Norwalk Tank Farm Update

Defense Energy Support Center-

Americas West

Norwalk Tank Farm

Restoration Advisory Board

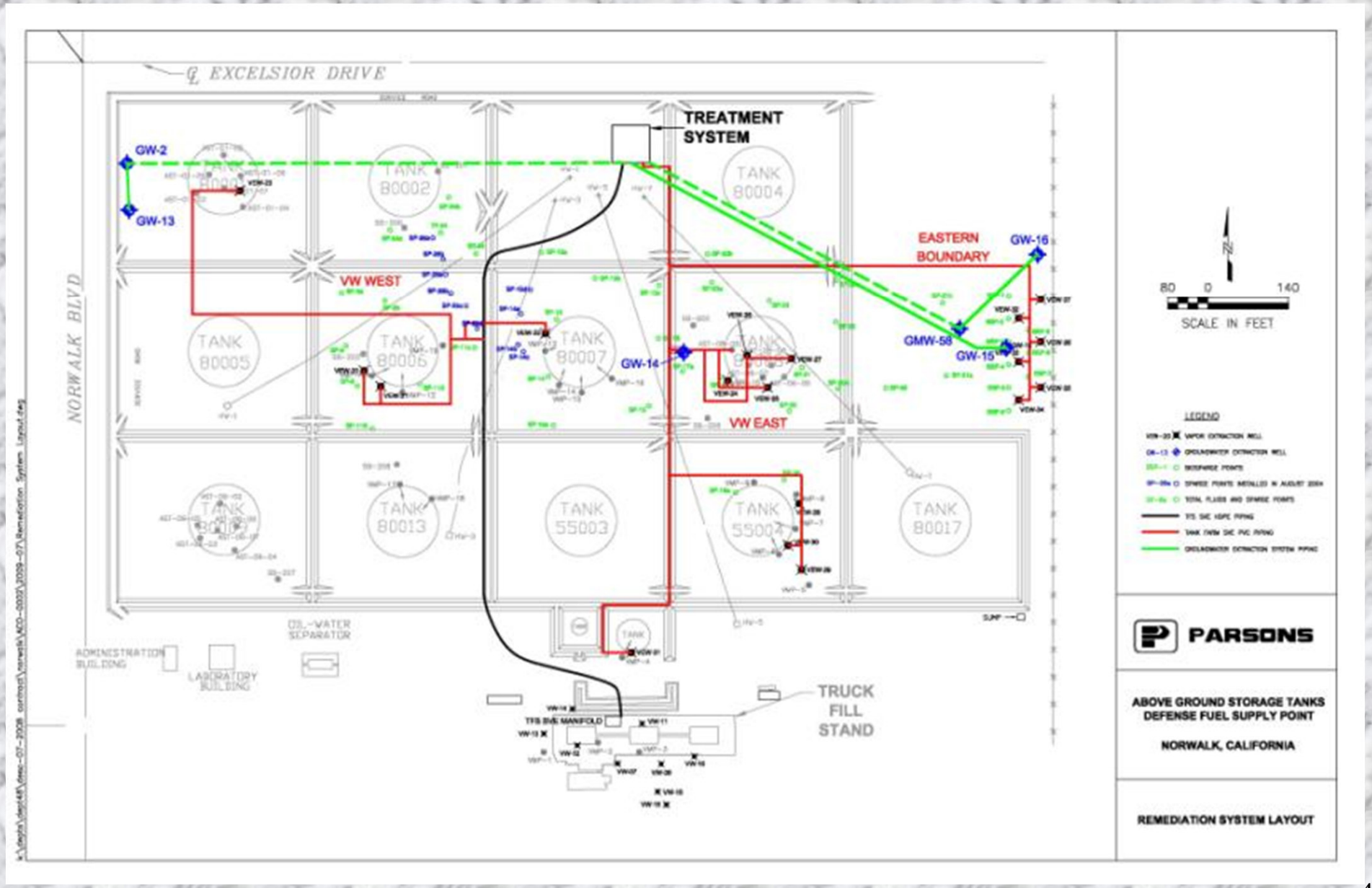
February 10, 2011

Presentation Overview

- Remediation Operations Update
- Additional Assessment Update
- Revised Remedial Action Plan Progress Report
- Planned Activities
- 2nd Semiannual 2010 Groundwater Monitoring Event

Remediation Operations Update

DESC Remediation System Layout



General Site Activities

- Completed weed abatement in August
- Submitted NPDES Discharge Monitoring Report (DMR):
  - 2nd Qtr 2010 (Aug 12) and 3rd Qtr 2010 (Oct 15)
- Submitted Remediation Monthly Status Summary Report:
  - July (Aug 13), August (Sept 14), September (Oct 6), October (Nov 12), November (Dec 15), December (Jan 17)
- Conducted Groundwater Monitoring (GWM):
  - July 12-13: 3rd quarter 2010 GWM event
  - October 4-8: 4th quarter 2010 GWM event
- Treated and Evacuated Contents of Tank 20001 (Jan 2011)

Groundwater Remediation System Activities

- Repaired broken hose between GAC-1 and GAC-2 (Sept 9)
- Repaired leak at discharge to storm drain (Sept 24)
- Carbon change-out (Nov 5)
- Replace collar and gasket at BF-3 (Nov 18)
- Added Arsenic Removal Media/Vessel (Dec 1)
- Replaced pressure gauge between GAC-3 and Arsenic Exchange Vessel (Dec 15)
- Power failure at remediation compound – repaired (Dec 27)
- GWTS shut down between Jan 8, 2011 and Jan 18, 2011 while Tank 20001 contents evacuated
- Repaired leak in hose at GW-15 on Jan 28

GWTS Selenium Issue

- Confirmation samples collected in triplicate, sent to three independent laboratories for confirmatory analysis. All results non-detect. Selenium exceedance is result of laboratory anomaly.
- System operation resumed September 7th
- Accelerated selenium sampling schedule (weekly) followed until system operation compliance re-established
- No repeat occurrence to date

GWTS Operations Summary

- System **On** from July 1, 2010 through January 31, 2011 except for the following periods when it was **Off**:
  - Jul 2 - Jul 14: 3rd quarter sentry GWM
  - Jul 21 – Sept 7: pending Selenium exceedance confirmation and remedial option evaluation
  - Sept 24 – Oct 11: 2nd semiannual GWM
  - Nov 3 – Nov 10: pending GAC change-out
  - Dec 27 – Jan 4: pending power outage identification and restoration
  - Jan 8 – Jan 18: temporary discharge of treated waster from Tank 20001.

Vapor Extraction System Activities

- Design drawings, inter-disciplinary checks
- November/December system modifications
  - Reconfigure 5K GAC vessels with 8” inlet/outlet
  - Post-blower through effluent re-piping with 8” carbon-steel, sch. 80 PVC, and flex hose
  - Install new 50 HP variable frequency device (VFD) in PLC
  - Install 50 HP Tuthill blower package
  - Upgrade power supply to support new blower/VFD
  - Reprogram PLC with modifications for new components
  - Check system filters, replace as necessary
  - Clear manifold inlet, knock out vessel
  - Install in-line temperature/pressure gauges
- Permit modification for blower upgrade to be submitted in February

Remediation System Update

- Weekly System Inspections
- System Performance & Compliance Sampling:
  - Third Quarter: July 1, 14, and 19; September 7, 15, 21, and 24
  - Fourth Quarter: October 14 and 26; November 24; December 1 and 17
- GWTS GAC Change Outs – GAC-1 GAC-2, and GAC-3 completed on November 5, 2011
- GWTS shut down for quarterly groundwater monitoring events
  - Third Quarter between July 12th and 13th
  - Fourth Quarter between October 4th and 8th

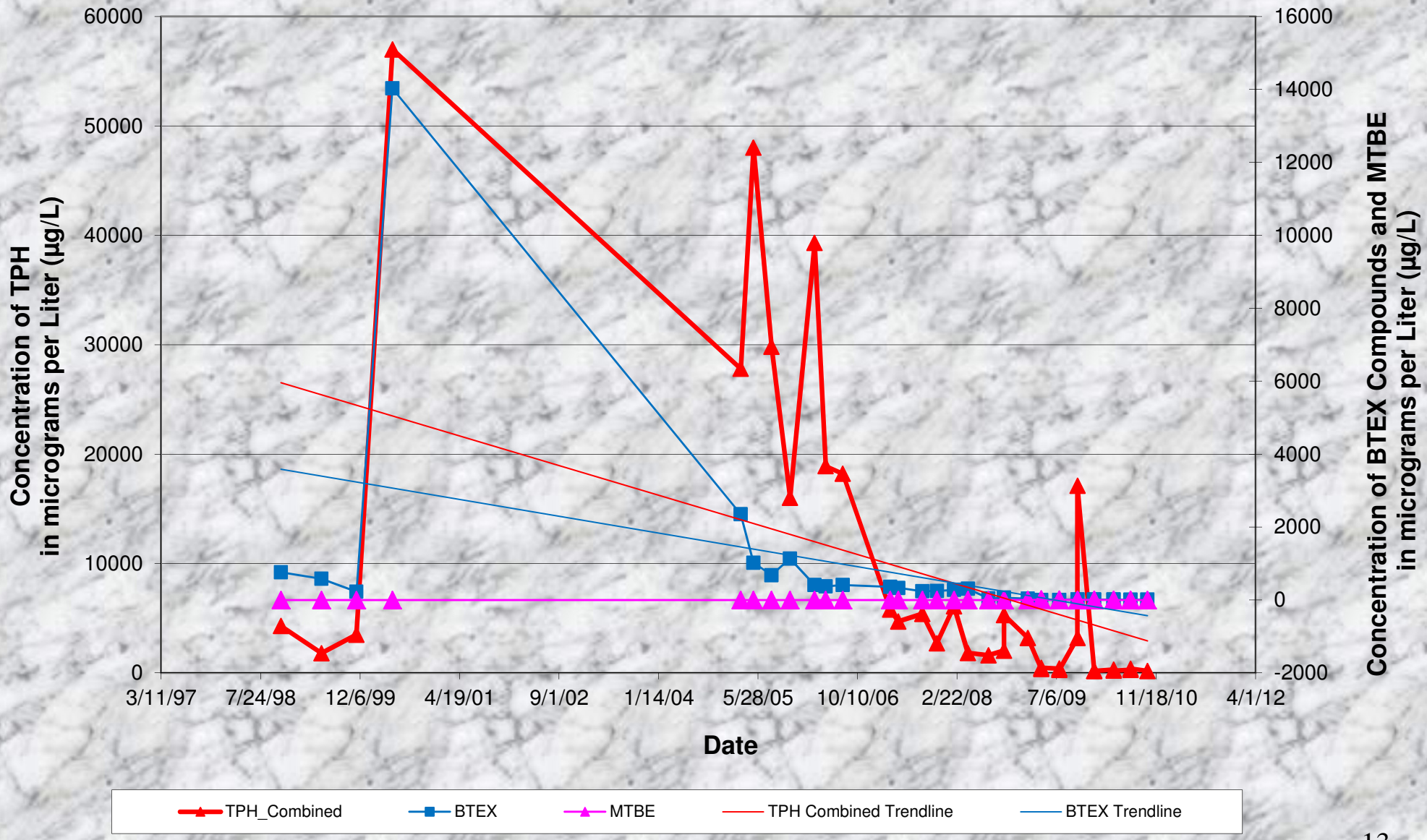
Overall Operations Summary

- Groundwater extracted and treated:
  - 460,295 gallons in Q3 2010
  - 1,106,835 gallons in Q4 2010
  - 52.3 million gallons since April 1996
- Vapor extraction system modifications – start-up/shake-down, begin continuous VES operation
- Data for hydrocarbon destruction calculations will be available 1st Quarter 2011

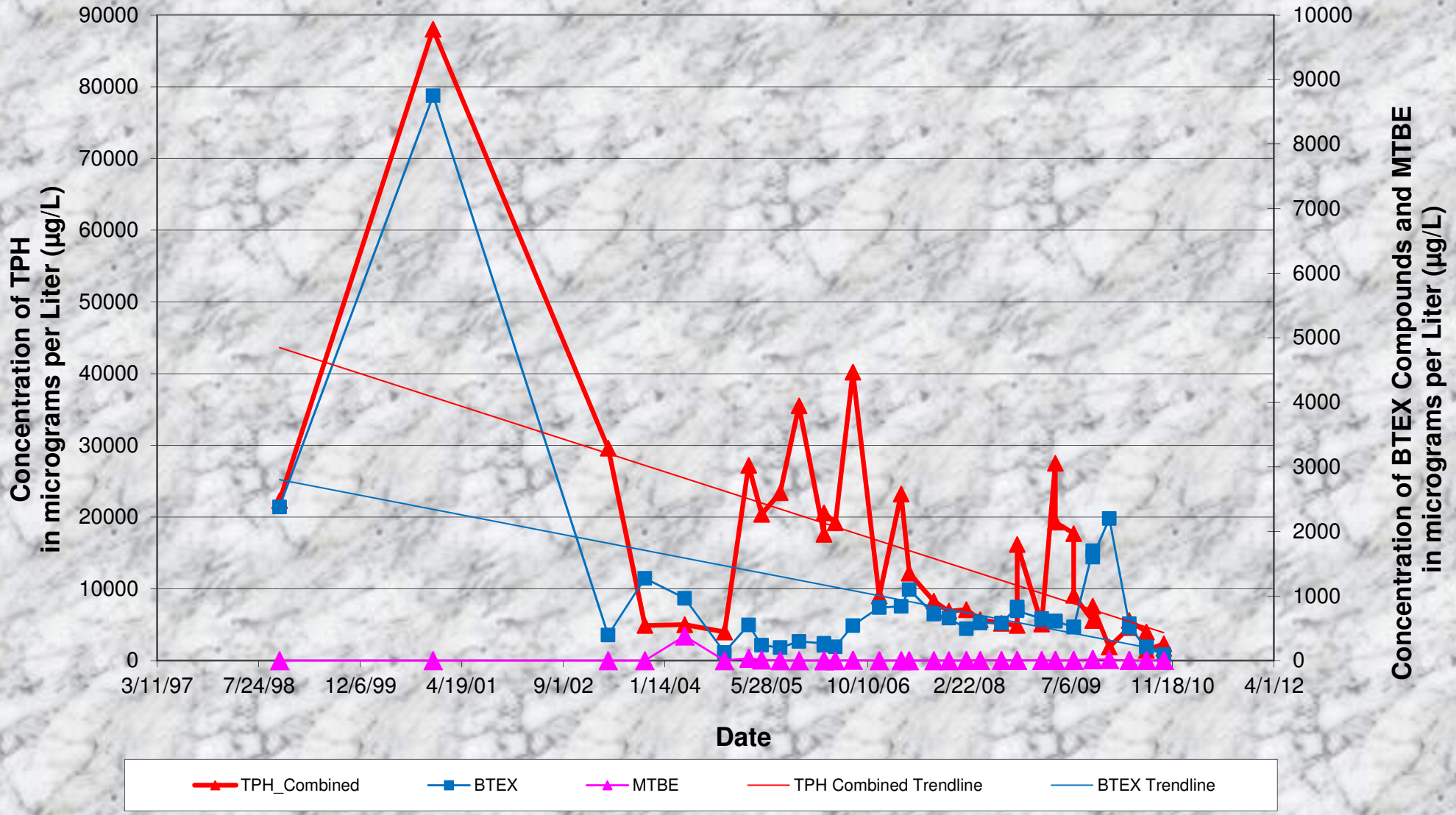
North-Eastern Area Groundwater Extraction Update

- Groundwater extraction began from GW-15 on April 22, 2009 and GW-16 on July 22, 2009
- Since extraction began in 2009, concentrations of TPH from October 2010 have remained generally at low or nondetectable levels at GMW-58; have decreased at GMW-59, GMW-60, and GMW-61
- At GWM-62, in the 3rd quarter a sheen of product was observed and in 4th quarter 0.18 feet of product was measured
- The following concentration slides for eastern GWM wells indicate an overall decreasing trend in TPH at all wells and at GMW-62 the trend has been overall stable
- All concentrations at GMW-63 and GMW-64 located in Holifield Park remain below detection limits
  - Benzene was detected at GMW-63 at a low estimated concentration (0.39 J µg/L) in January 2010, but was not detected in subsequent sampling in April, July, or October 2010

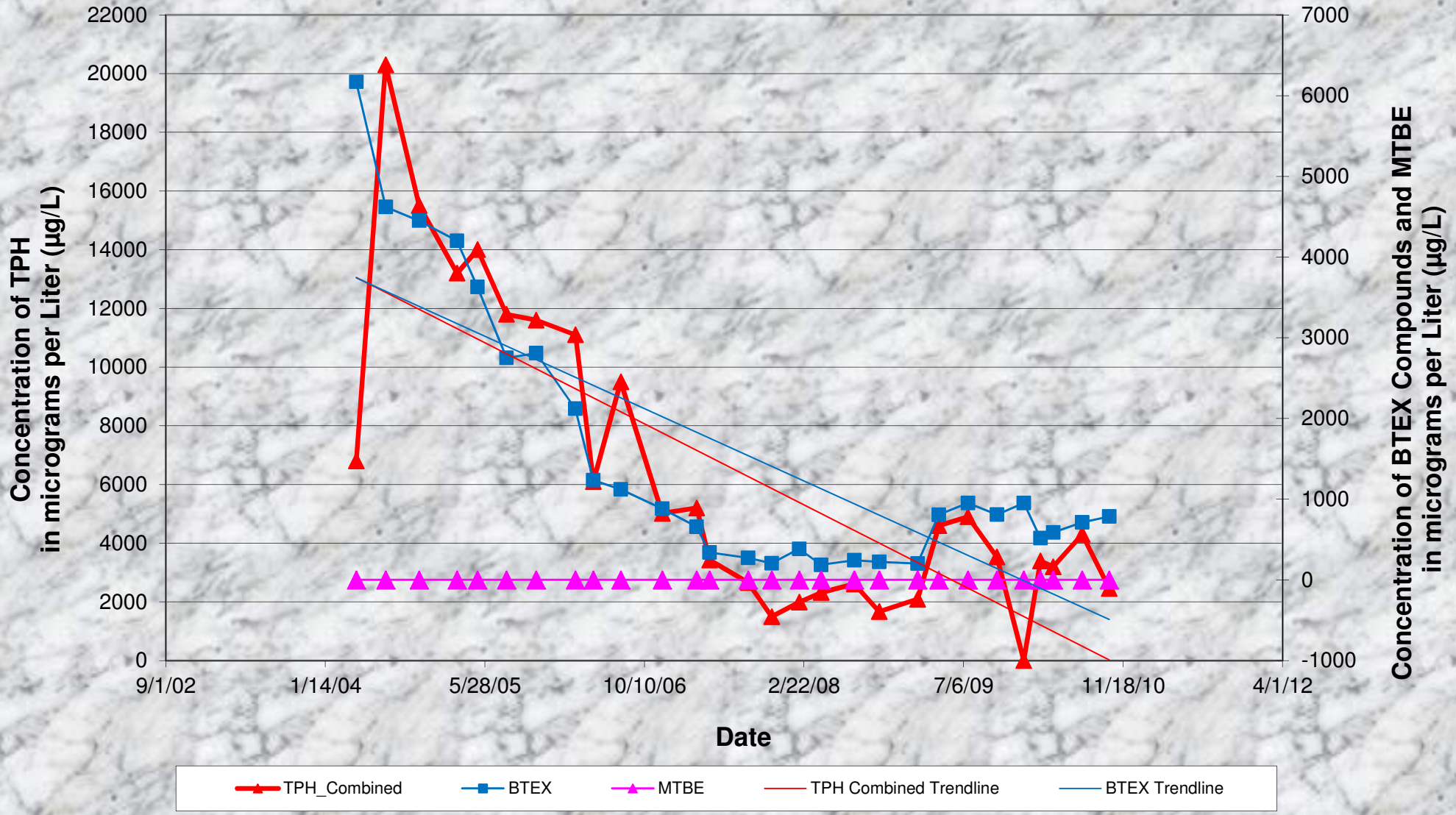
GMW-58 Concentration Trends



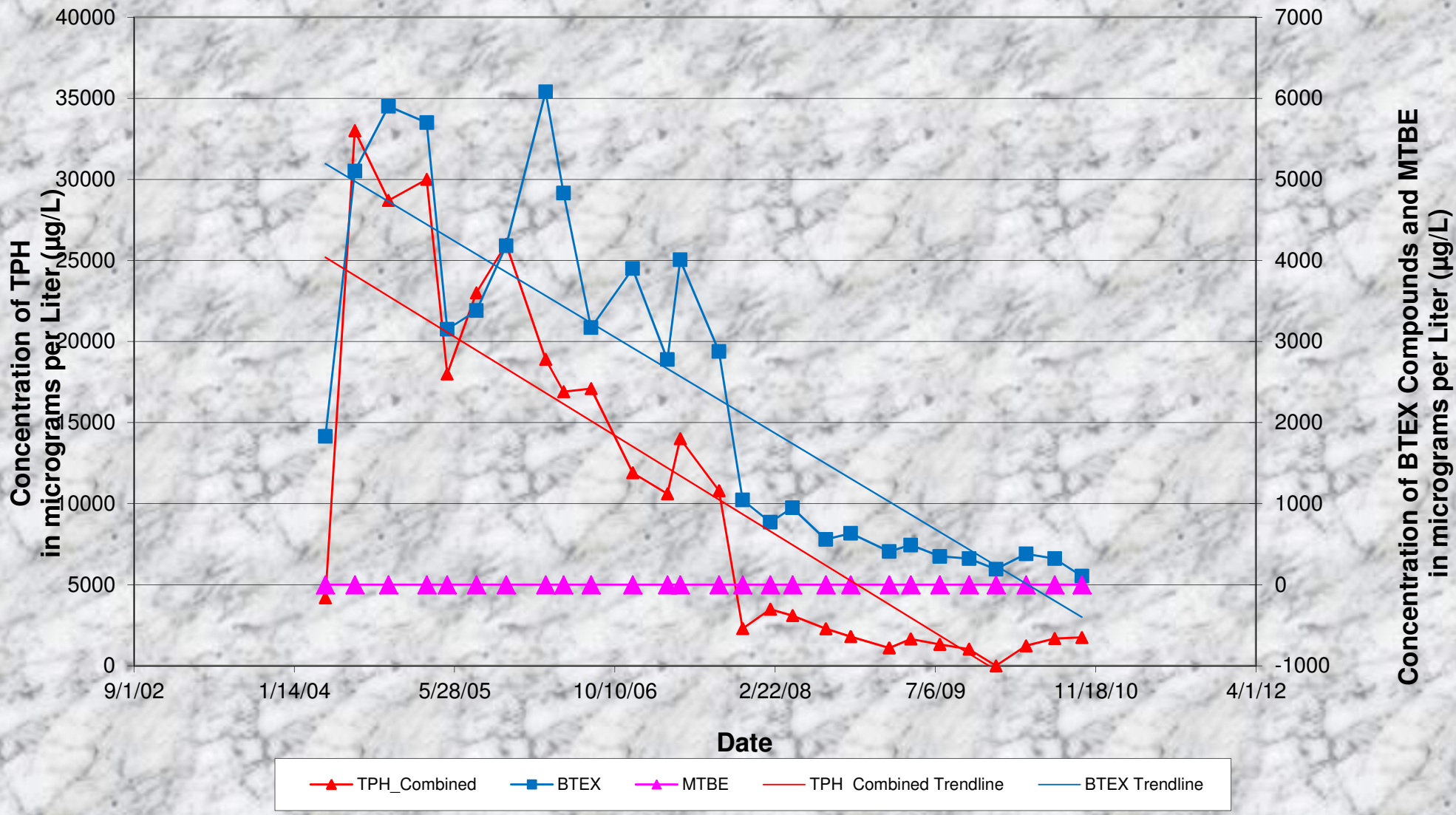
GMW-59 Concentration Trends



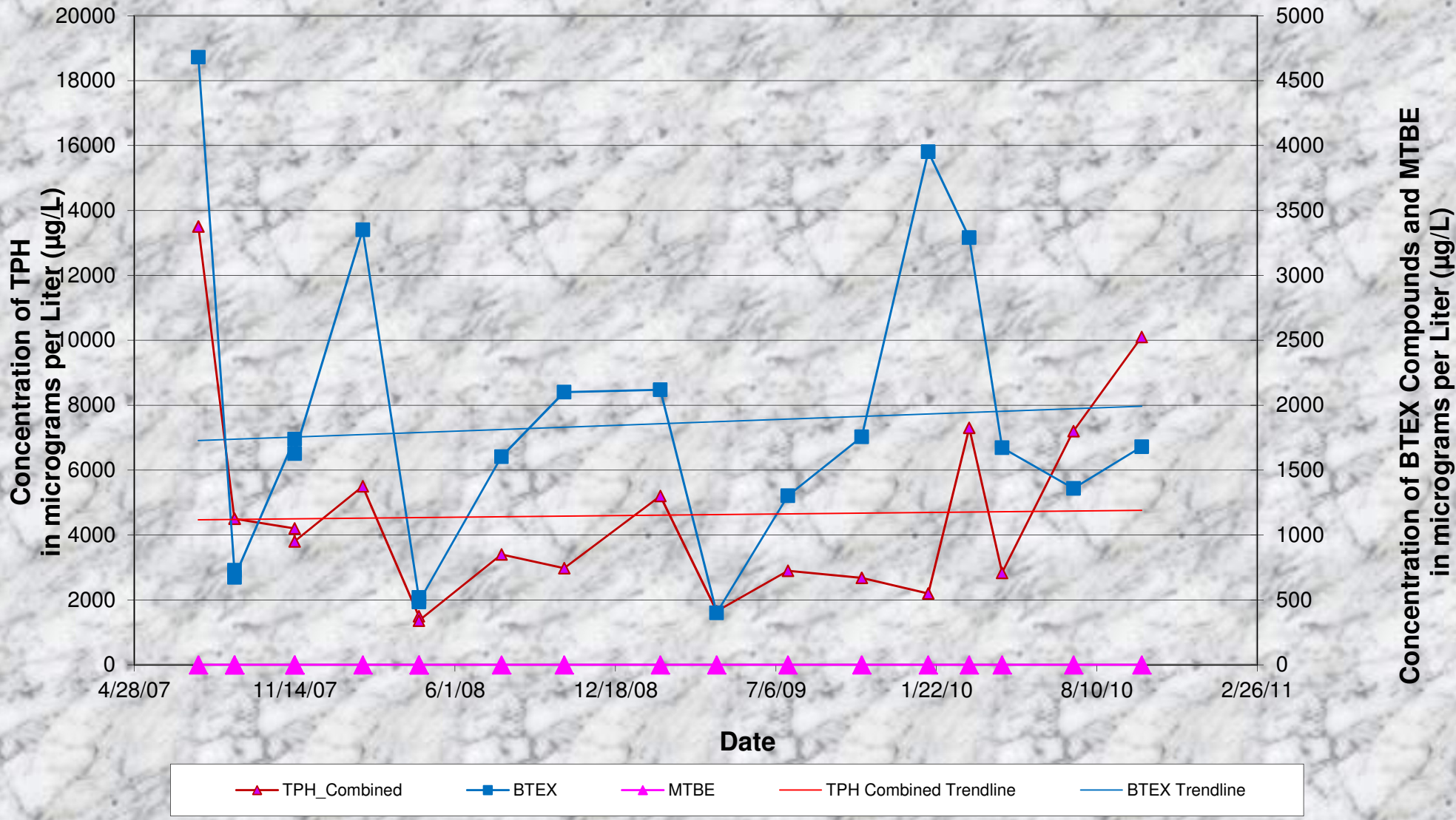
GMW-60 Concentration Trends



GMW-61 Concentration Trends

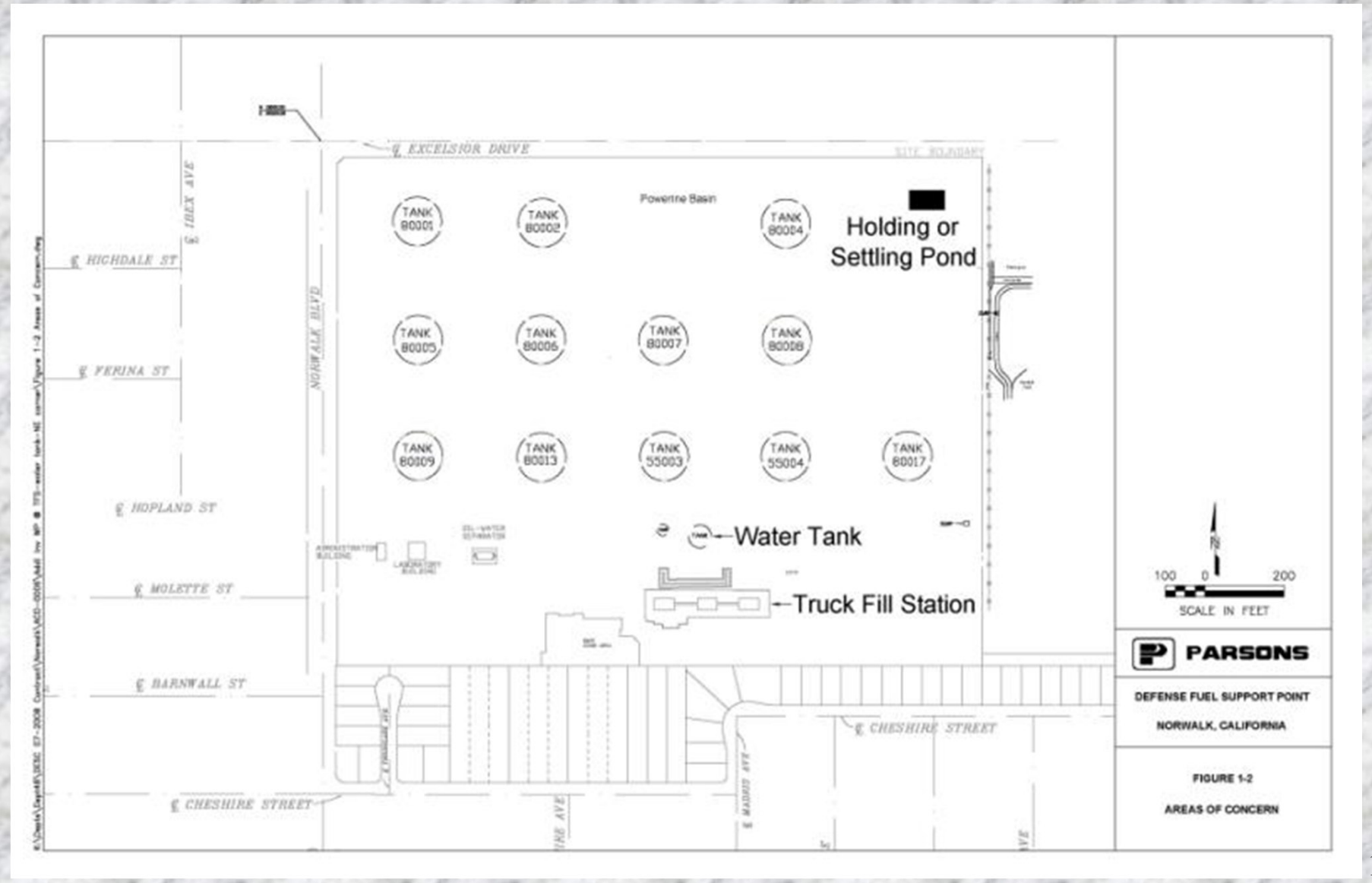


GMW-62 Concentration Trends



Additional Assessment Update

Additional Assessment Update
TFS, Water Tank, NE Settling Pond Site Locations



Additional Assessment Update TFS, Water Tank, NE Settling Pond

- Investigation summary report submitted on October 14th
  - Field activities included Gore™ soil gas survey and soil sampling
- Summary of findings:
  - TFS area - approximately 185,000 pounds of fuel-related contaminants remain in soil
  - Water tank area - approximately 60,300 pounds of fuel-related contaminants remain in soil
  - NE corner - the extent of impacted soil appear limited to the immediate area around GMW-66. Assuming that an area of 100 square feet was impacted with the contaminants identified in GMW-66, there would be approximately 0.02 pounds of fuel-related contaminants remain in soil
- Recommendations:
  - NE corner of the site - No further action or remedial action are needed
  - TFS and water tank areas – upgraded SVE technology

Additional Assessment Update
LNAPL Characterization and Vapor Monitoring

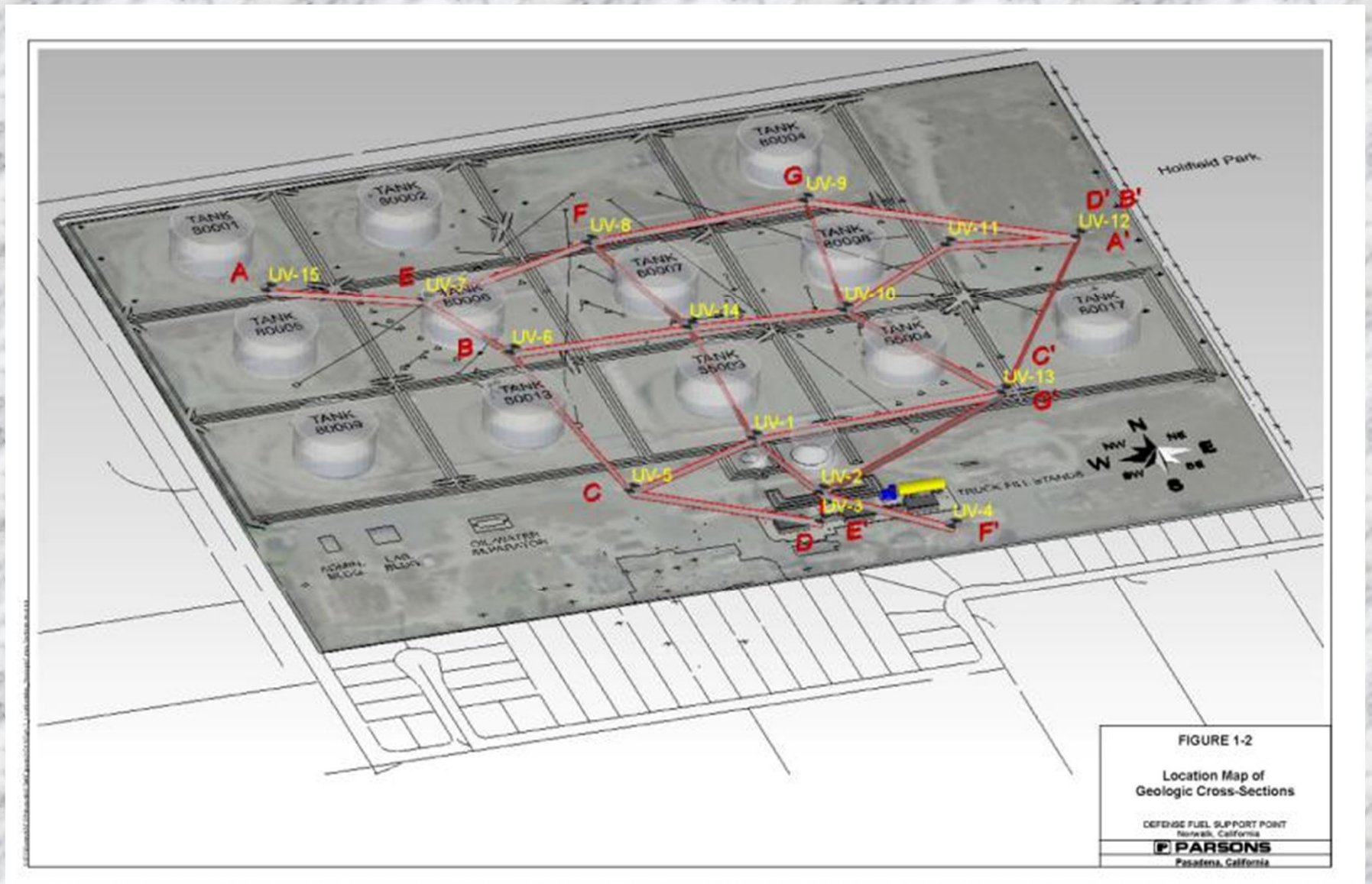
- Report submitted January 14, 2011
  - CPT/UVOST conducted at 15 locations to 90 foot depth (into Bellflower Aquitard)
  - Core samples collected at 4 locations to confirm UVOST interpretation
  - Fourteen soil gas samples collected at 7 new vapor monitoring probe (VMP) locations
- Non-aqueous phase hydrocarbons found at low concentrations at several locations
  - Vertical extent limited to 1-2 feet near water table "smear zone" with no displacement head to drive migration
  - NAPLs not identified at deeper depths in alluvial aquifer or Bellflower Aquitard
  - Detected hydrocarbons interpreted to be at less than residual saturation (non-mobile)

Additional Assessment Update
LNAPL Characterization and Vapor Monitoring

- The Bellflower Aquitard is present across the entire site, and thins to 25 feet thick on the eastern side of the site
  - CPT results indicate the Bellflower is comprised mostly of silty and clayey layers with some interbedded silty sand layers
- Soil gas results indicate that no VOCs above screening/action levels have impacted the northern site boundary area
  - Three more quarterly soil gas sampling events will be performed at the 7 new VMPs

Additional Assessment Update

CPT/UVOST Locations and Cross-Sections



Additional Assessment Update

West-East Cross-Section

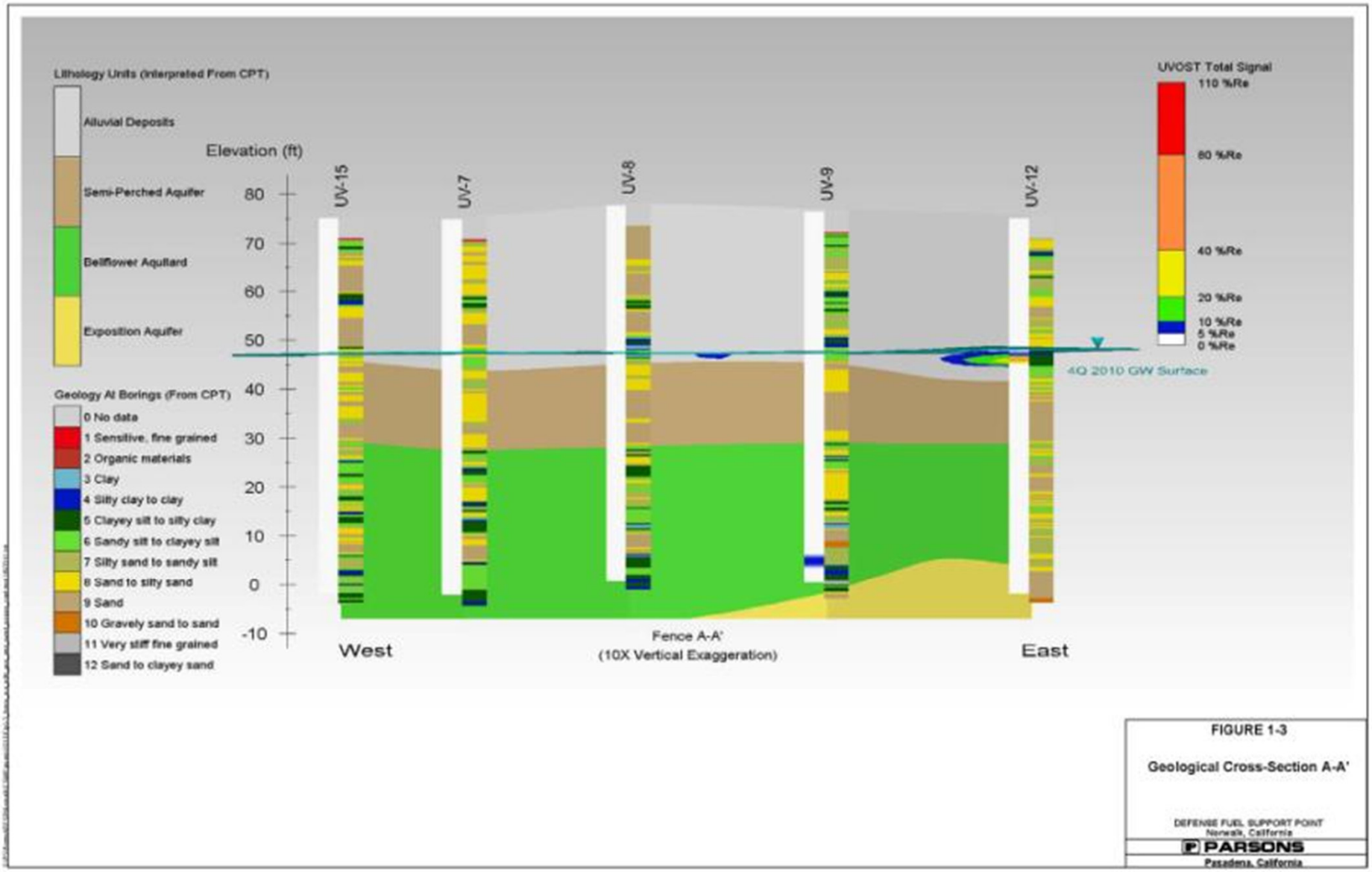


FIGURE 1-3

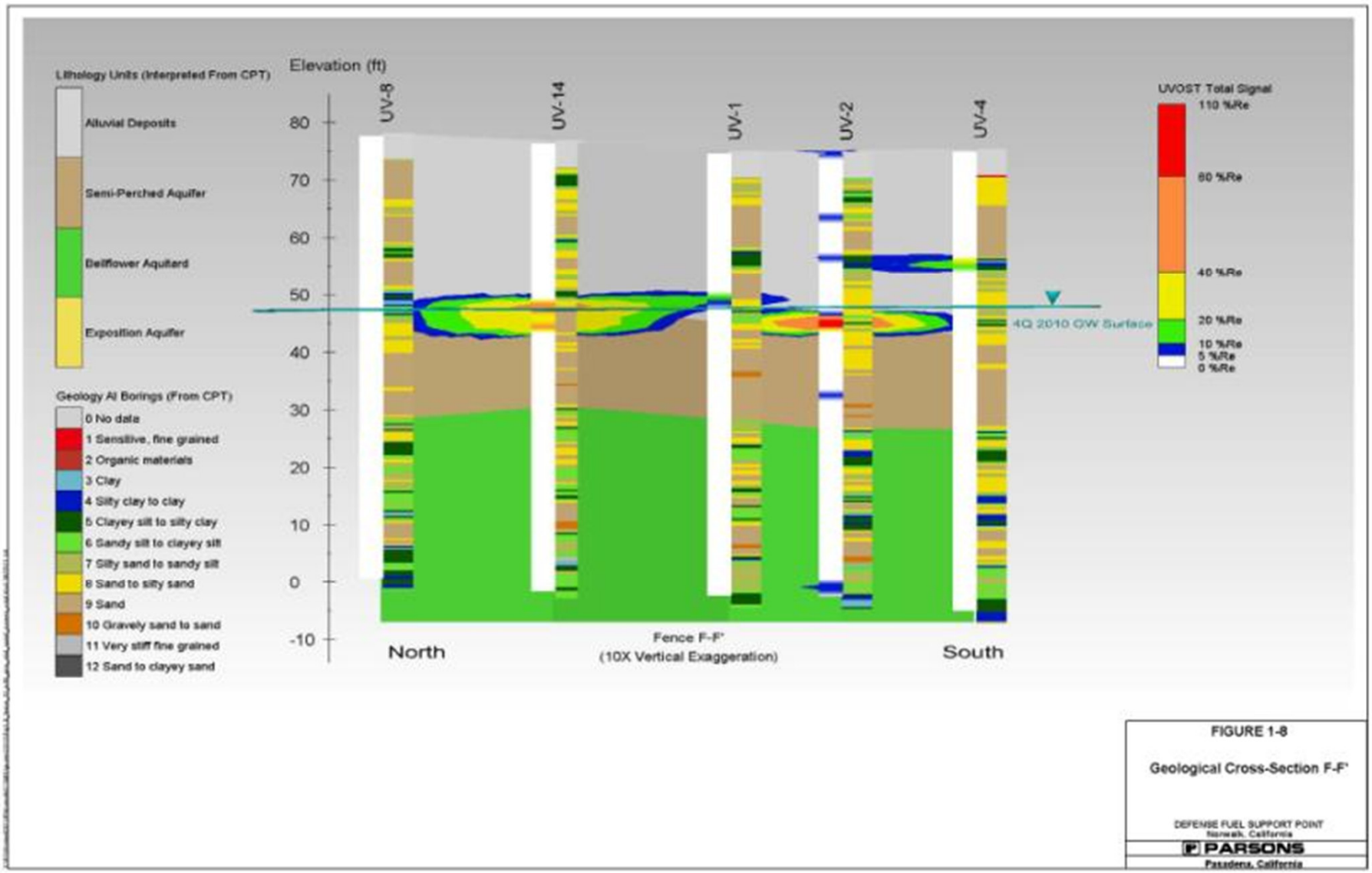
Geological Cross-Section A-A'

DEFENSE FUEL SUPPORT POINT
Norwalk, California

PARSONS
Pasadena, California

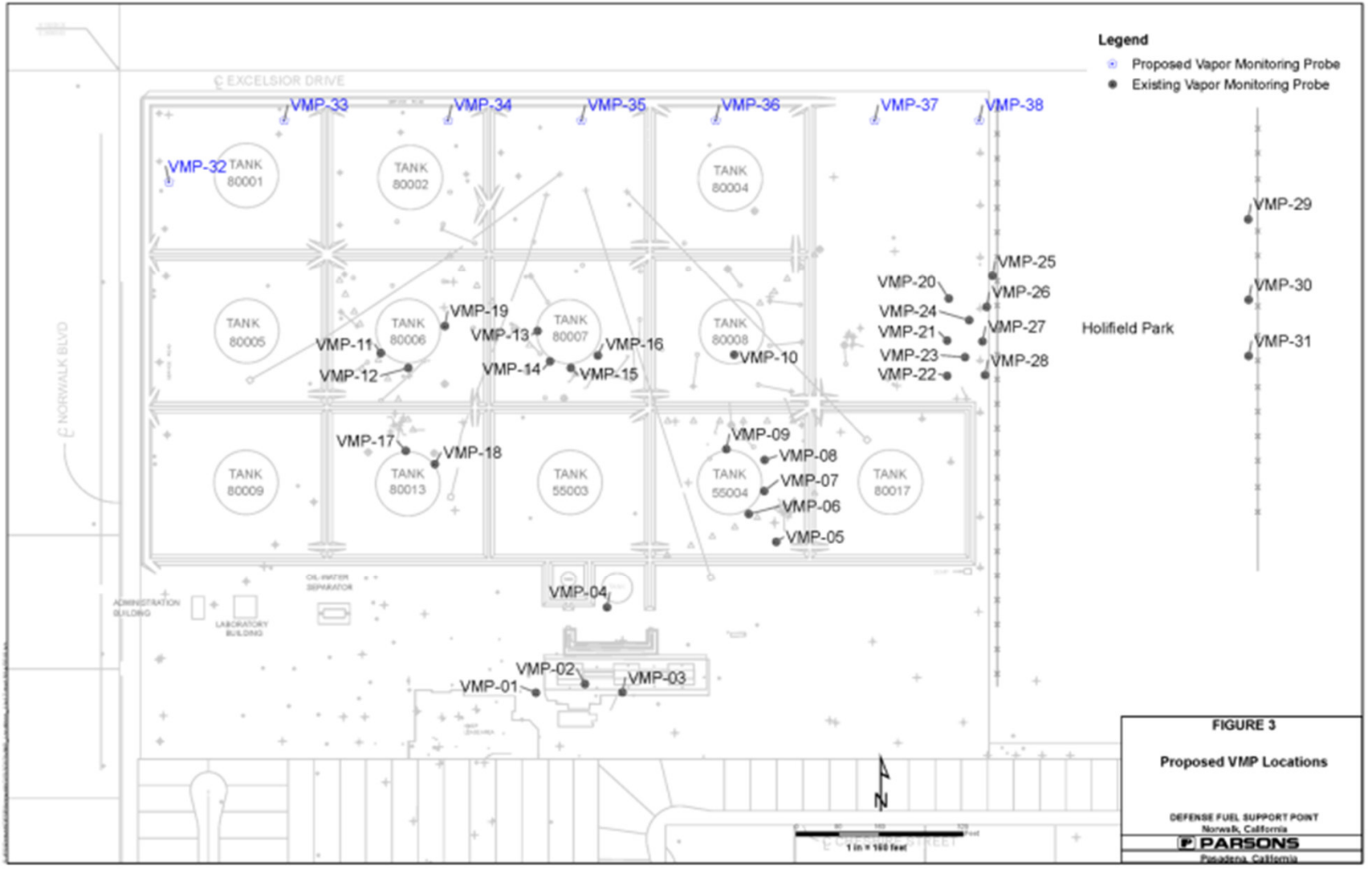
Additional Assessment Update

North-South Cross-Section



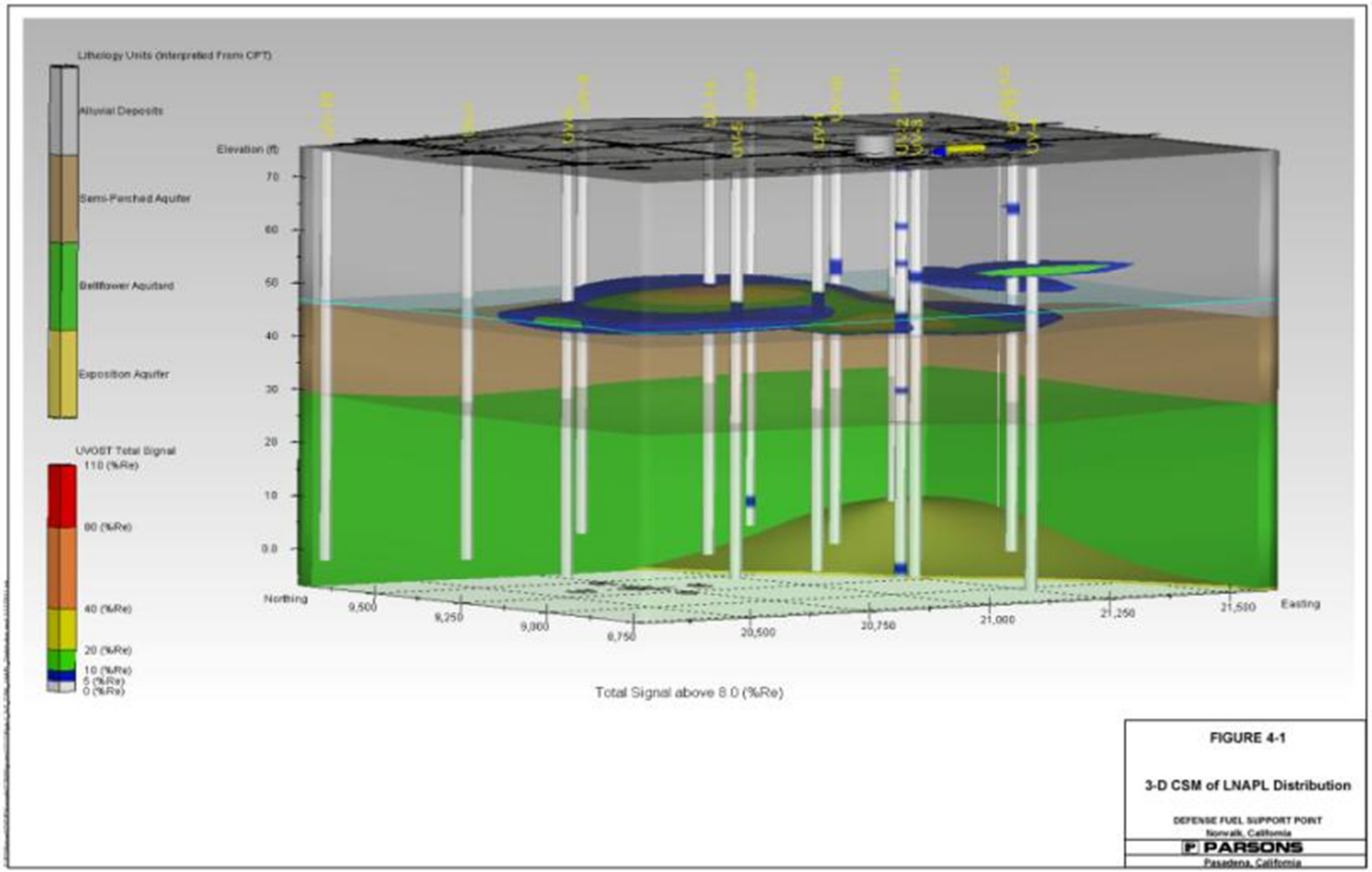
Additional Assessment Update

Vapor Monitoring Locations



Additional Assessment Update

Conceptual Site Model of LNAPL Distribution



Revised Remedial Action Plan
Progress Report

Update on 5-Year Action Plan

- Free product recovery
  - Fuel thickness and extent of free product in wells have decreased
  - Oct 2010 free product only detected in 5 wells in the north-central, north-eastern, and TFS areas with thicknesses ranging from 0.18 feet (GWM-62) to 1.05 feet (MW-15)
- Soil venting & Biosparging
  - Expanded well network in various areas
  - SVES began continuous operation from the north-eastern area in Jan 2011

Update on 5-Year Action Plan

- Groundwater extraction
  - Effectively decreased free product plumes
  - Extraction from north-west corner and north-eastern area for containment has been effective
  - Off-site wells continue to show non-detect or decreasing trends in TPH and BTEX concentrations
  - Although TPH concentrations in most wells are lower and/or are declining, GW extraction is used for plume containment

Remedial Action Plan Update

- ***Soil Remediation Schedule***
- SVE operation - Jan 2011 – Dec 2013
- Conduct additional soil investigation under concrete foundations - Feb 2011 to June 2011
- SVE & bioventing operation combined - Mar 2011 to Dec 2013
- Respiration test & soil confirmation sampling – Jan 2014 to June 2014
- Potential new remedial solution – date TBD

Remedial Action Plan Update (cont)

- ***Groundwater Remediation Schedule***
- Groundwater extraction
- Biosparging
- Potential new remedial solution
- Monitored natural attenuation
- Confirmatory groundwater sampling
- Request no further action

Planned Activities

Planned Activities for Next Semiannual Period

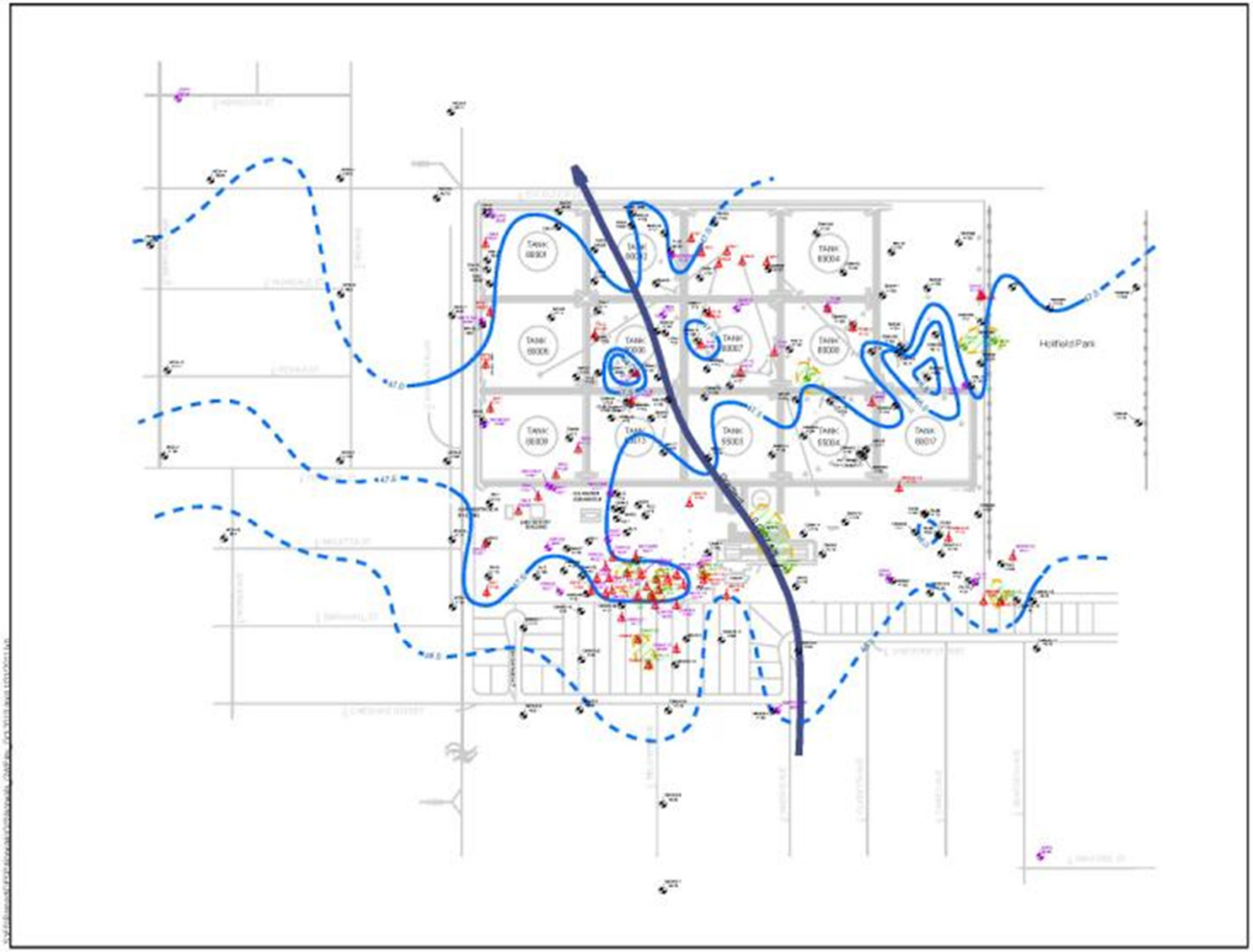
- Continue weekly system inspections, required sampling, evaluation, and optimization of GWTS
- Continue operation, system inspections, required sampling, and optimization of VES
- Site-wide weed abatement
- Conduct 1st semi-annual GWM (Jan 10-12) and 2nd GWM event
- Prepare and submit NPDES DMR for 4th quarter 2010 and 1st quarter 2011
- Concrete demolition activities

2nd Semiannual 2010 Groundwater Monitoring Event

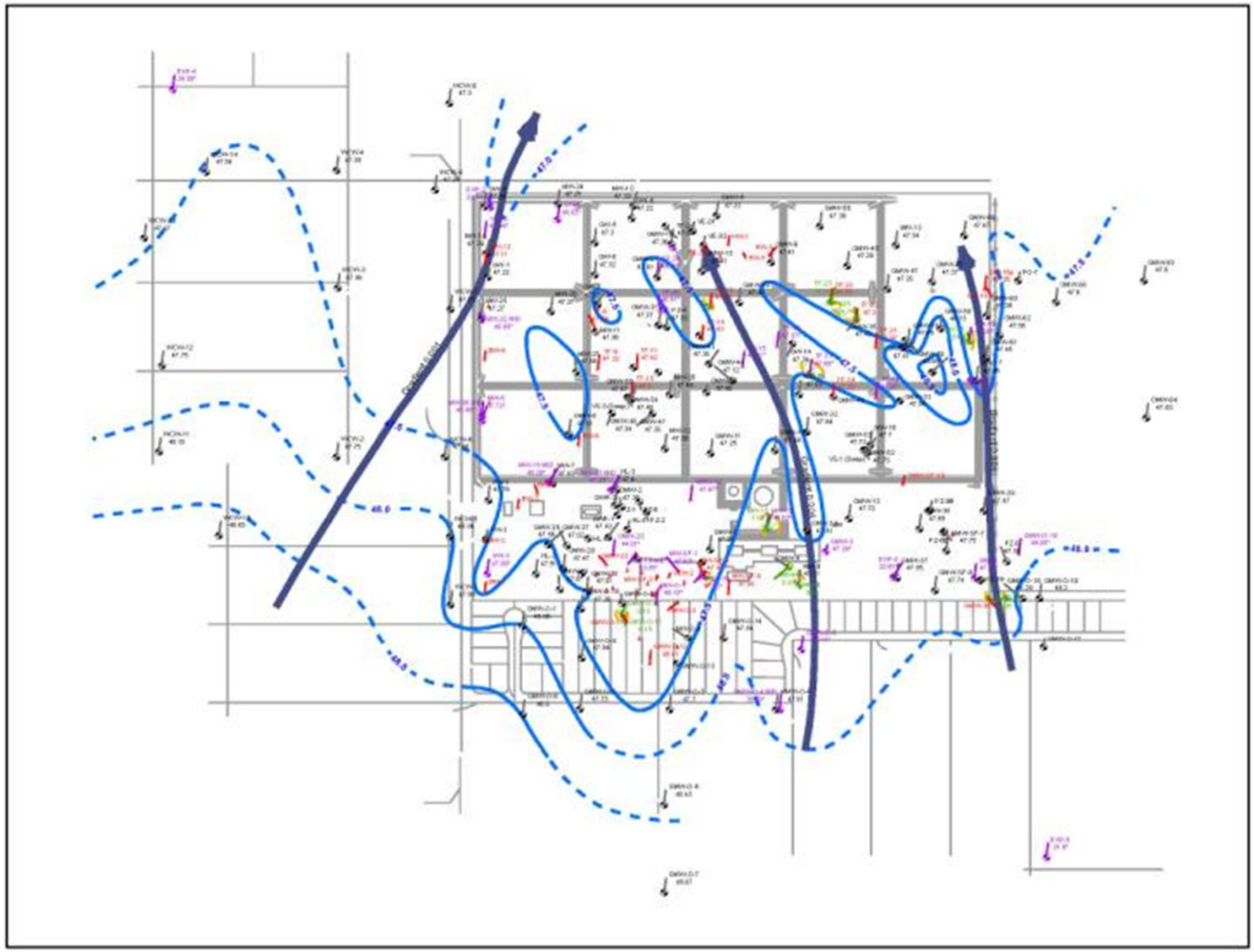
Second Semiannual 2010 Groundwater Monitoring Event

- 122 wells sampled, including 4 Exposition aquifer wells
- Groundwater elevations decreased by approximately 0.5 foot since April 2010
- Very low estimated concentrations of MTBE were detected in two Exposition aquifer wells
- Free product was detected in 13 wells and ranged in thickness from 0.01 feet to 1.05 feet (MW-15)

Groundwater Elevation and Free Product Plumes - October 2010



Groundwater Elevation and Free Product Plumes - October 2009



Second Semiannual 2010 Groundwater Monitoring Event

- Free product was observed in 13 of the 214 wells measured during the second 2010 semiannual monitoring event, with the maximum apparent free product thicknesses of 1.05 feet at MW-15
- In most areas, the lateral extents of TPH, benzene, 1,2-DCA, and MTBE in groundwater remain similar to those interpreted during April 2010
- In general, TPH concentrations have remained similar to the April 2010 semiannual event; however, some wells have exhibited decreases such as GMW-59, GMW-60, and GMW-61 located in the northeastern area

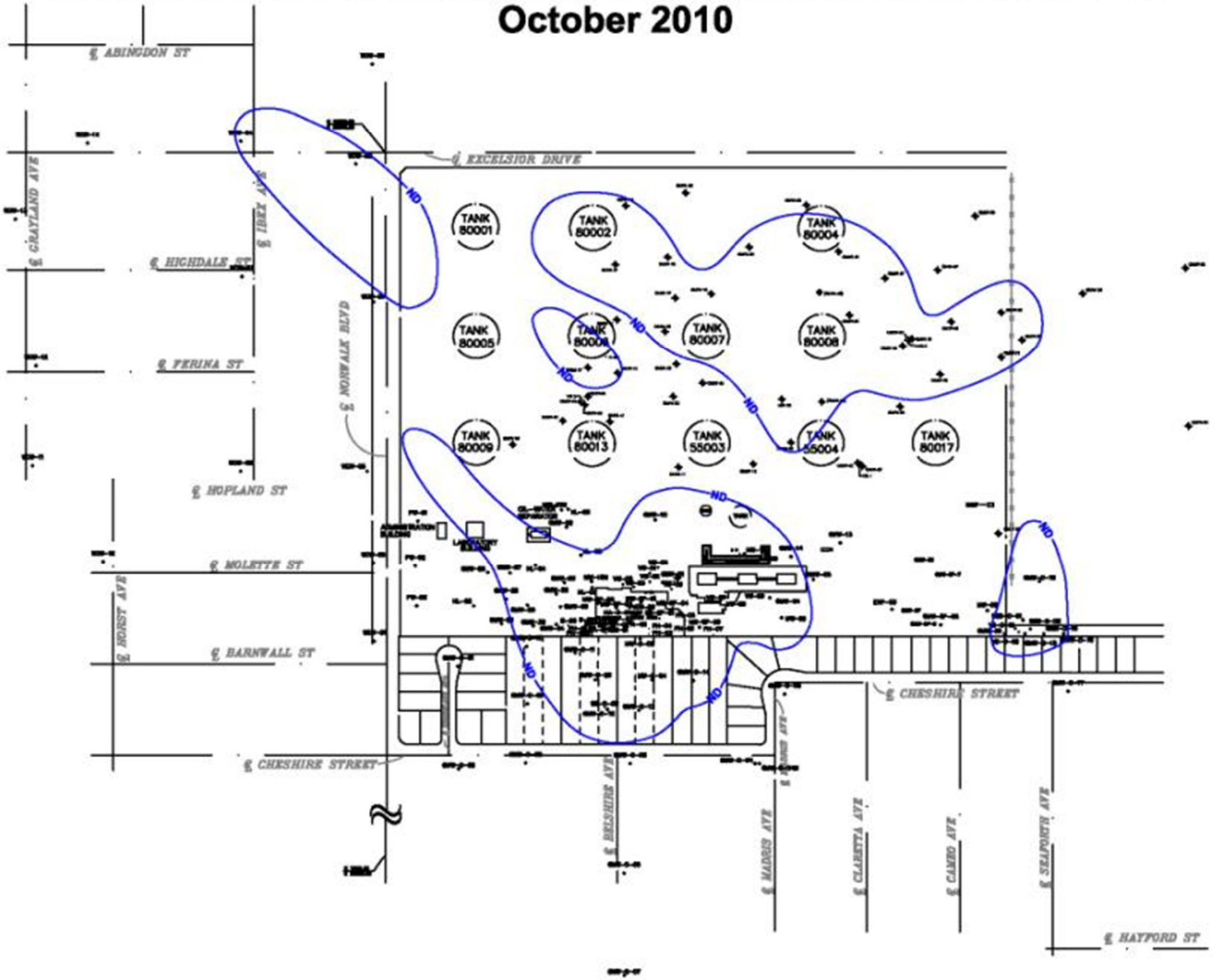
Second Semiannual 2010 Groundwater Monitoring Event

- Benzene was not detected in any of the off-site wells west of the site, or in any of the Exposition wells
- All detections of 1,2-DCA were below the risk-based cleanup goal of 70 µg/L. 1,2-DCA was not detected in any of the Exposition aquifer wells
- Concentrations of MTBE in off-site monitoring wells west of the site generally remained below the detection limit or were detected at low concentrations below the risk-based cleanup goal of 40 µg/L

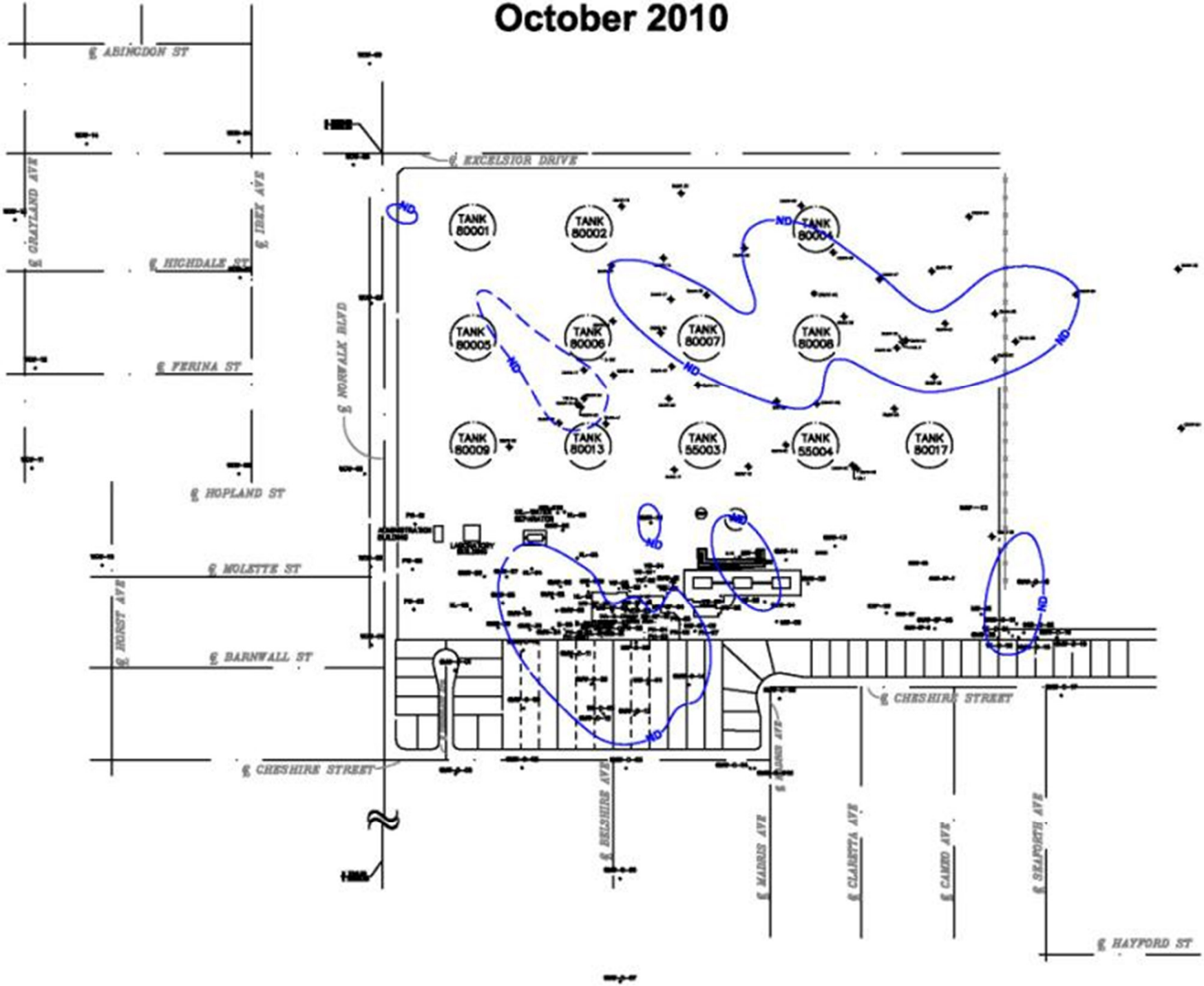
Second Semiannual 2010 Groundwater Monitoring Event

- The extent of TBA is similar to the MTBE plume in the south-central plume area
- MTBE was detected at very low concentrations (far below the clean-up goals) in samples collected from two Exposition aquifer wells (EXP-1 and EXP-3) on the eastern side of the site
- We continue to carefully monitor the MTBE concern in the Exposition Aquifer

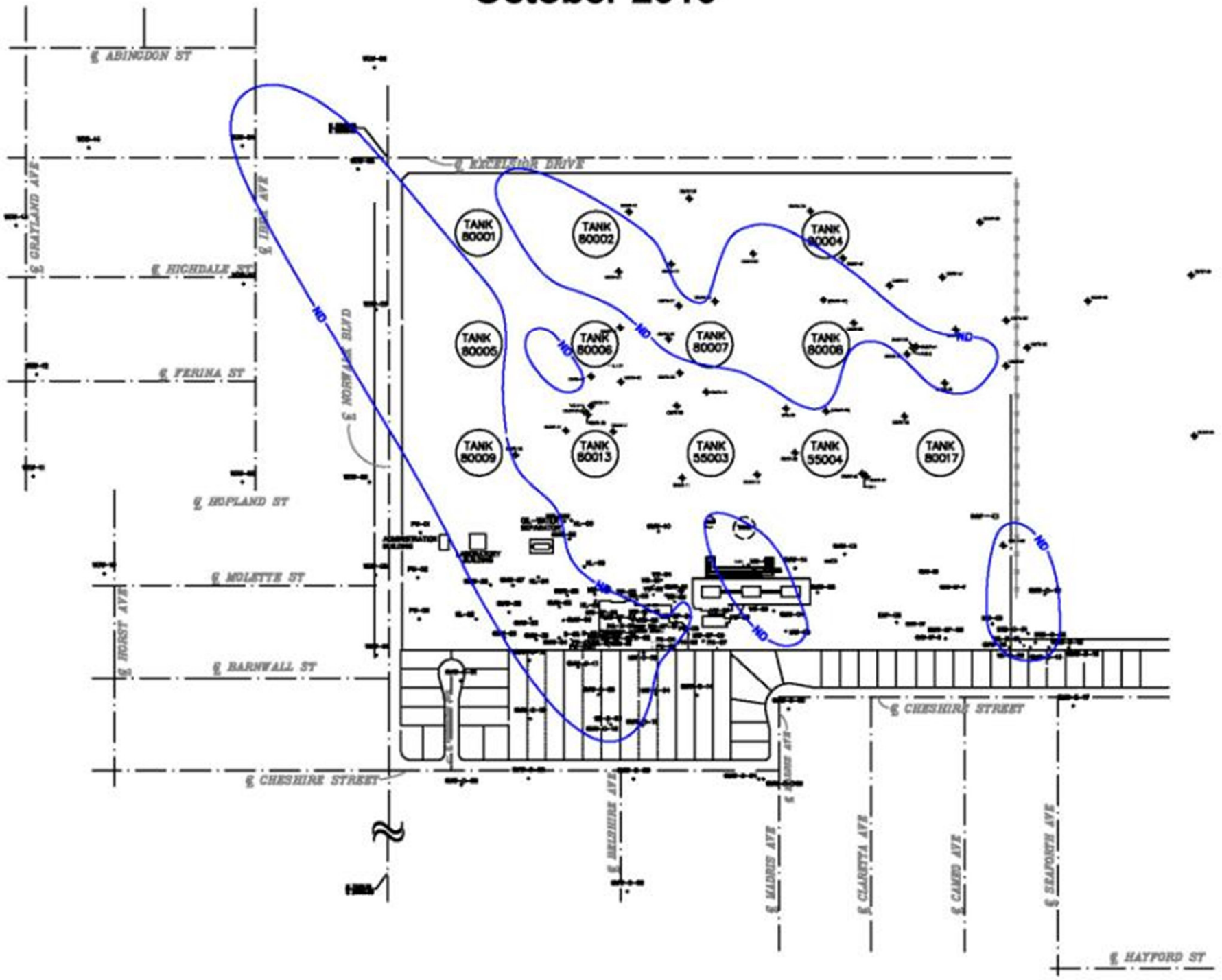
Total Petroleum Hydrocarbons In Uppermost Groundwater Zone
October 2010



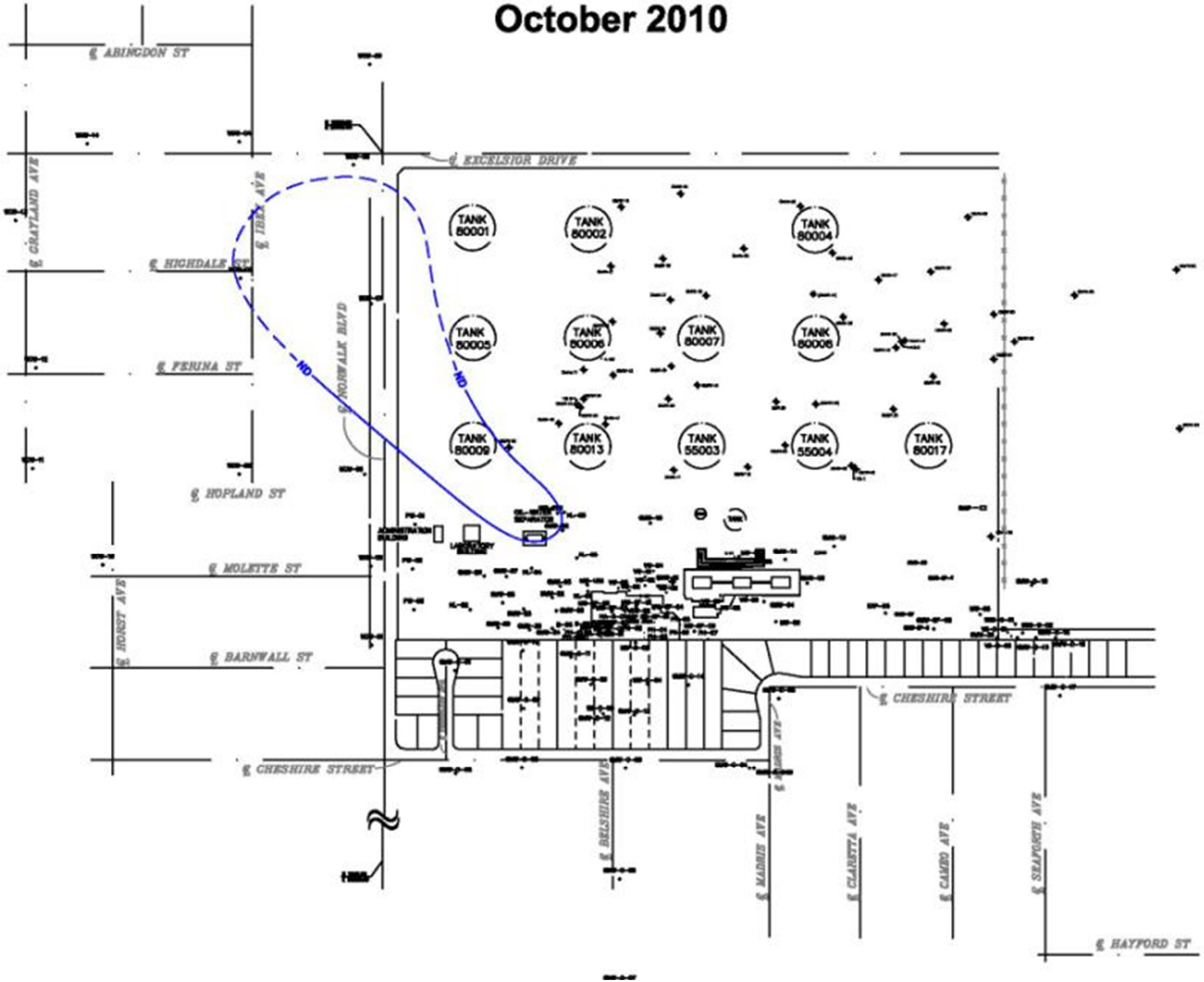
Benzene In Uppermost Groundwater Zone
October 2010



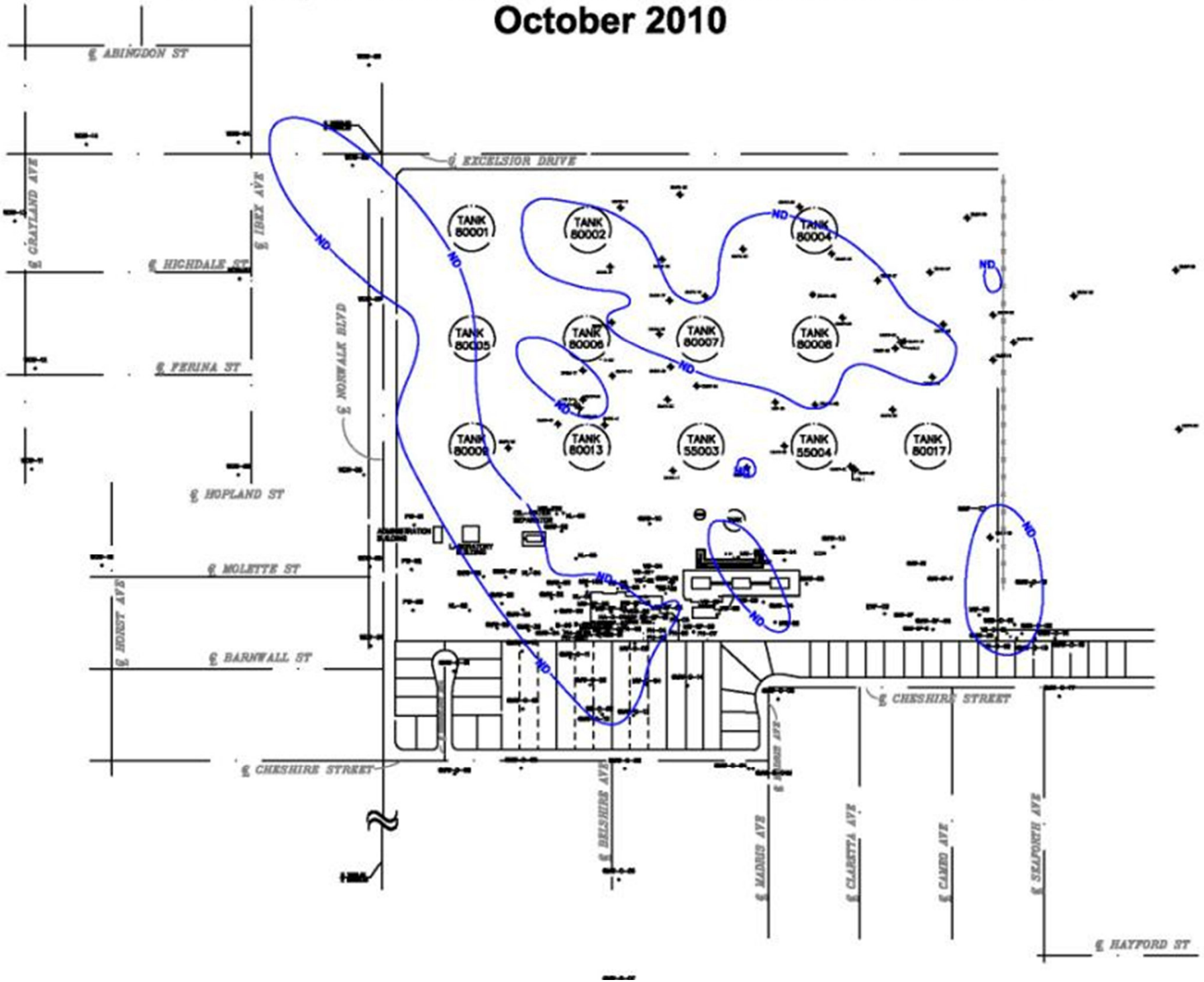
Methyl tert-butyl ether In Uppermost Groundwater Zone
October 2010



1,2-Dichloroethane In Uppermost Groundwater Zone
October 2010



Tert-Butyl Alcohol In Uppermost Groundwater Zone
October 2010



Discussion