

Norwalk Tank Farm Update

*Presented to the Norwalk Tank Farm
Restoration Advisory Board*

January 31, 2008

Presentation Overview

Topics to be Covered

- Second Addendum to RAP Update
- Remediation Operations Update
- Conceptual Site Model Update
- Additional Assessments
(Southeastern 24-Inch Block Valve Area)

Second Addendum to RAP Update

■ Remediation System Enhancements

- Installed pumps in seven new wells and MW-O-1 (south-central area) to lower the water table and enhance product recovery.
- Replaced two 1,500-lb liquid phase carbon vessels with two 2,000-lb liquid phase carbon vessels.
- Installed second air compressor.
- Upgraded electrical components of groundwater treatment system.
- Started operation of new dual-phase extraction wells.

Remediation System Enhancements



Second Addendum to RAP Update

- **Other Remediation System Adjustments**
 - Adjusted pump intake depths for south-central area to lower the water table.
 - Reduced pumping rates in West Side Barrier system based on reduced lateral extents of 1,2-DCA and MTBE and increased pumping in the south-central area.

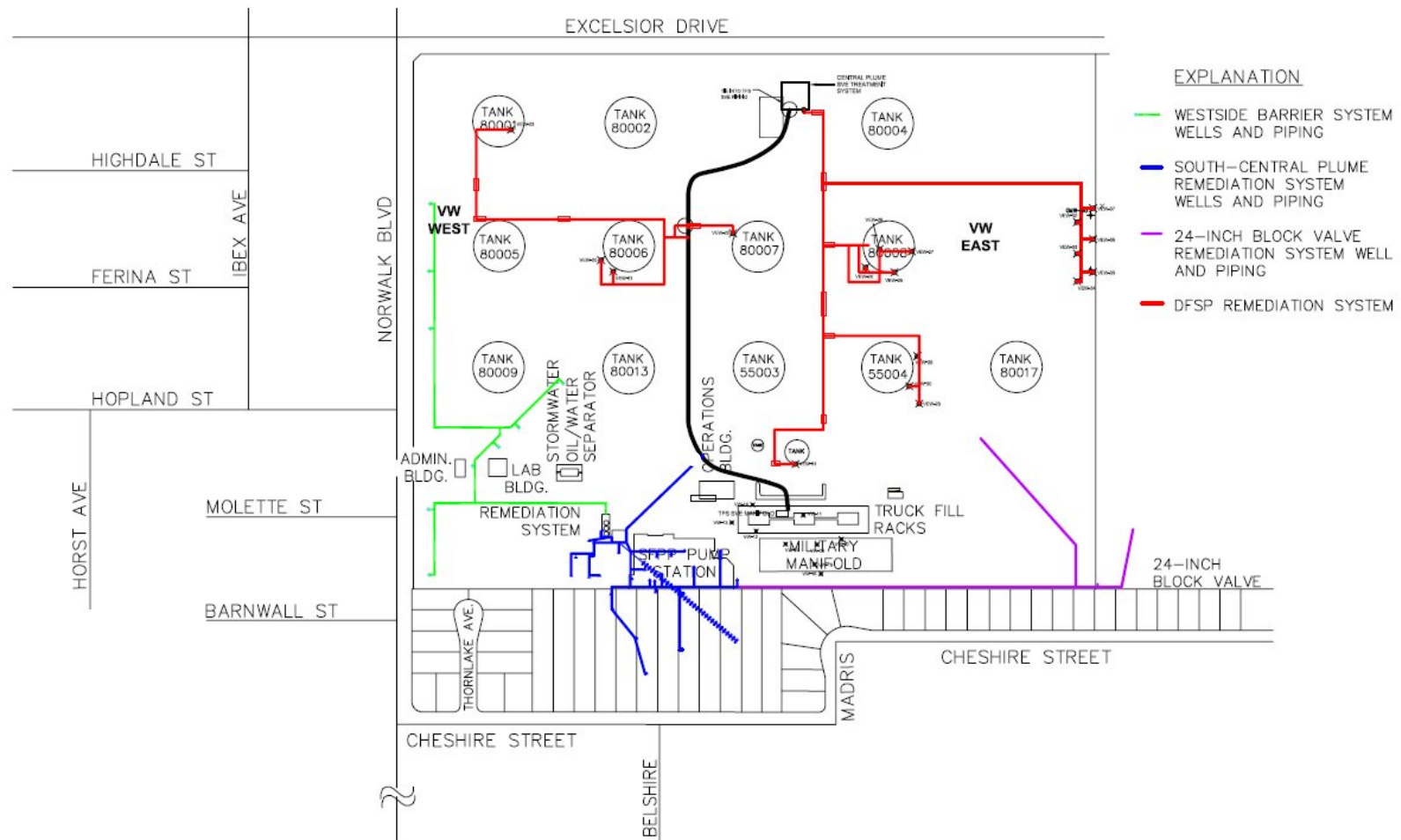
Second Addendum to RAP Update

- Installed leak detection system at five pipeline block valves:
 - Three block valves located near southwestern corner of the site;
 - One located near the northeastern corner of the site; and
 - One at the southeastern 24-inch block valve location.

Leak Detection Sensor



Map of Remediation Systems



Groundwater/Product Extraction System

- 18 total fluids (product and groundwater) extraction wells and 2 groundwater extraction wells in the South-Central Plume area
- 2 total fluids (product and groundwater) extraction wells in the Southeastern 24-Inch Block Valve area
- 3 groundwater extraction wells in the West Side Barrier area

Groundwater/Product Extraction System Operations Summary

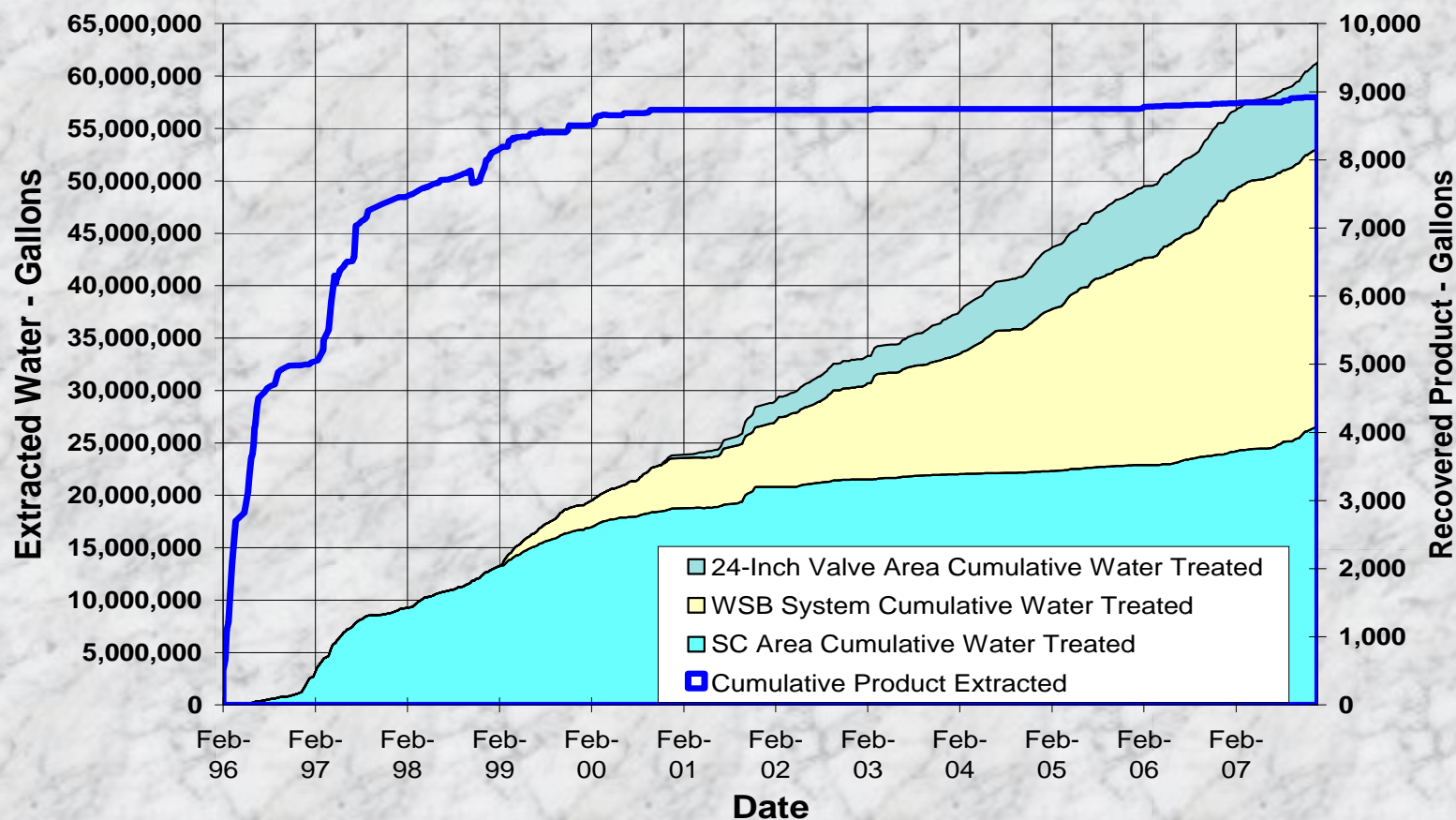
- Total groundwater extracted fourth quarter 2007:
 - South-Central Plume area: 1,264,000 gallons
 - Southeastern 24-Inch Valve area: 436,000 gallons
 - West Side Barrier area: 372,000 gallons
 - Manual product recovery: 11 gallons
- Total groundwater extracted since September 1995:
 - South-Central Plume area: 26.6 million gallons
 - Southeastern 24-Inch Valve area: 8.2 million gallons
 - West Side Barrier area: 26.5 million gallons
 - Total groundwater extracted: 61.3 million gallons
 - 8,917 gallons free product removed

Groundwater/Product Extraction System Operations Summary

- The groundwater/product extraction system operated continuously during fourth quarter 2007 with the following exceptions:
 - System shut down for electrical upgrades
 - System shut down for fourth quarter 2007 groundwater sampling; liquid phase carbon vessel upgrades performed during this time to minimize system down time.
- Percent operation: 70%

Groundwater/Product Extraction System Operations Summary

Summary of Product Extracted and Water Treated



Soil Vapor Extraction System

- 24 onsite and 6 off-site vapor extraction wells in the South-Central Plume area.
- 2 vapor extraction wells in the Southeastern 24-Inch Block Valve area.

Soil Vapor Extraction System Operations Summary

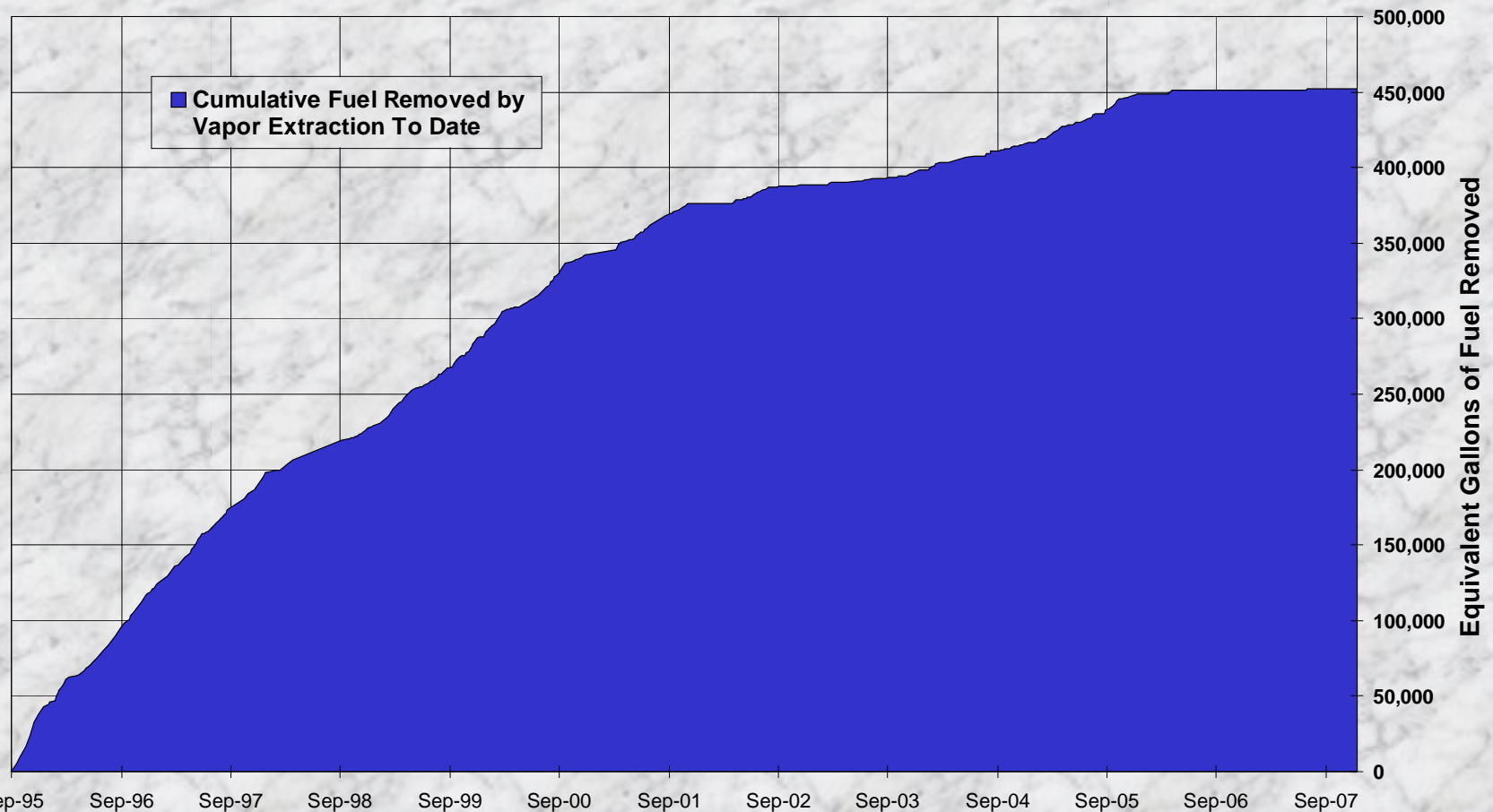
- Approximately 372 gallons equivalent of fuel removed from soil and destroyed by catalytic oxidation during Fourth Quarter 2007.
- Approximately 452,340 gallons equivalent of fuel removed from soil and destroyed by catalytic and thermal oxidation since September 1995.
- Approximately 58,319 hours of operation since September 1995.

Soil Vapor Extraction System Operations Summary

- The SVE system operated continuously during fourth quarter 2007 with the following exceptions:
 - Fourth quarter groundwater sampling.
 - SVE system was shutdown from 11/16/07 to 1/11/08 for troubleshooting and repair of the oxidizer's combustion system.
- Percent operation: 51%

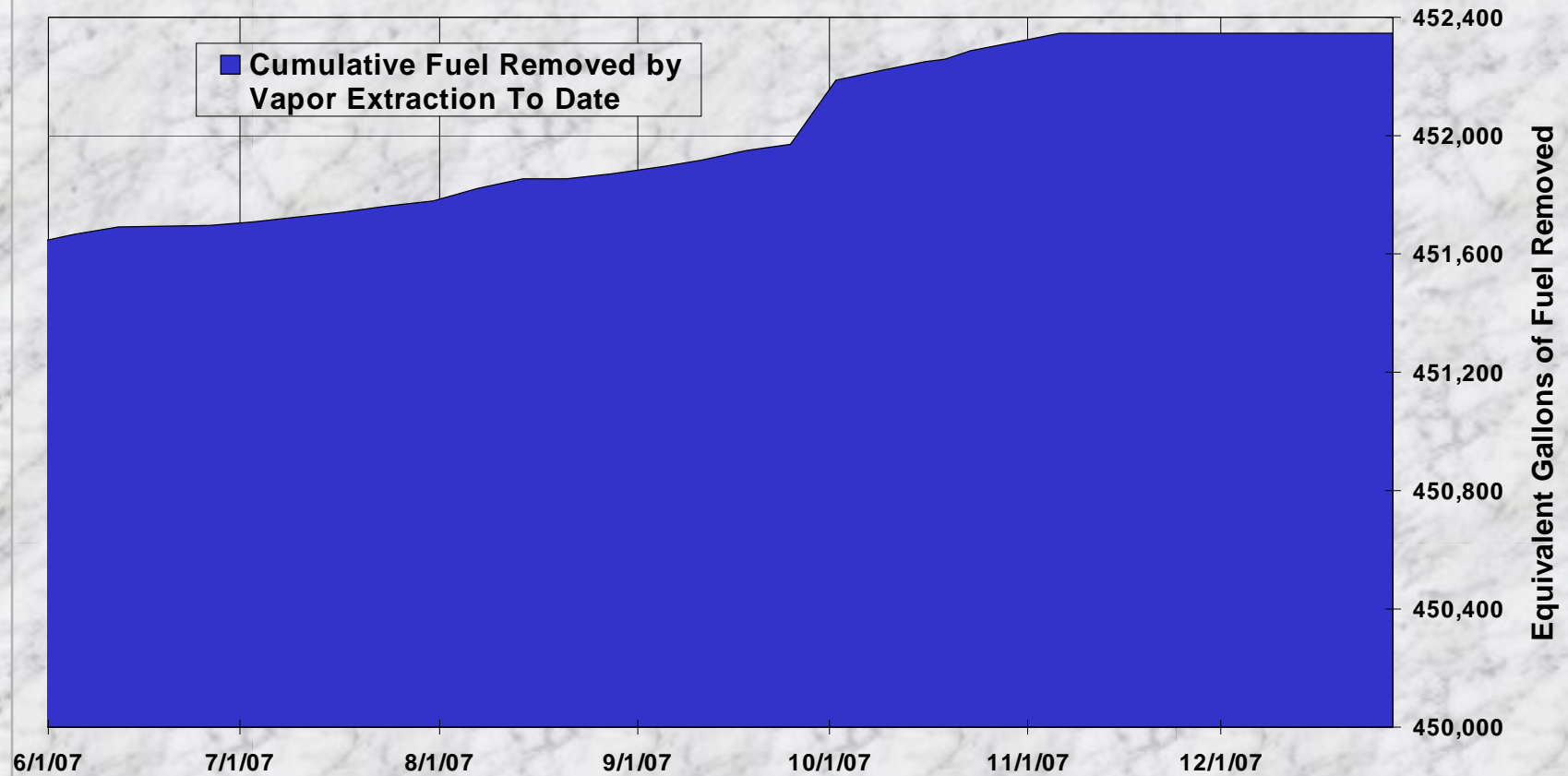
Soil Vapor Extraction System Operations Summary

Cumulative Fuel Removed by Vapor Extraction To Date



Soil Vapor Extraction System Operations Summary

Cumulative Fuel Removed by Vapor Extraction - Past Six Months



Planned Remediation Activities

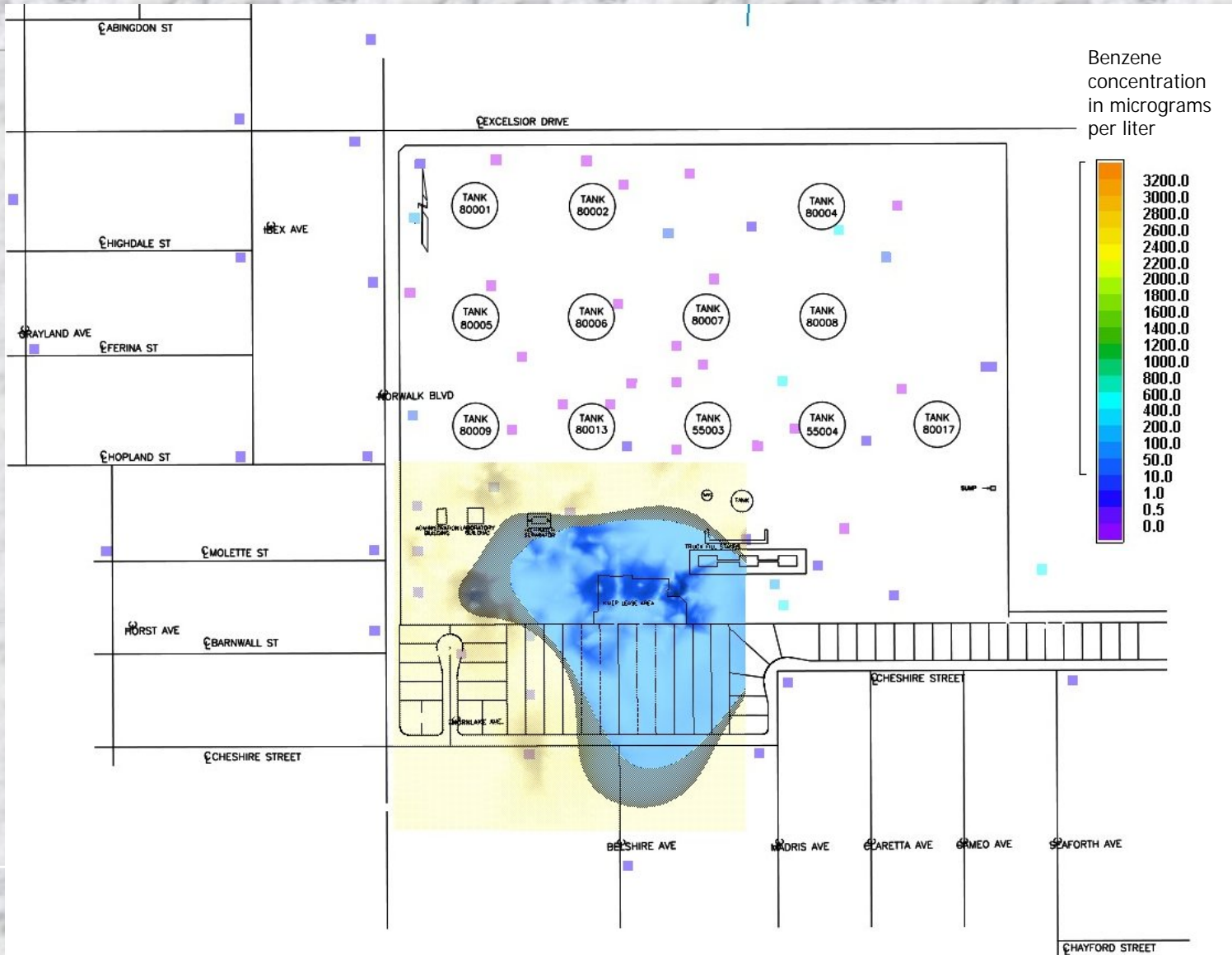
- Continue weekly system inspections.
- Continue data collection for monitoring and evaluation of remediation systems.
- Continue adjustments to remediation wells to optimize remediation (i.e., turn pumps on/off, open/close wells to SVE, adjust pump intake depths).

Conceptual Site Model

- Currently working with the RWQCB to develop a conceptual model showing generalized lithologic conditions and remediation progress.
- Using EarthVision (a 3-dimensional geospatial modeling program) to create a conceptual model of the south-central area.
- Model development steps included:
 1. Database review and update
 2. Development of conceptual lithologic model
 3. Development of benzene distribution model

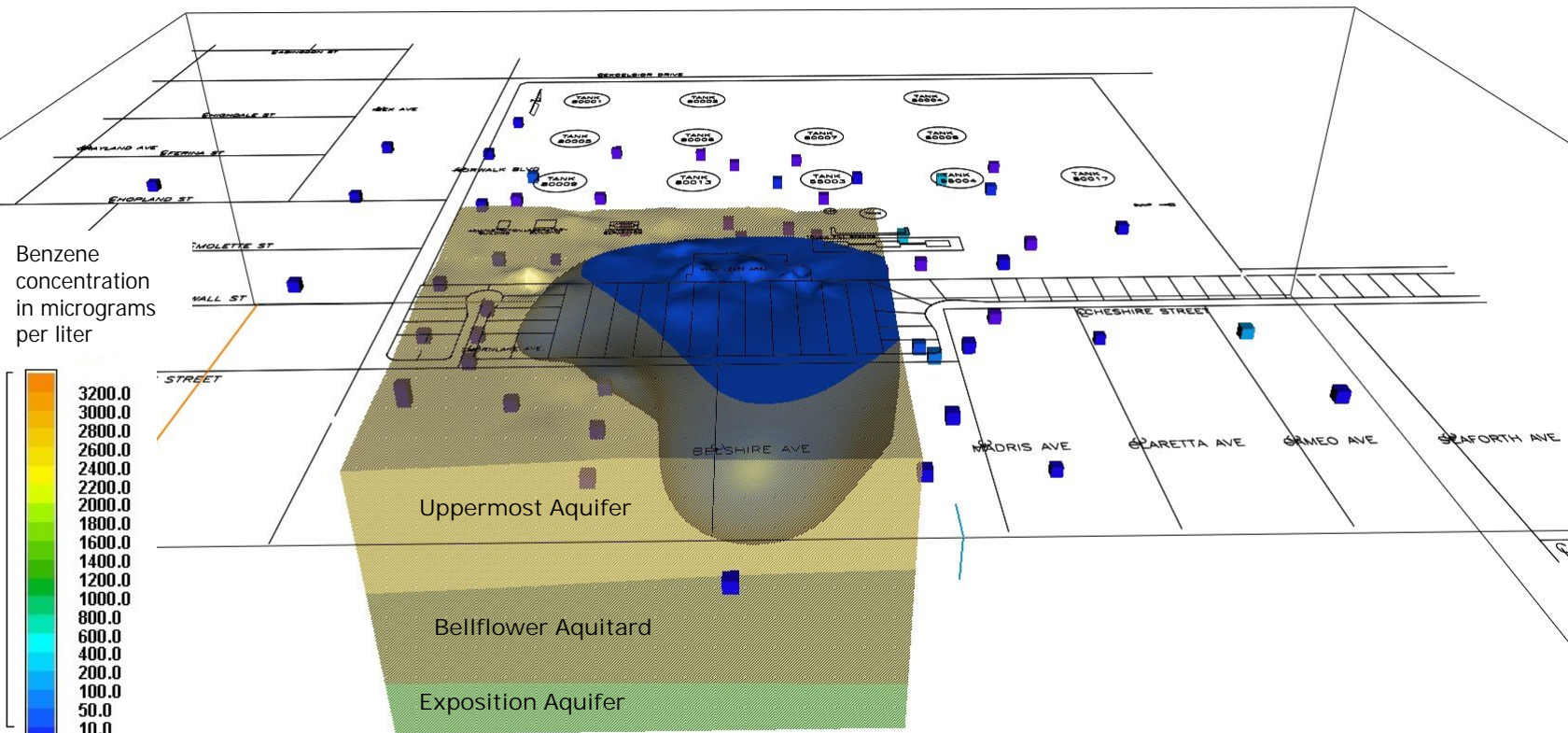
Conceptual Site Model

Plan View of South-Central Benzene Plume (1998)

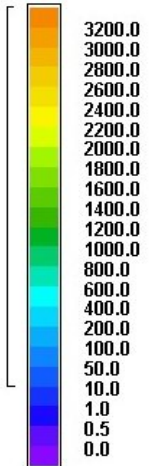


Conceptual Site Model

Oblique View of South-Central Benzene Plume (1998)

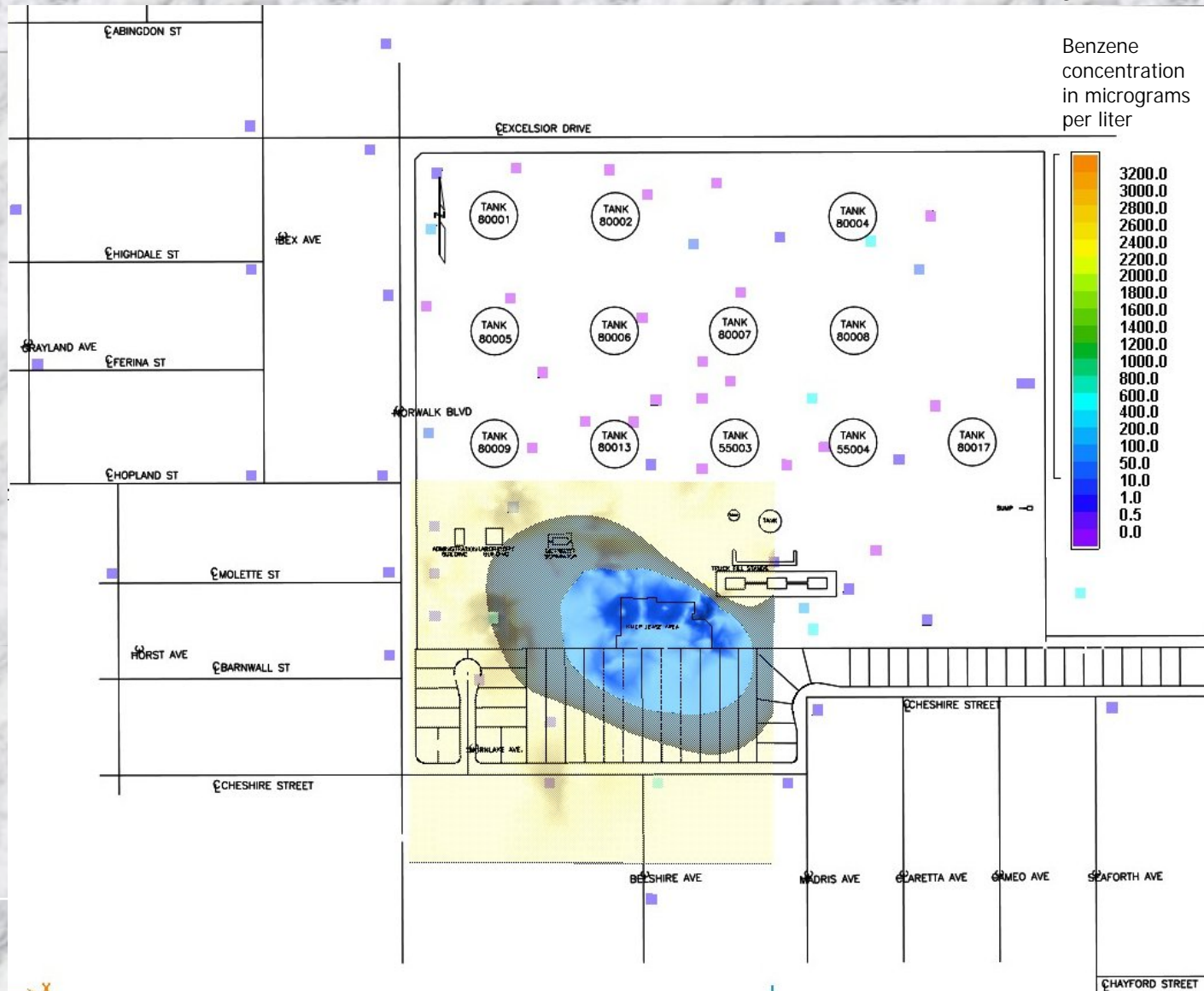


Benzene concentration in micrograms per liter



Conceptual Site Model

Plan View of South-Central Benzene Plume (May 2007)



Additional Assessments (Southeastern 24-Inch Block Valve Area)

- In a letter dated December 3, 2007, the RWQCB requested two work plans for the off-site 24-inch block area.
- The work plan for soil gas sampling and surface emission testing was submitted to the RWQCB on December 14, 2007.
- The work plan for additional subsurface assessment was submitted to the RWQCB on January 25, 2008.

Additional Assessments (Southeastern 24-Inch Block Valve Area)

- Objectives are to:
 - Further assess the presence of volatile fuel constituents in soil gas
 - Evaluate potential surface emissions of volatile fuel constituents if indicated by results of soil gas survey
 - Delineate the lateral extent of dissolved fuel constituents
 - Delineate the vertical extent of dissolved fuel constituents
 - Confirm the depth and presence of the Bellflower Aquitard