alto, update on Sustainable Groundwater Management Act
 - Good discussion on potential goals:
 - Increased understanding of the hydrology and geology of the Basin
 - Serving as a forum for sharing information among all stakeholders
 - Continued sustainable use of the Basin to maintain groundwater quality and quantity and protect beneficial uses

Meetings Have Provided a Forum for Information Sharing and Learning

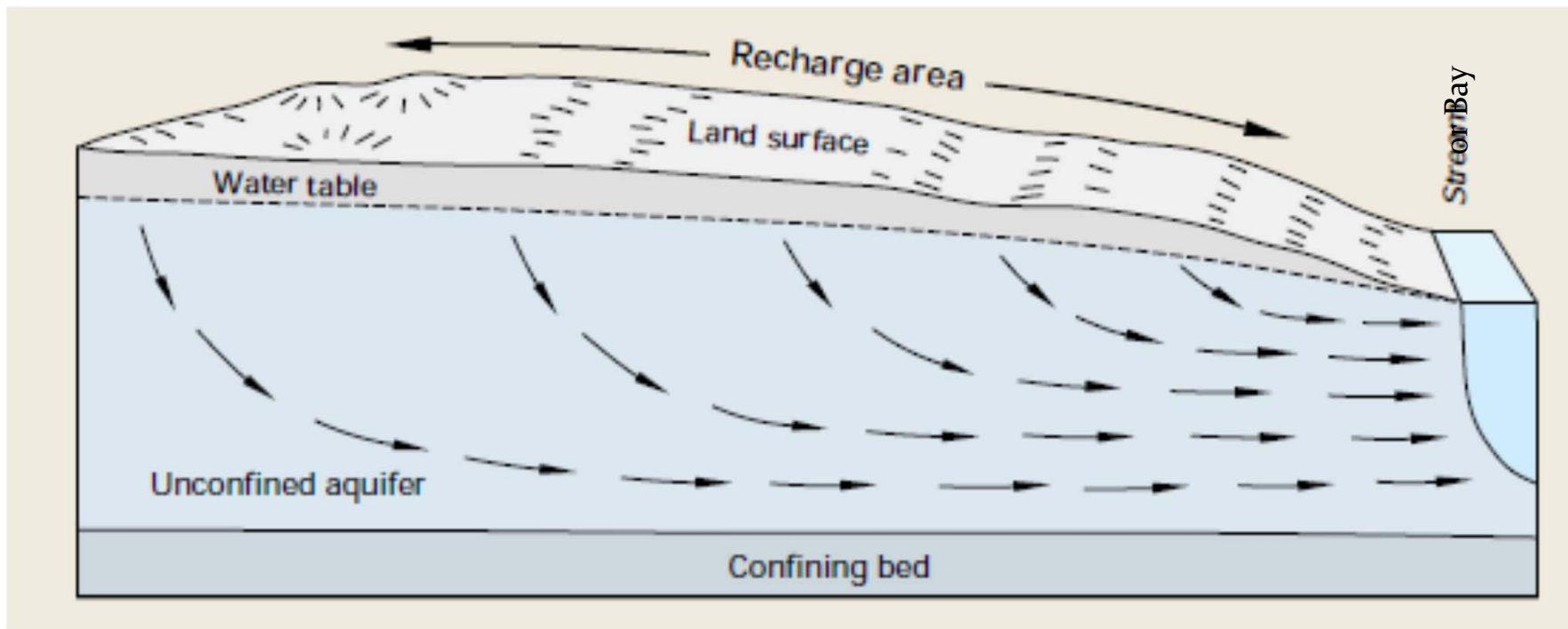
- January 11th, 2016 meeting
 - Presentations included: Westside Basin, Santa Clara Valley Water District – Santa Clara Sub-Basin, San Mateo County, Sustainable Groundwater Management Act updates
 - Good discussion on lessons learned from adjacent basins
 - Good discussion with group and San Mateo County staff about their upcoming Assessment



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What is a Groundwater Basin or Aquifer?

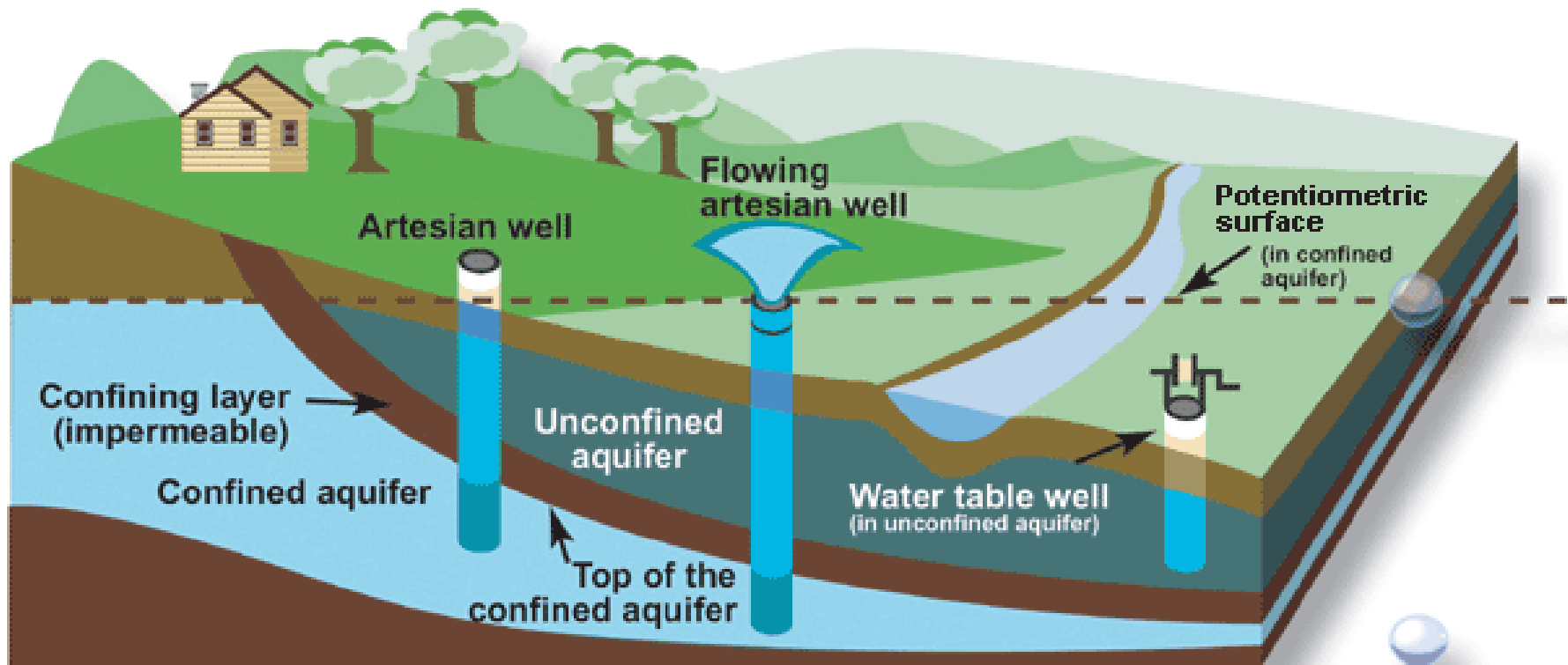


An aquifer is an underground layer of water-bearing permeable rock, rock fractures or unconsolidated materials (gravel, sand, or silt) from which groundwater can be extracted using a water well.

What is a Shallow Aquifer?

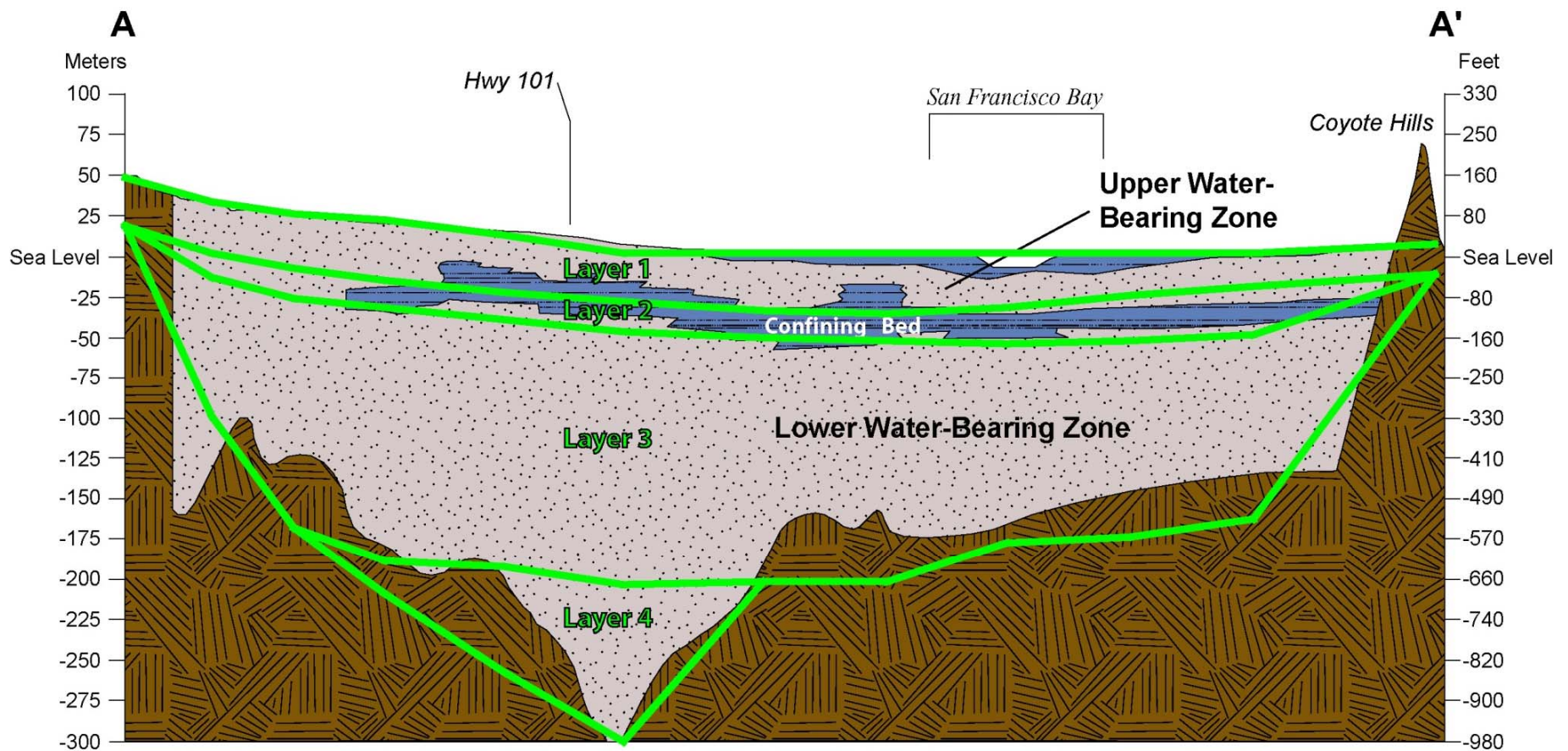
- Typically (but not always) the shallowest aquifer at a given location is unconfined, meaning it does not have a confining layer (an aquitard or aquiclude) between it and the surface.

What is an Unconfined vs. a Confined Groundwater Basin



Source: Environment Canada, USGS

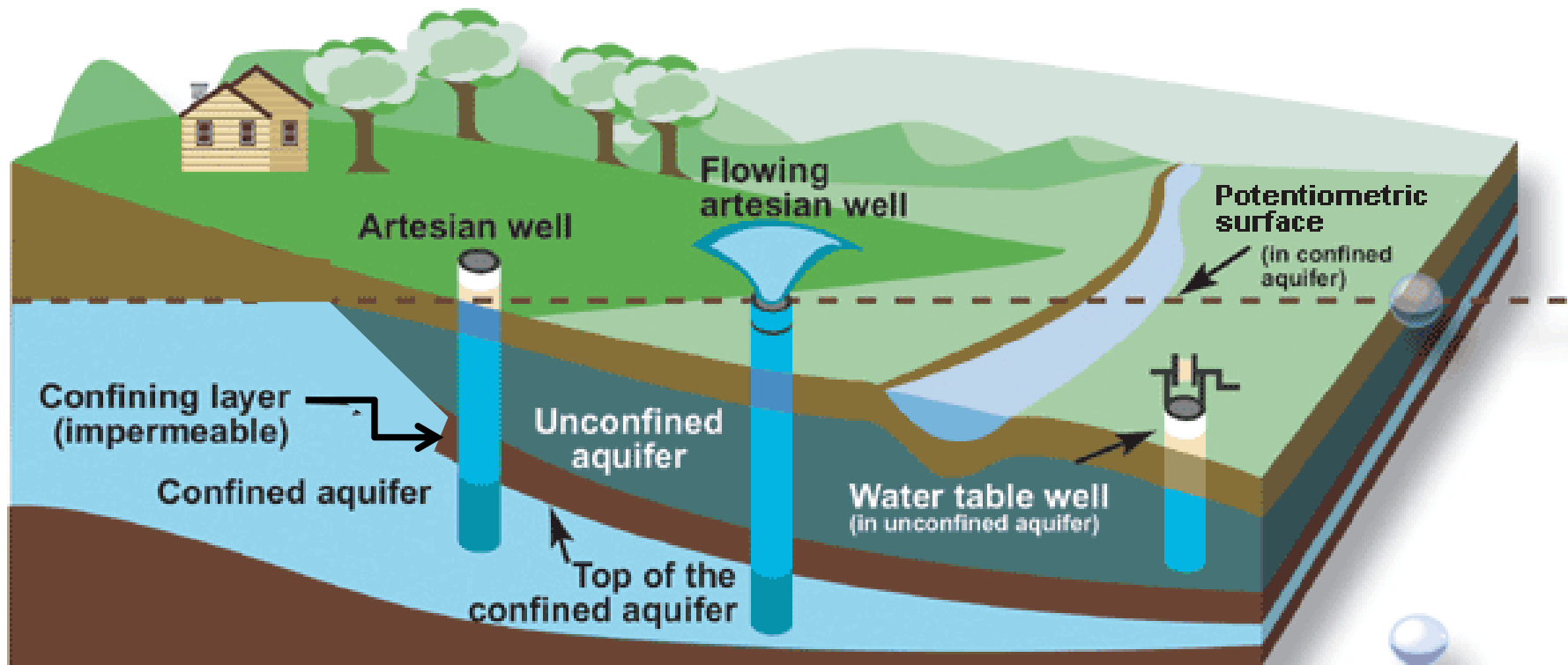
San Mateo Plain has Shallow and Deep Aquifers



Geologic Cross Section of Basin

0 1 2 Miles
Vertical Exaggeration 20x

What is an Unconfined vs. a Confined Groundwater Basin

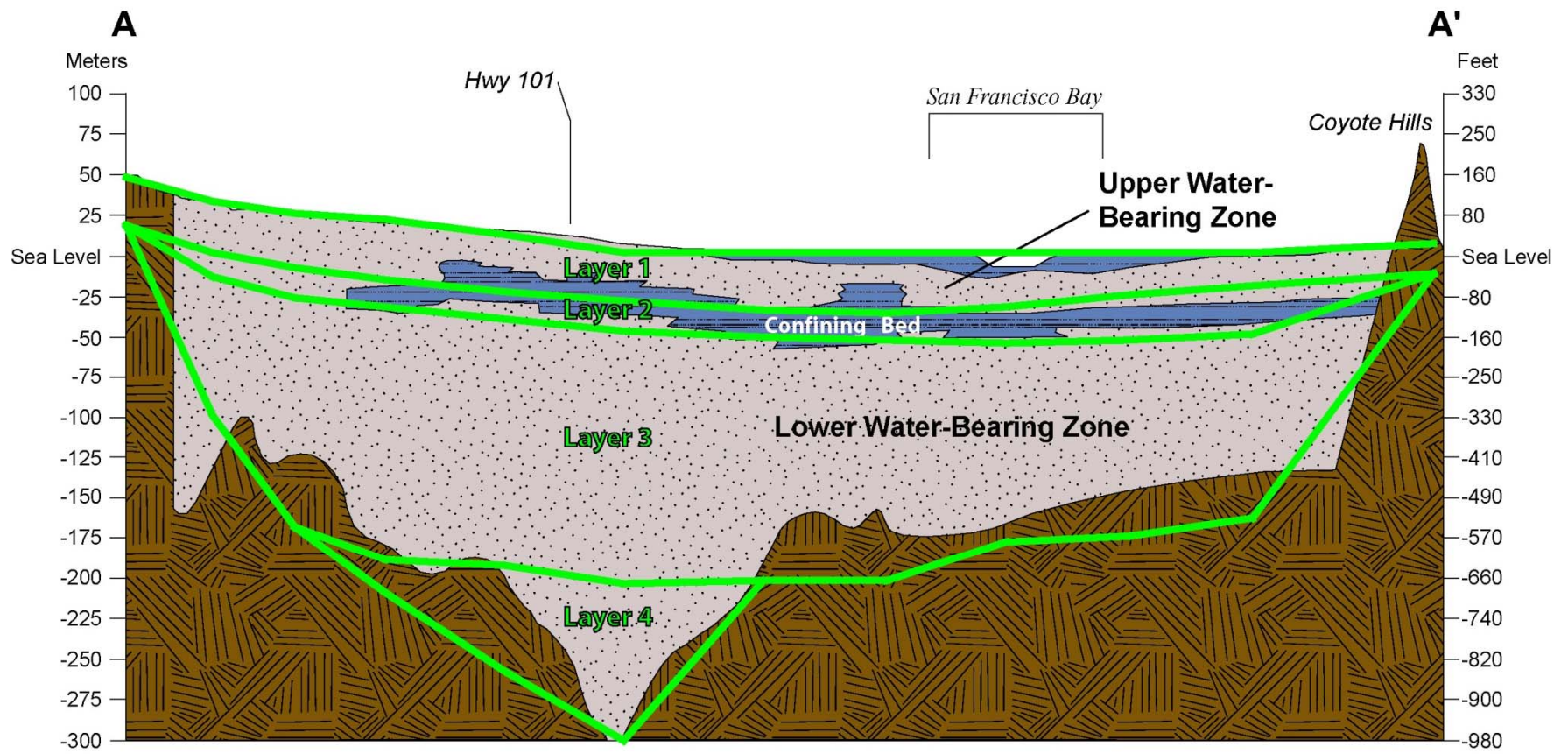


Source: Environment Canada, USGS

General Properties of the Shallow Zone

- Deep zone is principal aquifer: thicker and more permeable
- Thickness varies ~70 ft
 - Water bearing zones even smaller
- Material varies from coarse near the foothills to finer grained near the bay
 - Material was deposited by streams and varies by distance from a channel
 - Course materials near foothills are directly connected to the deep zone
 - Bay mud layer does not extend inland to the foothills
 - This area is where recharge can occur
 - Rainfall infiltration, landscaping return flows

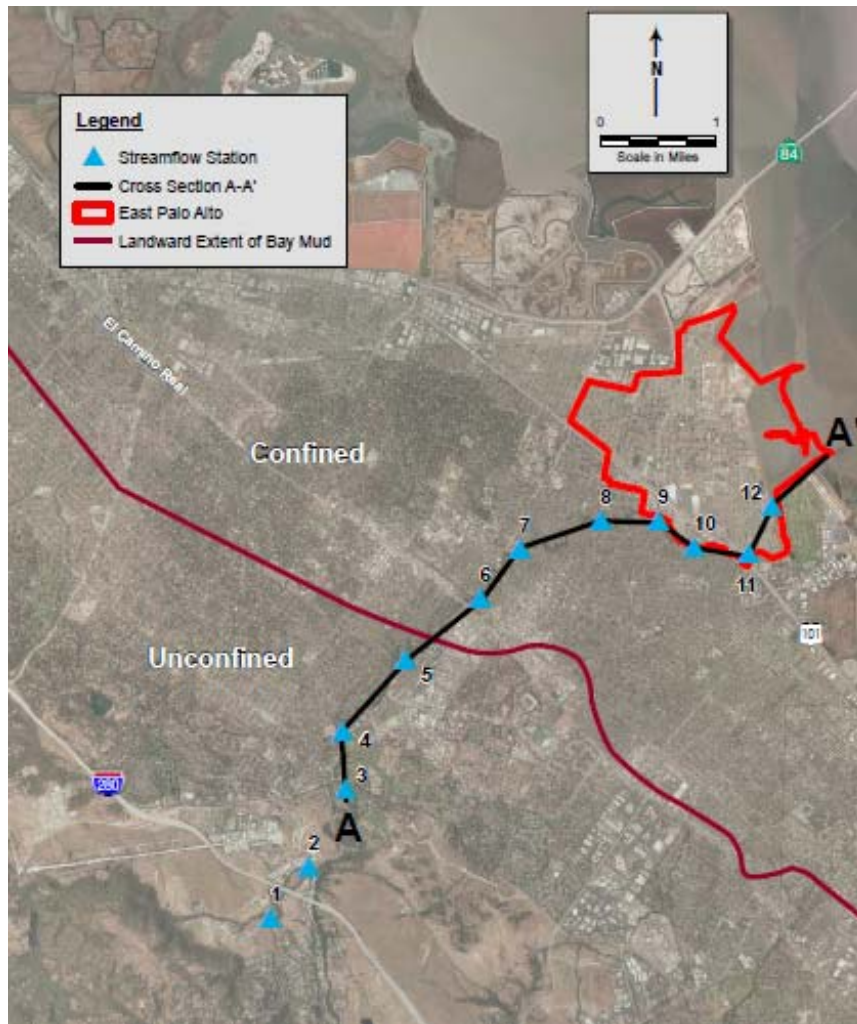
San Mateo Plain Basin's Deep Aquifer is Recharged in West



Geologic Cross Section of Basin

0 1 2 Miles
Vertical Exaggeration 20x

Bay Mud Confining Layer



- Old bay mud extends under a large portion of the shallow zone
- Deep aquifer is confined below the bay mud layer
- Deep aquifer is unconfined in area near foothills
 - Recharge occurs where bay mud layer is absent

Source: East Palo Alto
Groundwater Management Plan

Agenda

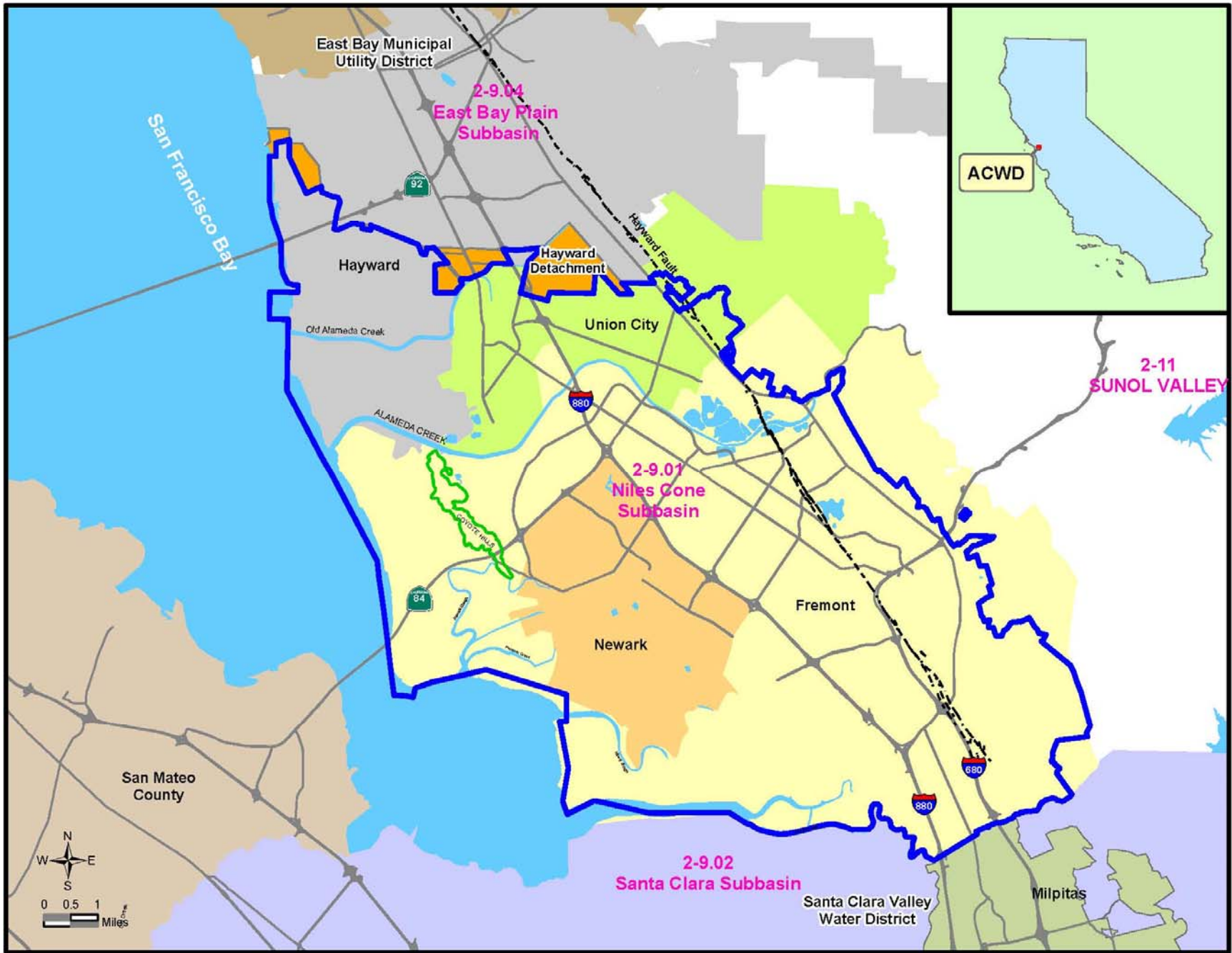
- Welcome and introductions
- Summary of previous meetings
- Groundwater 101 – Shallow groundwater
- **Use and management of basins adjacent to the San Mateo Plain Sub-basin: The Niles Cone Sub-Basin – Michelle Myers, Groundwater Resources Manager, Alameda County Water District**
- West Bay Sanitary District's Recycled Project – Sharon Heights Golf Course
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Alameda County Water District

Niles Cone Groundwater Basin Management

April 19, 2016

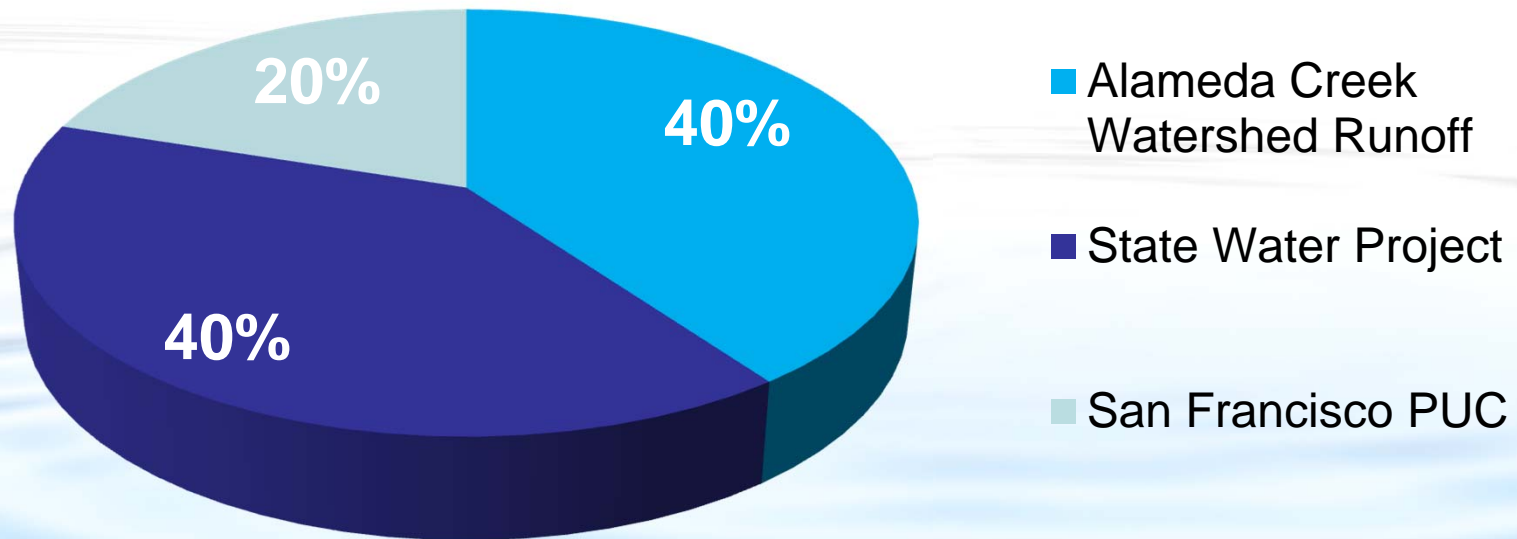


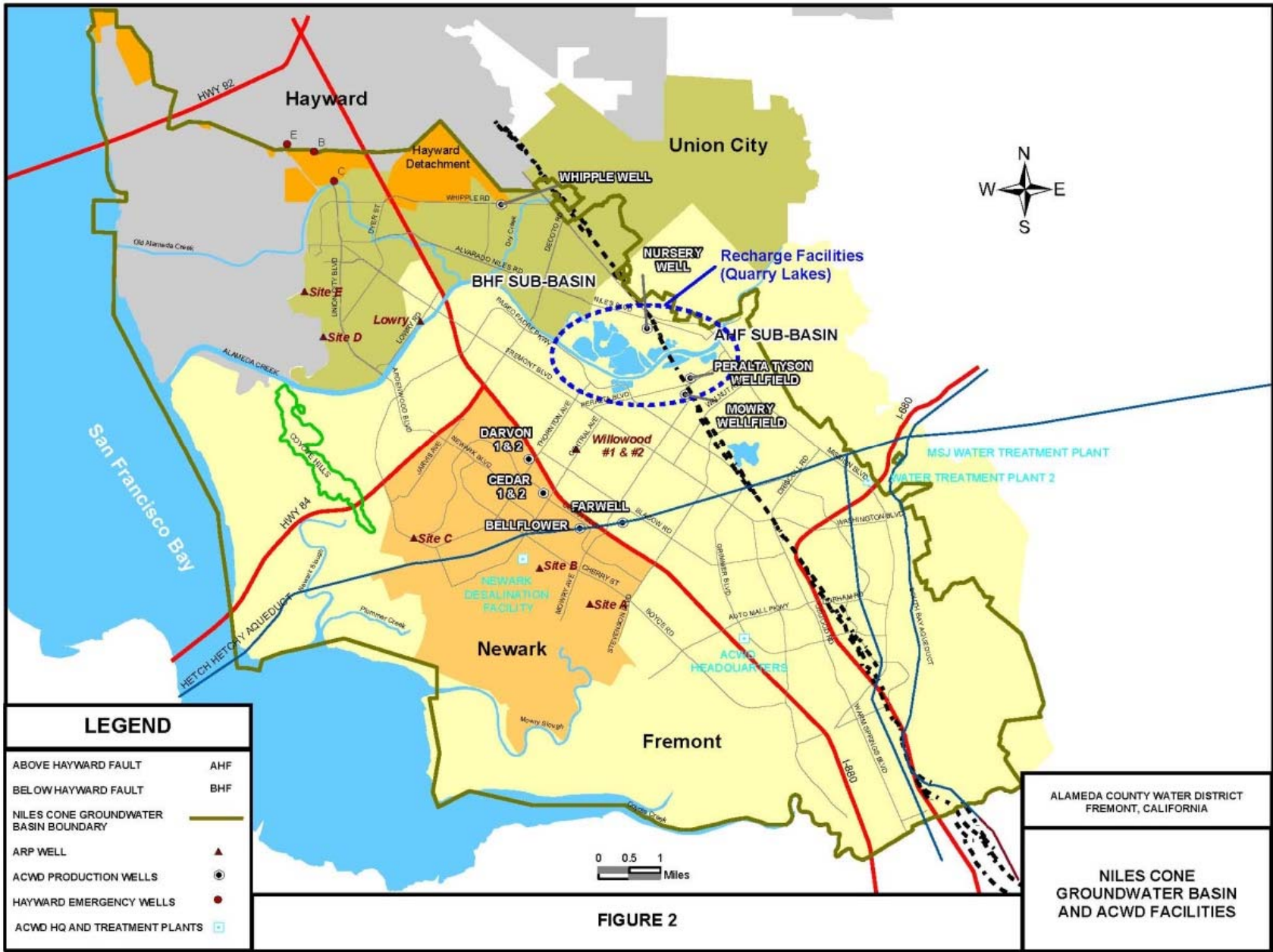
ACWD Overview

- Founded in 1914
- Serve Fremont, Newark, and Union City
- Population Served: ~344,000
- Nearly 83,000 Connections
- Elected Board: 5 Directors



ACWD Water Supply Sources – Typical

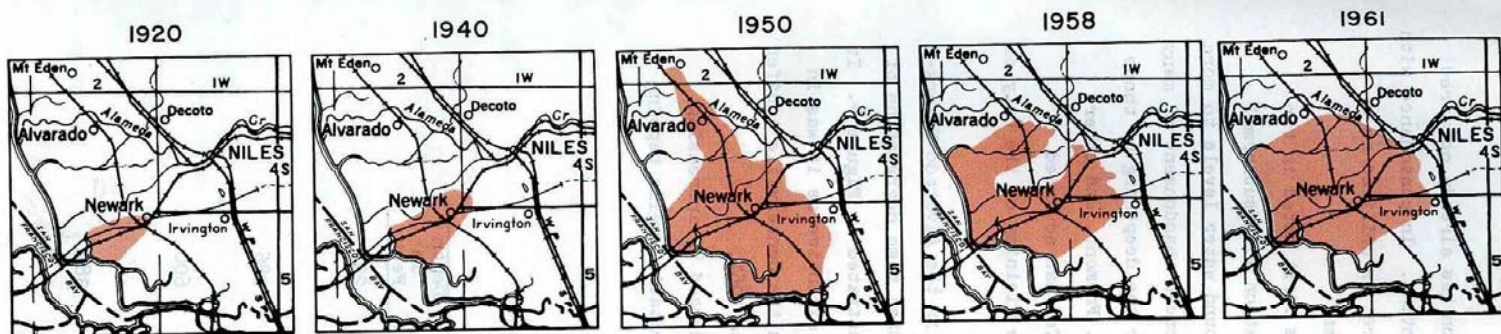






Niles Cone Groundwater Basin: Seawater Intrusion

- Salt water intrusion observed in the 1920s
- Growing water demand from farmers, ranchers, and nearby towns
- Groundwater level dropped below sea level - landward migration of sea water
- Unregulated installation and abandonment of wells



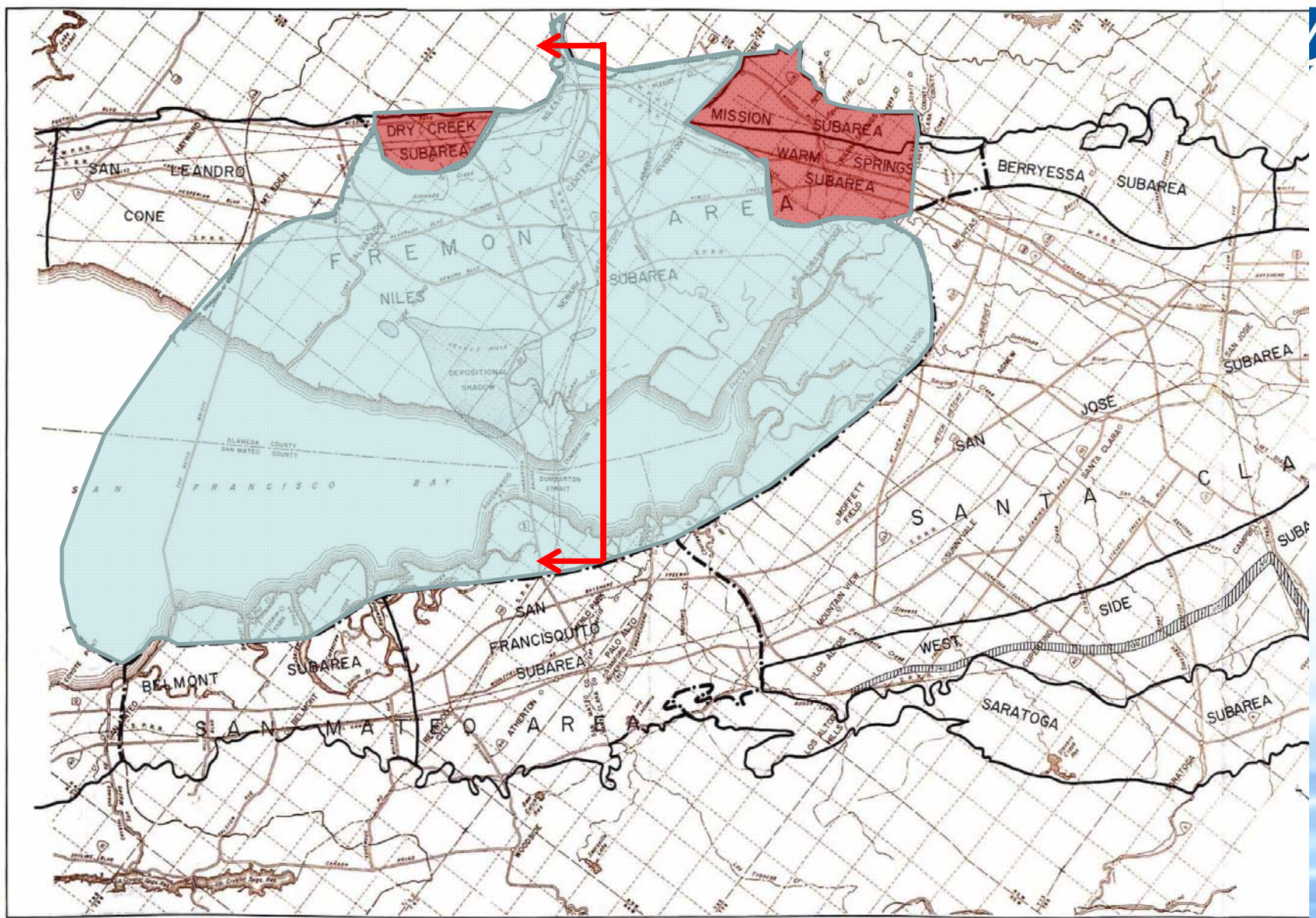
SHALLOW GROUND WATER AQUIFER

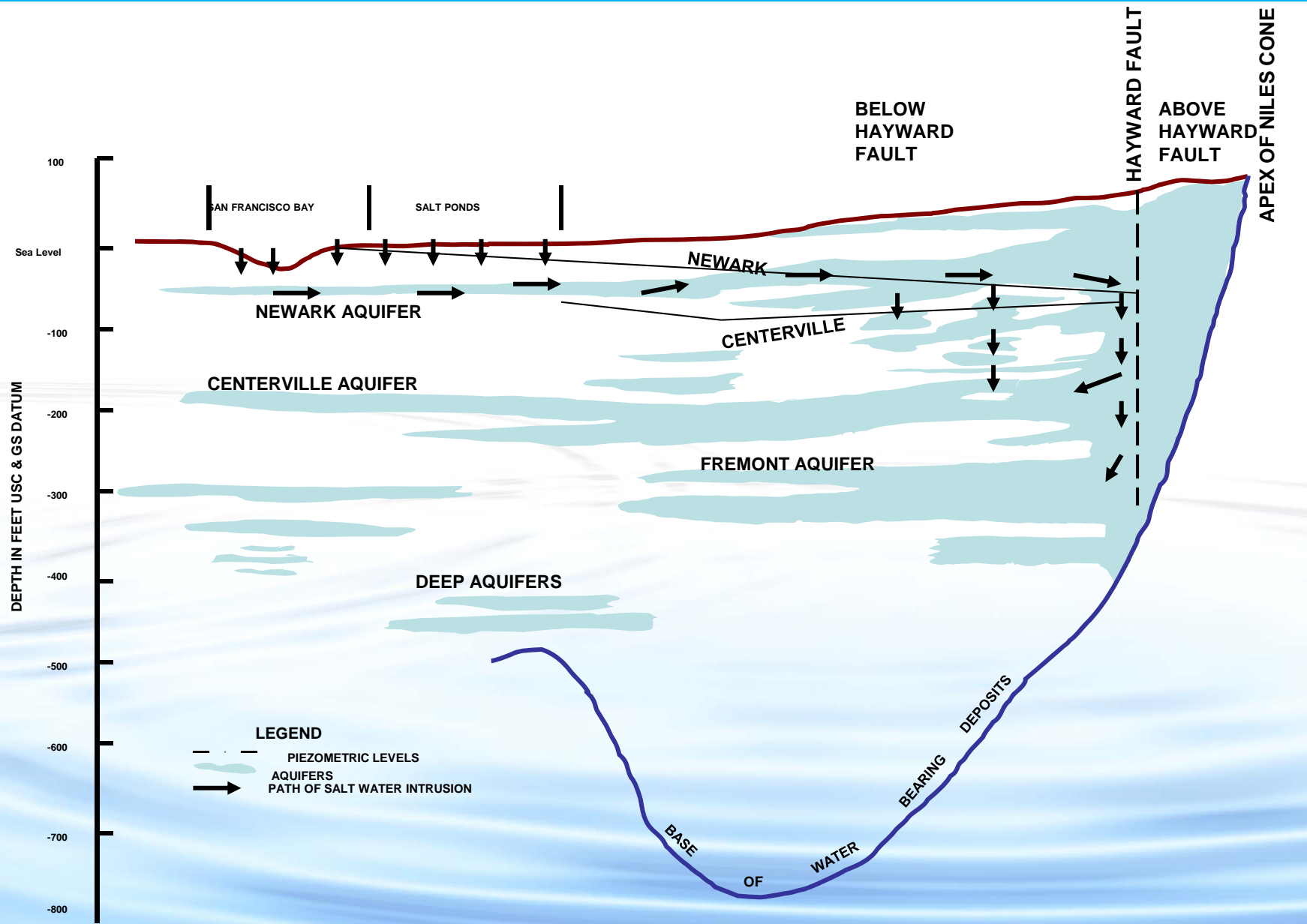


DEEP GROUND WATER AQUIFER

INDICATES WATER WITH CHLORIDE CONCENTRATIONS EXCEEDING 350 PPM
 SCALE OF MILES
 0 2 4 6 8 10 12

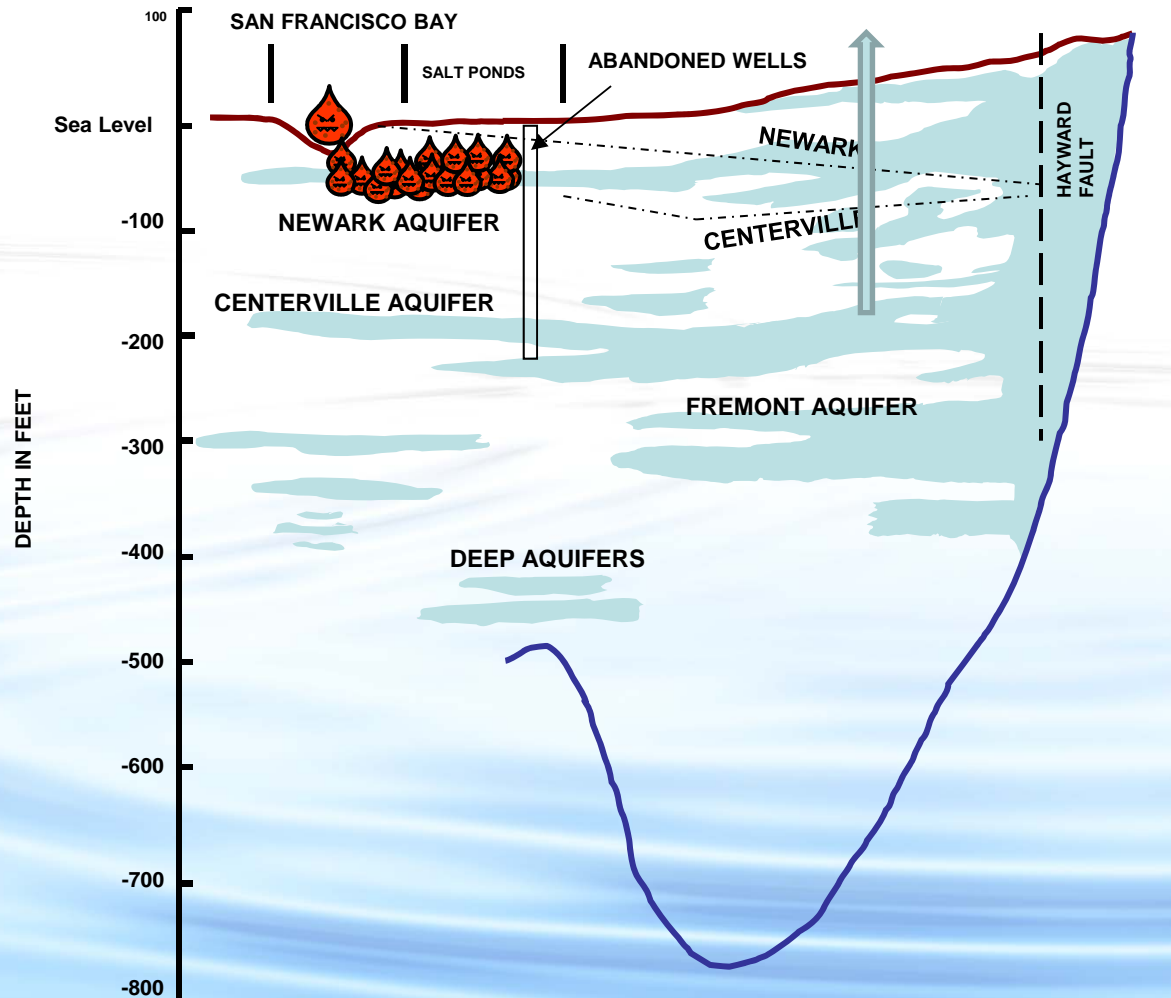
Figure 4.
 SALT-WATER DEGRADATION OF GROUND WATER IN THE SHALLOW NEWARK AQUIFER
 AND DEEP CENTERVILLE AQUIFER IN THE BAY PLAIN



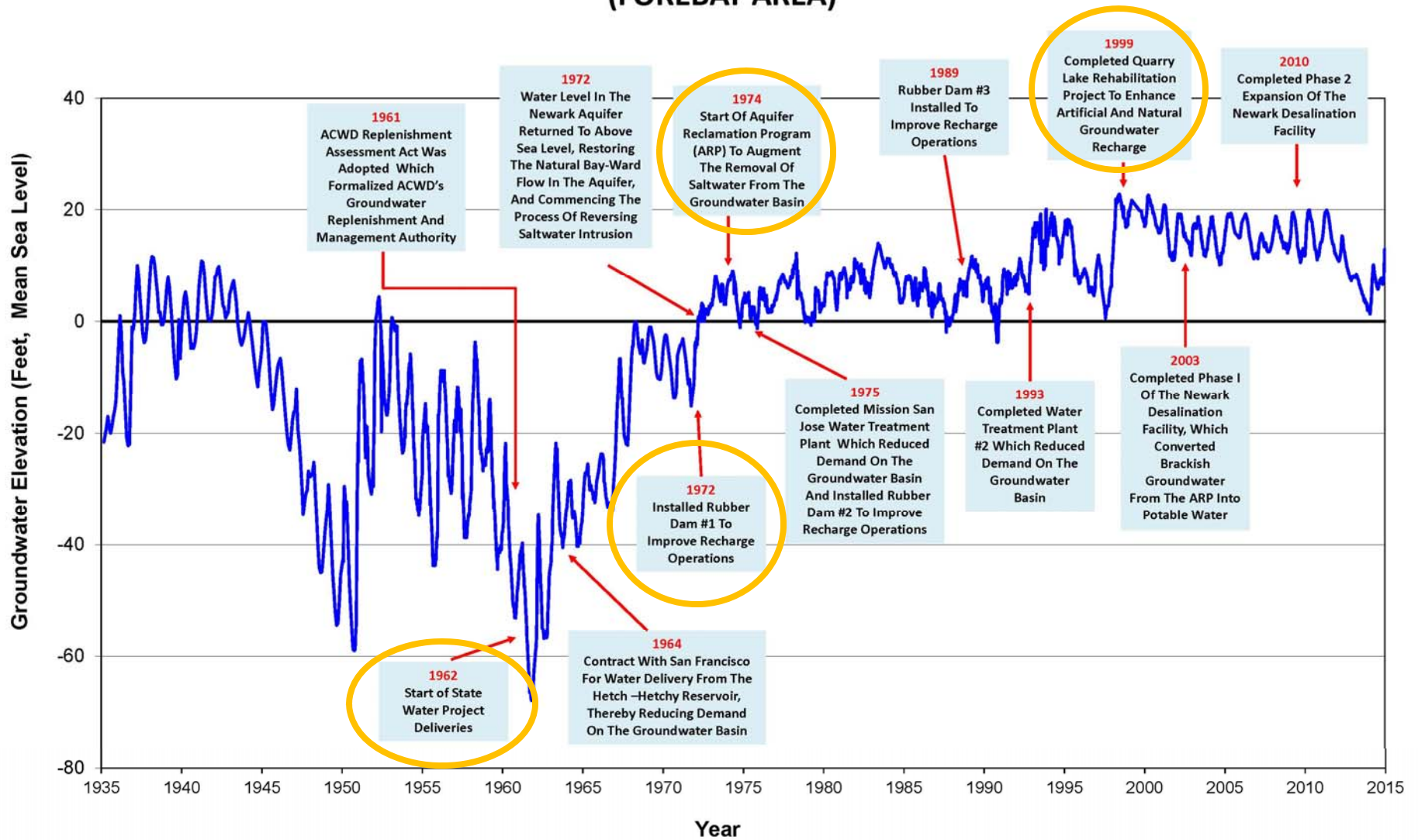


INTRUSION OF SALT WATER INTO THE FREMONT STUDY AREA

Salt Water Intrusion

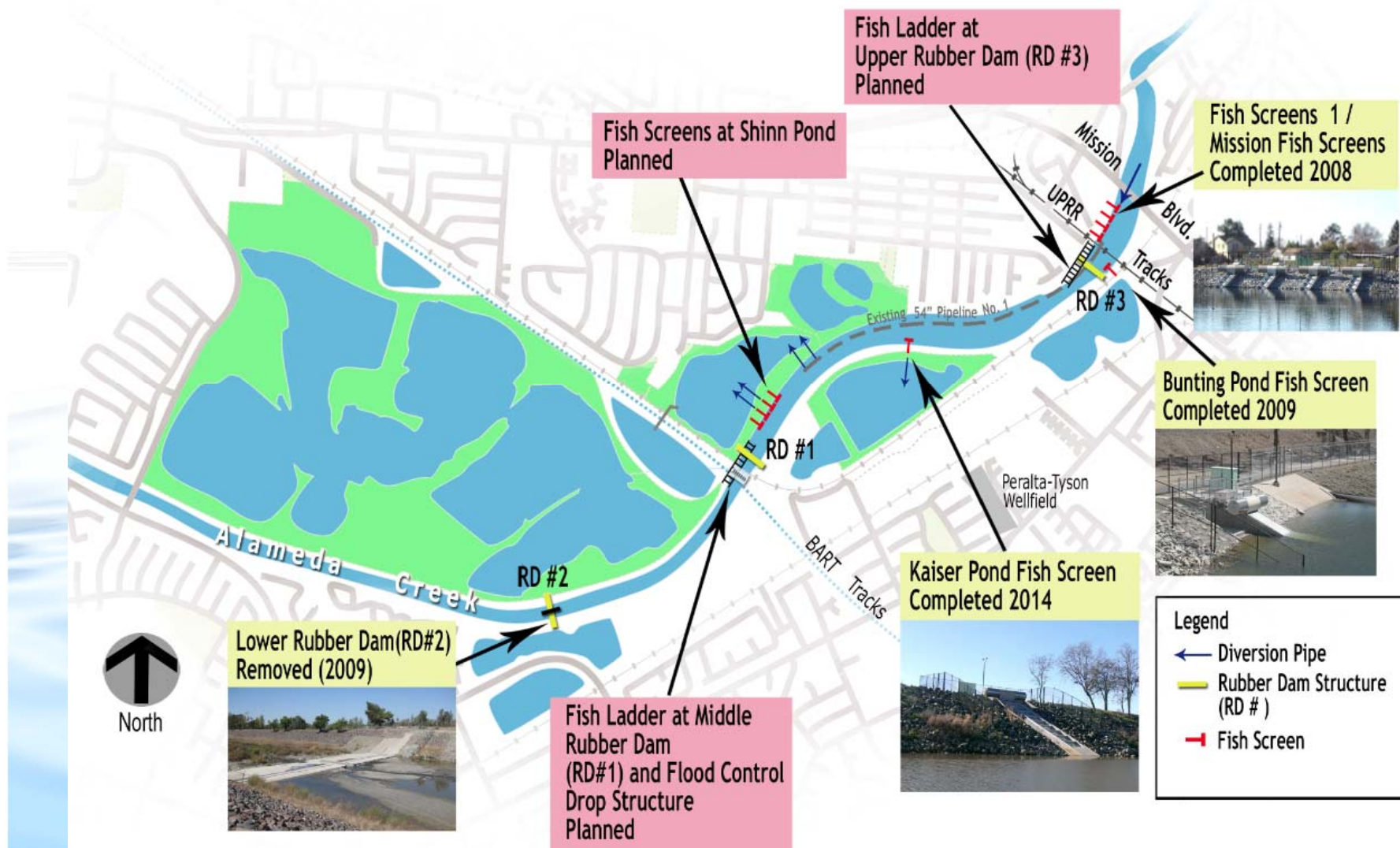


HISTORICAL WATER LEVELS IN THE NEWARK AQUIFER (FOREBAY AREA)

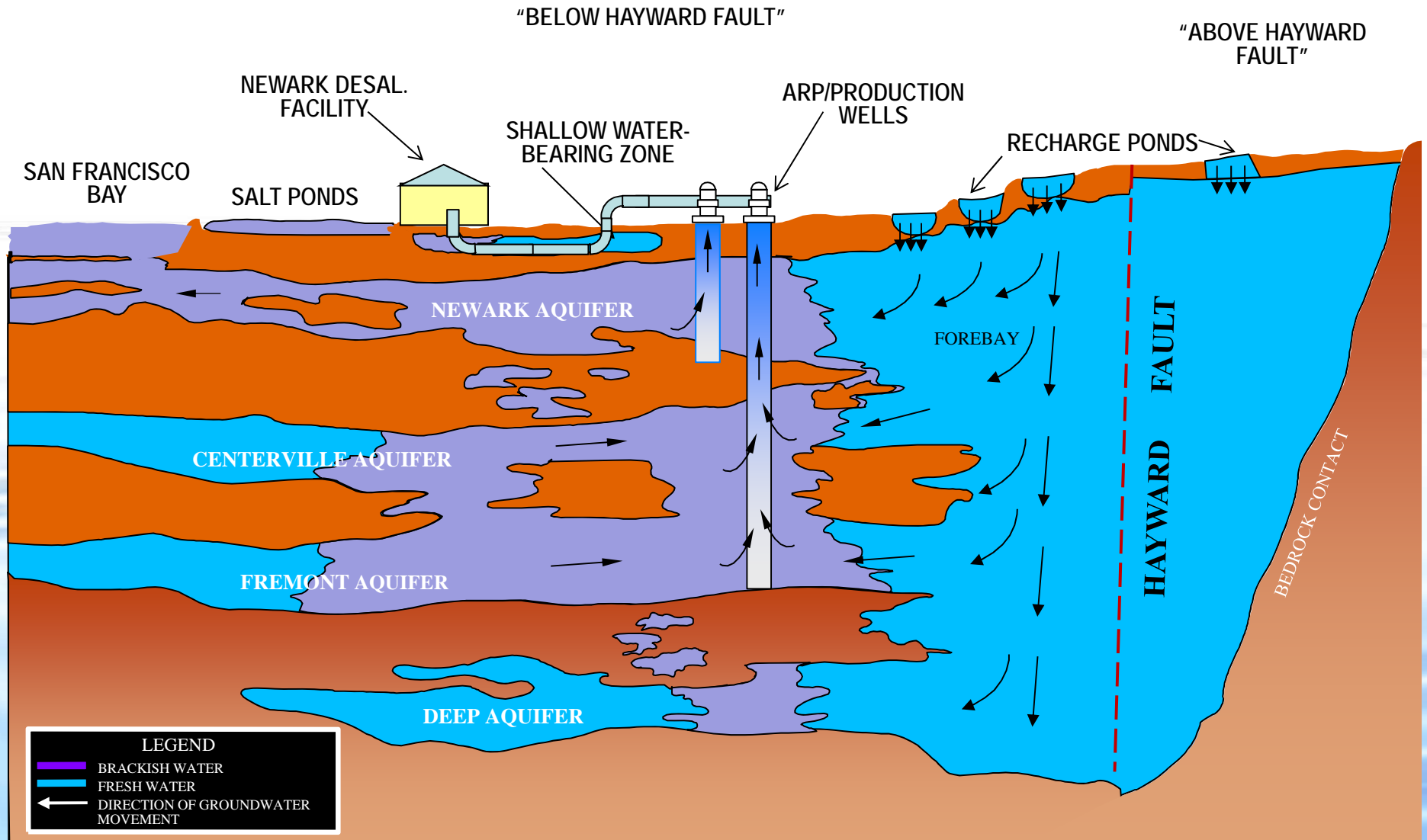




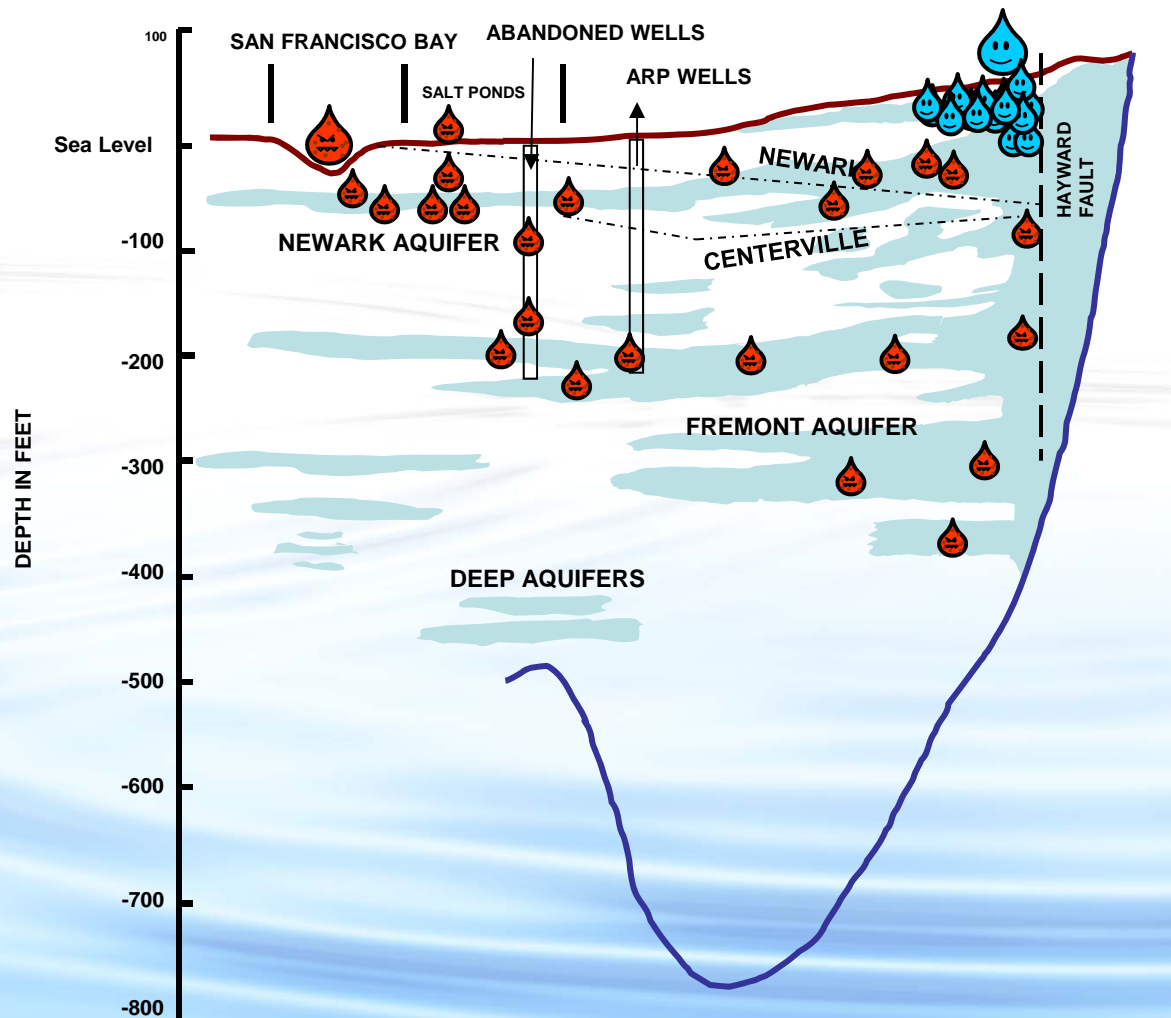
Alameda Creek Fish Passage Facilities



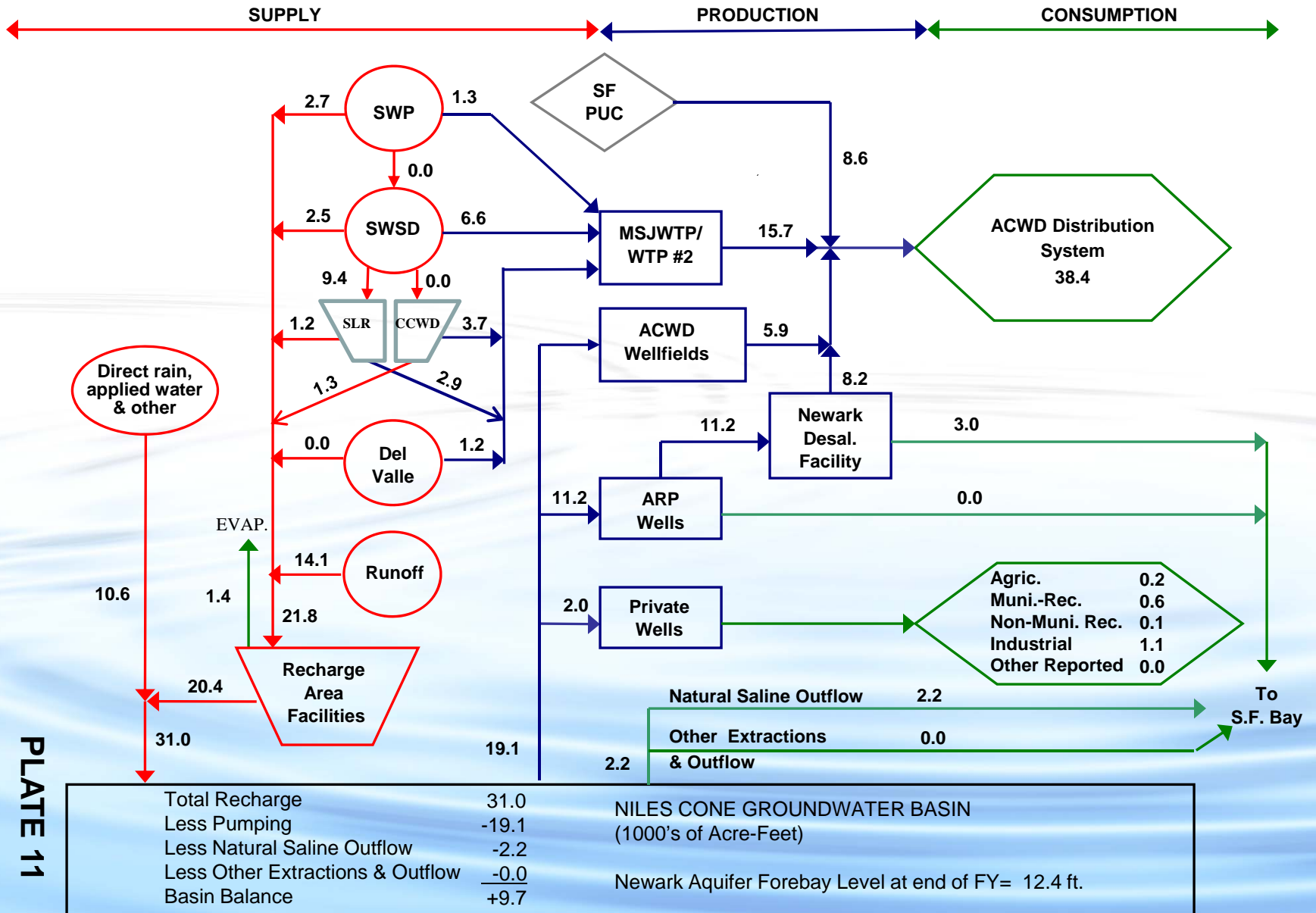
Aquifer Reclamation Program



Aquifer Reclamation Program

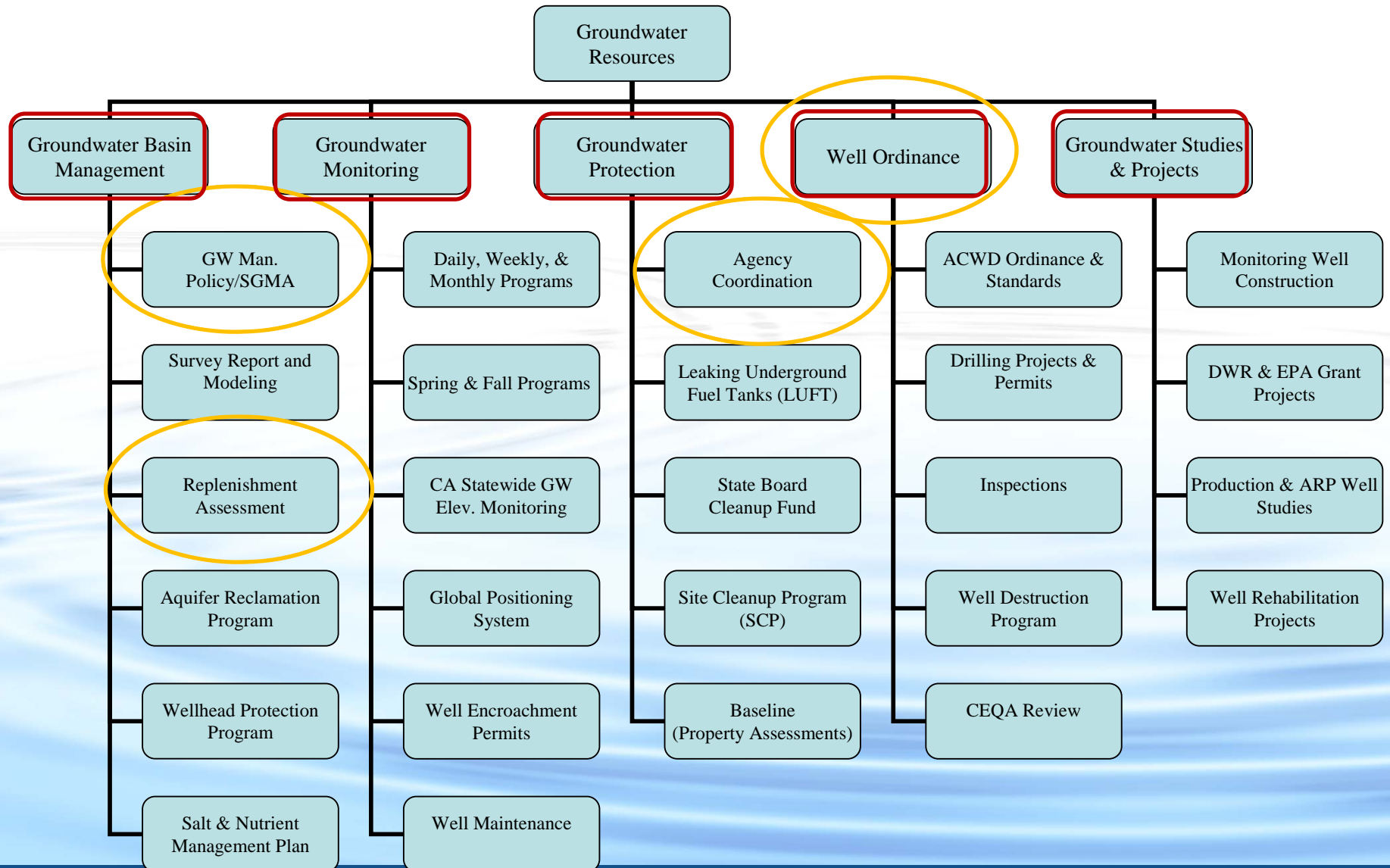


**ALAMEDA COUNTY WATER DISTRICT
WATER SUPPLY/DEMAND INVENTORY FY 2014/15 (ACTUAL*)
(1000's OF ACRE-FEET)**



* Based on actual historical conditions, but quantities herein may deviate from true values due to limitations in accuracy of flow model and /or measurements.

Groundwater Functional Org. Chart



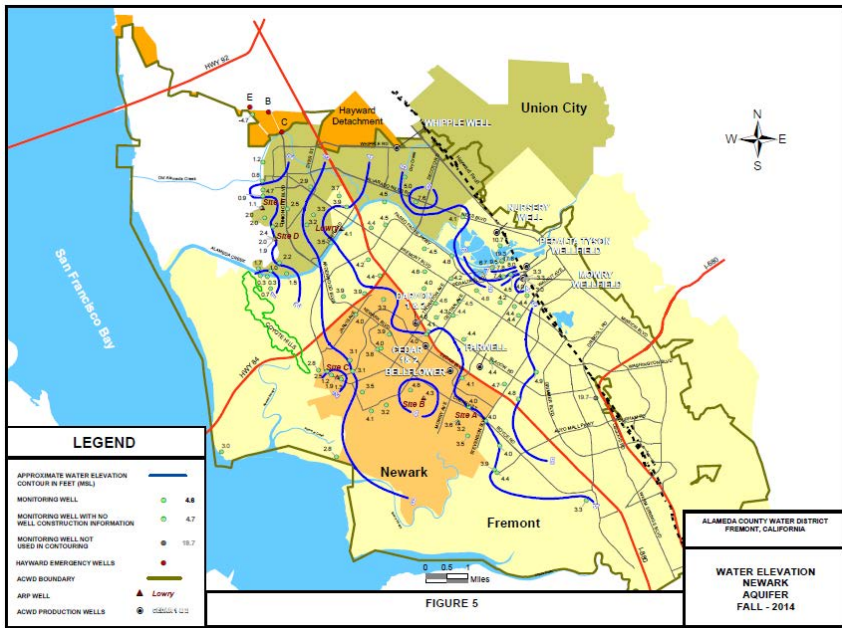
Groundwater Monitoring



MONITORING WELL WATER LEVEL MEASUREMENT



MONITORING WELL SAMPLING



Groundwater Protection Program - Cooperative Agreements



- Agreement: Oversight of the investigation and remediation of unauthorized releases that threaten groundwater.
- Scope: (1) All LUFT Sites (95 Open)
(2) Most SCP Sites (81 Open)
- Term: Indefinite
- Adopted: Regional Board – June 27, 1996
Fremont – March 25, 1997
Newark – ACDEH – Oct. 8, 2009
Union City – August 12, 1997
Hayward – July 27, 2000

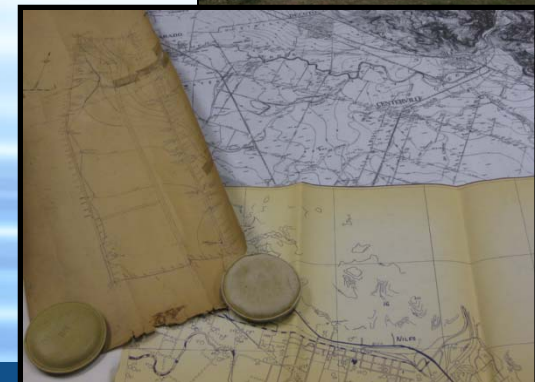
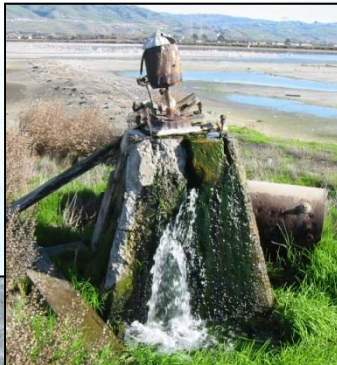


LUFT = Leaking Underground Fuel Tank; SCP = Site Cleanup Program

Well Ordinance Program-ACWD Groundwater Protection Act



- Drilling Permits (537 permits in 2015)
- Inspection (886 inspections in 2015)
- Well Records
- Historical Maps
- Well Destruction



Groundwater Studies & Projects

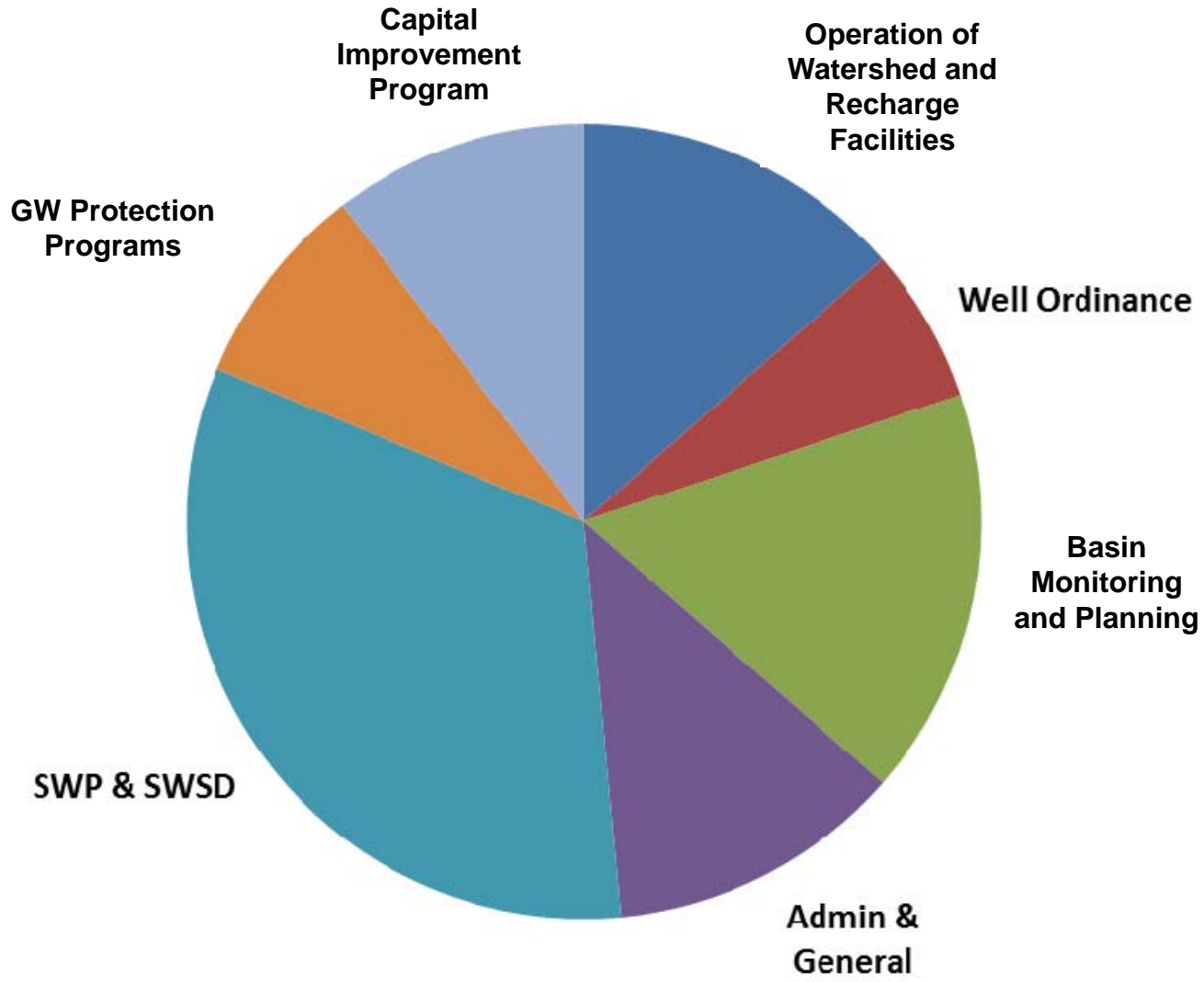


- DWR Local Groundwater Assistance Grant
- First Grant in FY 1994/95
- Recently Awarded \$225,000 in April 2014
- Total of 86 Wells Installed from Grants



FY 2016/17 PROJECTED GW BASIN COSTS

Total: \$16,055,000



Questions?



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- **West Bay Sanitary District's Recycled Project – Sharon Heights Golf Course – Phil Scott, District Manager, West Bay Sanitary District**
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Recycled Water Project – Sharon Heights GCC

BAWSCA

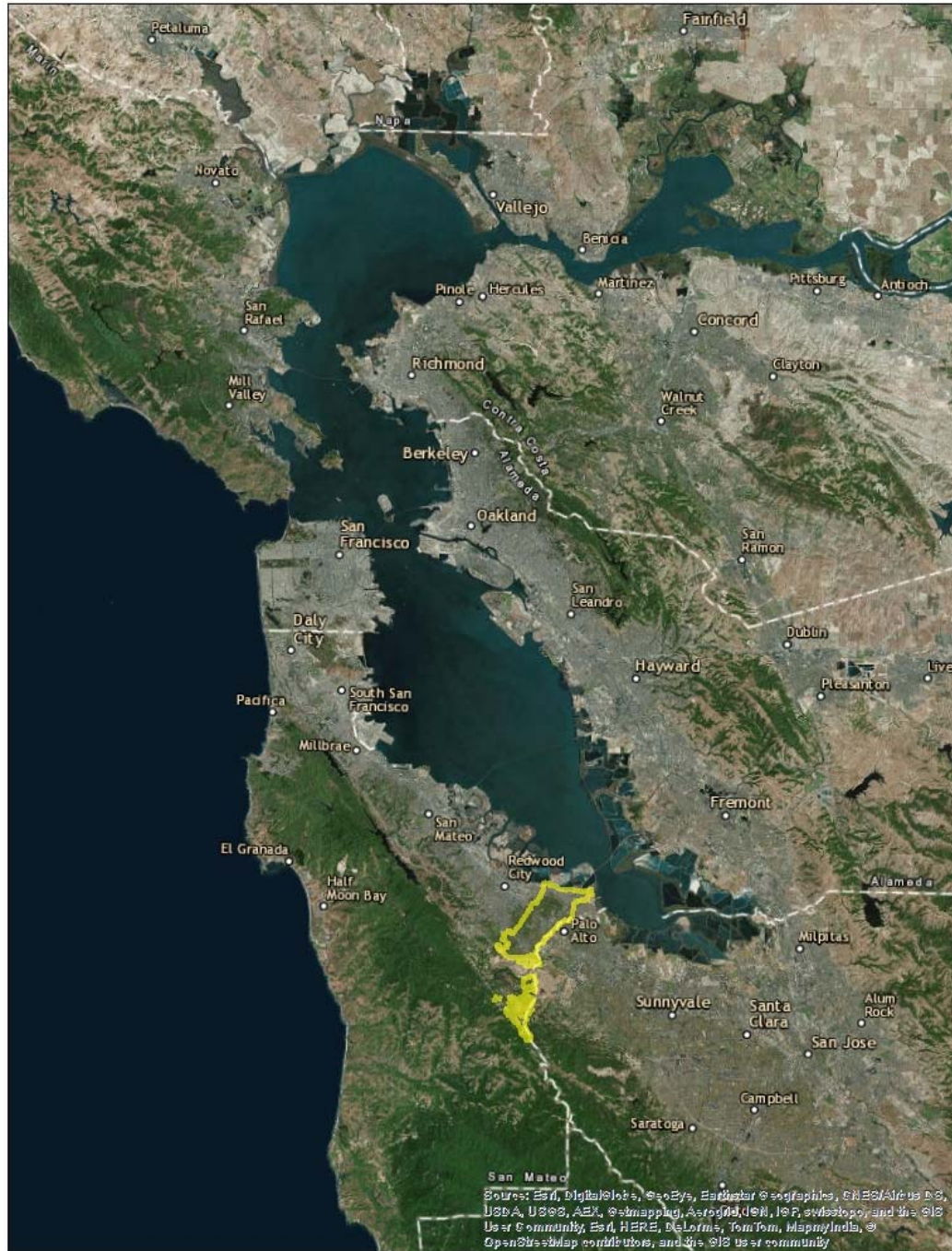
April 19, 2016

Topics

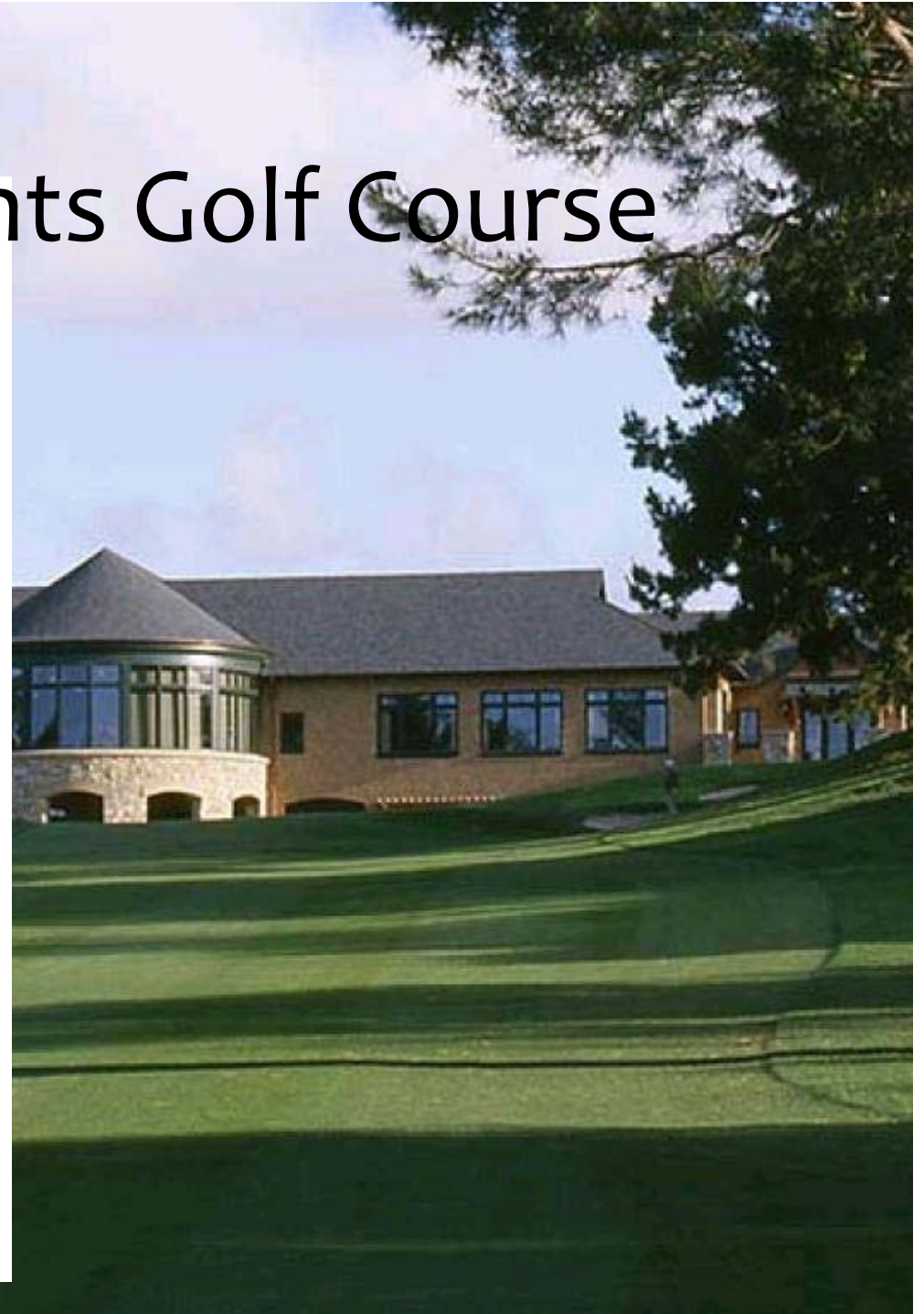
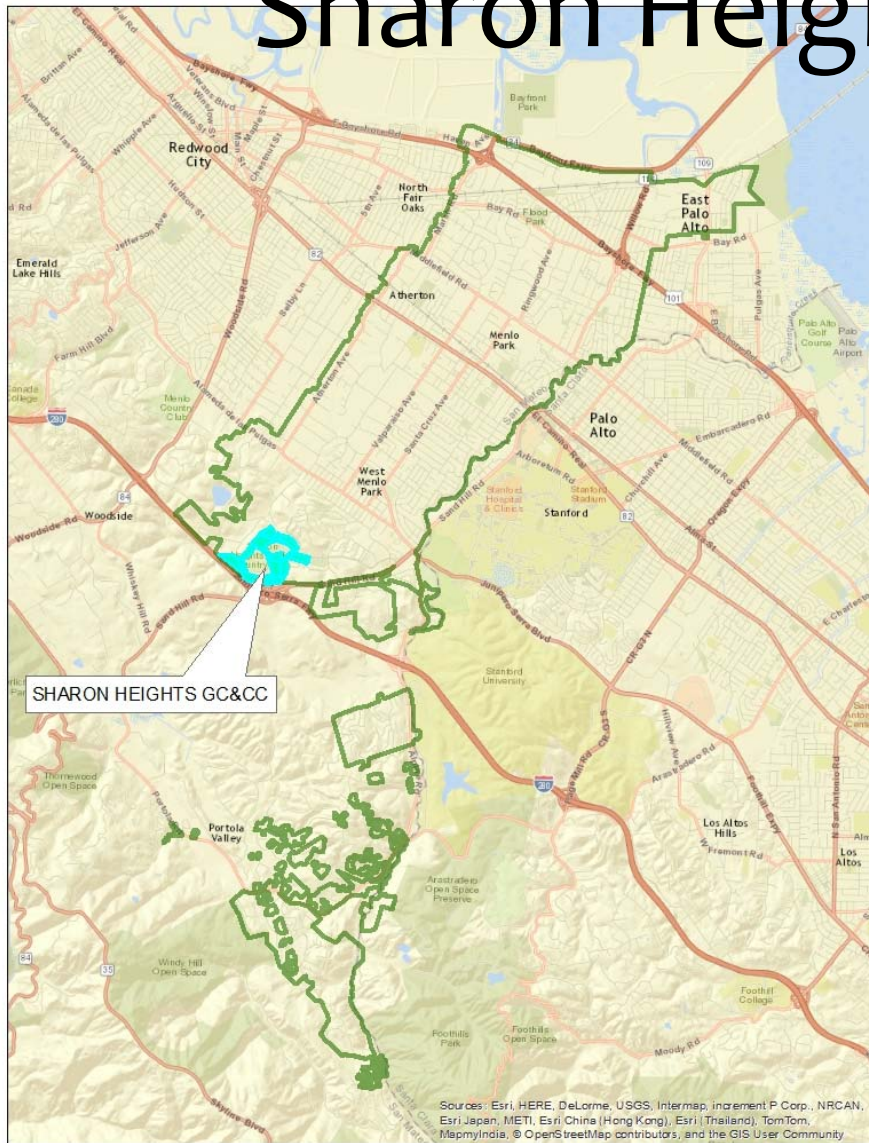
- * Overview of the *Recycled Water Project – Sharon Heights GCC*
- * Project Description
- * Anticipated Costs and Benefits of Project
- * Timeline and Current Status



Menlo Park
Atherton
Portola Valley
Portions of
East Palo Alto
San Mateo
and Santa
Clara Counties



Sharon Heights Golf Course



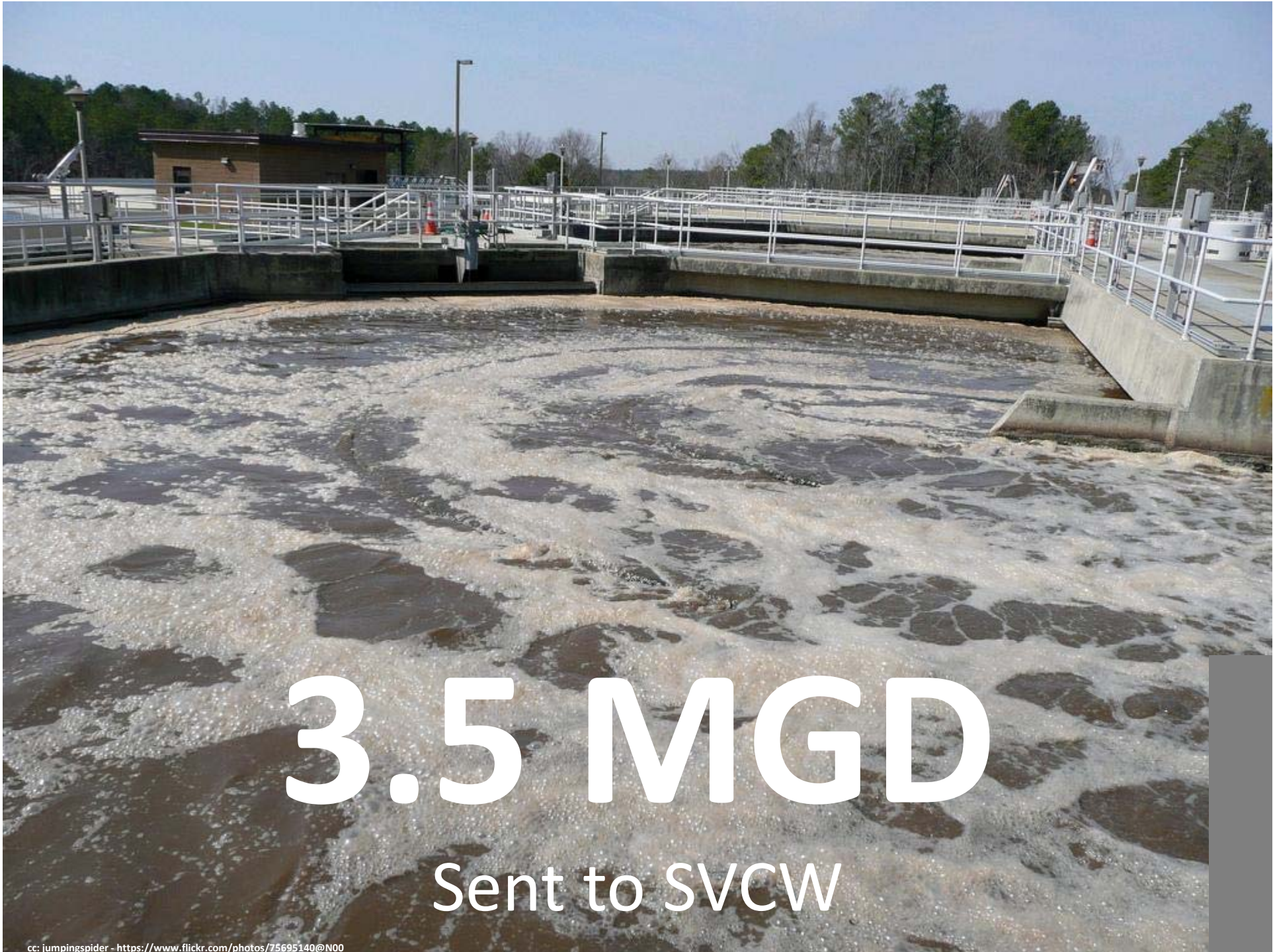
Recycled Water Project - Sharon Heights

Overview



200 miles of pipe





3.5 MGD

Sent to SVCW

West Bay & Golf Club

partner

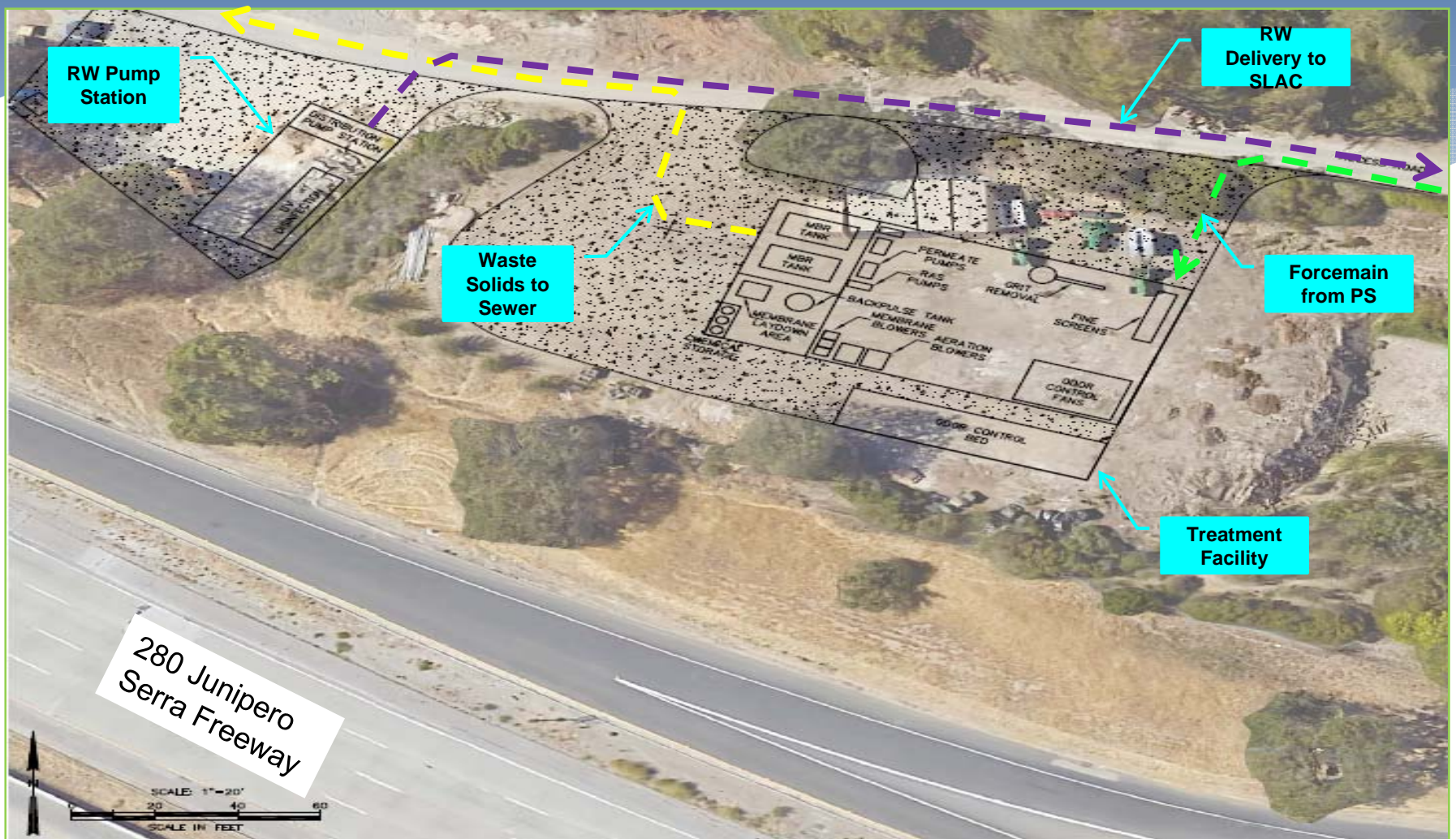


152 AFY

Non-potable demand



Project Description





Phase I

Treatment Facility

280 JUNIFERO
SERRA FREEWAY

SCALE 1"=20'

20 40 60

SCALE IN FEET

Sandhill Road

Waste Solids Discharge to Existing Sewer

Sharon Land Co (10 AFY)

Sharon Heights Golf Course (152 AFY)

Sand Hill Commons (11 AFY)

8" Forc

Sand Hill Road

6" RW Discharge to SLAC

Rosewood Sand Hill (24 AFY)

SLAC (25 AFY)

SLAC Cooling Tower (59 AFY)

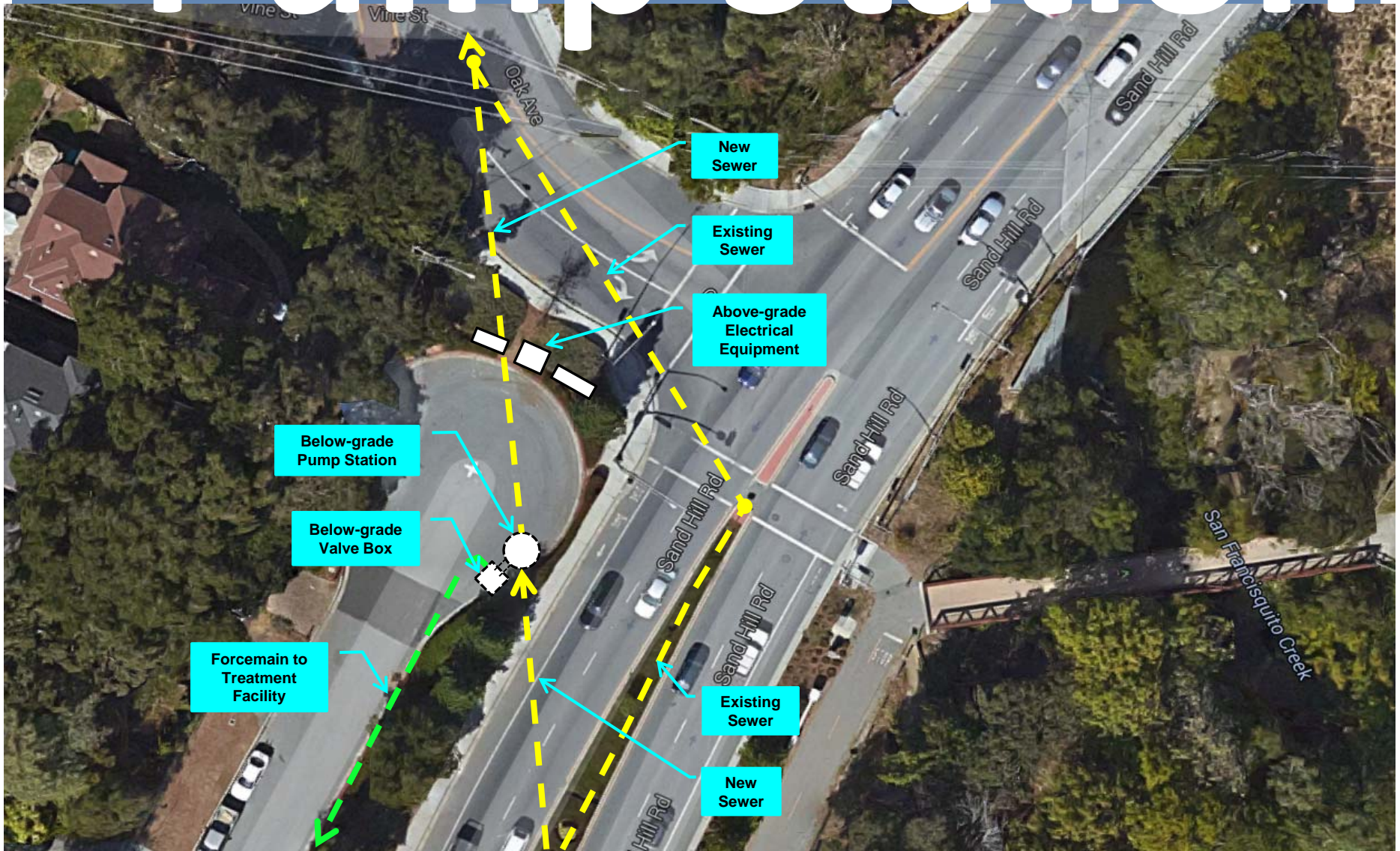
Highway 280

0.2 0.4 Miles

Legend

- Treatment Plant
- Industrial Site
- Potential
- Commercial
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Pump Station



SLAC

Phase II

84 AFY

HOA's

Phase III

44 AFY



Costs & Benefits





Sharon Heights only

Cap X \$15.6M,
O&M \$233k/yr,
Unit cost \$6,100/AF



Project Benefits



152 AFY

Recycled Water



New water supply



Use Less Potable Water



Reliability



A photograph of a field of grass, with some blades appearing green and others yellowish-brown, suggesting a mix of species or a dry season. The text '20 by 2020' is overlaid in a large, white, sans-serif font at the top of the image.

20 by 2020

water conservation goals

Timeline



DUC 354-350-351-346

Design 2016



Phase I

2017

Irrigate

Phase II - 2018+





Phase III - 2019+

Questions





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San Mateo County's Assessment of San Mateo Plain Sub-basin

April 19, 2016

San Mateo Plain Groundwater
Reliability Partnership

Environmental Health Services

Heather Forshey, Director

Charles Ice, Groundwater Protection Program Lead



COUNTY OF SAN MATEO
HEALTH SYSTEM

County's Objectives for Assessment of San Mateo Plain Sub-Basin

- Assess the groundwater resources, current usage, and current condition
 - Evaluate the hydrogeologic and groundwater conditions of the entire sub-basin
 - Evaluate surface water and groundwater interactions in the sub-basin
 - Evaluate threats to the sub-basin quality and quantity
 - Assess recharge areas
 - Interactions with adjacent basins and sub-basins

Environmental Health Services

Heather Forshey, Director

Charles Ice, Groundwater Protection Program Lead



COUNTY OF SAN MATEO
HEALTH SYSTEM

County's Objectives for Assessment of San Mateo Plain Sub-Basin

- Some more details
 - Data compilation, unification, and sharing
 - Basin hydrogeologic conceptual model
 - Basin water balance
 - Assess threats to water quality
 - Initial basin conceptual model
 - Groundwater numerical model
 - Fill data gaps
 - Update and refine hydrogeologic and numerical models
 - Scenario evaluations

Environmental Health Services

Heather Forshey, Director

Charles Ice, Groundwater Protection Program Lead



COUNTY OF SAN MATEO
HEALTH SYSTEM

County's Objectives for Assessment of San Mateo Plain Sub-Basin

- Describe all of the various groundwater management strategies available and identify all GSA-eligible and non-GSA-eligible agencies and various interested stakeholder groups
- Identify long-term strategies to sustainably manage groundwater resources through local policies and cooperative relationships

Environmental Health Services

Heather Forshey, Director

Charles Ice, Groundwater Protection Program Lead



COUNTY OF SAN MATEO
HEALTH SYSTEM

County's Actions in San Mateo Plain Sub-Basin

- Measure A Letter of Intent (January 2015)
- Revised Groundwater Assessment Plan for San Mateo Plain (September 2015)
- Resolution to Board approving contract with Erler and Kalinowski, Inc., Todd Groundwater, and Hydrofocus (April 2016)
- Tentative 1st Workshop May 17, 2016 City of San Mateo Library, Oak Room

Environmental Health Services

Heather Forshey, Director

Charles Ice, Groundwater Protection Program Lead



COUNTY OF SAN MATEO
HEALTH SYSTEM



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Next Steps

- BAWSCA board to fund ongoing efforts of the Groundwater Reliability Partnership
- BAWSCA to continue to host meetings to further goals:
 - Increased understanding of the hydrology and geology of the Basin
 - Serving as a forum for sharing information among all stakeholders
 - Continued sustainable use of the Basin to maintain groundwater quality and quantity and protect beneficial uses