



DEFENSE LOGISTICS AGENCY

AMERICA'S COMBAT LOGISTICS SUPPORT AGENCY



Norwalk Tank Farm Update

Norwalk Tank Farm
Restoration Advisory Board

February 27, 2014



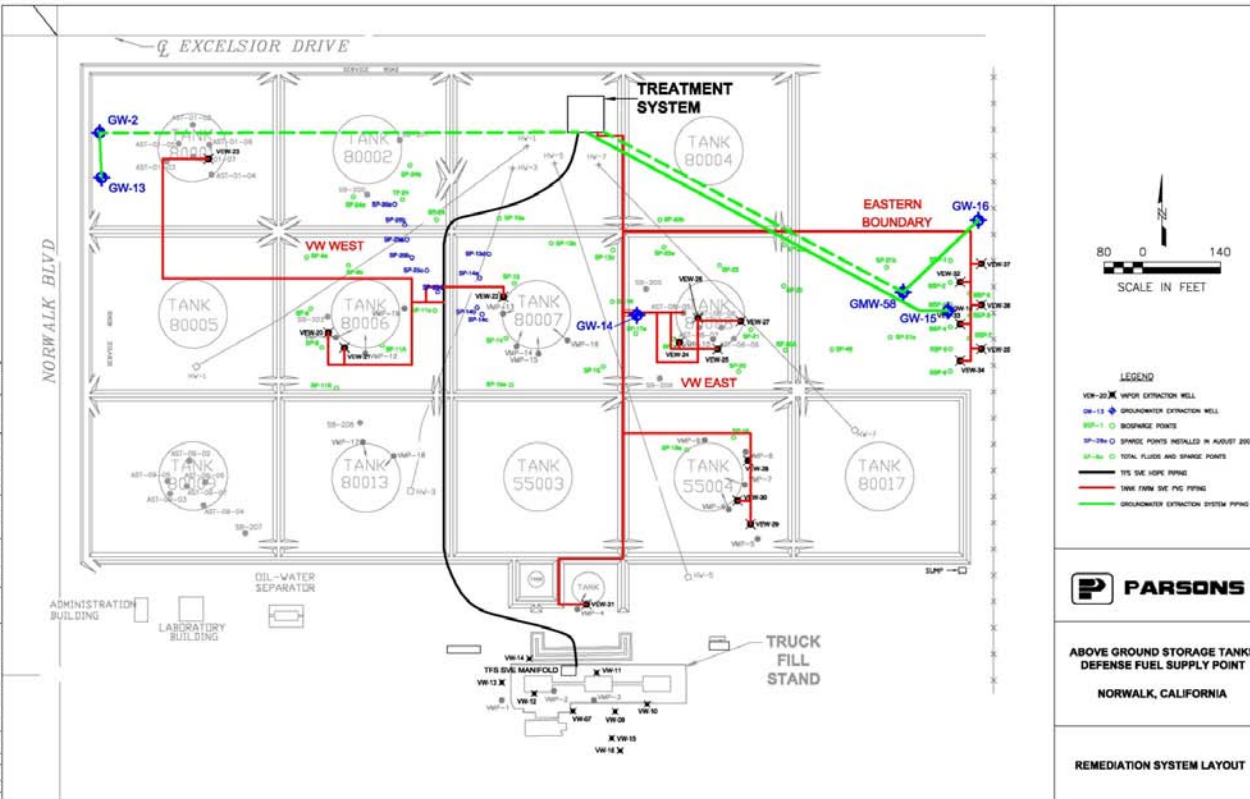
Presentation Overview

- Remediation Operations Update
- Five-Year Action Plan Progress Report
- Remedial Action Plan Update
- Planned and Future Activities
- Second Semiannual 2013 Groundwater Monitoring Update



Current Remediation Systems

- Groundwater extraction for contaminant mass containment (average flow 32 gpm)
- Soil vapor extraction for contaminant mass removal and containment (average flow 145 cfm)
- Biosparging for contaminant mass removal
- Localized vacuum recovery for free product (average recovery over the last year almost 50 gal/month)
- Absorbent socks for passive free product recovery





Updated Aerial



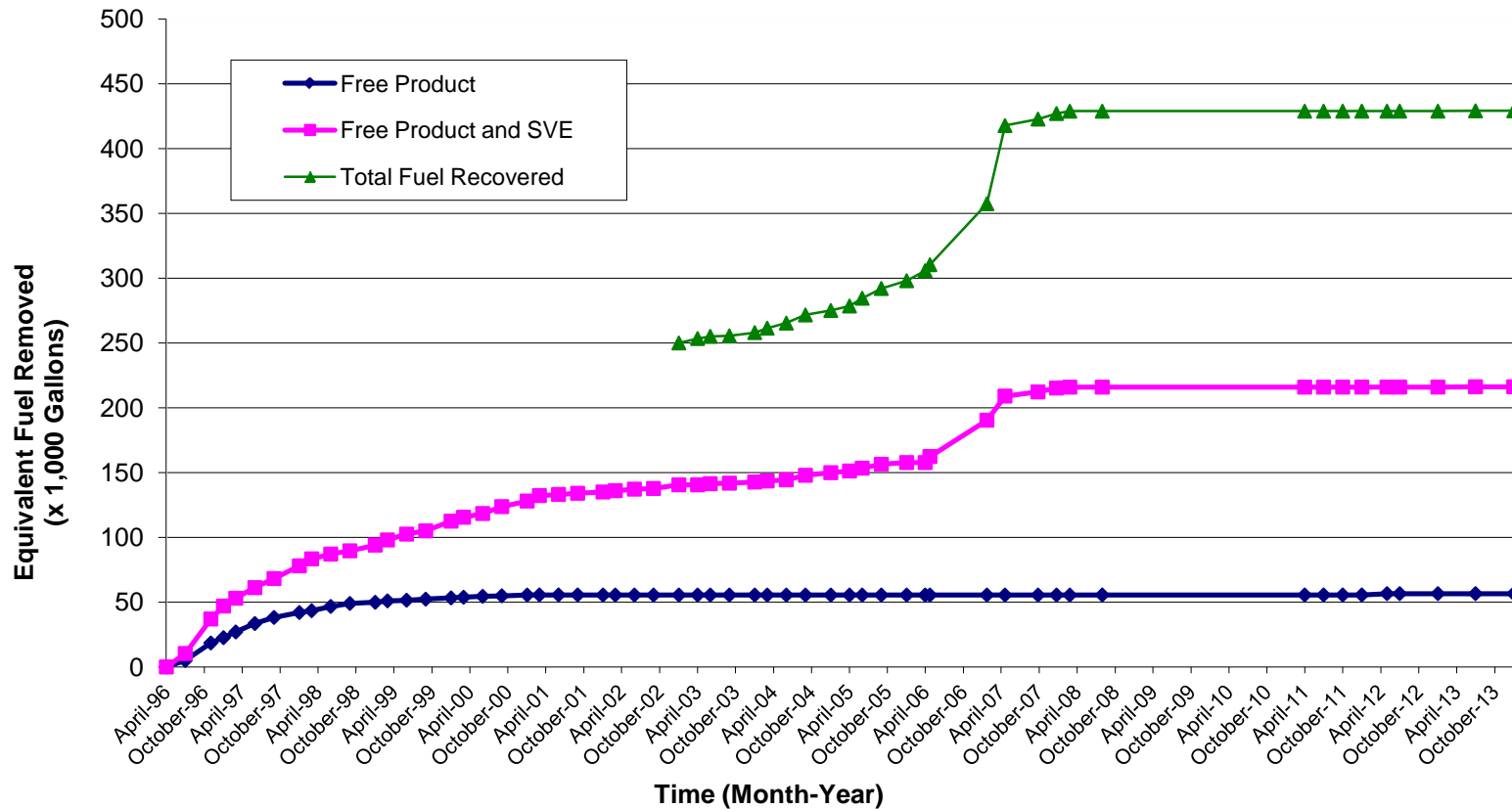


Remediation Systems Operations Summary

- GWE Operation:
 - 2 wells (GW-2 and GW-13) in the north-west area
 - 2 wells (GW-15 and GW-16) in the north-eastern area
 - operation time:
 - 3rd quarter 2013: 77.4% of time
 - 4th quarter 2013: 14.6% of time
- SVE Operation:
 - four horizontal wells (HW-1, HW-3, HW-5, HW-7) spanning the former tank farm area
 - six vertical wells (SVE-32 through SVE-37) in the north-eastern area
 - operation time:
 - 3rd quarter 2013: 3% of time during
 - 4th quarter 2013: 99.4% of time



Remediation Systems Operations Summary





Overall Operations Summary

- Groundwater extracted and equivalent mass of hydrocarbons removed:
 - 3rd quarter 2013: 1,568,777 gallons (0.033 pound)
 - 4th quarter 2013: 304,954 gallons (0.0064 pound)
 - 67.8 million gallons (9,912 pounds) since April 1996
- Soil vapor extraction system equivalent mass of hydrocarbons removed:
 - 3rd quarter 2013: 0.22 gallons (1.56 pounds)
 - 4th quarter 2013: 0.055 gallons (0.388 pounds)
 - 417.2 gallons (2,958 pounds) since April 1996



Five-Year Action Plan Progress Report

- LNAPL Conceptual Site Model submitted September 30
- Free product recovery
 - Groundwater elevation has continued to decrease since 2005 and therefore, as expected, an increase in free product has been observed in the most recent events but well below the historical levels
 - In October 2013 free product was detected in nine wells in the north-central area, two wells in the northeastern area, and two wells in the truck fueling area
 - 284 gallons of free product was recovered during reporting period
 - GMW-62 located in Holifield Park along with any on-site well that has measurable product are gauged weekly and vacuum recovery is conducted once one foot thickness is measured



Five-Year Action Plan Progress Report

- Soil vapor extraction
 - SVE operates on an optimized pulsed frequency from the north-central and northeastern areas
- Groundwater extraction
 - Effectively decreased free product plumes over time
 - Extraction from north-west corner and northeastern area for containment has been effective
 - Off-site wells are monitored semiannually and overall 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, GWE is used for plume containment



Remedial Action Plan Update

- **Soil Remediation Schedule**

- SVE &/or bioventing operation: January 2012 – December 2014
- Soil excavation to areas where impacts are above the approved soil cleanup goals down to 10 feet below surface grade – 2014
- Remedial solution for deeper impacted soil from greater than 10 feet below ground surface to groundwater: TBD
- Soil confirmation sampling and reporting and request for NFA: TBD

- **Groundwater Remediation Schedule**

- GWE for containment will continue
- Evaluate free product and groundwater remediation technologies
- Remedial action will be proposed and implemented



Planned and Future Activities

- Continue operation, weekly system inspections, required sampling, evaluation and optimization of GWE and SVE systems
- Conduct 1st semiannual 2014 event in April and support in the site-wide semiannual report to be prepared by CH2M HILL
- Prepare and submit NPDES DMR and remediation system progress reports for 1st, 2nd, and 3rd quarters 2014
- Excavation of the top 10-feet at impacted areas where soil cleanup criteria are exceeded will be conducted to minimize and eliminate human exposure. As agreed by the RWQCB, after successful soil excavation and confirmation sampling, shallow soil to 10 feet bgs will be considered for No Further Action
 - Excavation is anticipated to commence during the third quarter of 2014 and will be conducted in accordance with the 2012 *Onsite Soil Management Plan*



Planned and Future Activities

- Traditional technologies have accomplished mass removal to date but have reached flat levels and are no longer effective in capturing more mass removal
- Focus on mass removal of residual free product, deeper soil impacts, and groundwater impacts for long-term remedial action
- Several alternative remedial approaches are being considered to target the deeper soil, residual free product, and impacted groundwater
- DLA will also be evaluating the results from the SFPP biosparge pilot test
- Remedial alternative technical evaluation will be completed by the end of March 2014 and technical meeting and/or notification to the RWQCB will be provide for the recommended technology and/or pilot test to be conducted



Second Semiannual 2013 Groundwater Monitoring Update

- Second Semiannual Event conducted in October 2013 by both DLA and SFPP
- Well Gauging by Blaine Tech and Parsons
 - 166 wells gauged
- Well Sampling by Blaine Tech
 - Low-flow sampling methods
 - 166 wells gauged
 - 110 wells sampled
 - TFE & GWE systems were turned off prior to gauging and sampling as well as SFPP's SVE system
 - DLA's SVE system was on during gauging and sampling

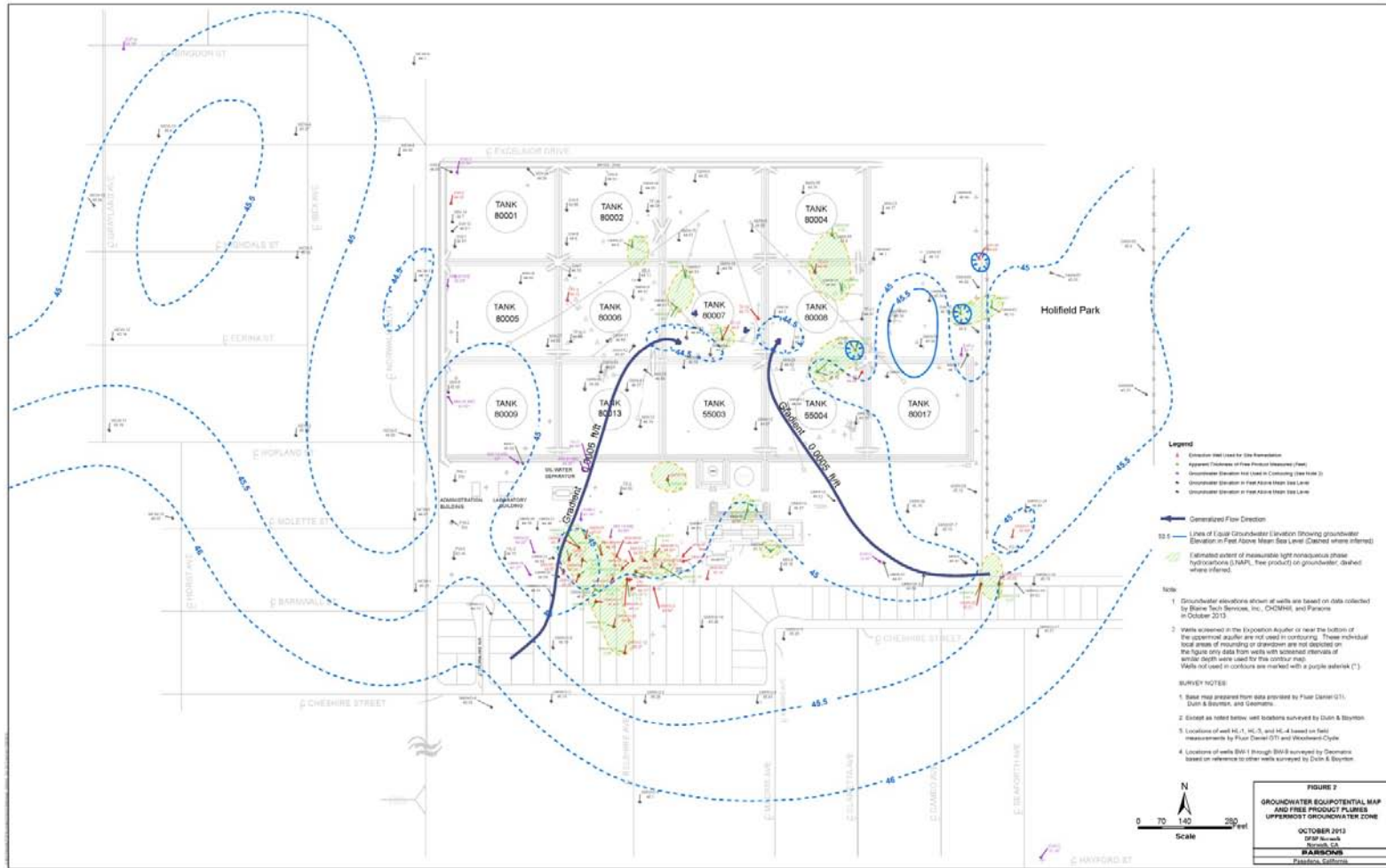


Second Semiannual 2013 Groundwater Monitoring Update

- Uppermost Aquifer Groundwater Elevations and Flow
 - Groundwater elevations approximately 1.2 foot lower than those reported for October 2012
 - Groundwater elevations near historical lows since monitoring first began in 1990s
 - Horizontal hydraulic gradient was approximately 0.0006 ft/ft toward the north
- Exposition Aquifer Groundwater Elevations and Flow
 - Groundwater elevations were approximately 2 feet lower than those reported for October 2013
 - Horizontal hydraulic gradient was approximately 0.0005 ft/ft toward the east-southeastward, substantially different than the uppermost groundwater zone

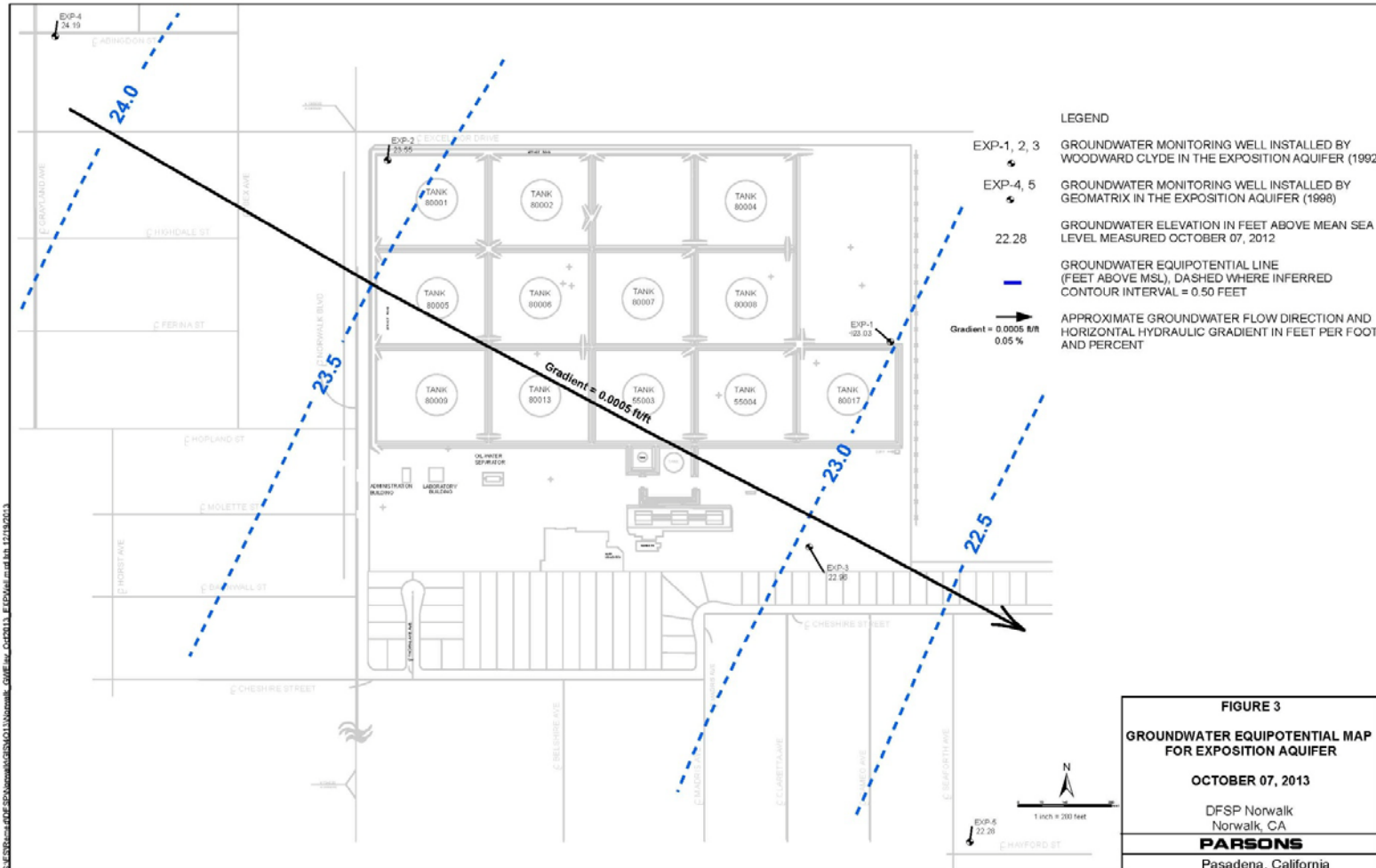


Groundwater Elevation – Water Table



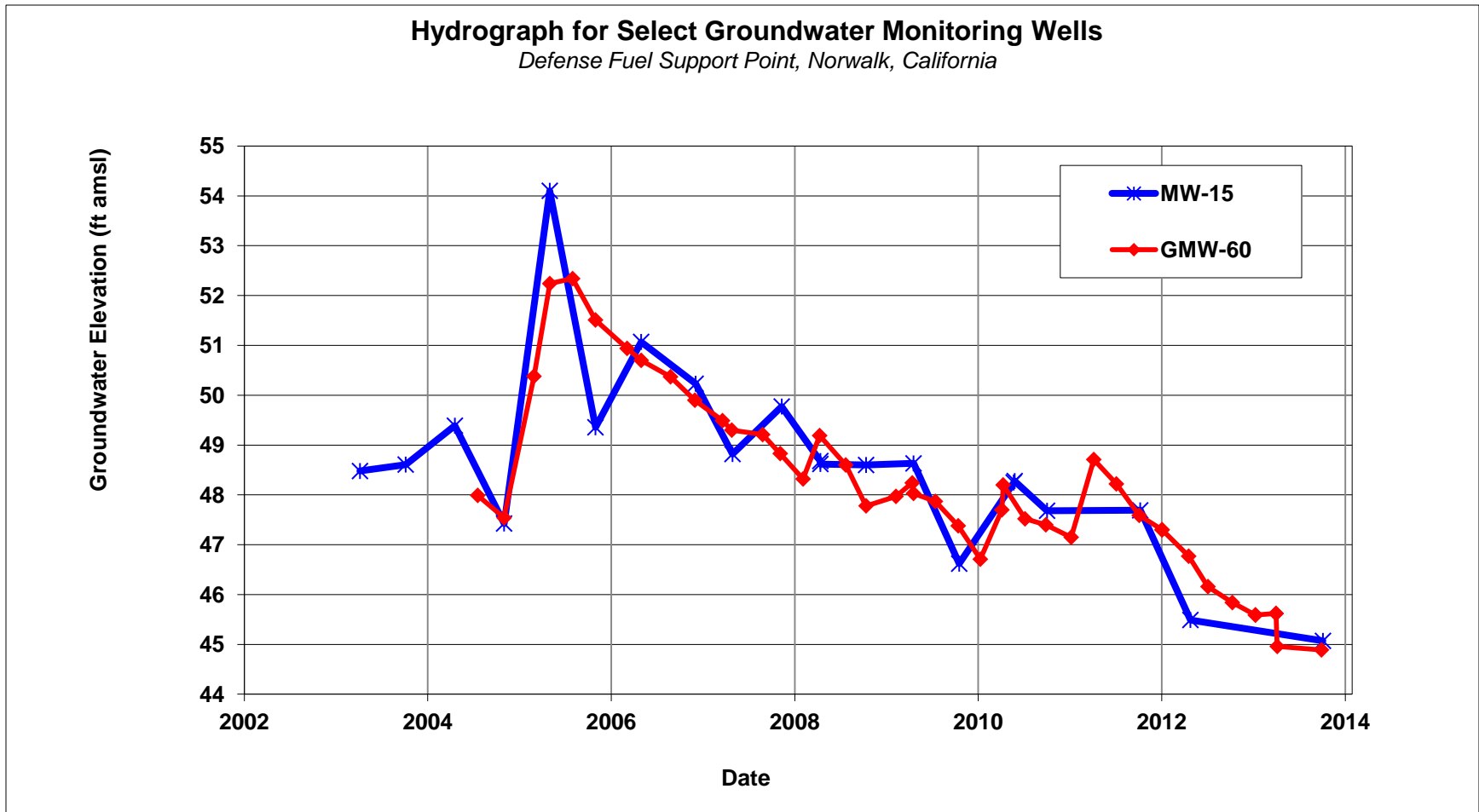


Groundwater Elevation - Exposition





Decline in Groundwater Elevation





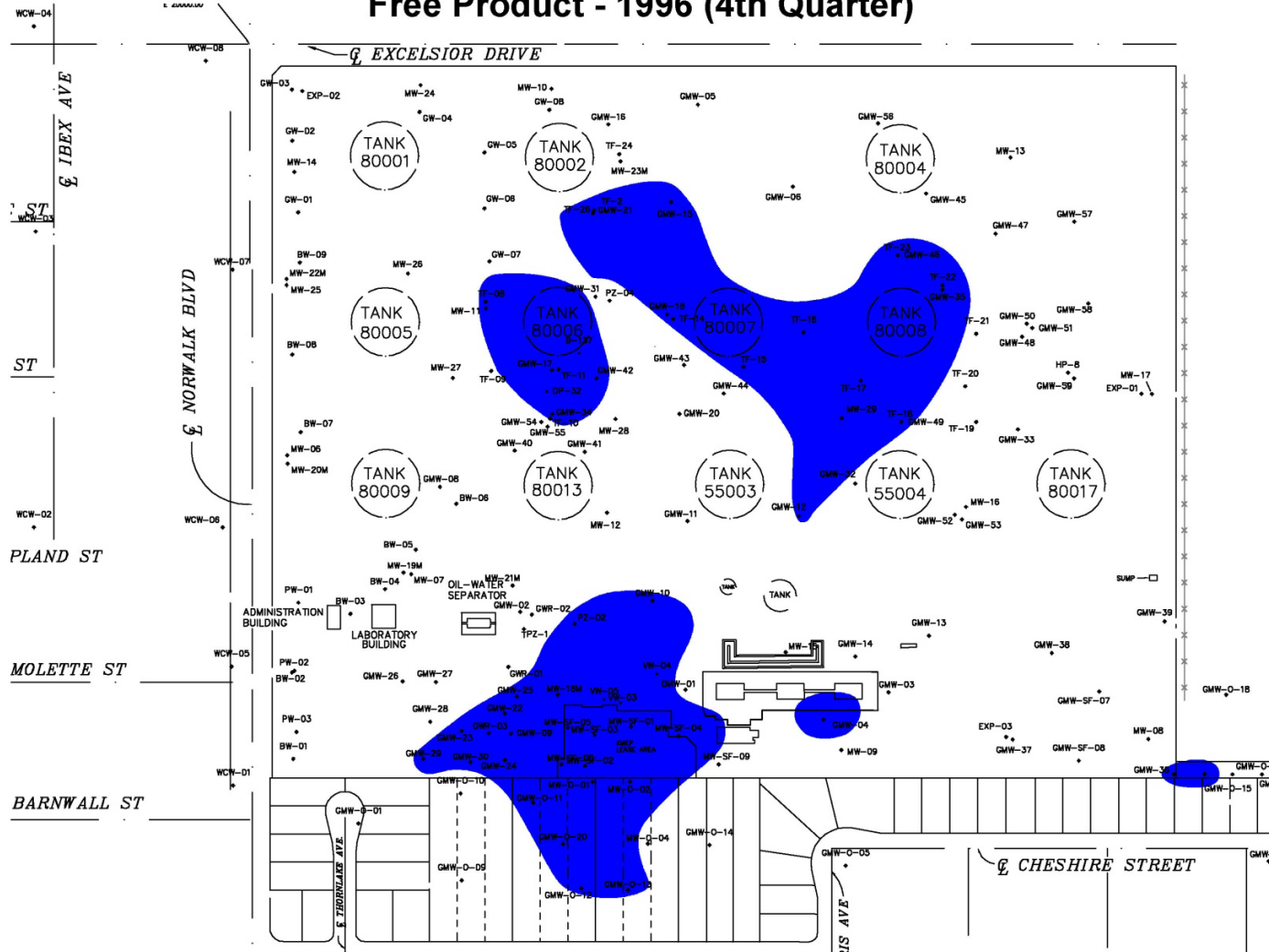
Second Semiannual 2013 Groundwater Monitoring Update

- Free product was measured in 31 of the 166 wells gauged
 - North-central area: GMW-7, GMW-18, GMW-21, GMW-35, GMW-45, TF-15, TF-18, TF-20, and TF-23
 - Eastern area: GMW-62 and GW-15
 - Truck fueling area: GMW-4 and MW-15
 - South-central area: GMW-9, GMW-10, GMW-22, GMW-24, GMW-25, GMW-O-11, GMW-O-12, GMW-O-20, GMW-O-23, GWR-3, MW-SF-1, MW-SF-2, MW-SF-13, MW-SF-14, MW-SF-15, and MW-SF-16
 - Southeastern area: GMW-36 and GMW-O-15
- Thickness ranged from 0.02 foot to 5.42 feet
- Measured free product observed in these areas was greater than past events, likely due to a continued decline in water levels across the site



Free Product Plumes - 1996

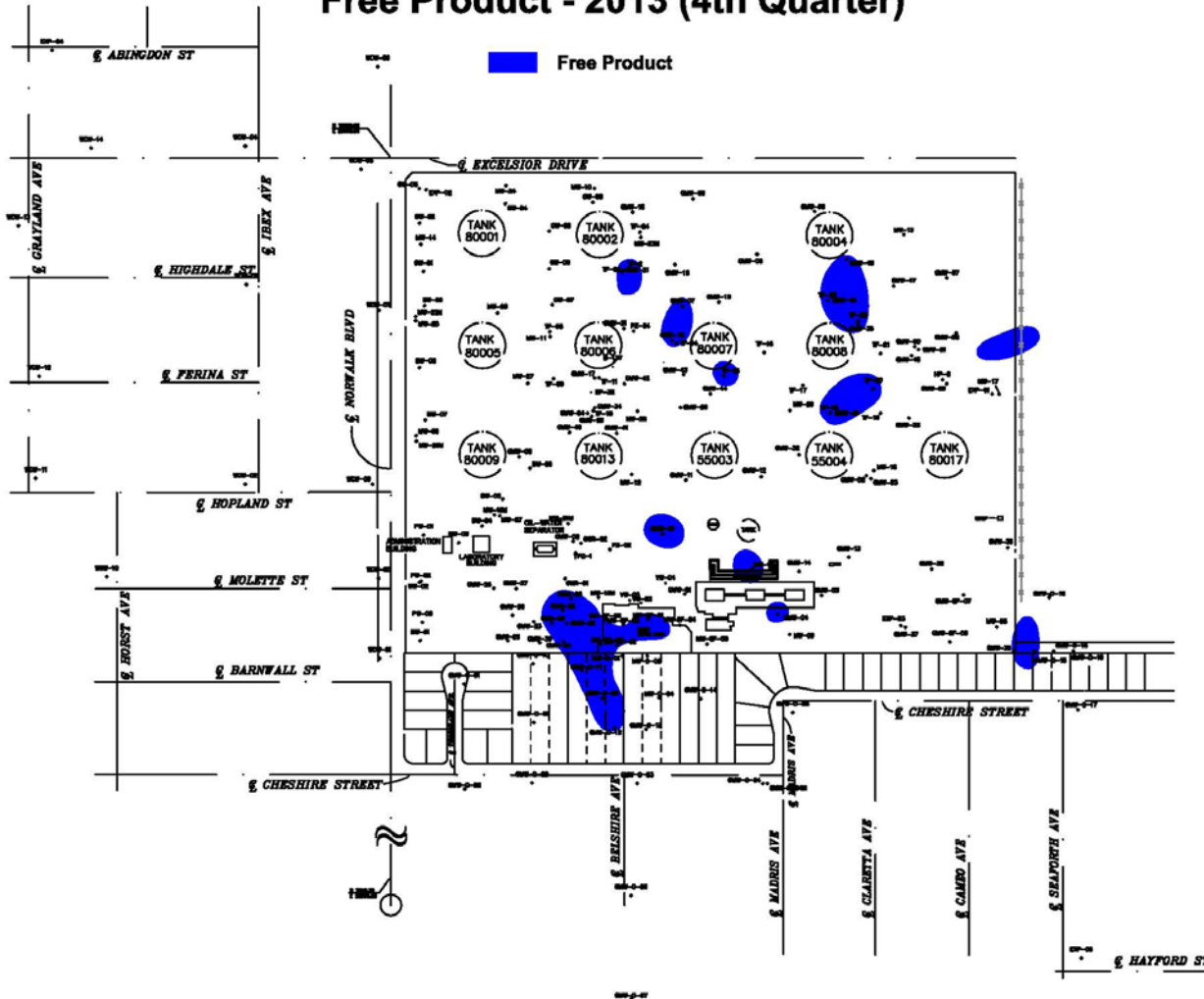
Free Product - 1996 (4th Quarter)





Free Product Plumes – October 2013

Free Product - 2013 (4th Quarter)





Second Semiannual 2013 Groundwater Monitoring Update

- **Exposition Aquifer Wells**
 - Wells sampled:
 - EXP-1, -2, and -3 sampled by both DLA and SFPP
 - EXP-4 and EXP-5 sampled by SFPP
 - All analytical results were Non Detect (ND), except for the following:
 - TPH as diesel was detected at EXP-1 and EXP-2 in the SFPP split sample at concentrations of 130 µg/L and 140 µg/L, respectively
 - 1,2-DCA was detected at EXP-3 in the DLA split sample at an estimated concentration of 0.36 J which is below the laboratory reporting limit
 - These type of low-level detections occasionally occurs in the EXP wells. DLA and SFPP will continue to monitor the EXP wells and closely watch for any future potential detections.

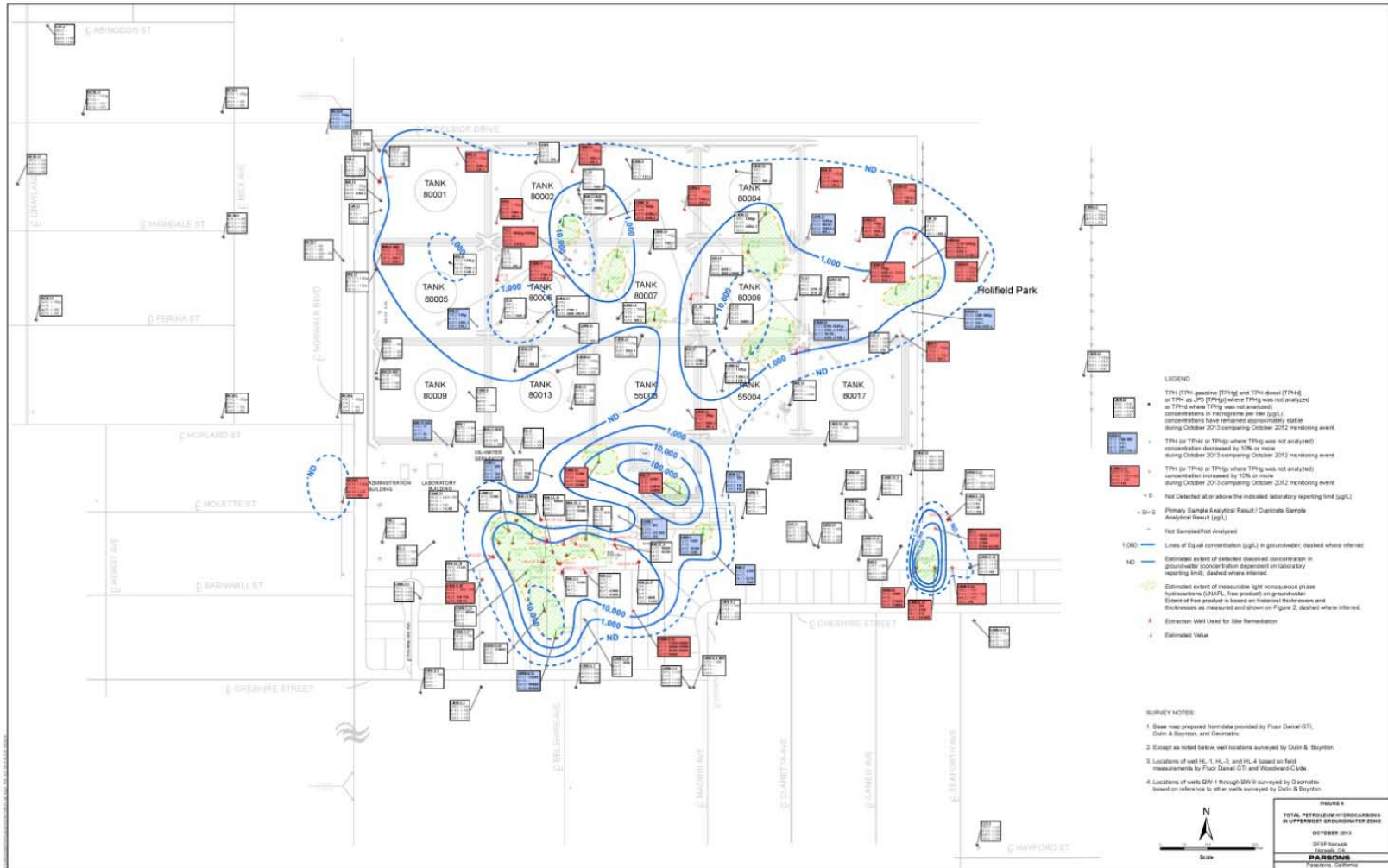


Second Semiannual 2013 Groundwater Monitoring Update

- **Uppermost Aquifer Wells**
 - In most areas, the lateral extents of TPH, benzene, MTBE, TBA, and 1,2-DCA in groundwater remain similar to those interpreted during recent previous monitoring events
 - Concentrations are influenced by water level fluctuations



Total Petroleum Hydrocarbons



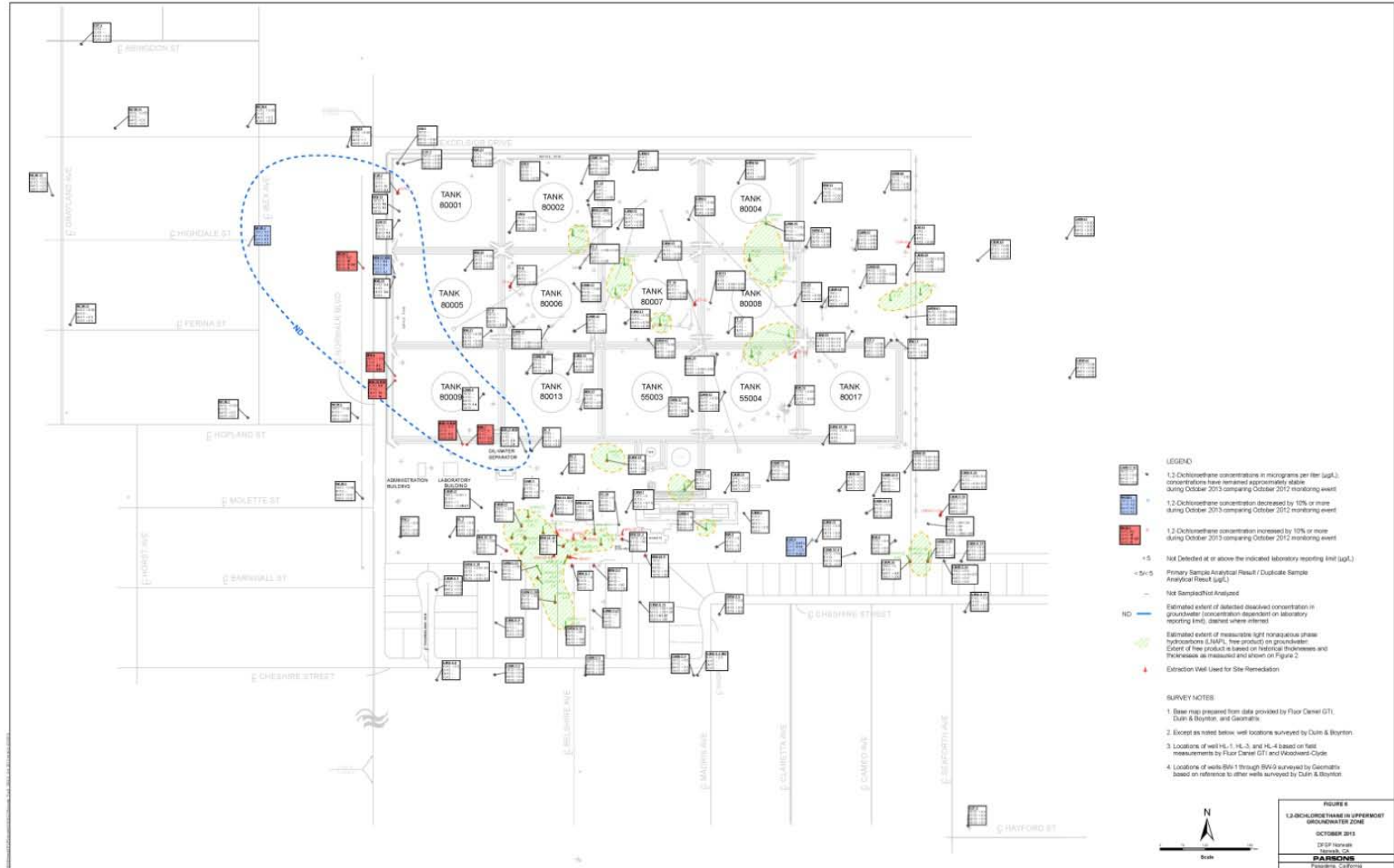


Benzene



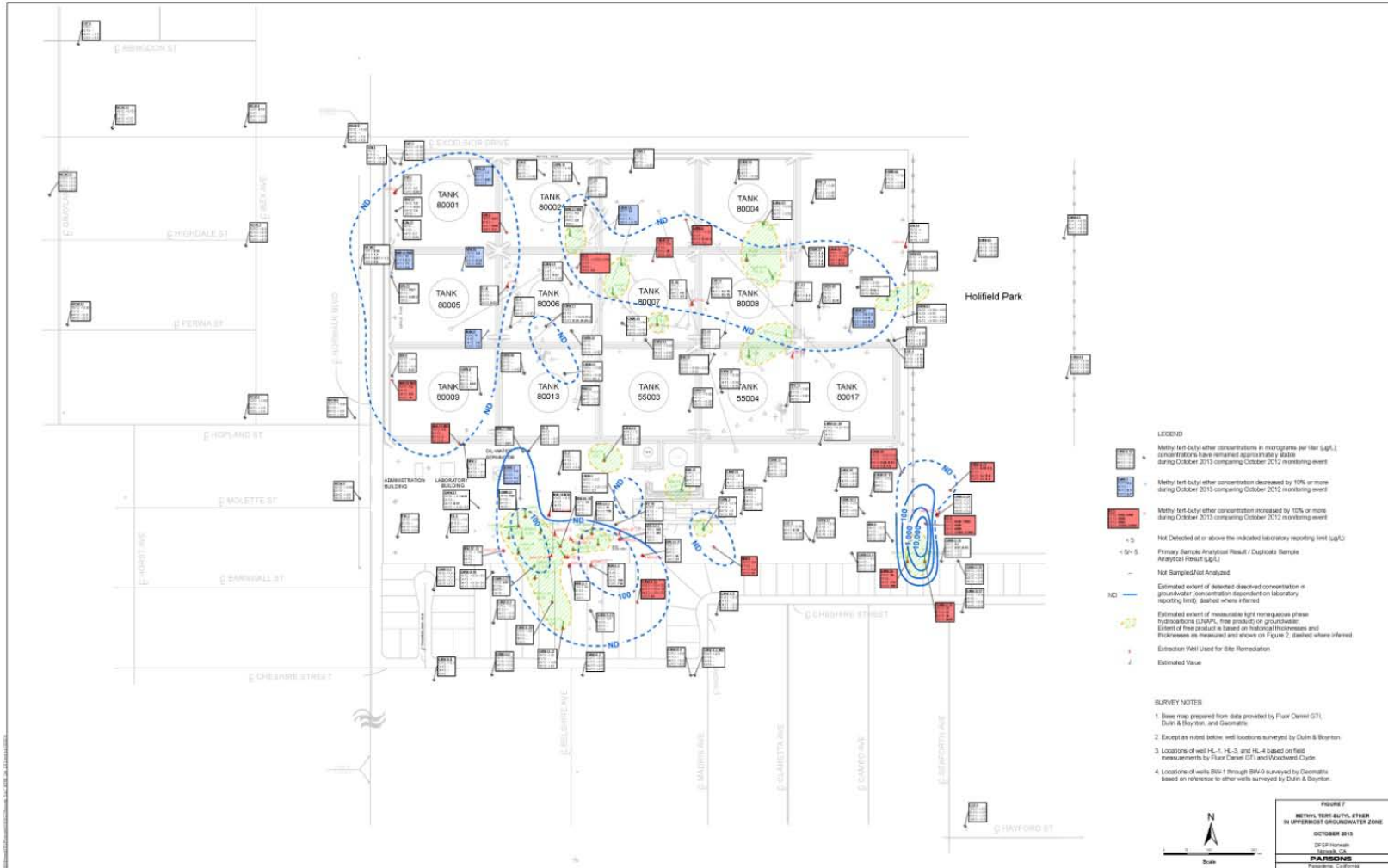


1,2-Dichloroethane



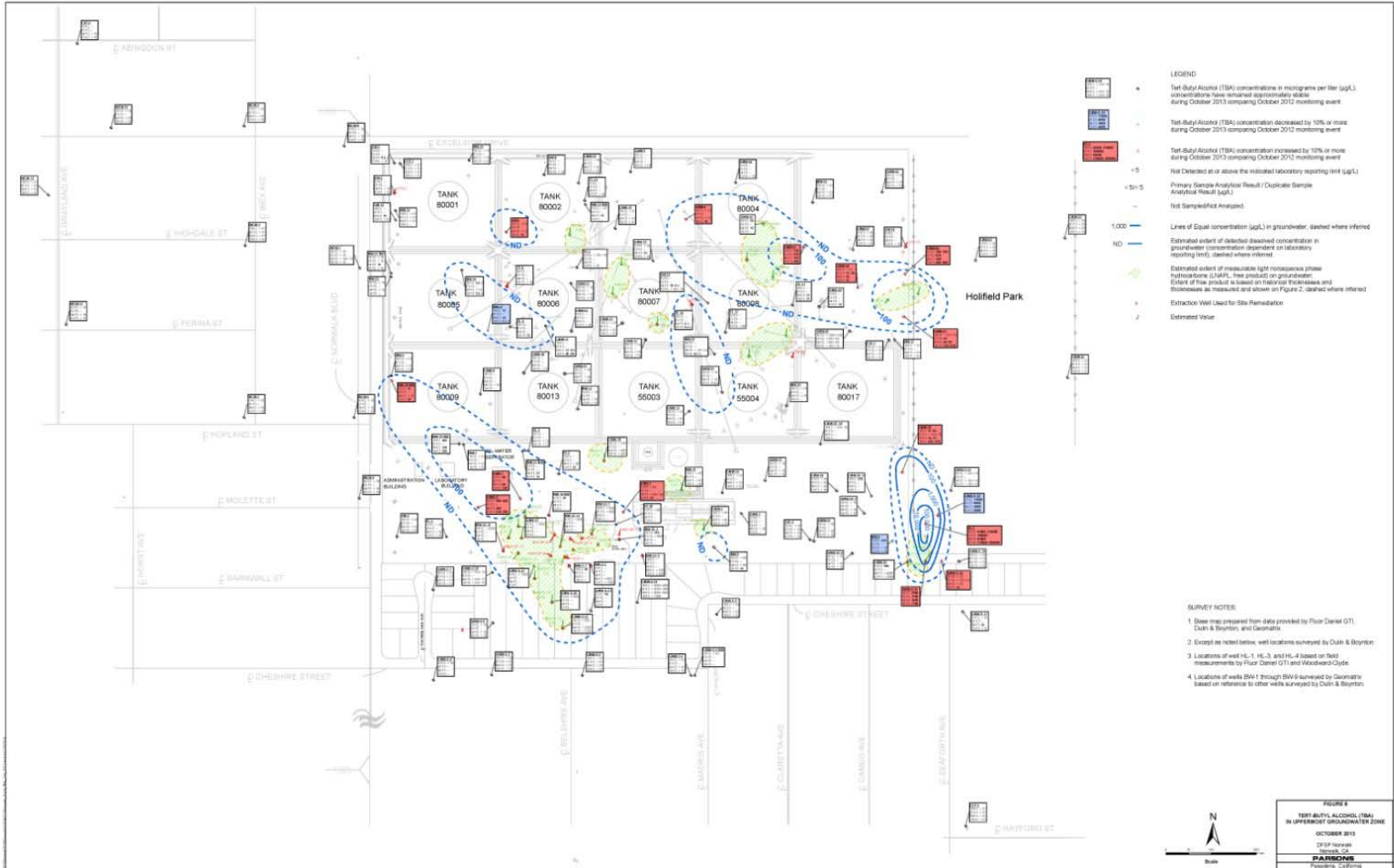


Methyl Tertiary-Butyl Ether





Tertiary-Butyl Alcohol



DEFENSE LOGISTICS AGENCY

AMERICA'S COMBAT LOGISTICS SUPPORT AGENCY

