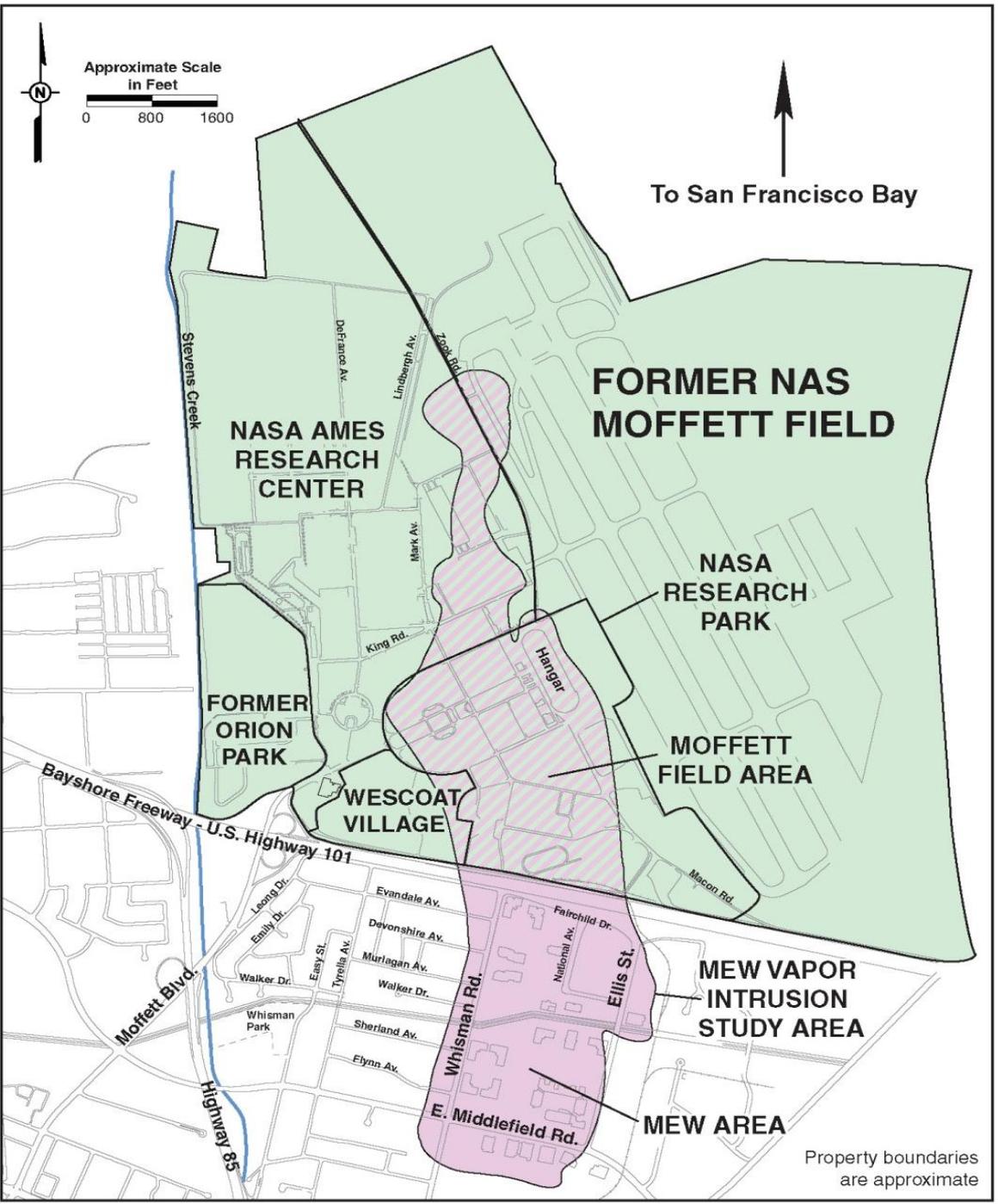


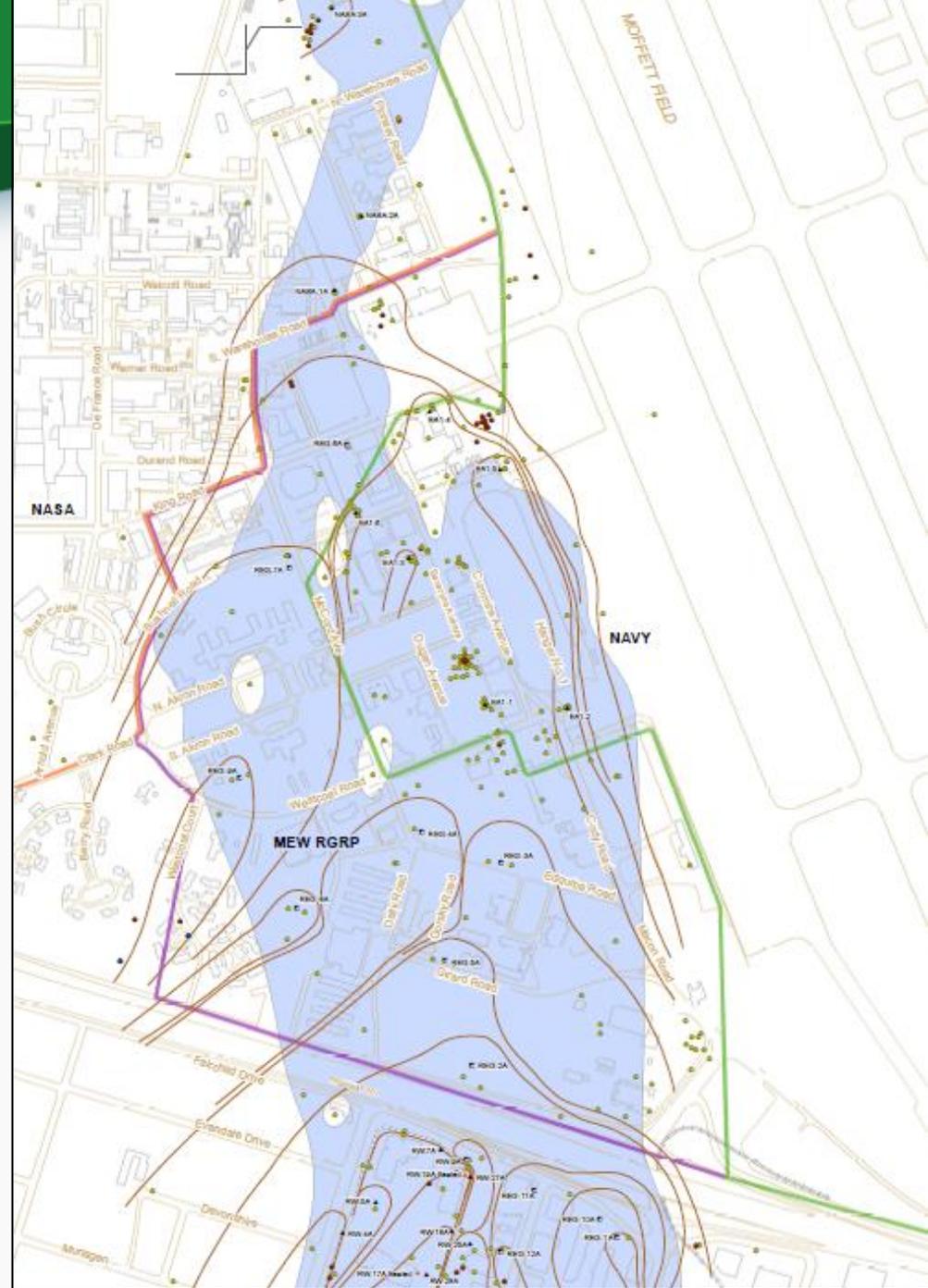
A large, faint watermark of the EPA logo is centered in the background. The logo features a stylized flower with three leaves and a circular head, surrounded by the text "UNITED STATES ENVIRONMENTAL PROTECTION AGENCY".

EPA Regional Groundwater and Vapor Intrusion Update

**NAS Moffett Field
Restoration Advisory Board Meeting
February 7, 2013**

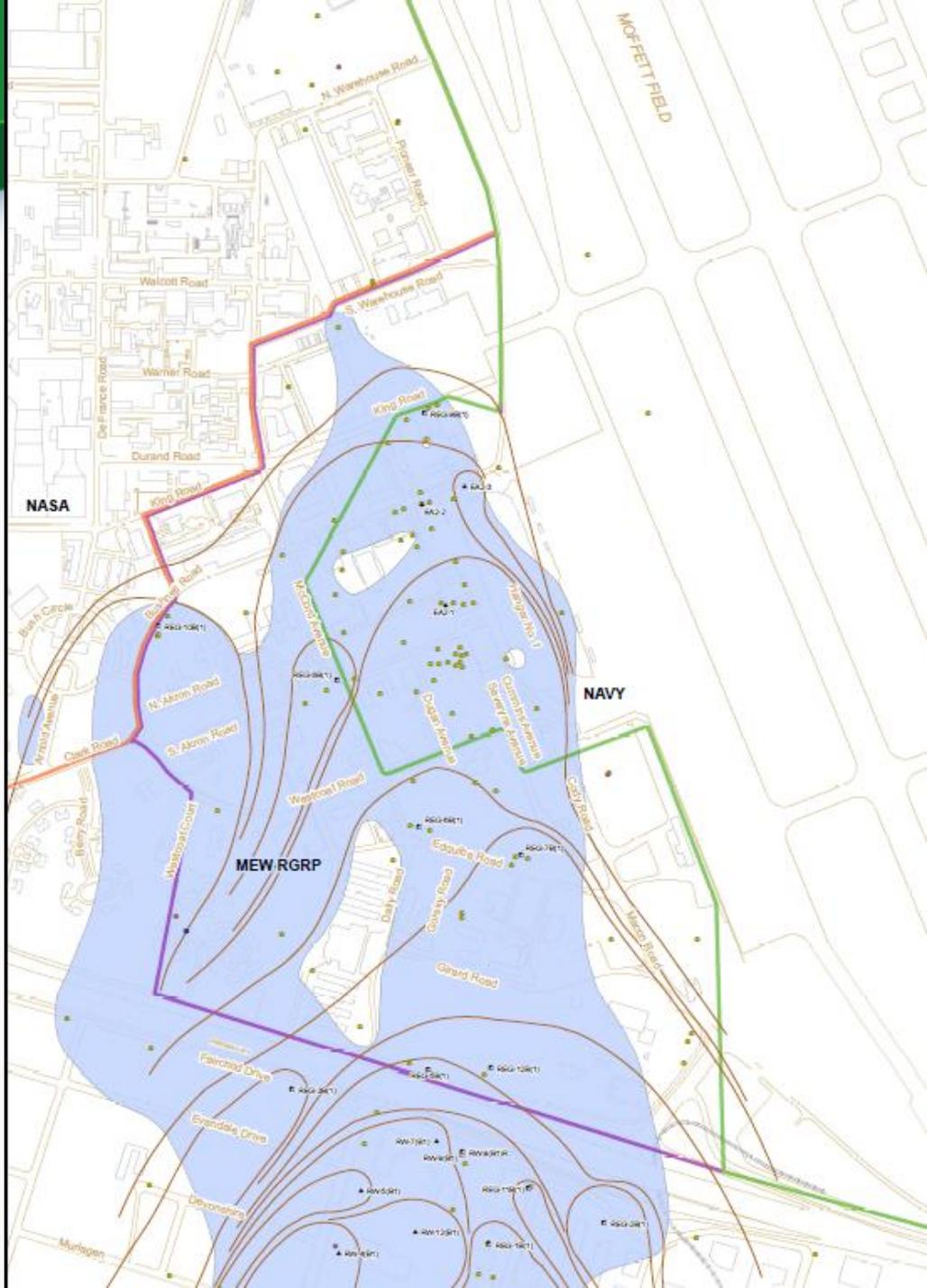


TCE Plume and Estimated Capture Zone – A/A1 Aquifer (0 - 45 feet below ground surface)



TCE Plume and Estimated Capture Zone - B1/A2 Zone

(50 - 75 feet bgs)



TCE Plume Estimated Capture Zone – B2 Aquifer (75 - 110 feet bgs)



Hydraulic Containment Work Completed

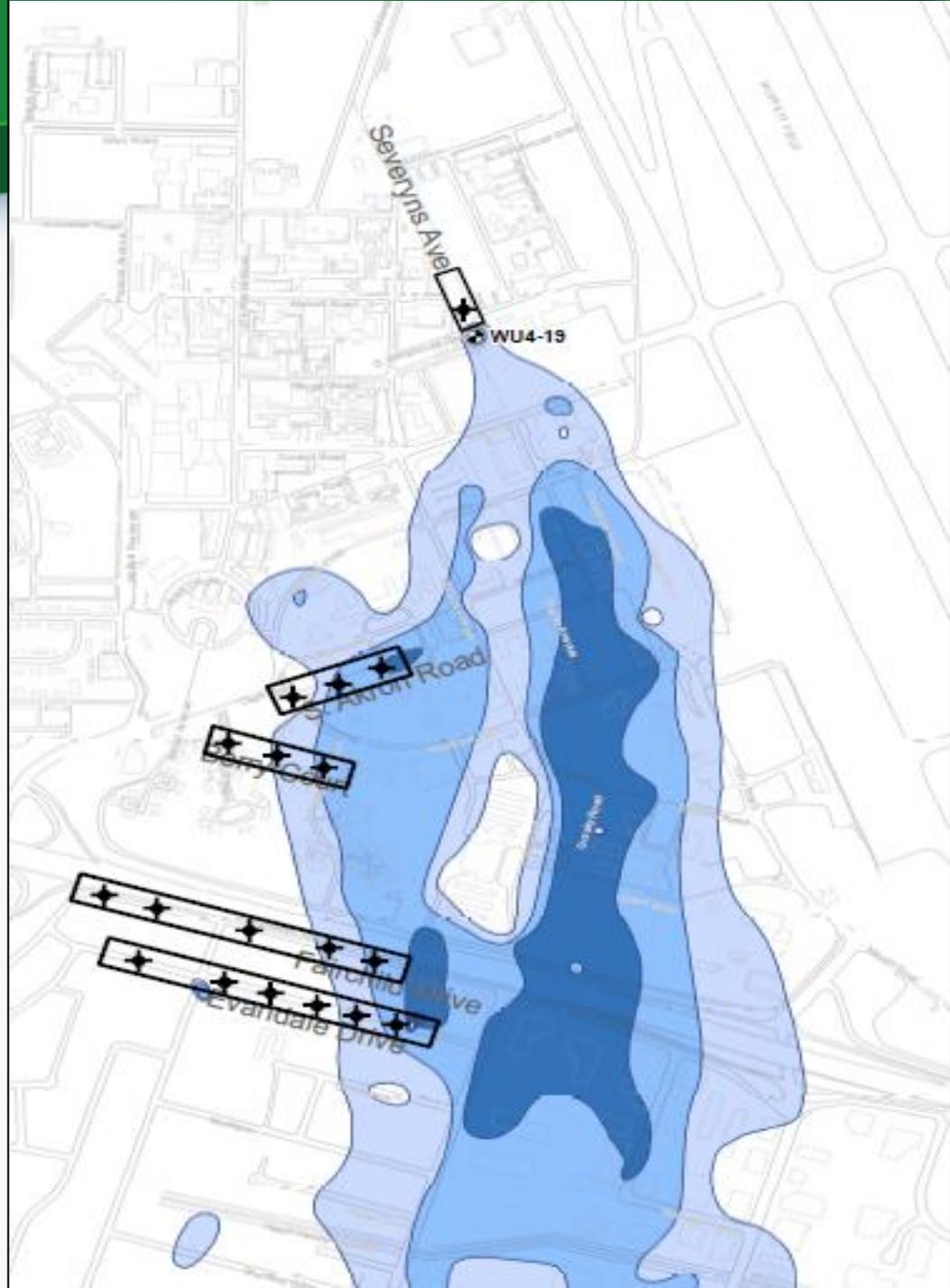


- Advanced cone-penetrometers to evaluate types of soil in specific areas
- Collected grab groundwater samples from boreholes to select well locations to define plume margins and characterize B2 Aquifer
- Sampled wells at toe of plume in A/A1 Aquifer Zone to evaluate plume stability

Areas of Investigation – A/A1 Aquifer Zone



Areas of Investigation – B1/A2 Aquifer Zone



Areas of Investigation B2 Aquifer Zone



Preliminary Findings



- Plume margins confirmed in each area with the exception of residential area south of 101
- High trichloroethene (TCE) in shallow groundwater beyond estimated plume boundary in residential area south of 101
- Plume area characterized in B2 Aquifer
- Soil is heterogeneous with discrete layers of contamination

TCE Groundwater Results Along Western Margins – North of Highway 101



Legend

-  2012 – 2013 Groundwater Sample Locations
- Results** Maximum TCE concentrations in parts per billion
- ND** Not Detected (below laboratory detection limit)
- Bgs** Below ground surface
- TCE** Trichloroethene

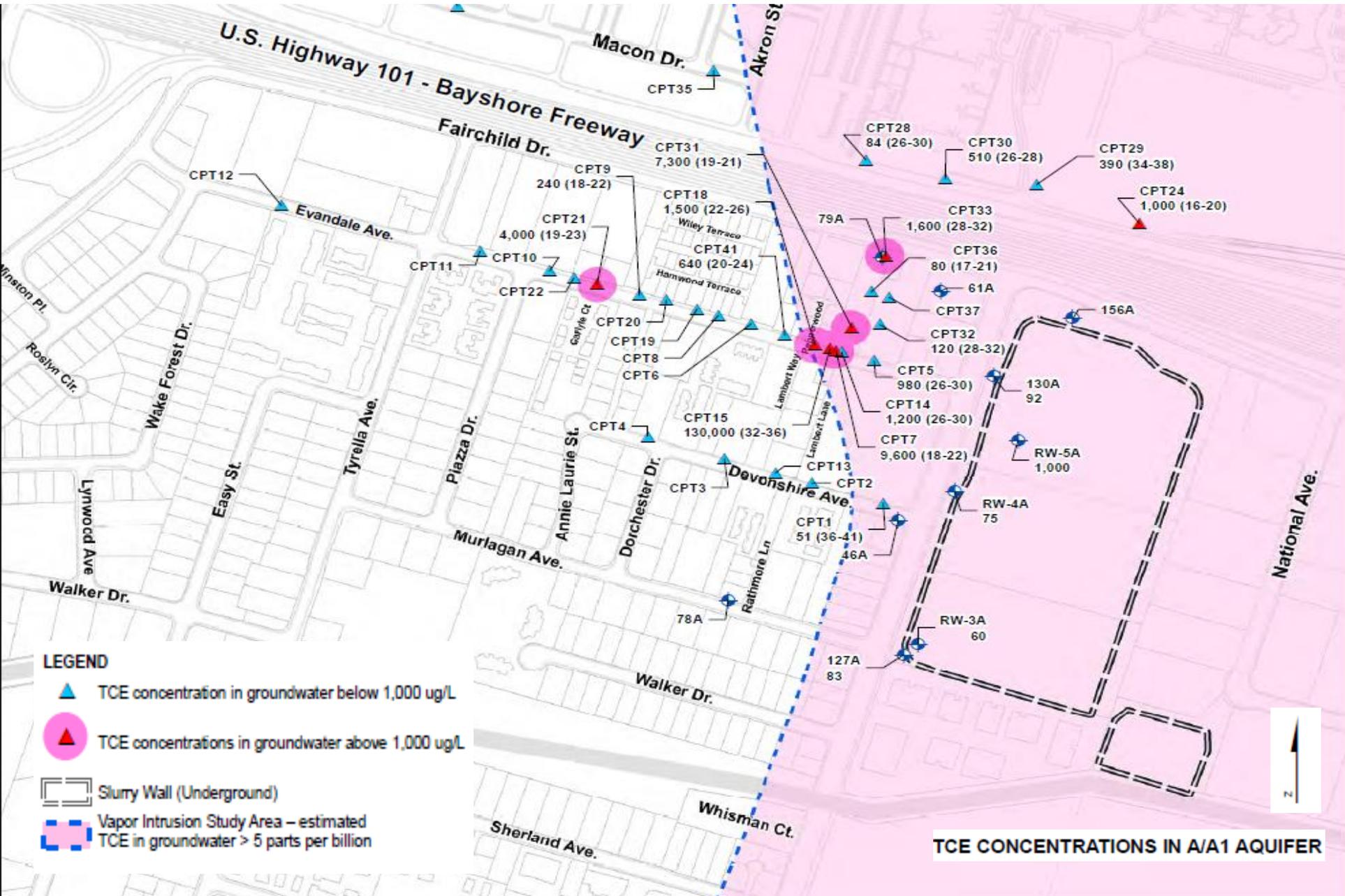


TCE Groundwater Results

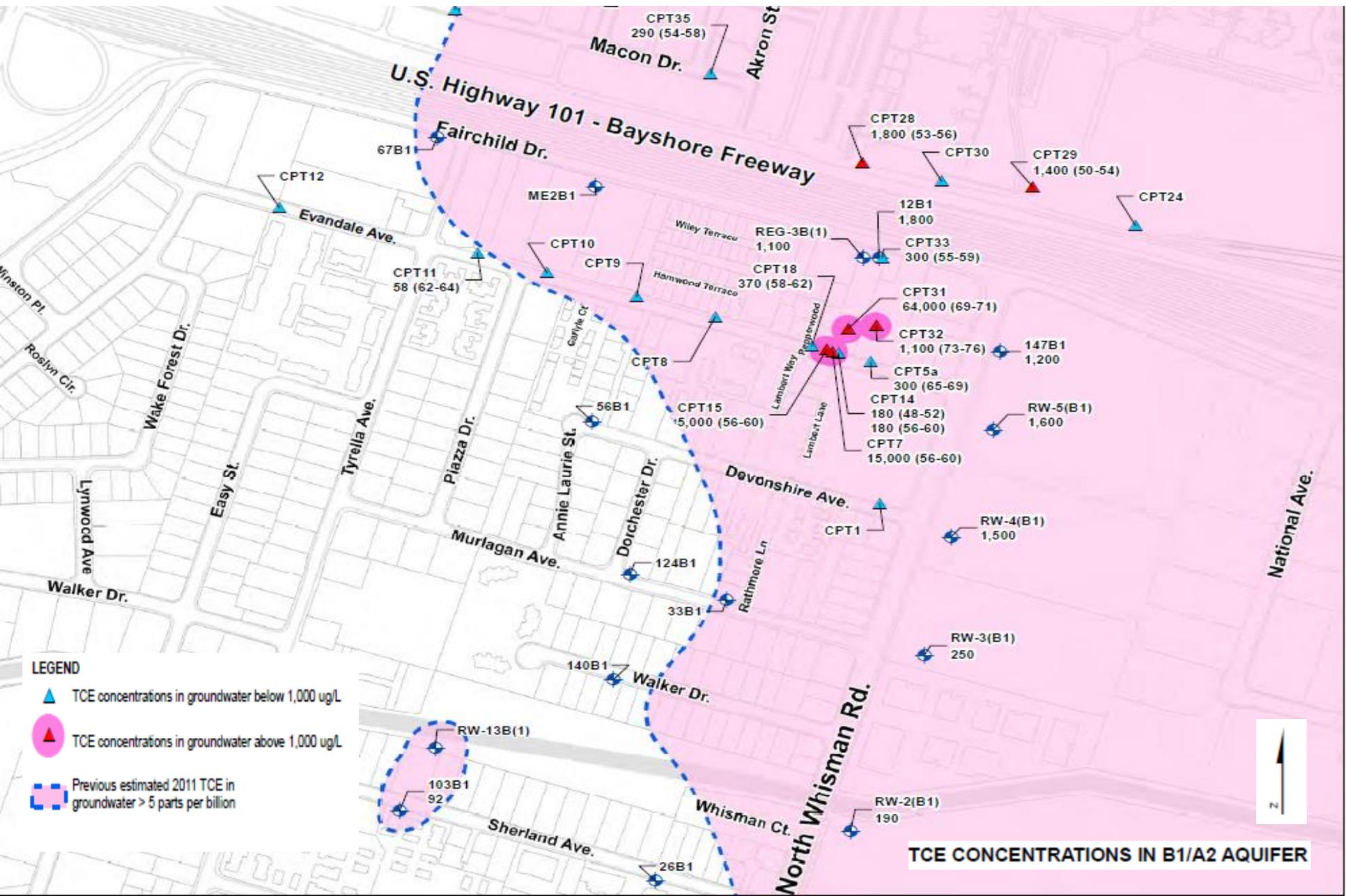
Former Naval Air Station Moffett Field
February 2013



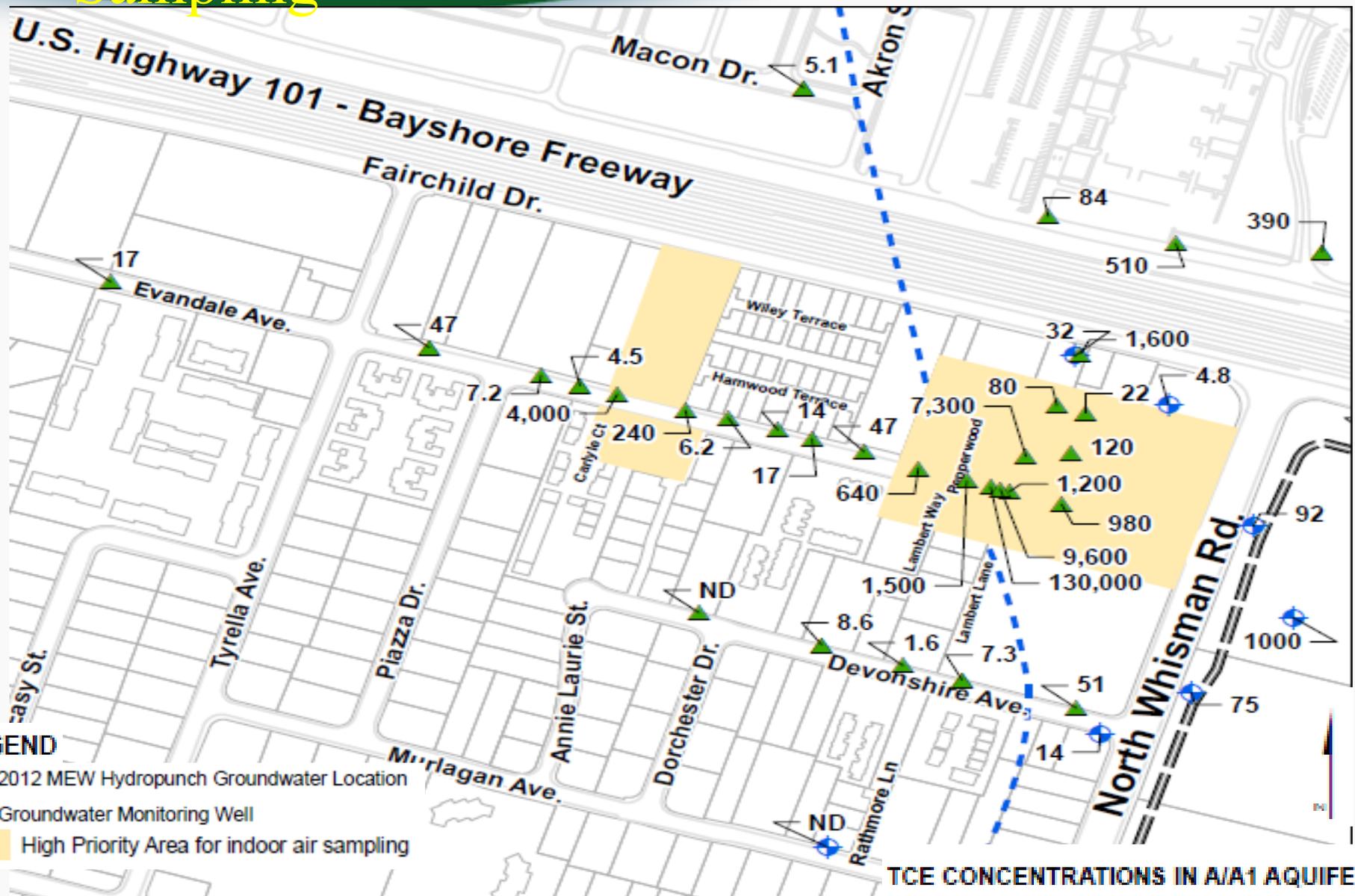
Maximum TCE Groundwater Results Western Margins – South of Highway 101 (A/A1 Aquifer)



Maximum TCE Groundwater Results Western Margins – South of Highway 101 (B1/A2 Aquifer)



High Priority Areas for Indoor Air Sampling



Groundwater – Next Steps



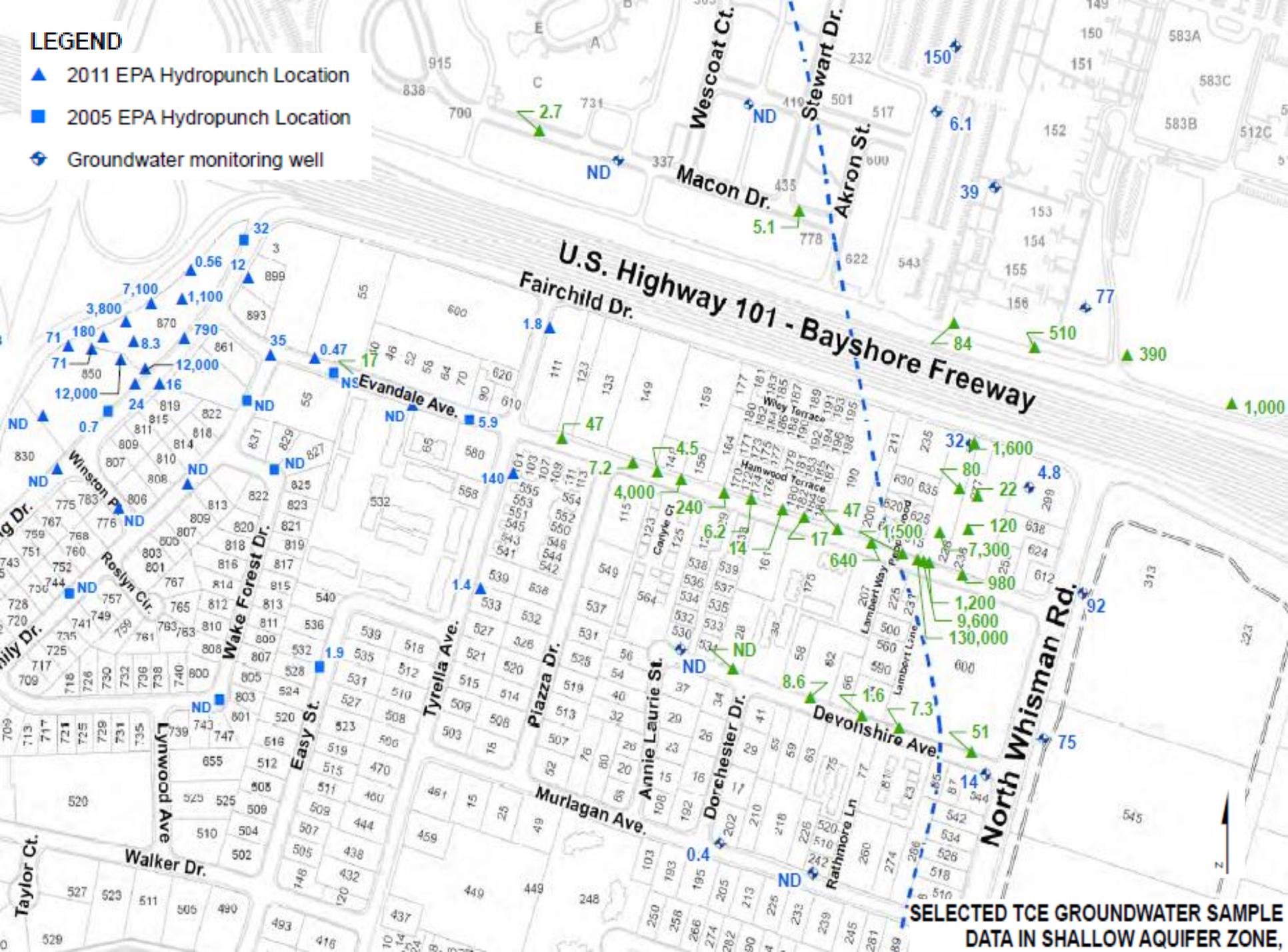
- Determine extent of hot spots with further step-outs in residential area south of 101
- Install extraction wells to clean up hotspot areas
- Finalize report summarizing data
- Install and sample monitoring wells near plume boundaries (western, eastern, toe of plume)
- Continue monitoring existing wells at toe of plume
- Review plume boundaries
- Conduct modeling to evaluate capture in B2 Aquifer



Questions

LEGEND

- ▲ 2011 EPA Hydropunch Location
- 2005 EPA Hydropunch Location
- ◆ Groundwater monitoring well



SELECTED TCE GROUNDWATER SAMPLE DATA IN SHALLOW AQUIFER ZONE



Sitewide Groundwater Supplemental Feasibility Study

- Stakeholder Comments on Preliminary Draft (July 2012)
- National Remedy Review Board Meeting (July 24, 2012)
- National Remedy Review Board Comments (January 14, 2013)



Stakeholder and Remedy Review Board Comments

- In situ redox technologies (comments related to safety, support, implementation, cost)
- Integrate groundwater and vapor intrusion (VI) remedy; provide metric for VI risk reduction related to groundwater
- Address role of vadose zone contamination



Stakeholder and Remedy Review Board Comments

- Evaluate improvements to slurry walls
- Better explain approach to using monitored natural attenuation (MNA)
- Areas of cleanup should also focus on sensitive populations and future development

EPA Next Steps



- Meetings with stakeholders to discuss concerns and path forward for the Site-wide groundwater remedy



Questions

EPA Contact Information



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For More Information

www.epa.gov/region9/mew

www.epa.gov/region9/moffettfield

Additional Slides





Remedy Review Board Comments on Groundwater Feasibility Study

- Provide a metric for measuring vapor intrusion risk reduction related to accelerated groundwater cleanup
- Assess potential presence of dense non-aqueous phase liquid
- Compile results of all in-situ redox technologies and provide more details on how the technologies would be applied and when
- Address the role of vadose zone contamination
- Evaluate improvements to slurry walls
- Better explain approach to using monitored natural attenuation as component of remedy



Community Advisory Board Comments

- Support for Alternative 4 (in situ redox plus optimized system and monitored natural attenuation)
- Groundwater feasibility study should be integrated with vapor intrusion remedy
- Areas for cleanup should not just include those with high concentrations but all areas of sensitive populations and future development
- Monitored natural attenuation should not be considered until more active treatment is completed and concentrations fall below 50 ppb
- Deployment of Permeable Reactive Barriers reconsidered



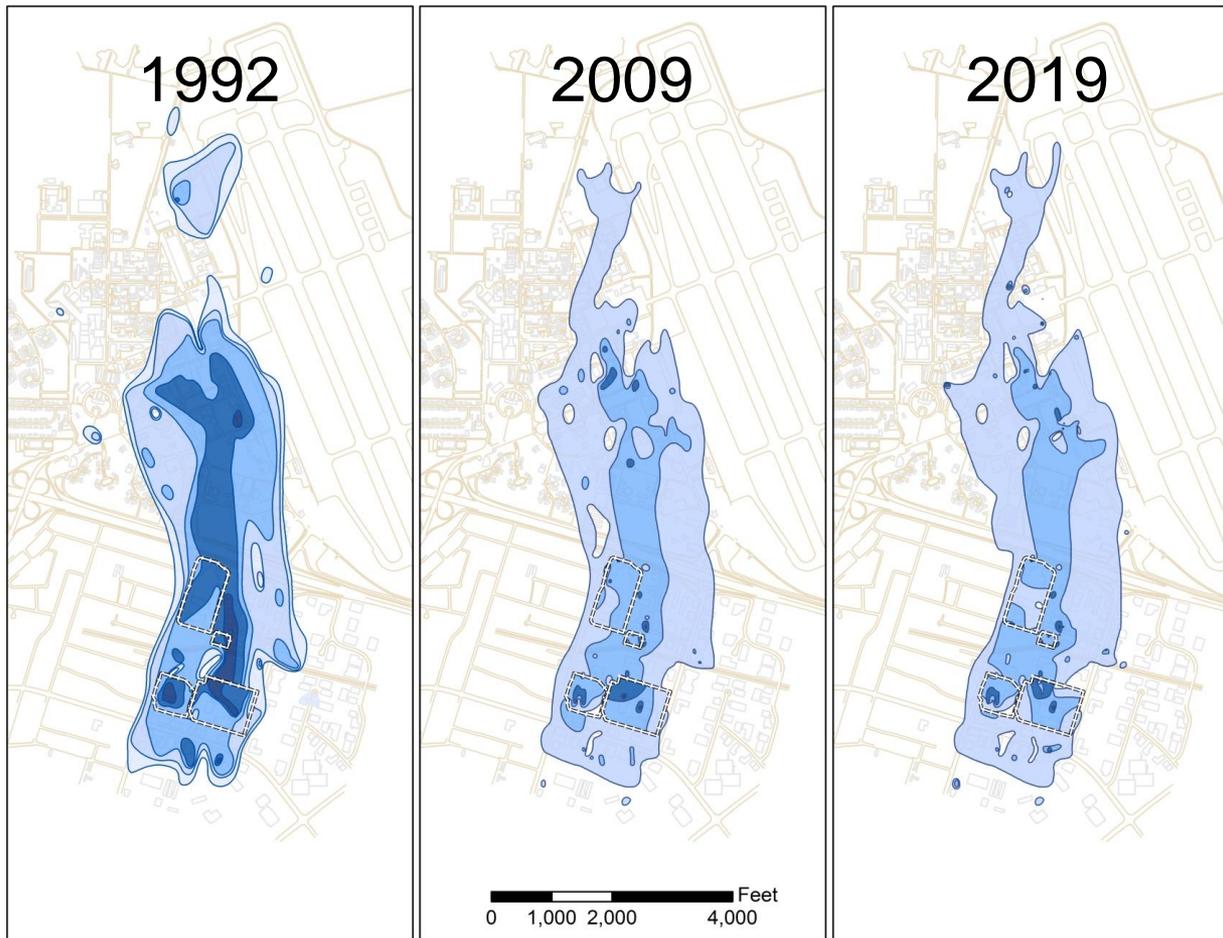
Community Advisory Board Comments (Continued)

- Model should be relied upon only for comparative analysis
- Concerns with safety to building occupants using in situ technologies beneath buildings and end results if only partial treatment
- FS needs more discussion on difficulties implementing in situ treatment technologies beneath buildings and associated disruptions to properties



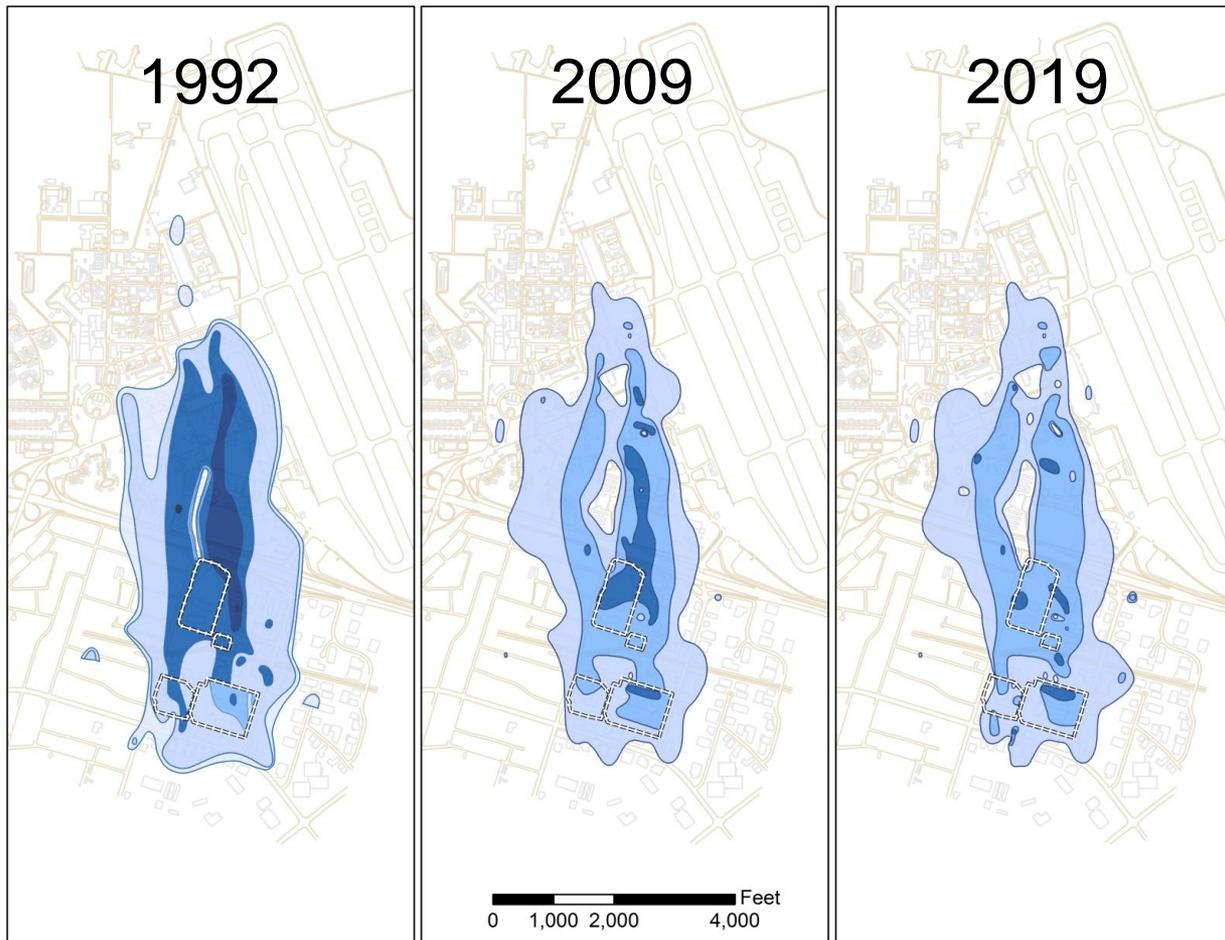
Projected VOC Plume – A Aquifer

(0 to 45 feet bgs)





Projected VOC Plume – B1/A2 Aquifer (50 to 75 feet bgs)





Projected VOC Plume- B2 Aquifer (75 to 110 feet bgs)

