



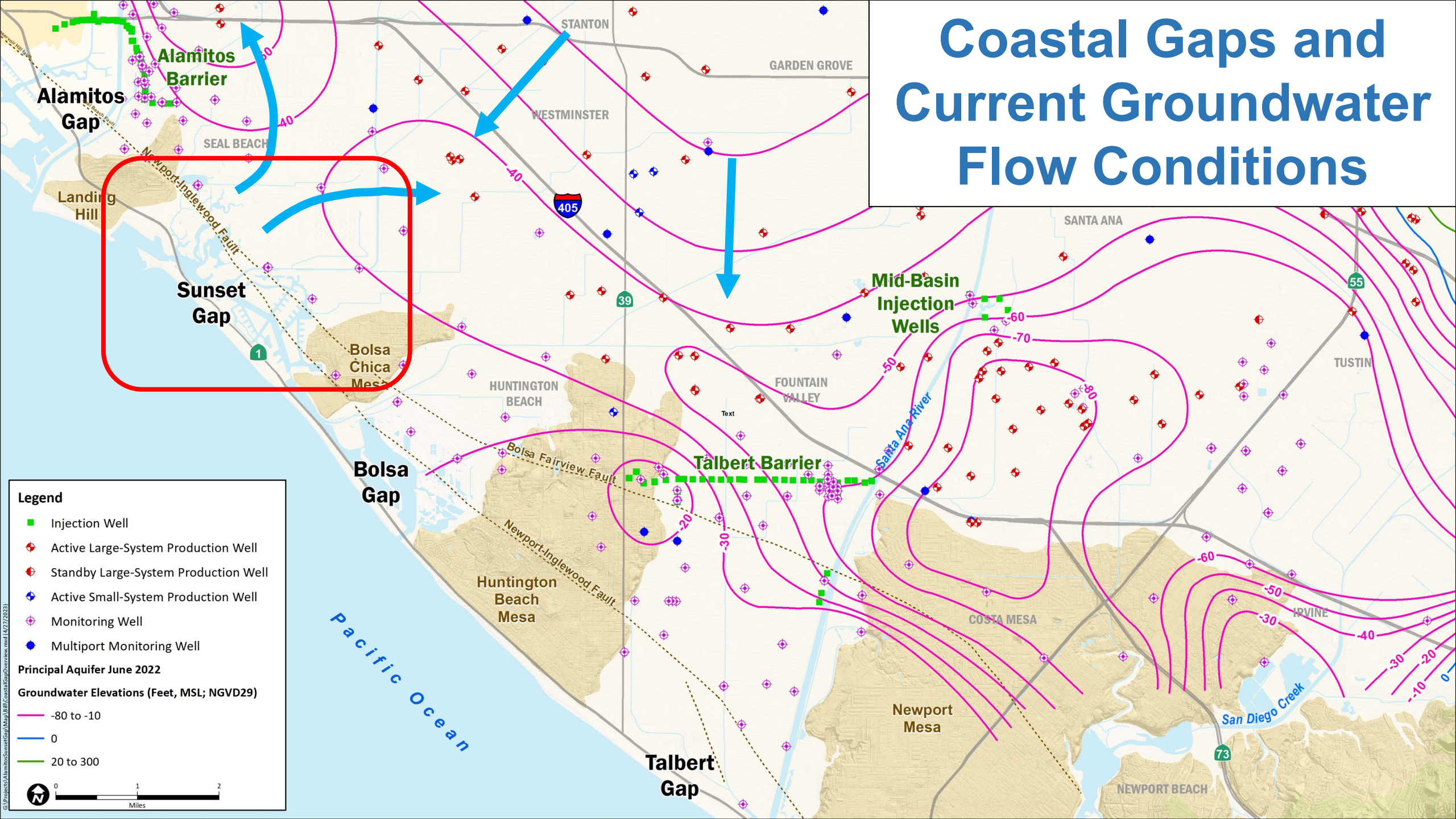
Sunset Gap Seawater Barrier Feasibility Study

Bill Leever, PG, CHg
Principal Hydrogeologist

Pre-Proposal Meeting
May 31, 2023



Coastal Gaps and Current Groundwater Flow Conditions



Legend

- Injection Well
- Active Large-System Production Well
- Standby Large-System Production Well
- Active Small-System Production Well
- Monitoring Well
- Multipoint Monitoring Well

Principal Aquifer June 2022

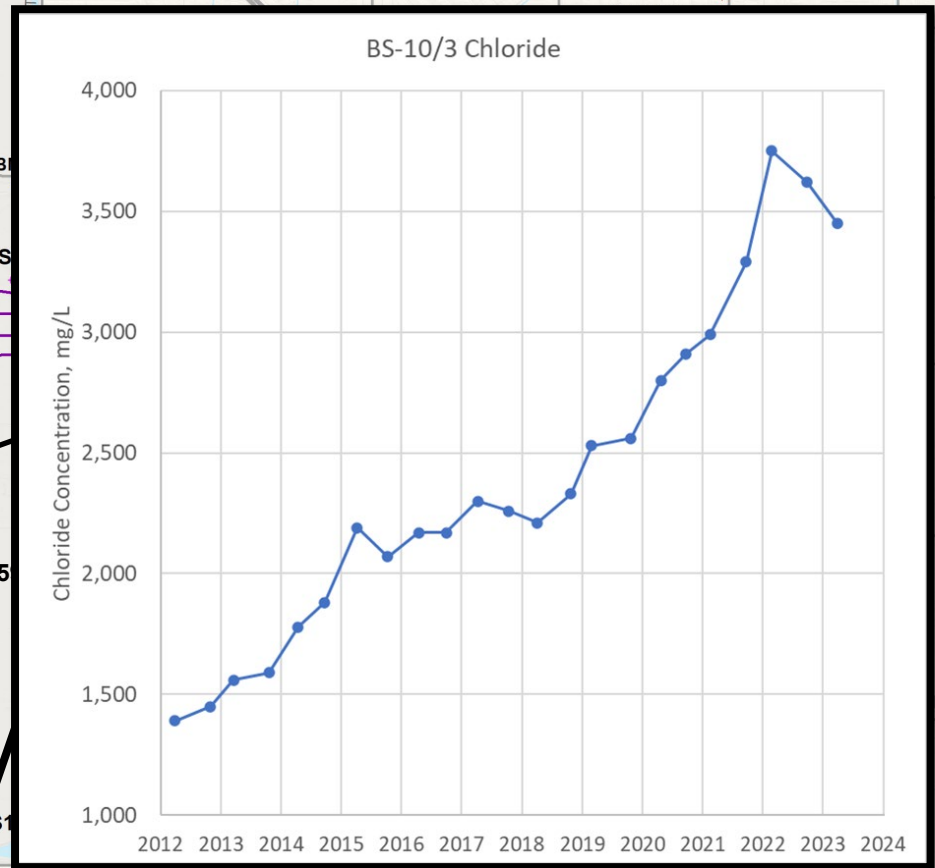
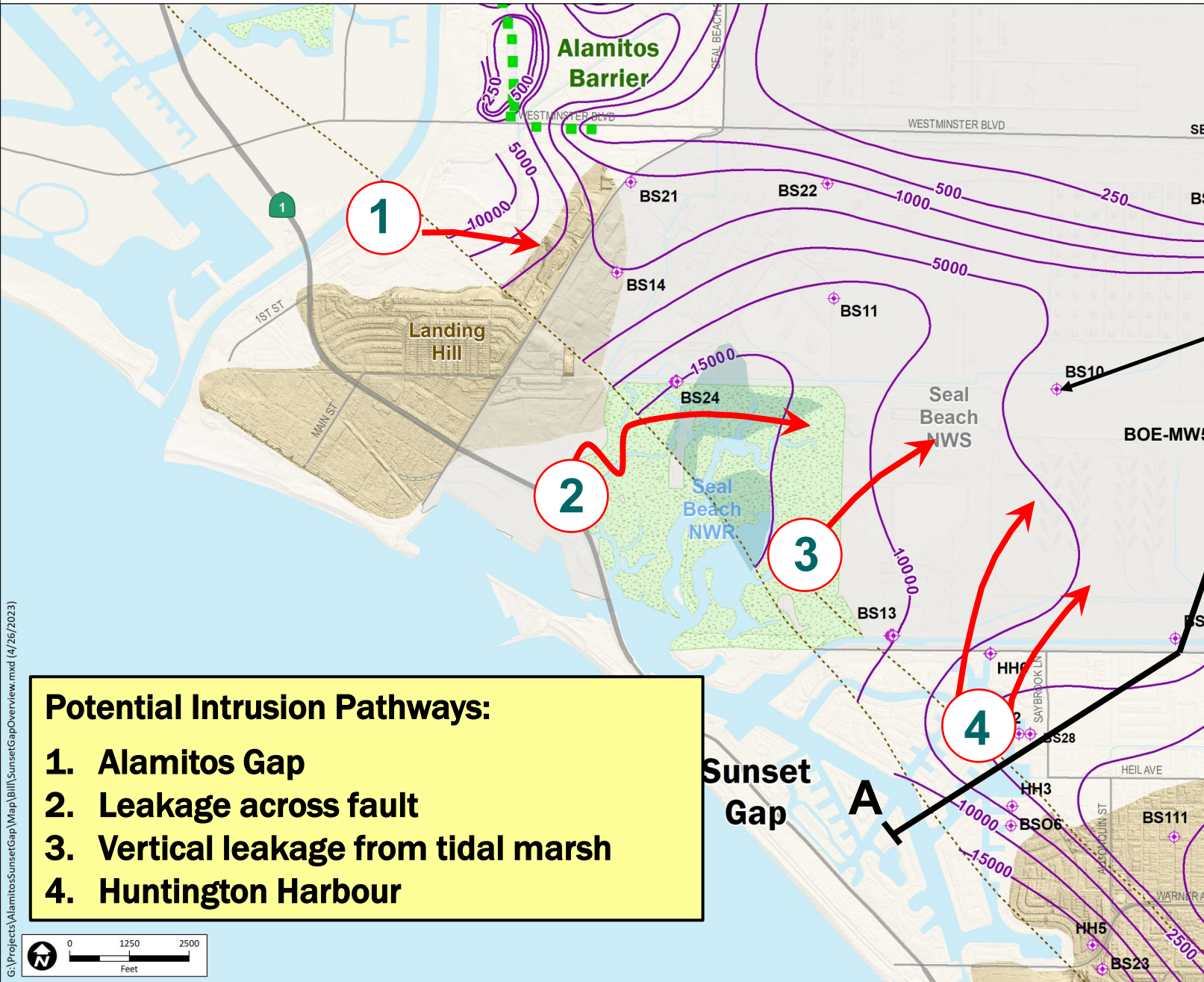
Groundwater Elevations (Feet, MSL; NGVD29)

- 80 to -10
- 0
- 20 to 300

0 1 2 Miles

G:\Projects\Alamos\SunsetGap\Map\All CoastalGapsOverview.mxd (4/27/2023)

Seawater Intrusion Pathways



- Potential Intrusion Pathways:**
- 1. Alamos Gap**
 - 2. Leakage across fault**
 - 3. Vertical leakage from tidal marsh**
 - 4. Huntington Harbour**

Beta/Lambda Aquifer Chloride (mg/L) Fall 2022

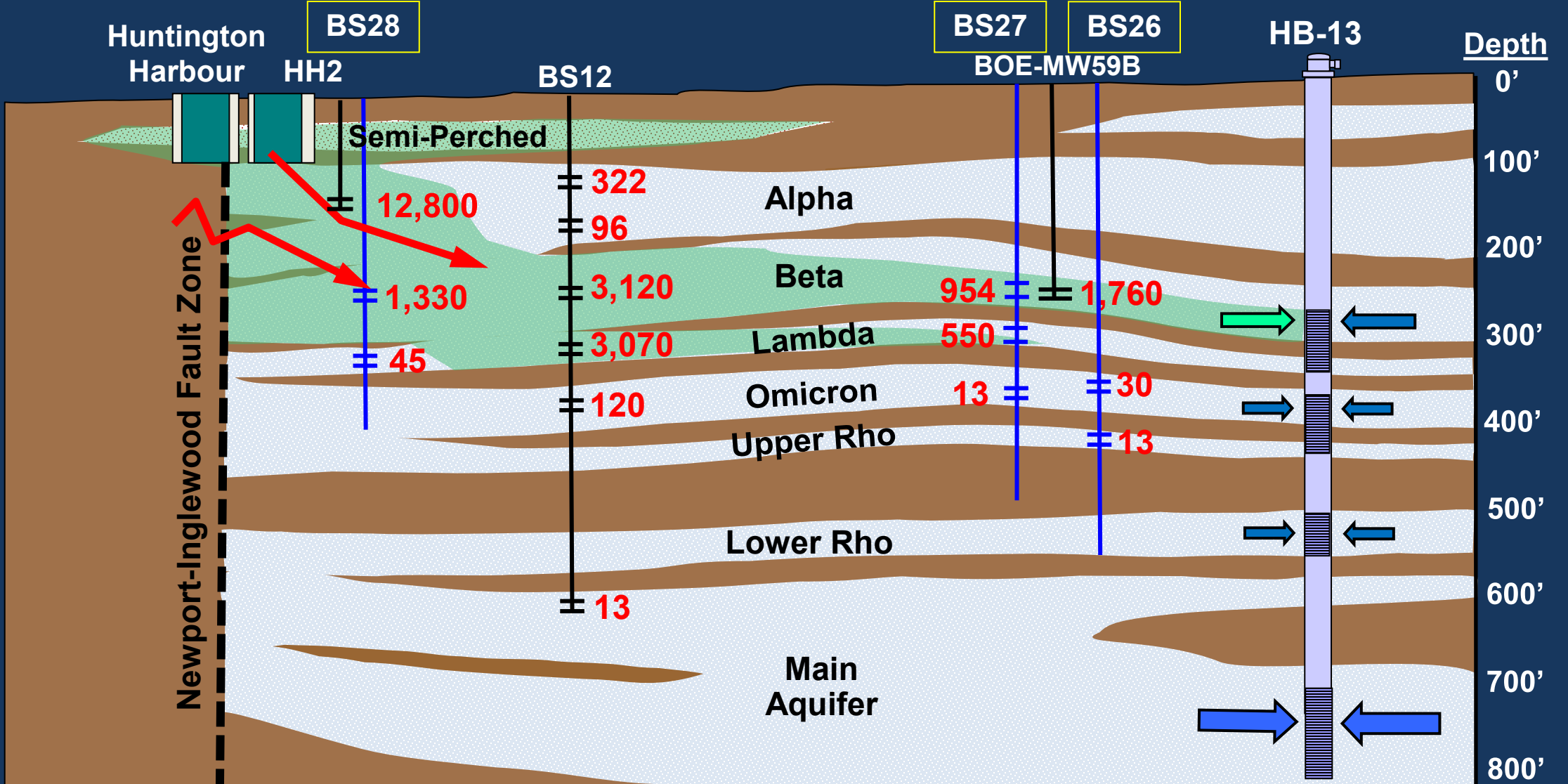
G:\Projects\Alamos\SunsetGap\Wrap\Bill\SunsetGapOverview.mxd (4/26/2023)



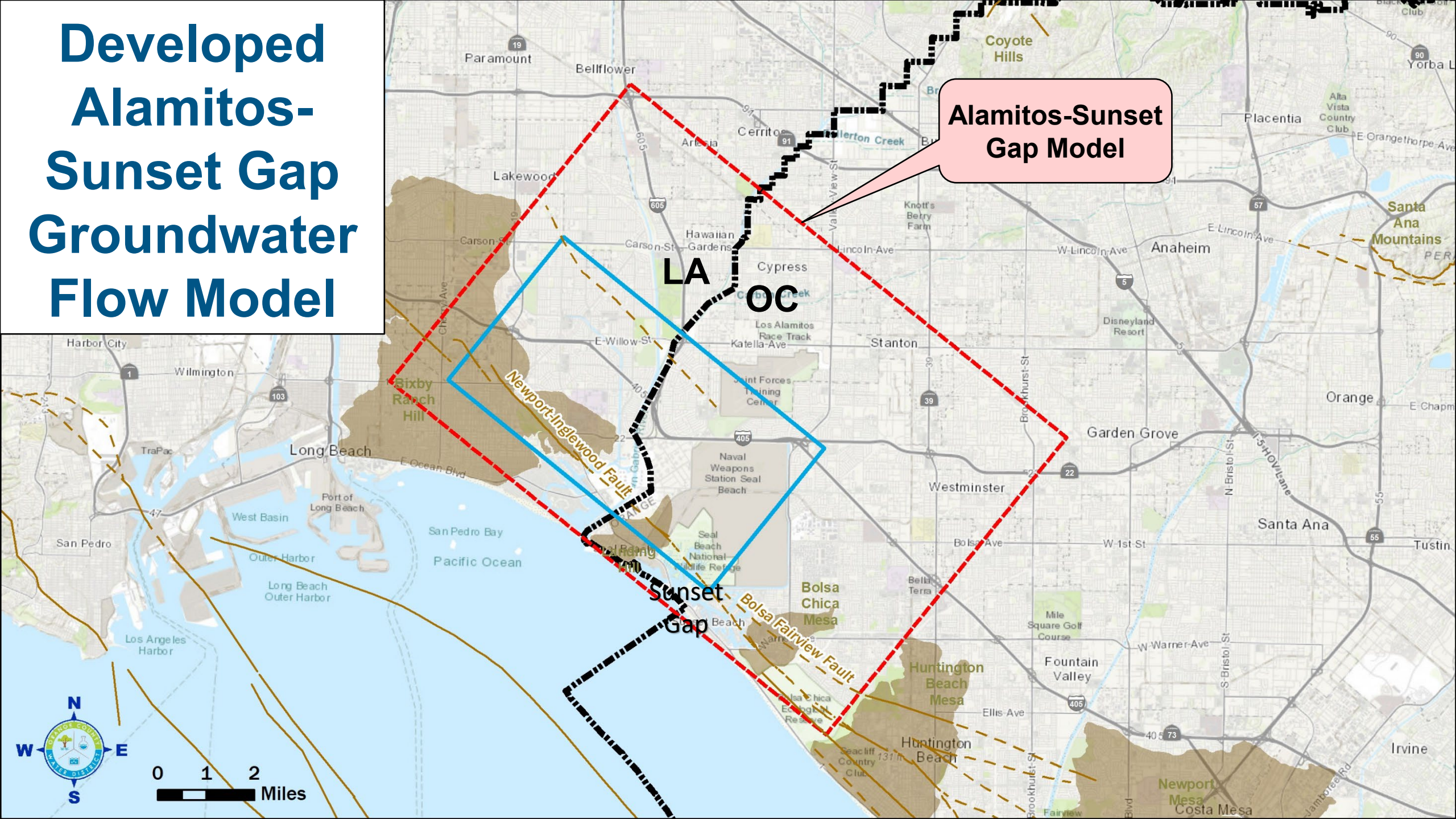
Seawater is intruding inland towards Huntington Beach production wells primarily in the Beta Aquifer.

South

North



Developed Alamitos- Sunset Gap Groundwater Flow Model



Alamitos-Sunset
Gap Model

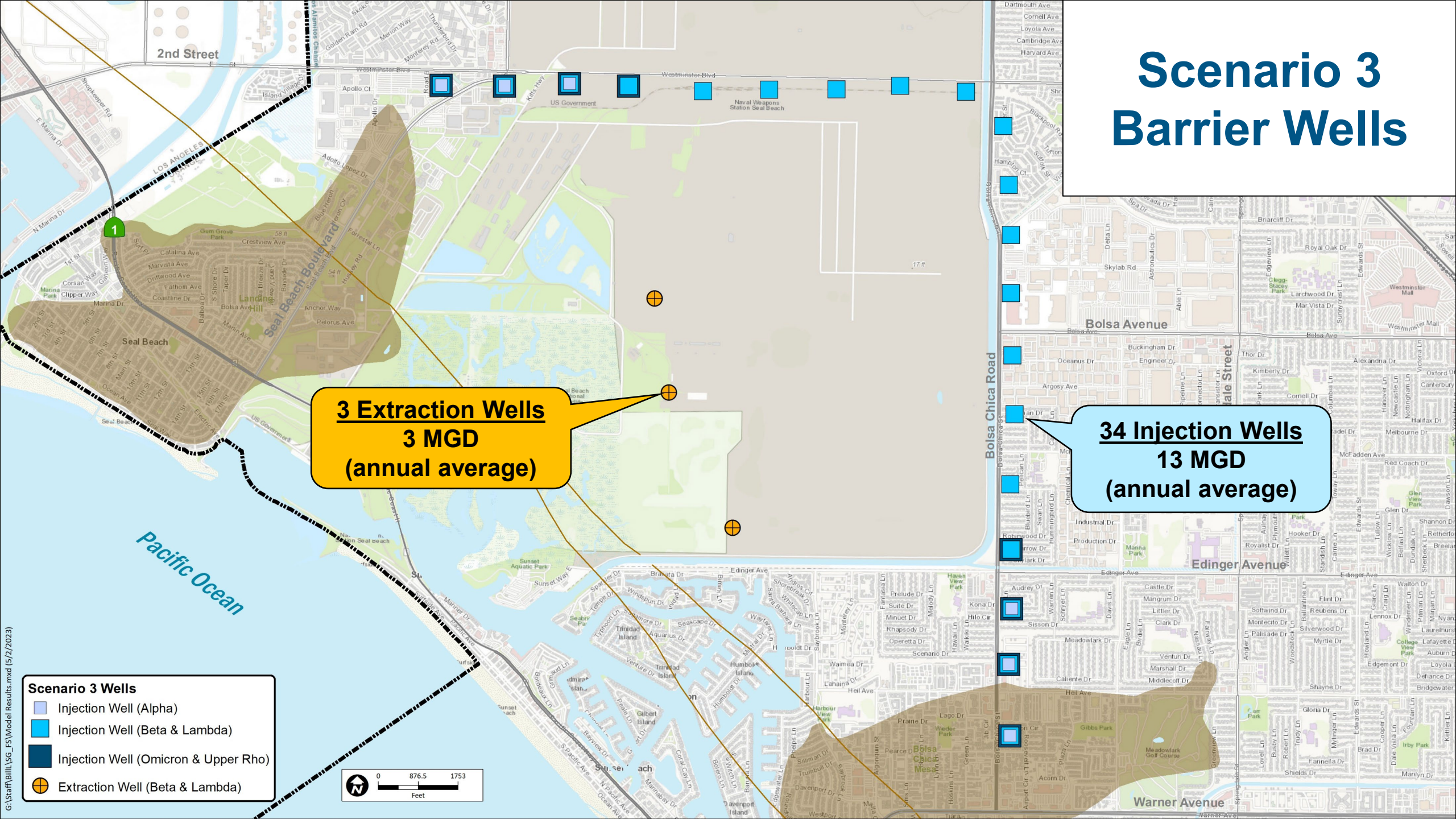
LA
OC

Sunset
Gap



0 1 2
Miles

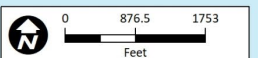
Scenario 3 Barrier Wells



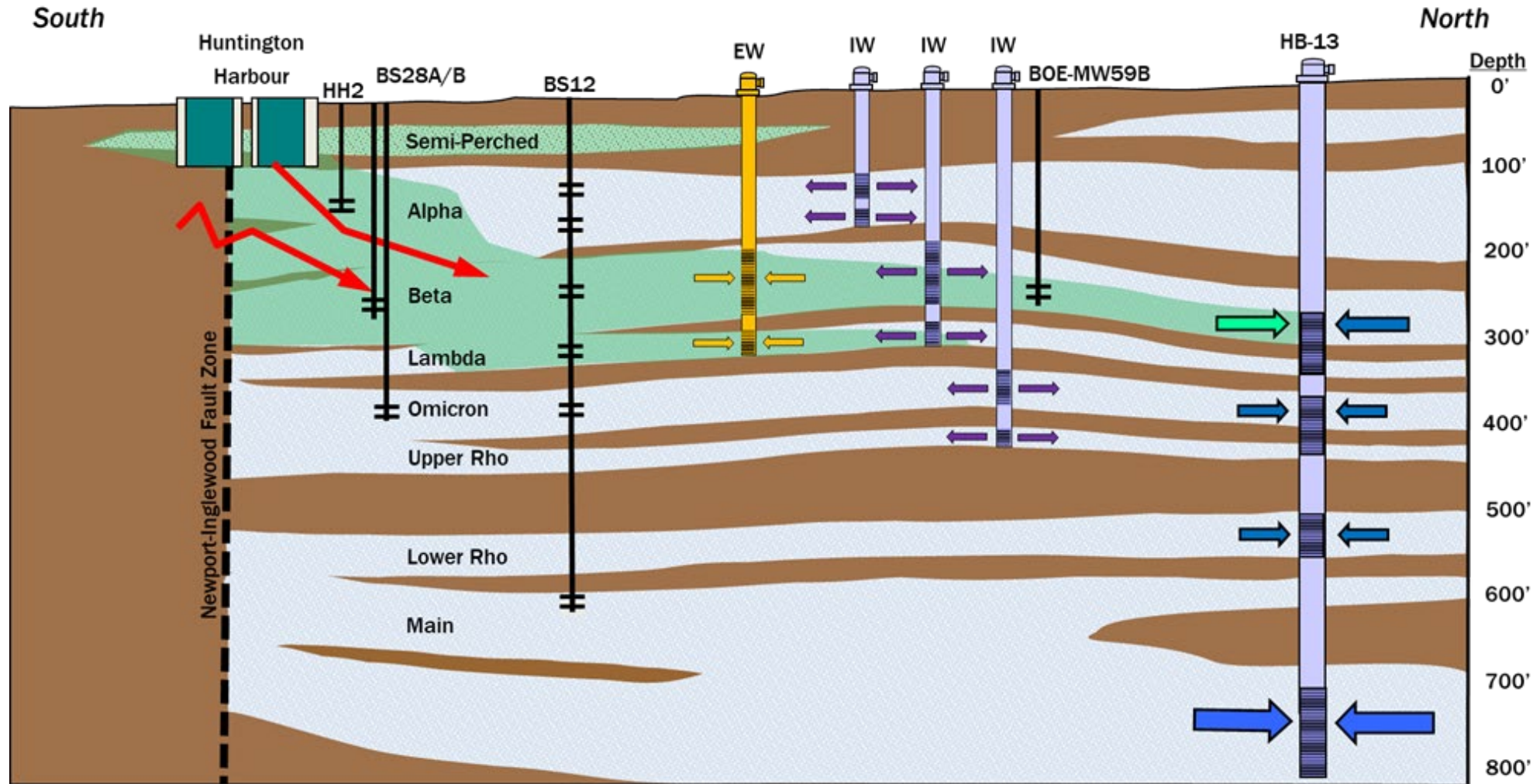
3 Extraction Wells
3 MGD
(annual average)

34 Injection Wells
13 MGD
(annual average)

- Scenario 3 Wells**
- Injection Well (Alpha)
 - Injection Well (Beta & Lambda)
 - Injection Well (Omicron & Upper Rho)
 - Extraction Well (Beta & Lambda)



Schematic Barrier Concept



Scenario 3 Predictive Chloride Beta Aquifer

Scenario 3 Wells

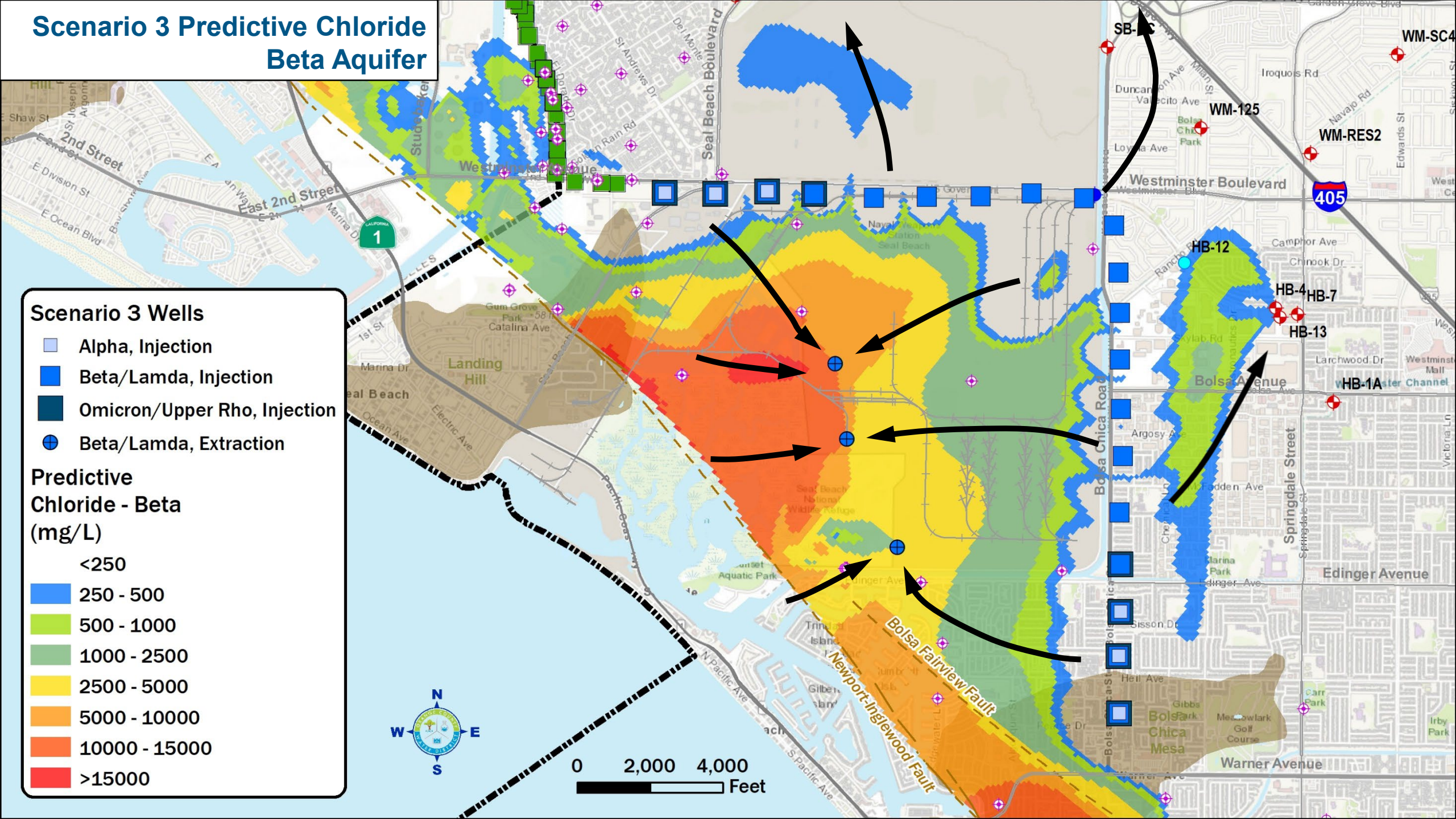
- Alpha, Injection
- Beta/Lamda, Injection
- Omicron/Upper Rho, Injection
- ⊕ Beta/Lamda, Extraction

Predictive Chloride - Beta (mg/L)

- <250
- 250 - 500
- 500 - 1000
- 1000 - 2500
- 2500 - 5000
- 5000 - 10000
- 10000 - 15000
- >15000

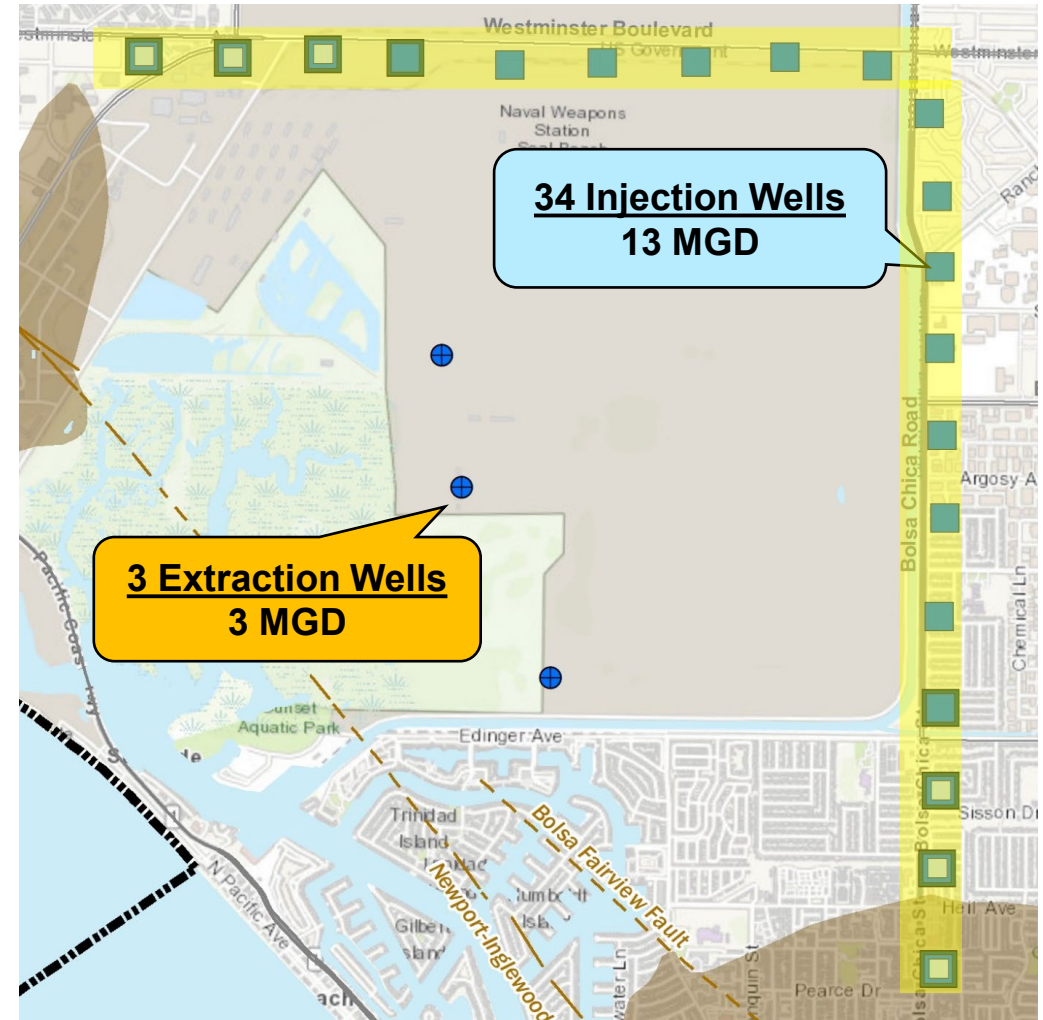


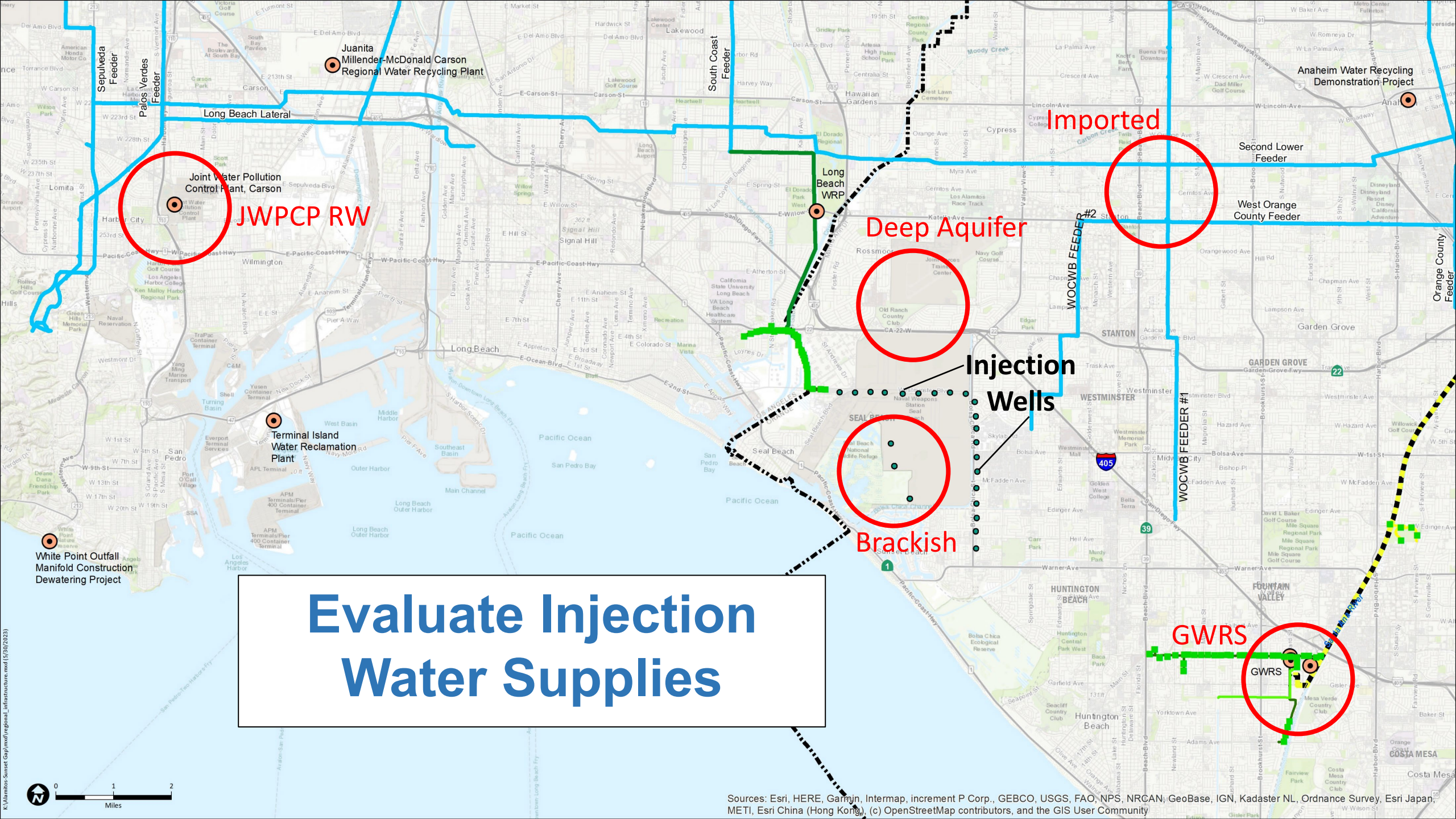
0 2,000 4,000 Feet



Feasibility Study Scope of Work

- Evaluate injection water supply
 - GWRS
 - Imported water
 - Deep aquifer groundwater
 - MWD's Carson plant
 - Brackish groundwater





Evaluate Injection Water Supplies

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Feasibility Study Scope of Work

- Evaluate injection water supply

- GWRS
- Imported water
- Deep aquifer groundwater
- MWD's Carson plant
- Brackish groundwater

Deliverable
Workshop 1
TM 1

- Extraction well siting and groundwater discharge

- Injection water supply
- Sewer
- Surface waters

Deliverable
Workshop 2
TM 2

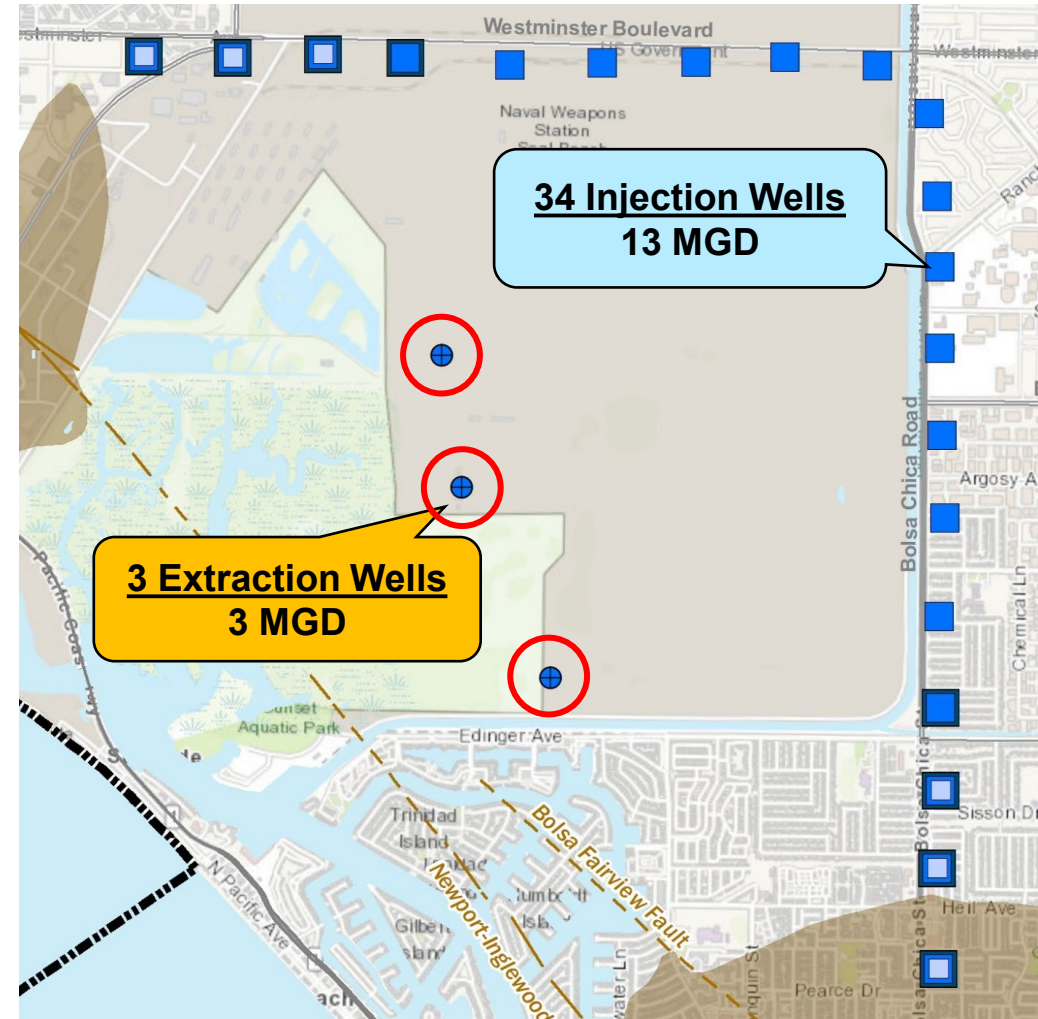
- Injection barrier alignment

- Project concept, 10% design and construction

- Feasibility Study report

- Test well implementation plan

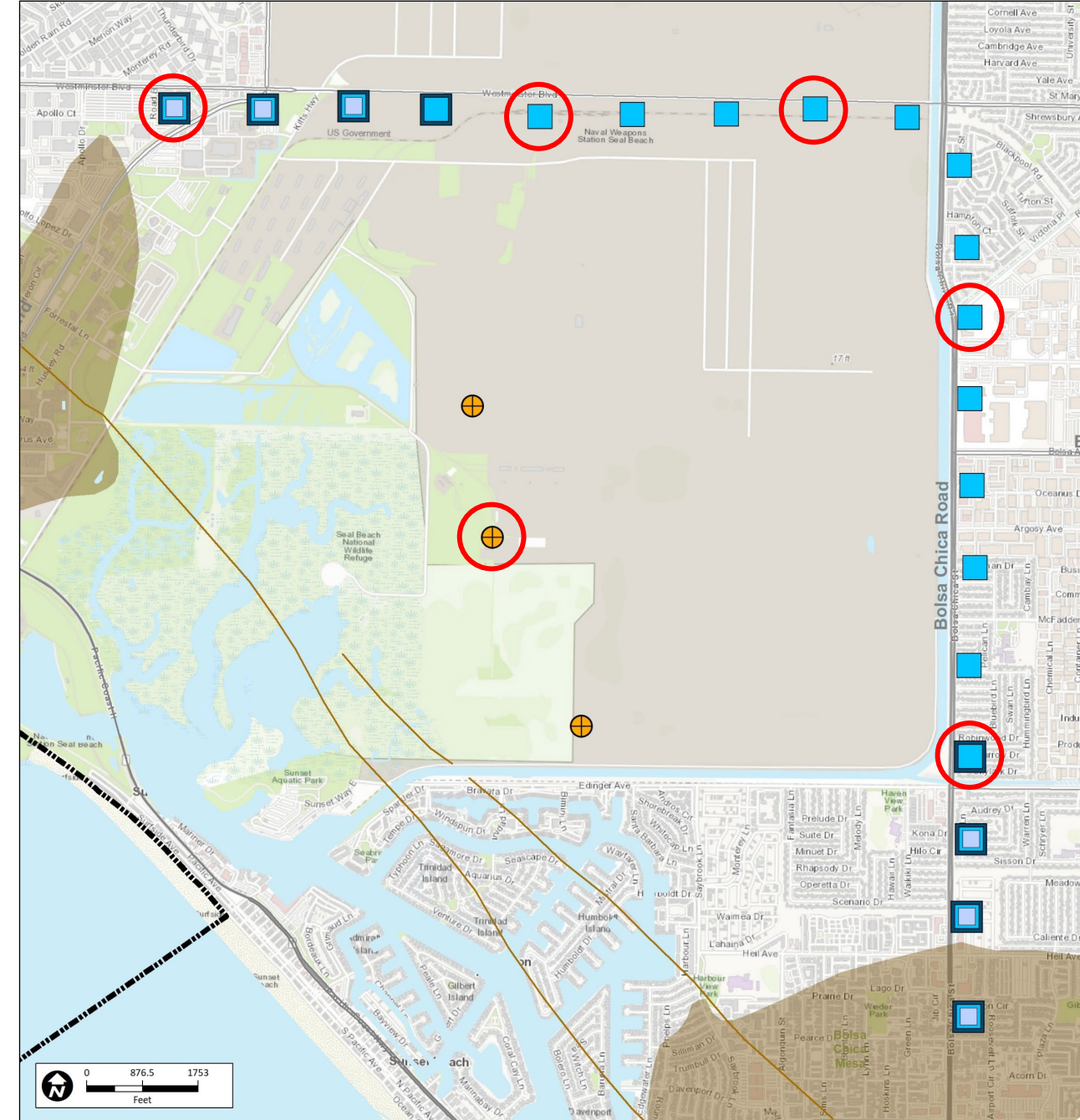
Deliverable
Workshop 3
TM 3



Test Well Implementation Plan

Produce sufficient hydrogeologic data (K,T,S) to refine the number, spacing, and flow rate of the barrier wells

- Test Wells (will become part of future barrier)
 - 9 injection wells at 5 sites
 - 1 Beta/Lambda extraction well
 - 1 Deep aquifer supply well (if needed)
 - 10 monitoring wells at 5 sites
- Plan
 - 30% design of all testing components
 - Data collection equipment and methods
 - Data analysis and interpretation methods
 - Permitting requirements
 - Engineer's estimate for construction, testing, data analysis, and reporting



Schedule



- RFP Issued: May 18, 2023
- Proposals Due: **June 30, 2023, 10:00 a.m.**
- Award Agreements: September 21, 2023
- Kick-off Meeting: October 4, 2023
- Final FS Report: October 4, 2024



QUESTIONS?

