



# **DFSP NORWALK**

## **Second Semiannual 2017 Groundwater Monitoring Event**



**Presented by Daniel Swensson**

# Overview

- **Fieldwork was conducted September 25 – October 25, 2017.**
- **Well gauging and groundwater sample collection was conducted by The Source Group, Blaine Tech, and SFPP.**
- **226 wells were gauged (treatment systems were off line).**
- **140 groundwater samples were collected from 114 wells using low-flow methodology (including duplicate, split, and confirmation samples)**

# **Groundwater Elevations & Gradient – Uppermost Aquifer**

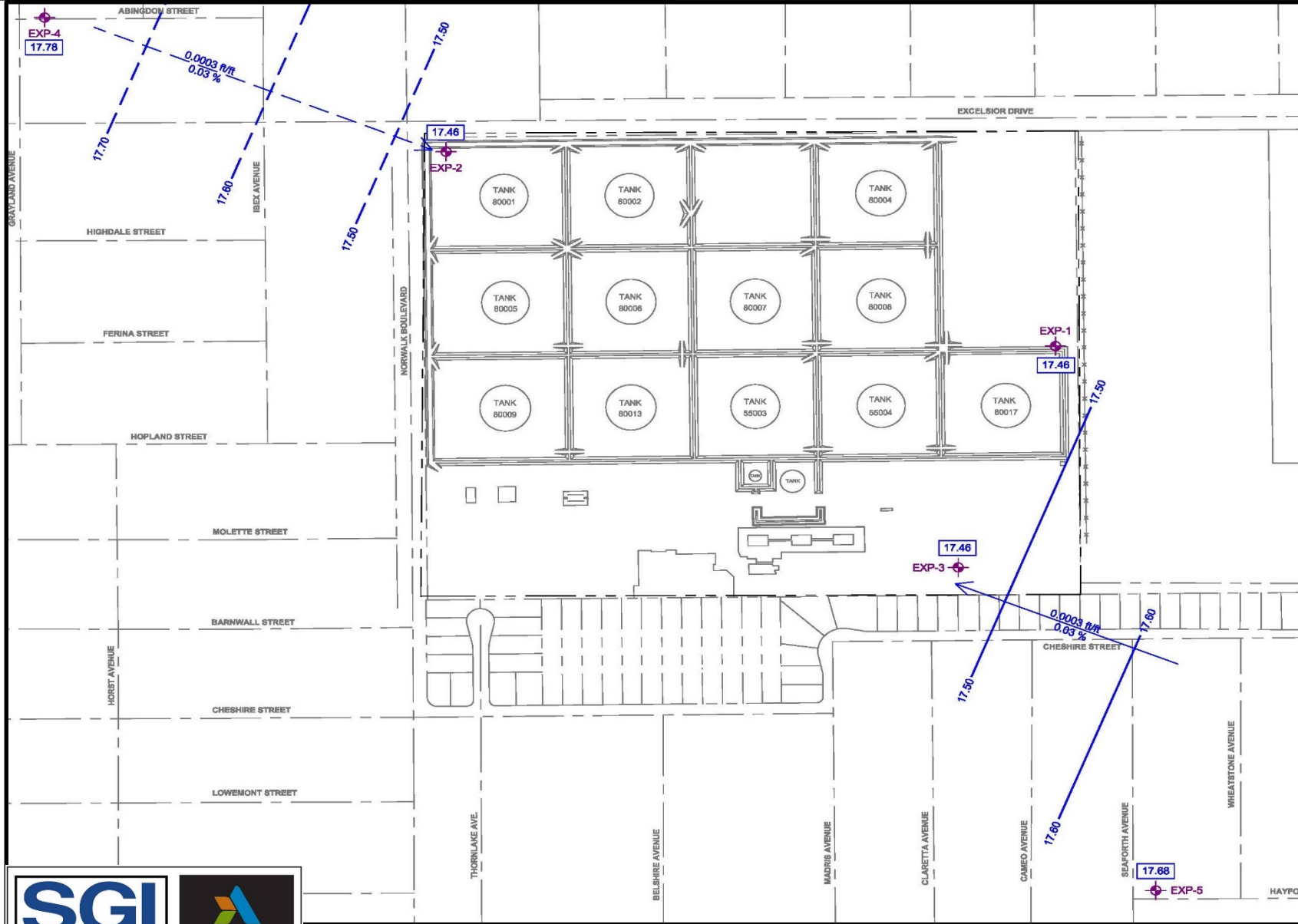
- **Depth to Groundwater ranged from 28.18 to 40.50 feet below top of well casings.**
- **Elevations dropped an average of 1.66 feet since the April 2017 monitoring event.**
- **The groundwater surface was generally characterized by a groundwater depression in the south-central area with gradients converging toward this depression.**



# Groundwater Elevations and Gradient – Exposition Aquifer

- **Depth to Groundwater ranged from 54.73 to 62.04 feet below top of well casings.**
- **Elevations dropped an average of 0.58 feet since the April 2017 monitoring event.**
- **The groundwater gradient beneath the site was generally flat with gradients converging toward the Site.**

# Figure 4: Groundwater Equipotential and Gradient Map – Exposition Aquifer – October 2017



# Floating Product

- **Floating product was measured or observed in 17 of the 226 wells gauged during this monitoring event.**
- **Since April 2017, measured product thicknesses increased in 10 wells and decreased in 13 wells.**
- **Product was observed in four areas of the site:**
  - **North-Central Area: Floating product was measured in 11 wells ranging from 0.05 to 1.70 feet,**
  - **Eastern Area: Floating product was present in two wells (0.01 foot in GMW-62 and 0.02 foot in GMW-68),**
  - **South-Central Area: Floating product was measured in two wells (0.18 foot in GMW-29 and 1.20 feet in GMW-O-12).**
  - **Southeastern Area: Floating product was measured in two wells (1.59 feet in GMW-O-15 and 0.02 foot in GMW-O-18).**





## Groundwater Sampling – Uppermost Groundwater Zone

- Overall, results were similar to previous sampling events.
- TPH as Gasoline were reported in 26 of the 114 sampled wells (maximum: 23,000 µg/L in MW-O-2).
- TPH as Diesel were reported in 72 of the 114 sampled wells (maximum: 71,000 µg/L in MW-SF-6).
- Benzene was reported in 32 of the 114 sampled wells (maximum: 9,400 µg/L in MW-O-2).
- 1,2-DCA was reported in 14 of the 114 sampled wells (maximum: 14 µg/L in MW-6).
- MTBE was reported in 28 of the 114 sampled wells (maximum: 210 µg/L in MW-O-2).
- TBA was reported in 24 of the 114 sampled wells (maximum: 30,000 µg/L in PZ-5).

# Groundwater Sampling – Exposition Aquifer

- **Split samples were collected from EXP-1, EXP-2, and EXP-3 by both The Source Group and Blaine Tech.**
- **Samples were collected from EXP-4 and EXP-5 by Blaine Tech.**
- **TPH as diesel were reported in EXP-1, EXP-2, and EXP-3 (maximum: 310 µg/L in EXP-1).**
- **Benzene was reported in initial samples from EXP-2 (0.98 and 1.4 µg/L ), but was not detected (<0.50 µg/L ) in the subsequent confirmation sample.**
- **Samples from EXP-4 and EXP-5 were non-detect for all analytes.**

# Confirmation Sampling – October 25, 2017

- **Inconsistencies were noted in several wells when comparing the laboratory results with historical data.**
- **Data indicated possible cross-contamination in samples from GW-3, EXP-2, and MW-24.**
- **The remaining inconsistencies were related to TPH as diesel reported in the samples from Exposition wells EXP-1 and EXP-3, and in eastern off-site wells GMW-63, GMW-64, and GMW-65:**
  - **Although TPH as diesel has been reported intermittently in the Exposition Aquifer wells, TPH as diesel have not been reported in these wells since 2012 and 2013.**
  - **This the first time TPH as diesel were reported in GMW-63 and GMW-64, and TPH as diesel were reported in one historical sample from GMW-65 (210 µg/L in October 2013).**
- **To evaluate these inconsistencies, confirmation samples were collected on October 25, 2017.**

## **Confirmation Sample Results – GMW-69, GW-3, EXP-2, and MW-24**

- **The presence of TPH as diesel, BTEX compound, and detected VOCs were confirmed in GMW-69.**
- **All of the BTEX compounds and VOCs reported in the initial samples from GW-3, EXP-2, and MW-24 were non-detect in the confirmation samples (TPH as diesel concentrations were similar to the concentrations reported in the initial samples).**
- **These results suggest the BTEX compounds and VOCs reported in the initial samples from GW-3, EXP-2, and MW-24 were likely due to cross-contamination.**

## **Confirmation Sample Results – EXP-1, EXP-3, and Eastern Off-Site Wells GMW-63, GMW-64, and GMW-65**

- **The presence of TPH as diesel was confirmed in EXP-1, but TPH as diesel were not detected in the confirmation sample from EXP-3.**
- **The presence of TPH diesel was confirmed in eastern off-site wells GMW-63, GMW-64, and GMW-65, and concentrations in all three confirmation samples increased as compared with the concentrations reported in the initial samples.**

# How Will We Address These Concerns?

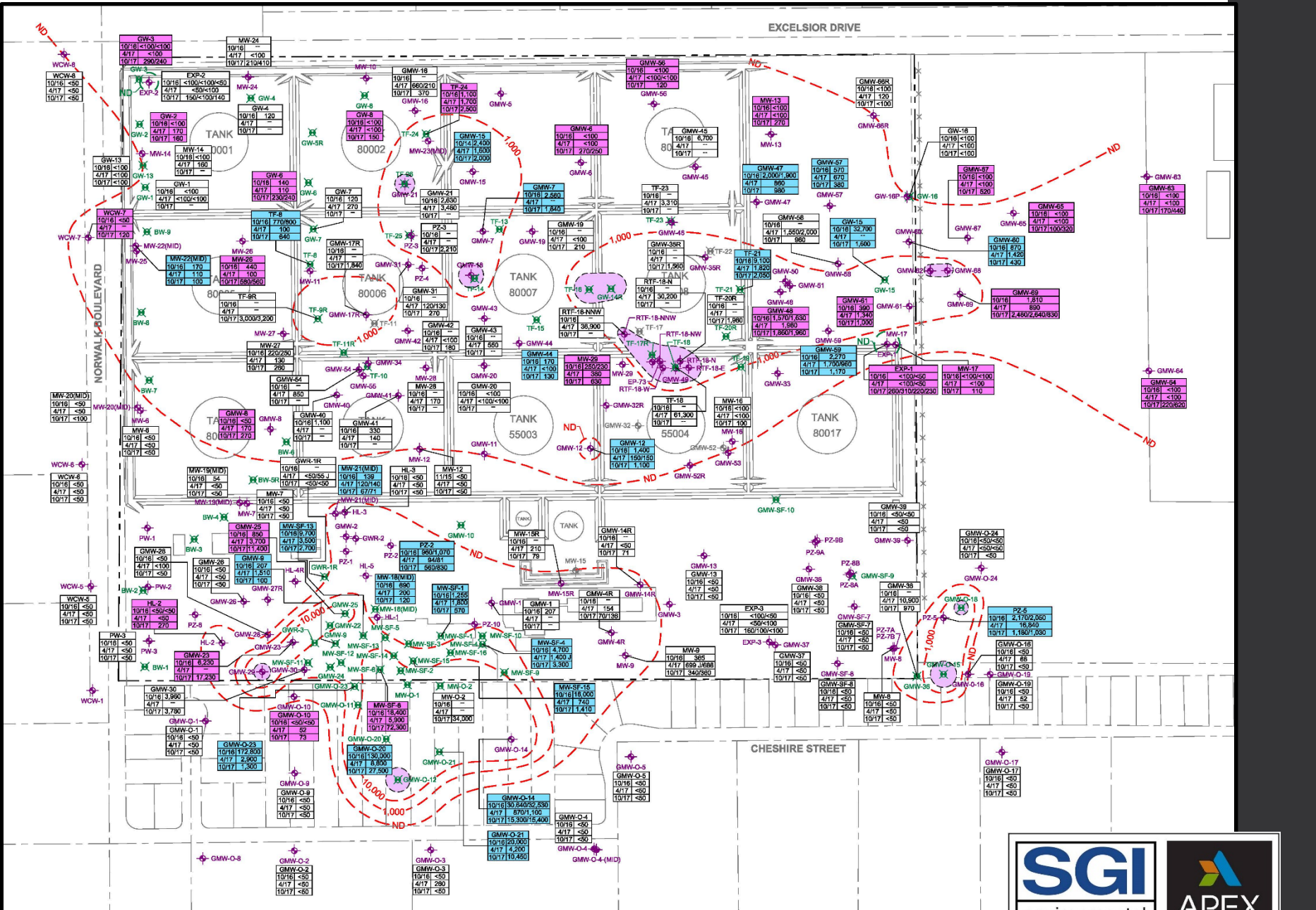
➤ To reduce the possibility of cross-contamination, three new submersible pumps were purchased and dedicated to groundwater sampling at DFSP Norwalk.

- One pump will be used to purge “clean” wells only;
- One pump will be used to purge moderately impacted wells, and
- One pump will be used to purge the most heavily impacted wells.

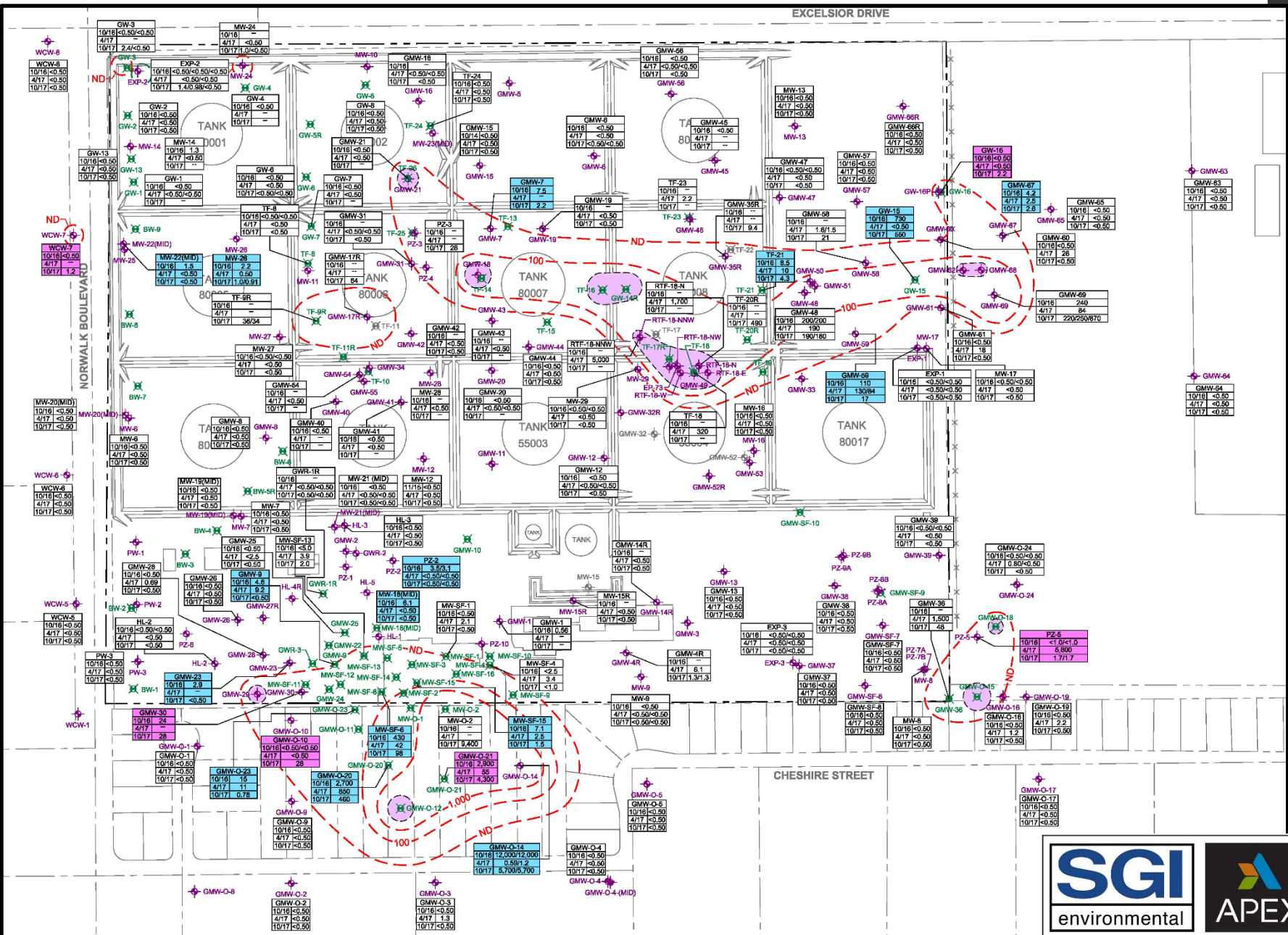
➤ To further evaluate the presence of TPH as diesel in Exposition Aquifer wells and the apparently increasing concentrations of TPH diesel, BTEX compounds, and other VOCs in eastern off-site wells, quarterly groundwater samples will be collected.

- EXP-1, EXP-2, and EXP-3 will be analyzed for TPH as diesel, and
- GMW-63, GMW-64, GMW-65, and GMW-69 will be analyzed for TPH as diesel, BTEX compounds, and VOCs.
- Note that samples were not collected during the first quarter 2018 due to access issues.

# Figure 6: Total Petroleum Hydrocarbons in Groundwater – October 2017



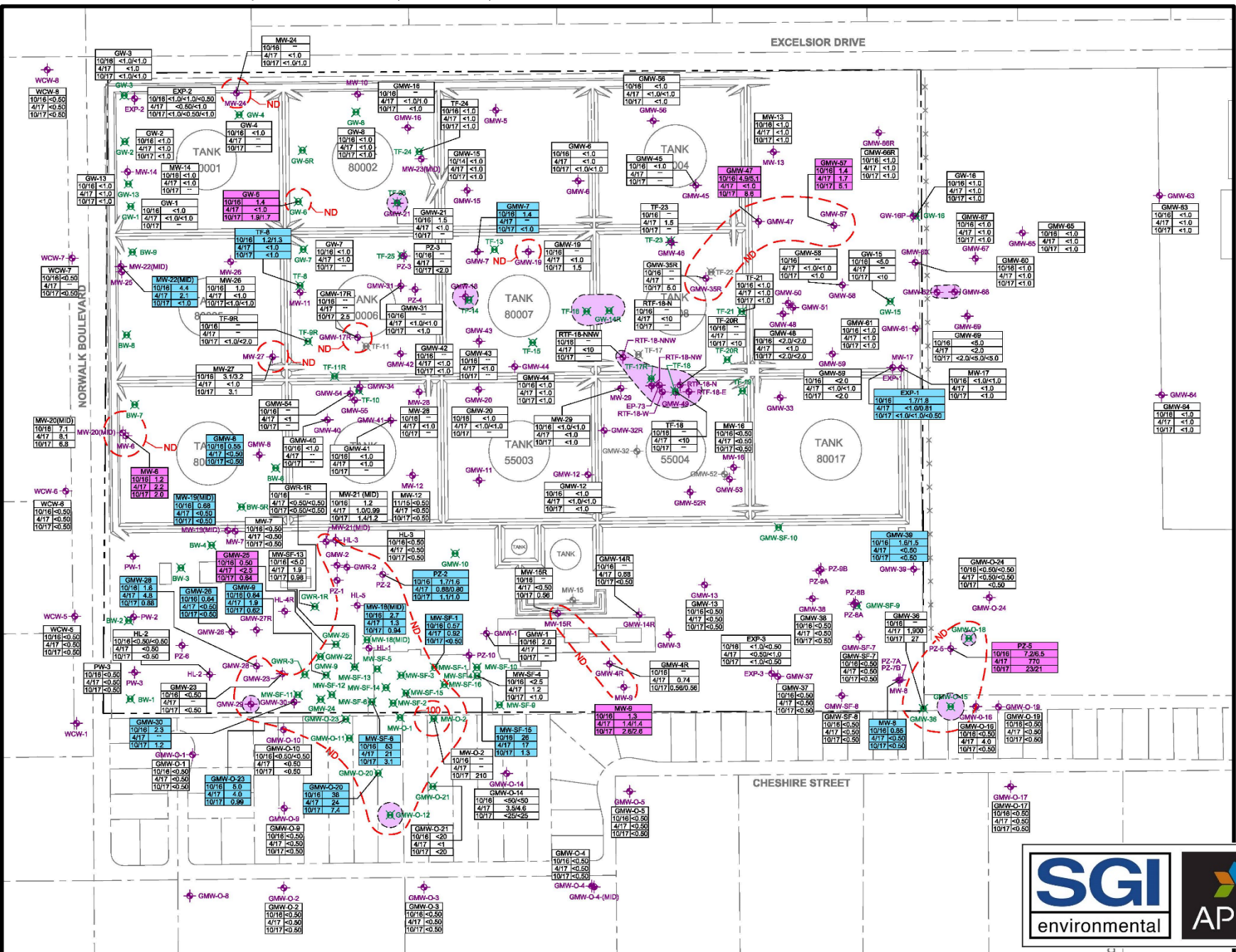
# Figure 7: Benzene in Groundwater – October 2017







# Figure 9 - Methyl tertiary-Butyl Ether in Groundwater – October 2017







# DFSP Norwalk Groundwater Event Update

## Questions & Discussion

