

DFSP NORWALK RESTORATION ADVISORY BOARD

**Defense Logistics Agency – Installation Support for Energy
Update**

February 23, 2017



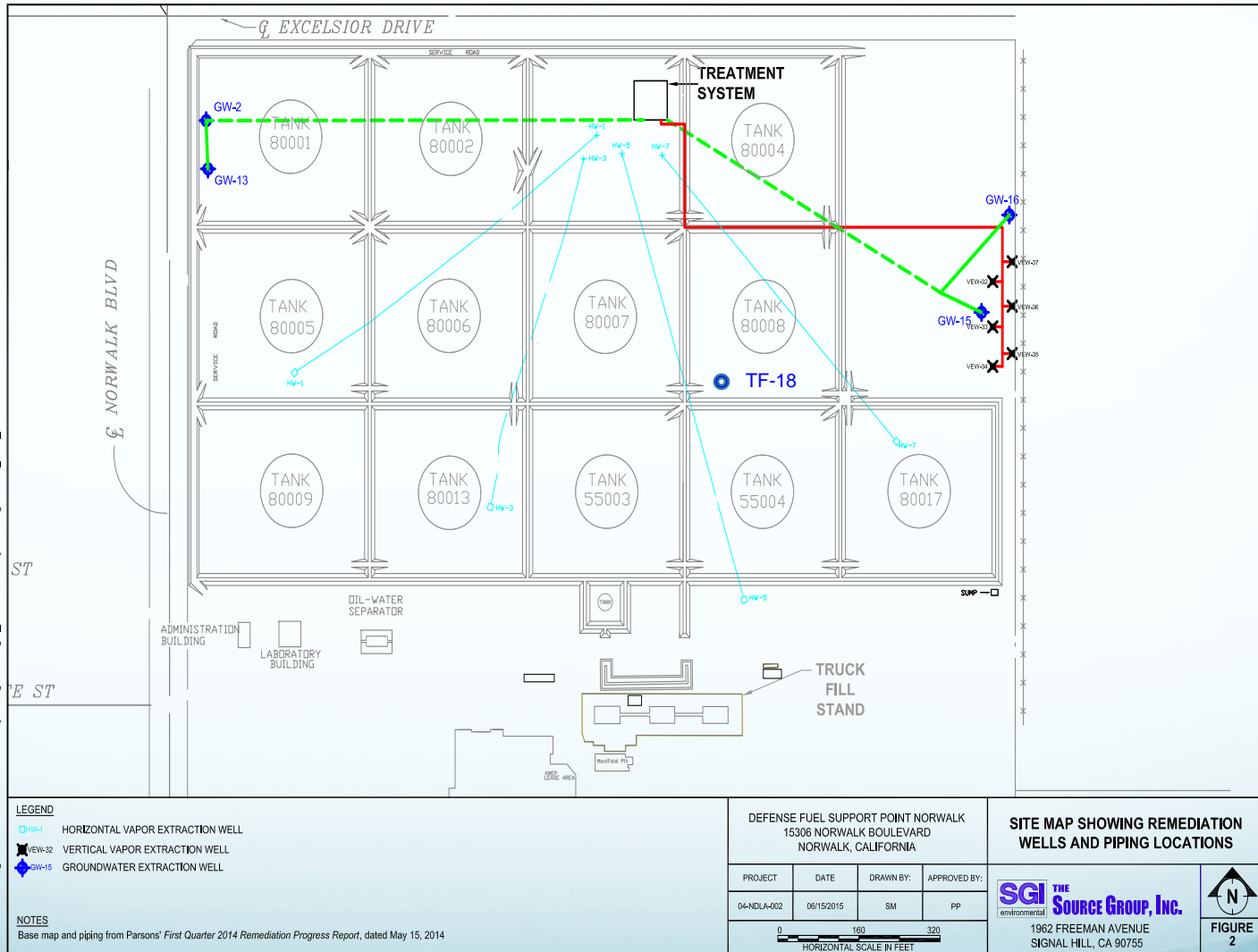
**THE
SOURCE GROUP, INC.**

Status of Remediation System

Status of Soil and Groundwater Remediation System

- **Groundwater Remediation: Treated 75.5 million gallons since April 1996 (approx. 700,000 gallons in 2016)**
- **SVE System: Recovered 2.95MM Pound (Hydrocarbon Equivalent) since April 1996 (approximately 6,000 pounds / 800 gallons in 2016)**
- **SVE system is currently operating – with majority of vapors drawn from treatment cells**
 - **With closure of treatment cells, horizontal SVE wells will be brought back on line**
- **LNAPL Recovery: 4,818 gallons in 2016**
 - **From TF-18 and 5 new extraction wells (Installed and Operational as August 2016)**
 - **Approximately 700 gallons/Month Currently (Compared to 60 gallons per month pre-August 2016)**

In-Situ Treatment System



DFSP Norwalk / Figures & CAD / Remediation Layout Figures / Fig 2_Remediation System Layout2007_2015_06-15

Soil Remediation – Site Wide

Soil Remediation:

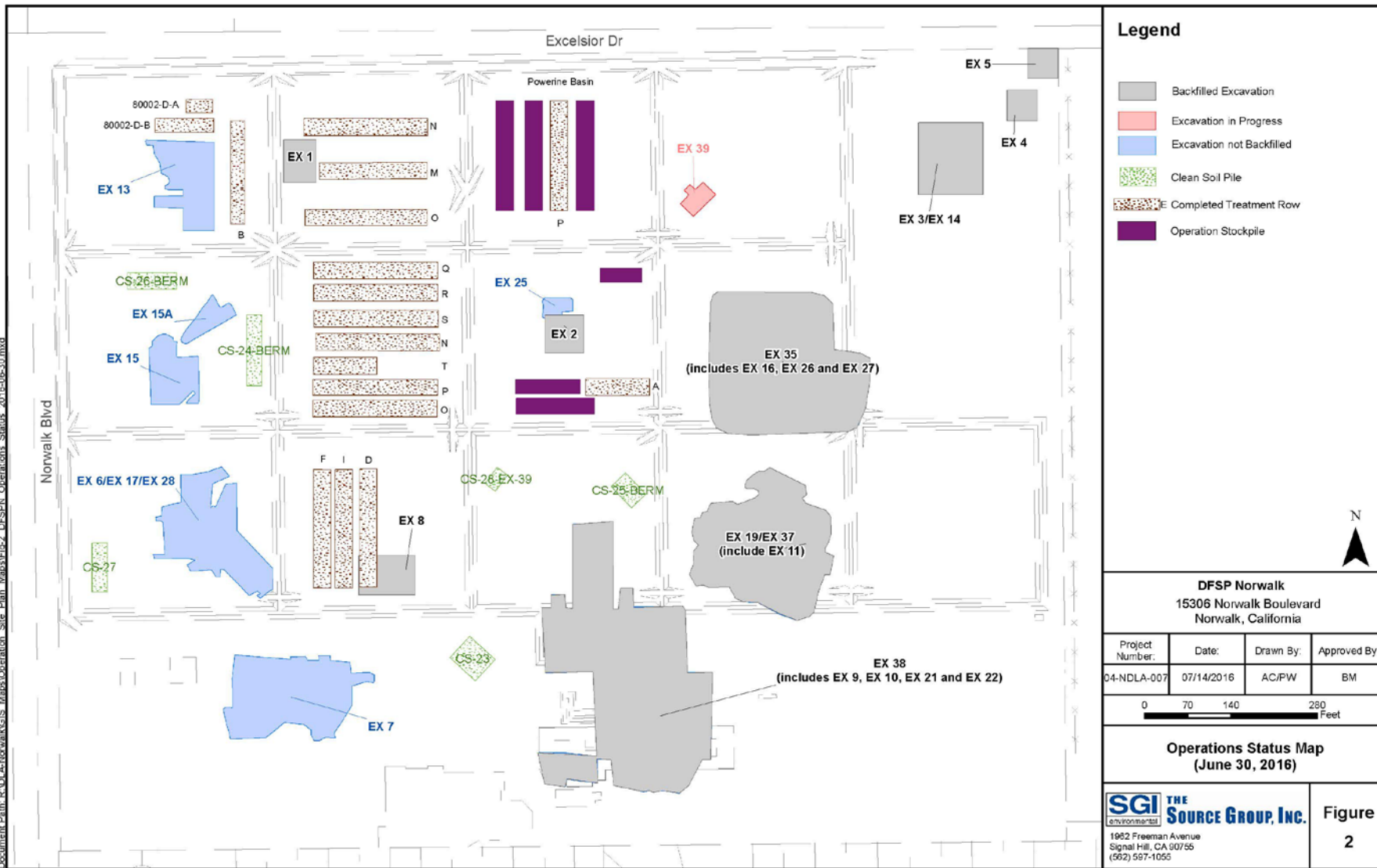
- **Soil Remediation Accomplished by Excavation and On-site Bio-remediation**
- **All Soil Between 0 to 10 feet with *Contamination Above Cleanup Goals* to be Excavated and Treated:**
 - **100% of the Targeted Shallow Soil Excavated from the Future Park Area**
 - **99.5% of the Targeted Shallow Soil Excavated Site-wide**
- **Deeper Soil (> 10 feet) with Highest Concentrations of Contamination (affecting groundwater) were Removed and Treated:**
 - **Tank Basin 80008 and 55004**
 - **Former Truck Rack Area**

Soil Remediation – Status

Soil Remediation Project Progress:

- ◆ **Approximately 130,000 yds³ (169,000 tons) of Soil Excavated**
- ◆ **57,000 yds³ (74,100 tons) of Cleaned Soil Tested and Approved for Backfill:**
 - ◆ **54,000 yds³ (70,200 tons) Treated and Approved for Backfill**
 - ◆ **16,000 yds³ (20,800 tons) Pending Approval (Phase 11)**
 - ◆ **3,000 yds³ (3,900 tons) Currently Being Treated**
- ◆ **Currently: Four Soil Treatment Piles are Under Monitoring Prior to Final Sampling (Maximum Number of Soil Piles during the Fall of 2016 was 40!)**

Status Map



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Soil Treatment Cells



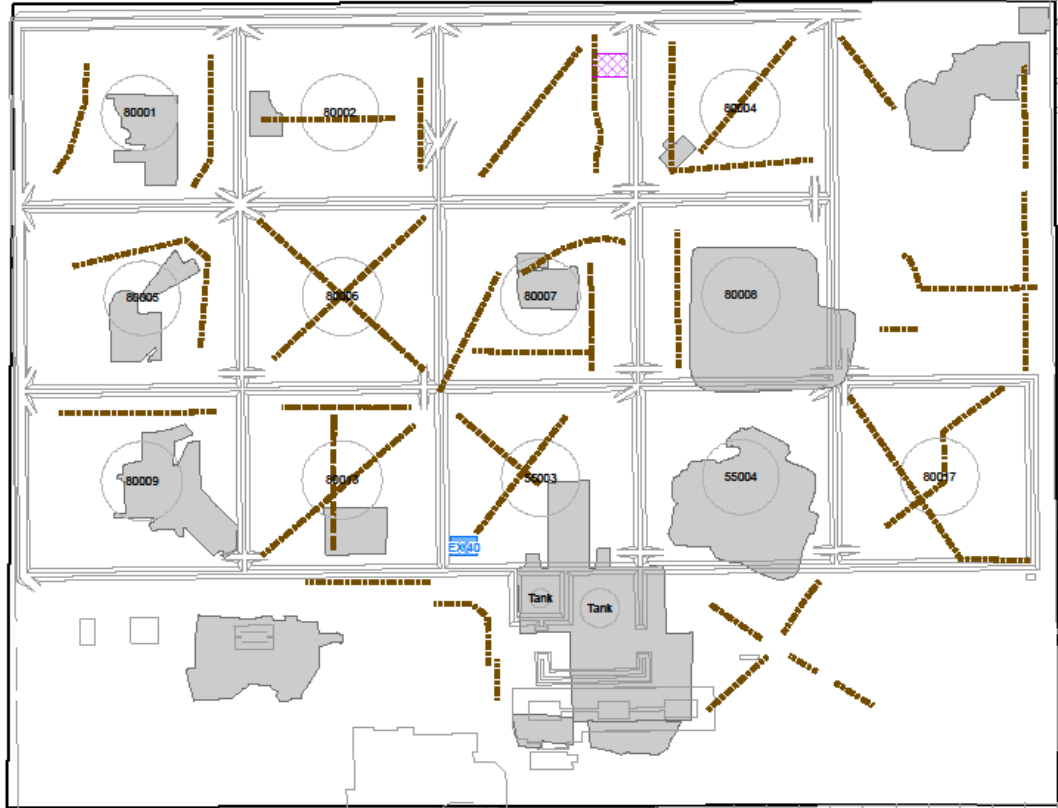
Soil Remediation – Status

Soil Remediation Project Progress:







- Approximately 130,000 yds³ of Soil Excavated
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 - 3,000 yds³ Currently Being Treated
- Currently: Four Soil Treatment Piles are Under Monitoring Prior to Final Sampling (Maximum Number of Soil Piles during the Fall of 2016 was 40!)
- **All “Cross Trenches” Have Been Performed – only Minor Amount of Additional Contamination Encountered and Removed**

Site-Wide Cross Trenching

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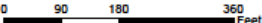
Legend

-  Former Above Ground Storage Tanks
-  Cross Trenches throughout the Site
-  Excavation in Progress
-  Existing SVE System
-  Backfilled Excavation
-  DFSP-Norwalk Border

Notes

SVE = Soil Vapor Extraction
 All cross trenches completed to 10 feet depth.



DFSP Norwalk 15306 Norwalk Boulevard Norwalk, California			
Project Number:	Date:	Drawn By:	Approved By:
04-NDLA-007	02/08/2017	PW	PP
 0 90 180 360 Feet			

Cross Trench and Excavation Locations

SGI THE SOURCE GROUP, Inc.
 1962 Freeman Avenue
 Signal Hill, CA 90755
 (562) 597-1055

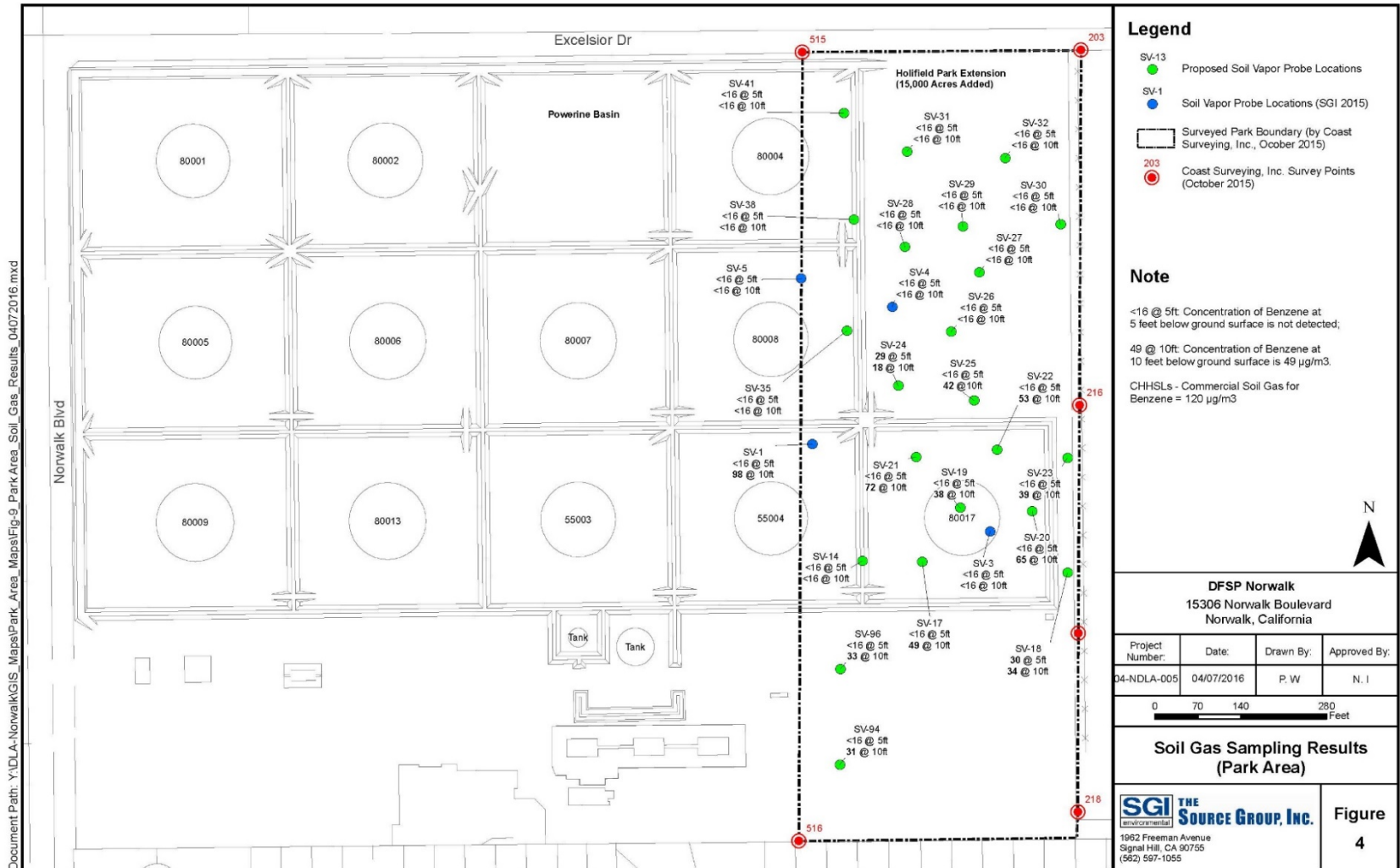
Cross Trenching– Looking Northeast



Soil Remediation: Eastern 15 Acre Park Area

- ◆ **Completed Backfill of Park Area Excavations**
- ◆ **Performed Confirmation Soil Gas Survey on Future Park Area**
- ◆ **Prepared Human Health Risk Assessment:**
 - ◆ **Findings of HHRA Confirmed that Proposed Park Area is Ready for Re-use**
- ◆ **Limited Additional Sampling SE Corner (Samples collected Week of February 12; results Pending) per Requirements of LARWQCB**
- ◆ **Updated Supplemental Report to be Submitted March/April 2017**

Eastern Park Area Soil Gas Results

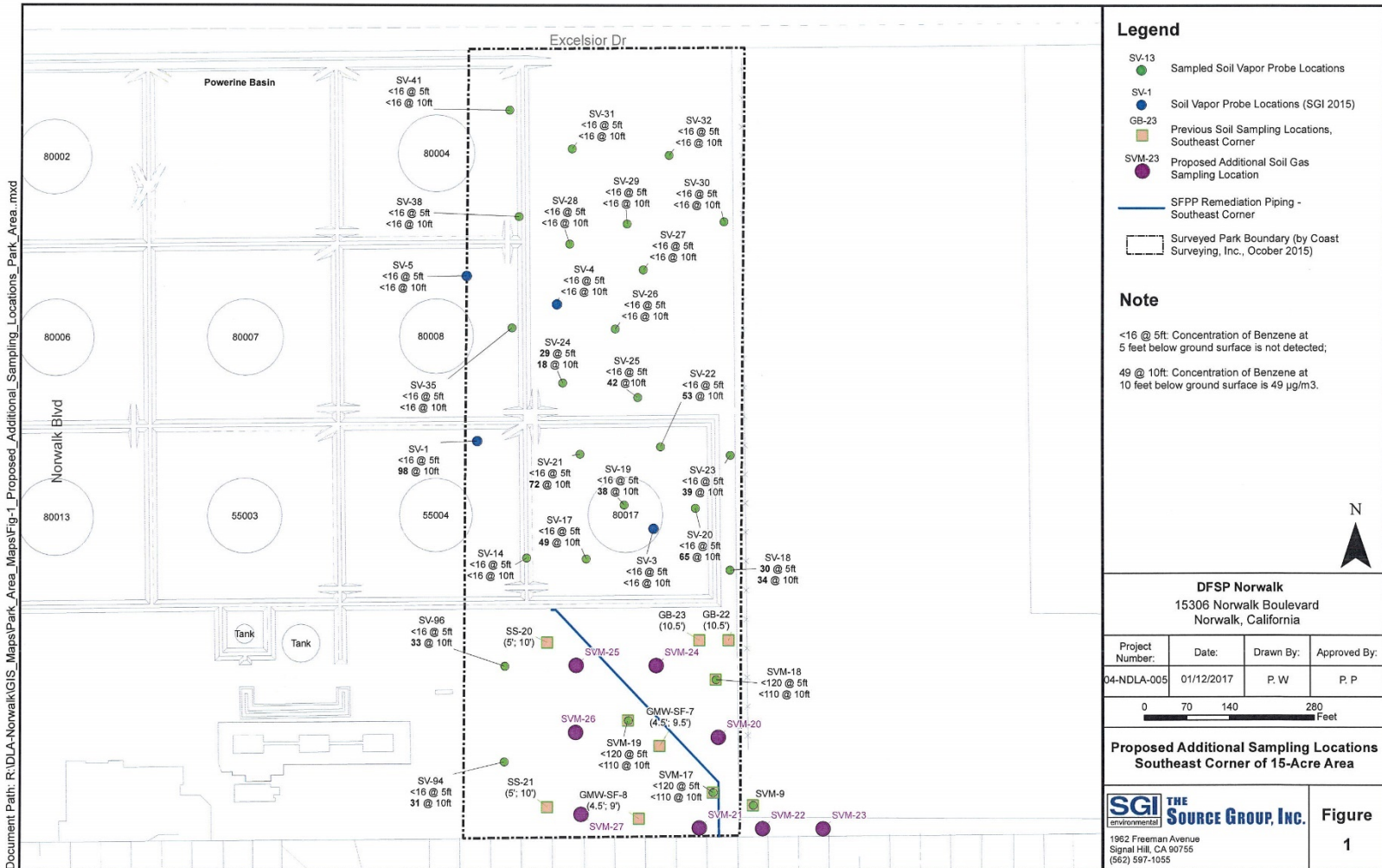


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Eastern Area – Additional Soil Gas and Soil Sampling - 2017



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Basin 80013 Post-Rain Flooding



Shallow Soil Remediation: to April 2017

- ✦ **Complete Soil Treatment (Estimate March 2017) and Request for Authorization to Re-use to Fill Remaining Excavations**
- ✦ **Transport Soil with “Recalcitrant” Contamination Off-Site For Recycling, If Needed**
- ✦ **Import Soil for Backfill – Additional Soil may be Needed due to Higher Compaction Density of Backfilled Excavations and Storm Water Control**
- ✦ **Backfill Remaining Excavations (March to April 2017)**

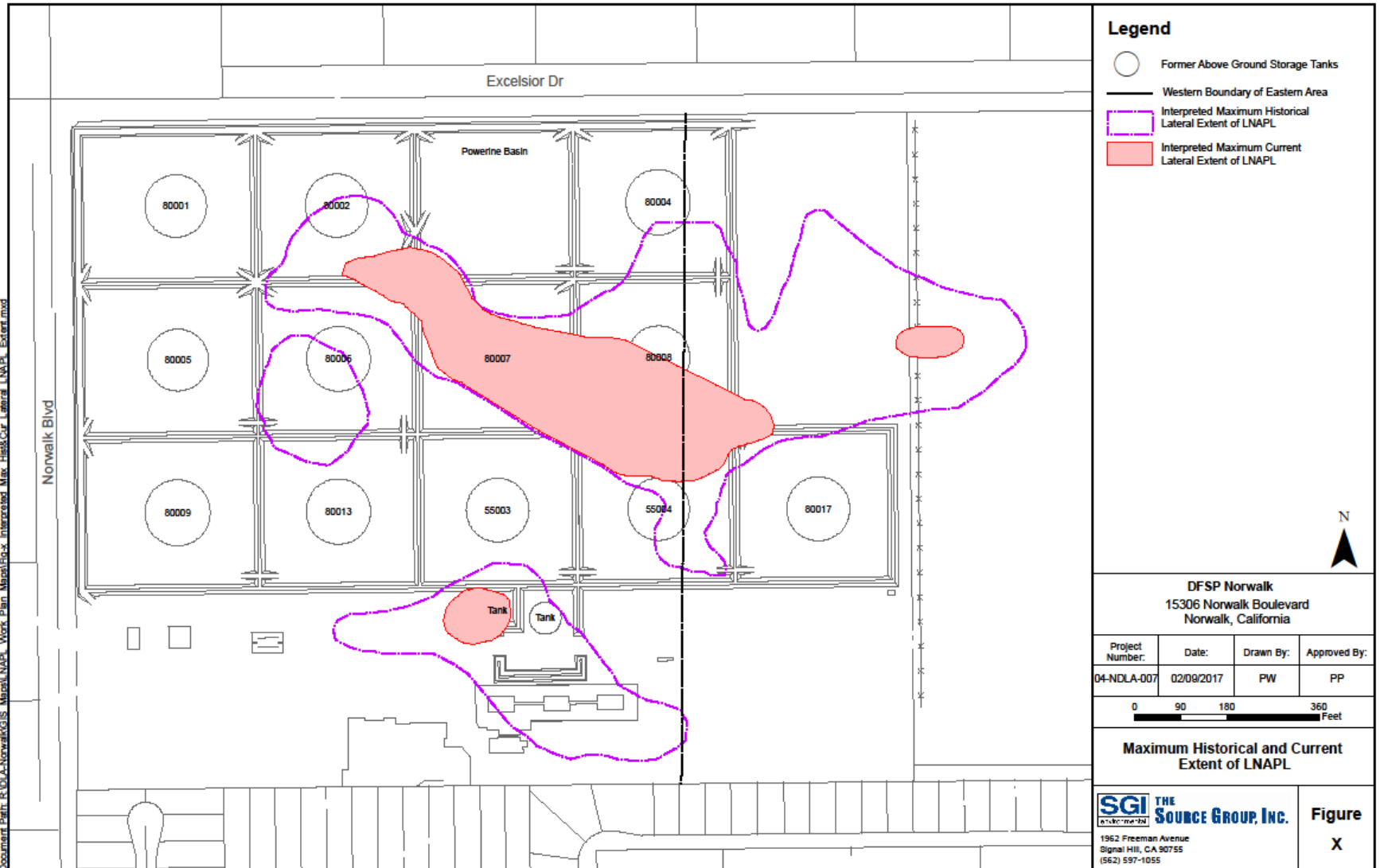
Shallow Soil Remediation – Future Steps

- ◆ **Perform Site-Wide Soil Gas Survey Upon Backfill of Final Excavations (April 2017)**
- ◆ **Human Health Risk Assessment – Focus will be Evaluation of Residual Concentrations in Soil Gas**
- ◆ **Prepare and Submit Case Review Form to RWQCB for Formal Closure of Shallow Soils, Western Area (May 2017)**
- ◆ **Request for No Further Remedial Action of Shallow Soil in Western 35 acres to be Submitted in June 2017.**

Groundwater – Planning for Next Phase

- **Submit a Revised LNAPL CSM and Present Subsurface Remediation Approach**
- **Install 8 Remaining Replacement Groundwater Wells**
- **Operate Free Product Wells in Tank Farm Central Area (TF-18)**
- **Evaluate LNAPL Recovery and Options for Enhancements; Currently Evaluating Expanded Well Network and Biosparging (similar to KMEP)**
- **Install and Commission New and Replacement Vertical Air Sparge Wells – Throughout Tank Farm**
- **Expanded Air Sparge Network in Eastern and Southern Area and Reconfigure System**

Focus of Future Remediation Efforts: LNAPL



DLA Update

Questions and Discussion

Second Semiannual 2016 Groundwater Monitoring Event

Presented by Daniel Swensson

Overview

- **Fieldwork was conducted October 3-11, 2016.**
- **Well gauging and groundwater sample collection was conducted by The Source Group, Blaine Tech, and SFPP.**
- **147 wells were gauged (treatment systems were offline).**
- **Groundwater samples were collected from 107 wells using low-flow methodology (including duplicate and split samples, 125 groundwater samples were analyzed).**

Groundwater Elevations and Gradient

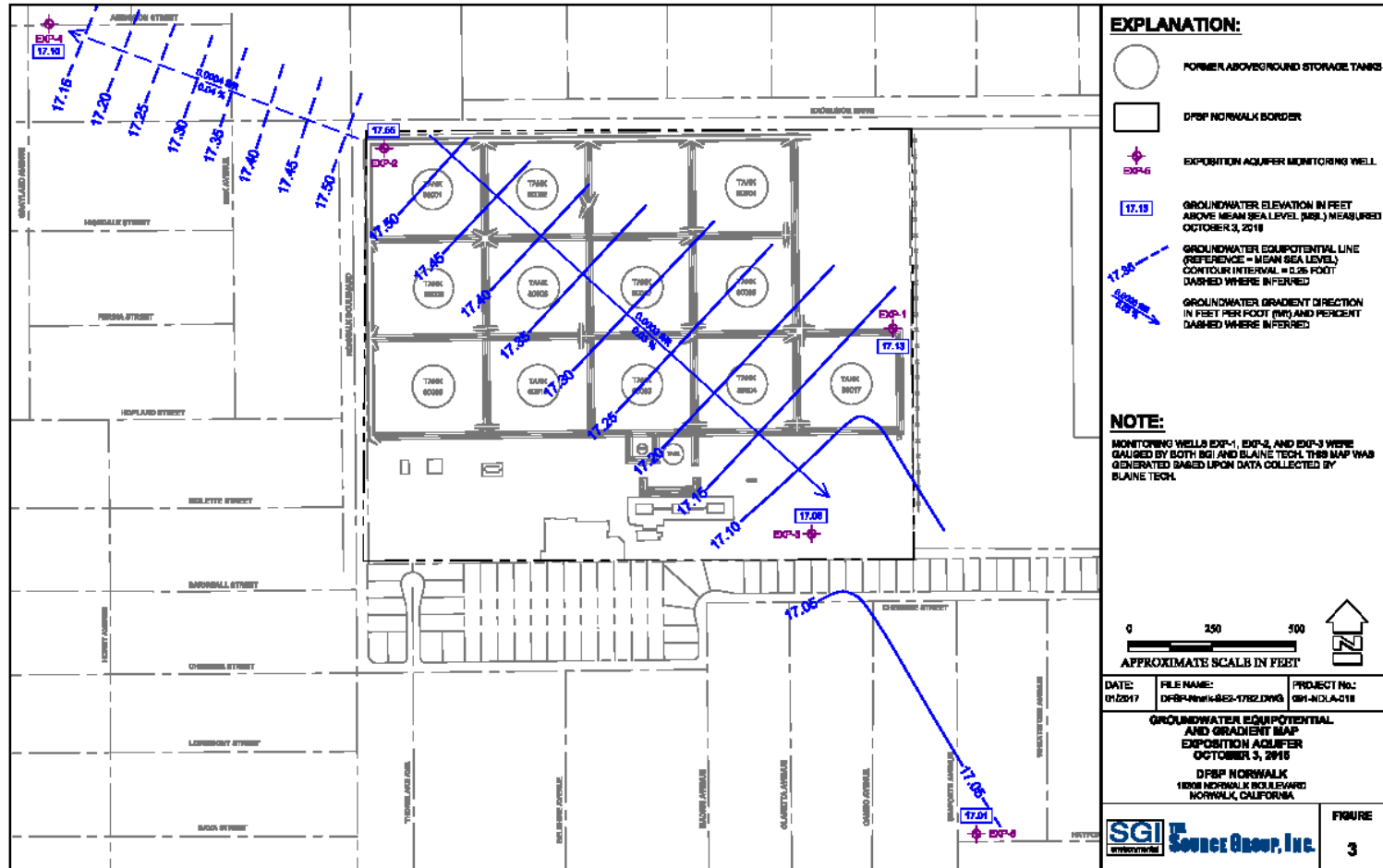
– Uppermost Aquifer

- ◆ **Depth to Groundwater ranged from 28.10 to 41.05 feet below top of well casings.**
- ◆ **Elevations ranged from 34.74 to 43.04 feet above mean sea level.**
- ◆ **Elevations dropped an average of 0.93 foot since the April 2016 monitoring event.**
- ◆ **The groundwater surface was generally characterized by a large groundwater depression in the south-central area with gradients converging toward this depression.**
- ◆ **Gradients ranged from approximately 0.002 to 0.029 ft/ft.**

Groundwater Elevations and Gradient – Exposition Aquifer

- ◆ Depth to Groundwater ranged from 55.40 to 62.18 feet below top of well casings.
- ◆ Elevations ranged from 17.01 to 17.55 feet above mean sea level.
- ◆ Elevations dropped an average of 1.98 feet since the April 2016 monitoring event.
- ◆ The groundwater gradient beneath the site was generally toward the southeast at approximately 0.0003 ft/ft.

Figure 3: Groundwater Equipotential and Gradient Map – Exposition Aquifer



Floating Product

- ❖ Floating product was measured in 16 of the 147 wells gauged during this monitoring event.
- ❖ Since April 2016, measured product thicknesses increased in eight wells, decreased in 10 wells, and remained the same in GMW-62.
- ❖ Product was observed in four areas of the site:
 - North-Central Area: Floating product was measured in five wells ranging from 0.77 to 3.39 feet,
 - Eastern Area: Floating product was present in two wells (0.01 foot in GMW-62 and 3.39 feet in GMW-68),
 - South-Central Area: Floating product was measured in six wells ranging from 0.01 to 2.30 feet, and
 - Southeastern Area: Floating product was measured in three wells ranging from 0.08 to 4.94 feet.

Groundwater Sampling – Uppermost Groundwater Zone

- Duplicate samples were collected from 15 wells.
- TPH as Gasoline was reported in 27 of the 107 sampled wells (maximum: 35,000 µg/L in GMW-O-20).
- TPH as Diesel was reported in 46 of the 107 sampled wells (maximum: 170,000 µg/L in GMW-O-23).
- Benzene was reported in 22 of the 107 sampled wells (maximum: 12,000 µg/L in GMW-O-14).
- 1,2-DCA was reported in 16 of the 107 sampled wells (maximum: 13 µg/L in MW-20[MID]).
- MTBE was reported in 32 of the 107 sampled wells (maximum: 53 µg/L in MW-SF-6).
- TBA was reported in 16 of the 107 sampled wells (maximum: 130,000 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.
- ◆ All results were non-detect with the following exception:
 - 1.7 and 1.8 µg/L MTBE in EXP-1.

Questions?