

Orangeburg Commerce Center Remedial Investigation Summary

5 Greenbush Road
Orangeburg, New York 10962
Section 74.15, Block 1, Lot 2 (portion)
BCP #C344078

Submitted to:
New York State Department of Environmental Conservation
Division of Environmental Remediation, Remedial Bureau C
625 Broadway
Albany, NY 12233-7014

Prepared for:
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June 2016

CERTIFICATIONS

I, Matthew M. Carroll, certify that I am currently a NYS registered professional engineer and that this Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).



Matthew M. Carroll
NYS PE #091629

6/20/2016

Date

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1.0 INTRODUCTION

Tenen Environmental LLC (Tenen), on behalf of the Volunteer, FB Orangetown, LLC, has prepared this Remedial Investigation (RI) Summary for the Orangeburg Commerce Center, located at 5 Greenbush Road in Orangeburg, NY (the “Site”).

The purpose of the RI Summary is to present the existing information from environmental investigations completed at the Site. Prior to the submittal of a Brownfield Cleanup Program (BCP) application, a confirmatory round of groundwater sampling was completed in November 2015 by Tenen. The details of this groundwater investigation are included in this report.

The report is organized as follows:

- Section 1 – Introduction
- Section 2 – Background
- Section 3 – Previous Investigations
- Section 4 – Geology / Hydrogeology
- Section 5 – Groundwater Investigation
- Section 6 – Summary

2.0 BACKGROUND

The Site, located at 5 Greenbush Road, Orangeburg, New York, is an approximately triangular-shaped parcel of 254,230 square feet bounded to the east by Greenbush Road, to the west by Western Highway and to the north by Highview Avenue. The tax map designation of the property is Section 74.15, Block 1, portion of Lot 2. The Site location is shown on Figure 1. The Site is zoned as Light Industrial (LI), denoting manufacturing, wholesale, warehouse, and storage uses, offices, commercial, recreation, and theaters as-of-right. The property is currently undeveloped; the northern portion of the Site is used as a contractor's storage yard while the remainder of the Site is vacant. Redevelopment of the Site will entail construction of a commercial use building.

The Site was part of a larger facility used for the manufacturing of Orangeburg Pipe beginning in or about the 1890s. Prior to 1946, the Orangeburg Pipe was manufactured by impregnating paper fiber cylinders with coal tar pitch. From 1946 to 1970, a paper and asbestos mixture was used to make the pipe cylinders. After 1970, wollastonite (a fibrous, magnesium oxide mineral) was used in place of asbestos. The original manufacturing was reported to take place on the Site, also known as the "Triangle Parcel." As operations expanded, manufacturing expanded to the areas east and south of the Site and many of the manufacturing operations were located on the adjacent current Lowe's property. The Site was reportedly used mainly for storage during this time. In 1953, manufacturing operations were acquired by Flintkote and pipe manufacturing was reportedly discontinued in 1973. After ceasing operations, most of the facility was destroyed by fire. The remaining structures were reportedly demolished and the majority of the debris was deposited on approximately 16 acre parcel to the southeast of the Site; the Site was reportedly not used for the disposal of the debris.

The project site was enrolled in the Voluntary Cleanup Program (VCP) by a prior owner (NYSDEC Site #V00342) and was investigated in accordance with the VCP requirements. Prior to enrollment of the Site in the VCP, characterization sampling was completed to determine if the conditions on the Site and surrounding properties, formerly part of the same historic operations, were appropriate for listing as an Inactive Hazardous Waste Landfill (IHWLF). A five-acre portion of the overall Orangeburg Pipe complex was listed as an IHWLF. The Site was reportedly not used for the disposal of Orangeburg Pipe, so it was likely not part of the five acres that were listed, and those five acre were later de-listed. The subject property was later voluntarily withdrawn from the VCP. The following spill records, all closed, were also associated with the subject property: 9008717, 9806678 and 0102771. Spill records 9008717 and 0102771 were related to petroleum impacts observed in the area of several underground storage tanks (USTs) used to hold fuel oil and gasoline. Spill record 9806678 was related to a minor surface spill.

3.0 PREVIOUS INVESTIGATIONS

Site investigations were conducted by Lawler, Matusky & Skelly Engineers (LMS) (1986, 1990, 1991), Dames & Moore (March 11, 1988), Hydrosience, Inc. (December 4, 2000; February 10, 2000; November 17, 2001), AKRF Engineering, P.C. (AKRF) (June 2009), and Tenen (January 18, 2016). The investigations conducted between 1986 and 2015 identified volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs) and metals at concentrations above regulatory levels in environmental media (soil, soil gas and/or groundwater). The primary VOCs are petroleum constituents and chlorinated solvents. The primary SVOCs are polyaromatic hydrocarbons (PAHs). Non-aqueous phase liquid (NAPL) has also been observed during the multiple field investigations performed at the Site. All previous reports are included in Attachment 2. Previous groundwater sample locations are shown on Figure 3 and previous soil sample locations are shown on Figure 4.

Historic analytical results for soil and groundwater were compared to the following:

- Soil – NYSDEC Commercial Use Soil Cleanup Objectives (SCOs).
- Groundwater – NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1 Class GA Water Quality Standards and Guidance Values (Class GA Standards).

All referenced environmental reports are provided in Attachment 2, except where noted, and include:

- a. Progress Report: Remedial Investigation Study at Flintkote Site, Orangeburg, NY, Lawler, Matusky & Skelly Engineers, 1986. *
- b. Well Redevelopment and Ground and Surface Water Sampling Report, Flintkote Property, Dames & Moore, March 11, 1988.
- c. Summary Report, Soil and Groundwater Investigations Conducted on Block 754 of the Former Orangeburg Pipe Manufacturing Site, Lawler, Matusky & Skelly Engineers, April 1991.
- d. Results of Methane Investigation, Hydrosience, Inc., December 4, 2000.
- e. Subsurface Investigation and Delineation Report, Hydrosience, Inc., February 10, 2000.
- f. Closure Workplan, Portions of the Orangeburg Pipe Manufacturing Facility, Hydrosience, Inc., November 17, 2001.
- g. Site Investigation Report, Triangle Parcel, VCP Site No. V00342-3, AKRF Engineering, P.C., June 2009.

* Original report not available. Discussion of findings based upon summaries provided in Site Investigation Report, Triangle Parcel, VCP Site No. V00342-3, AKRF Engineering, P.C., June 2009.

The 1986 LMS investigation included the installation and sampling of three wells. The acetone level in groundwater at one location was detected at a concentration slightly elevated above the Class GA Standards. Sampling of the LMS wells in 1988 yielded results similar to the 1986 investigation, also with iron and manganese detected at levels above the drinking water standards.

The 1990/1991 LMS investigation identified SVOCs in soils at concentrations above the Commercial Use SCOs at several locations, with the highest levels detected at TP-5 SOIL at the northern portion of the Site, west of the former tank farm. Elevated levels were also identified in TP-2 SOIL and TP-6 SOIL. A soil gas survey was conducted and three samples were obtained in the northern portion of the Site and analyzed for VOCs. One sample (SG-18) taken from the northwest corner of the Site contained detectable concentrations of tetrachloroethene (PCE), benzene and xylene. PCE was detected at 0.36 parts per million, which is 2,442 micrograms per cubic meter (ug/m³), above the NYS Department of Health (DOH) air guideline value (AGV) of 30 ug/m³. Benzene was detected below 0.01 ppm (32 ug/m³) and xylenes were detected below 0.15 ppm (651 ug/m³). Groundwater samples collected downgradient of the former fuel oil tanks contained 1,1-dichloroethane (1,1-DCA) at a maximum concentration of 24 micrograms per liter (ug/L) and 1,1,1-trichloroethane (1,1,1-TCA) at a maximum concentration of 65 ug/L, both of which were above the Class GA standard of 5 ug/L. Analysis of water within a subsurface pipe at the eastern Site boundary identified 1,1,1-TCA (12,000 ug/L), 1,1-DCA (720 ug/L), toluene (1,000 ug/L), ethylbenzene (650 ug/L) and xylenes (3,500 ug/L) at elevated concentrations. Oil-saturated soil was encountered through the entire depth of B-11 [0-14 feet below grade (ft-bg)], also located downgradient of the former tank area and in the area between B-11 and MW-22 during test pitting operations. The extent of documented petroleum impacts are shown on Figure 6. Previous soil vapor locations are shown on Figure 5.

In 2000, HydroScience identified an area of petroleum-impacted soil within the former fuel tank area. Sampling of the water from the pipe identified 1,1-dichloroethene (1,1-DCE) at 26 ug/L, 1,2-dichloroethene (1,2-DCE) at 2.6 ug/L, PCE at 4.6 ug/L and 1,1,1-TCA at 120 ug/L, each above their respective Class GA Standard. Lead was also detected in this sample at 58 ug/L. SVOCs were identified in soil samples at concentrations above the Commercial Use SCOs at several locations, with the highest levels detected at Pit 4 (2 ft-bg), located downgradient of the former tank area. Elevated levels were also identified in Pit 4 (8 ft-bg), Pit 5 (10 ft-bg) and BH99-01 (6 ft), all in or near the former fuel oil and gas tanks. The highest SVOC concentrations were identified at the northern portion of the Site, west of the former tank farm. Three locations were surveyed for the presence of methane, which was detected at 0.5% in one location and not detected in the other two locations.

The 2008 AKRF investigation also identified SVOCs at concentrations above the Commercial Use SCOs at several locations, with the highest levels detected at SB-18 (5-6 ft-bg), at the former plastic manufacturing building in the western part of the Site. Elevated levels were also identified in SB-9 (5-6 ft-bg), SB-11 (1-3 ft-bg) and SB-14 (5-6 ft-bg), all in or near the former fuel oil and gas tanks, and at SB-15 (1-2 ft-bg) in the former transformer area. The highest SVOC concentrations were identified at the northern portion of the Site, in the area of the former tank farm, and at locations below historical buildings. Metal concentrations above the applicable SCOs included lead at 2,250 mg/kg, above the Commercial Use SCO of 1,000 mg/kg, at SB-1 (4-5 ft-bg), near a former maintenance drain at the downgradient property boundary. Several chlorinated solvents, including 1,1,1-TCA, 1,1-DCA and PCE were detected in groundwater at MW-6, along the eastern property boundary. A fingerprint analysis of the sample from MW-4 identified a hydrocarbon distribution indicative of motor oil. SVOCs were identified in groundwater at concentrations ranging from 0.6 ug/L to 17 ug/L. Several compounds were identified in MW-2, at the eastern Site boundary, at levels exceeding their respective Class GA standards. SVOCs at concentrations above the Class GA standards were also detected on the

downgradient boundary at MW-6, including benzo(a)anthracene (0.6 ug/L), benzo(b)fluoranthene (0.6 ug/L) and chrysene (0.71 ug/L). Metals were detected in samples from all wells, with sodium, iron and manganese detected in multiple locations at levels above the Class GA standards.

In November 2015, Tenen Environmental (Tenen) performed groundwater sampling of six existing wells (MW-2, MW-3, MW-5, MW-6, TMW-1 and TMW-2). Additional information is included in Section 5. TMW-1 and TMW-2 appear to have been installed by AKRF, but are not referenced in the 2009 investigation report. SVOCs, predominantly polycyclic aromatic hydrocarbons (PAHs), were identified at concentrations above the Class GA standards in MW-2, MW-3 and MW-6 (all located at the eastern Site boundary), with the highest levels in MW-3. Total and dissolved metals, including iron, manganese and sodium were detected at concentrations above the Class GA standards in samples MW-2 and MW-6. The fingerprint analysis of the NAPL sample collected at well MW-4, upgradient of the former tank area, is consistent with a hydraulic lubricating oil or motor oil. The extents of documented petroleum impacts are shown on Figure 6.

4.0 GEOLOGY / HYDROGEOLOGY

The Site surface consists of existing concrete pads from the former buildings, small trees, brush and natural growth. The top 2 to 12 feet consists of a mixture of fill containing topsoil, sand, and gravel. The underlying sediments are reported to consist of glacial till containing a low permeability mixture of reddish grey sand, gravel, silt and clay. The deeper native overburden above the bedrock was reported to contain some stratified drift deposits. The depth to the bedrock surface ranges from 35 to 45 feet below grade and the bedrock formation is identified as the Brunswick formation, which is a sandstone conglomerate.

Previous groundwater studies show that groundwater exists beneath the Orangeburg Pipe complex in three distinct units. At the Site, the shallow water table exists at depths ranging from approximately 9 to 15 feet below grade and is present within fill material and the shallow till sediments. The second distinct unit exists in the deep till and stratified drift deposits. The third unit consists of a bedrock aquifer. A Site-specific water table elevation map, Figure 2, shows that groundwater flow in the shallow aquifer is to the east.

5.0 GROUNDWATER INVESTIGATION

5.1 Investigation Purpose and Approach

A round of confirmatory groundwater sampling was conducted by Tenen in November 2015 to determine current groundwater conditions were similar to those encountered in 2009, the date of the most recent prior sampling event.

5.2 Groundwater Sampling

On November 16 and 17, 2015, Tenen performed groundwater sampling at six existing wells (MW-2, MW-3, MW-5, MW-6, TMW-1 and TMW-2). MW-2, MW-3, MW-5 and MW-6 were installed during the AKRF 2008 investigation. TMW-1 and TMW-2 were installed by others and appear to be 2-inch slotted PVC pipes screened across the shallow groundwater interface. One sample of non-aqueous phase liquid (NAPL) was collected from MW-4 (also installed in 2008 by AKRF) for hydrocarbon fingerprint analysis. All sampling locations are shown on Figure 2 and described below.

Monitoring well/sample designation	Description of Location
MW-2	Eastern property boundary, downgradient of petroleum-impacted soil
MW-3	Eastern/downgradient portion of petroleum-contaminated soil area
MW-4	Upgradient of petroleum-impacted area
MW-5	Upgradient property boundary, at location of former transformers
MW-6	Eastern property boundary
TMW-1/TMW-2	Northern property boundary

No evidence of petroleum impacts was observed in the purged groundwater, with the exception of NAPL in well MW-4. Water temperature, pH and turbidity were field measured at each sampled well. Monitoring of indicator parameters was employed in order to stabilize parameters before sample collection. Groundwater sampling and purging was conducted using a peristaltic pump using low-flow techniques and samples were collected once water quality parameters were stabilized.

Groundwater samples were containerized in accordance with EPA analytical protocols. Each sample was labeled, sealed, and placed in a chilled cooler for shipment to the laboratory.

5.3 Sample Analysis

The samples were preserved on ice and sent under chain-of-custody documentation to Alpha Analytical, Inc. (Alpha). Alpha is certified by the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) as LABIDs 11627 and 11148. Samples MW-2 and MW-6 were analyzed for Target Compound List (TCL) VOCs, TCL SVOCs, pesticides, polychlorinated biphenyls (PCBs) and Target Analyte List (TAL) Metals (total and dissolved); samples MW-3, MW-5, TMW-1 and TMW-2 were analyzed for VOCs and SVOCs. A NAPL sample from MW-4 was sent for fingerprint analysis.

Groundwater results were compared to Class GA Standards. The Class GA Standards represent levels that are protective of the groundwater as a source of drinking water; however, drinking water at the Site is provided by an upstate New York municipal system. Based on the lithology at the Site, it is not likely that the shallow groundwater recharges the underlying low permeability water-bearing unit.

5.4 Sample Results

Groundwater sample results are included in Table 1. Laboratory deliverables are included in the Tenen 2015 investigation report in Attachment 2. The analytical results are summarized below.

VOCs were not detected in any sample. SVOCs, predominantly polycyclic aromatic hydrocarbons (PAHs), were identified at concentrations above the Class GA standards in MW-2, MW-3 and MW-6, with the highest levels in MW-3. Benzo(a)anthracene was detected at levels between 0.38 ug/L (MW-6) and 2.4 ug/L (MW-3), above the Class GA standard of 0.002 ug/L. Benzo(a)pyrene was detected at levels ranging from 0.51 ug/L (MW-2) to 1.8 ug/L (MW-3); the Class GA standard for this compound is not-detected. Concentrations of benzo(f)fluoranthene ranged from 0.63 ug/L in MW-2 to 2.4 ug/L in MW-3 and benzo(k)fluoranthene was detected at levels of 0.22 ug/L (MW-2) to 0.88 ug/L (MW-3), with levels of both compounds above their Class GA standards of 0.002 ug/L. Chrysene levels above the Class GA standard of 0.002 ug/L ranged from 0.27 ug/L (MW-6) to 2.4 (MW-3) and indeno(1,2,3-cd)pyrene was detected at concentrations between 0.27 ug/L and 0.86 ug/L, exceeding the Class GA standard of 0.002.

Total and dissolved metals, including iron, manganese and sodium were detected at concentrations above the Class GA standards in samples MW-2 and MW-6. Dissolved concentrations above the standard include iron (2,090 ug/L in MW-2), manganese (5,018 ug/L in MW-2 and 2,984 ug/L in MW-6), and sodium (175,000 ug/L in MW-2 and 94,500 ug/L in MW-6).

The results of the fingerprint analysis of the NAPL collected at MW-4 is consistent with a hydraulic lubricating oil or motor oil. A hydrocarbon distribution indicative of motor oil was also identified in a fingerprint analysis of a sample collected at MW-4 during the 2008 AKRF investigation.

5.5 Findings and Conclusions

The groundwater investigation indicated the following:

- concentrations of SVOCs and metals above the Class GA standards have been identified in groundwater at the eastern Site boundary; and,
- a fingerprint analysis of the NAPL sample collected in a well proximate to the former tank area was consistent with a hydraulic lubricating oil or motor oil.

6.0 SUMMARY

Based upon the investigations conducted between 1986 and 2015, groundwater at the Site has been impacted by VOCs (including chlorinated solvents and petroleum-related compounds), SVOCs (primarily PAHs) and metals. These contaminants have been documented at concentrations above the Class GA standard in one or more investigations; recent sampling indicates that VOC impacts are not present in groundwater at the Site. The groundwater sampling conducted by AKRF in 2008 identified SVOCs (primarily PAHs), VOCs, and metals at concentrations above regulatory levels at locations downgradient of the former tank area. The 2015 Tenen groundwater investigation confirmed the presence of SVOCs and metals in groundwater in the northern portion of the Site.

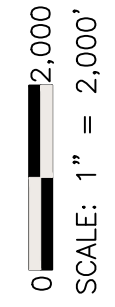
A soil gas survey was conducted by LMS in 1990/1991. Three soil gas samples were obtained in the northern portion of the Site and analyzed for VOCs. One sample (SG-18) taken from the northwest corner of the Site contained detectable concentrations of PCE, benzene, and xylene. PCE was detected at 0.36 ppm (2,442 ug/m³), above the NYSDOH AGV of 60 ug/m³. Benzene was detected below 0.01 ppm (32 ug/m³) and xylenes were detected below 0.15 ppm (651 ug/m³).

The soil sampling conducted by AKRF in 2008 identified metals (including chromium, lead and manganese) and SVOCs (primarily PAHs) at concentrations above the Commercial Use SCOs in Site soils. NAPL in soil was observed in two locations immediately to the east of the former tank area in the 1990 LMS study and within the former tank area by HydroScience in 2000. NAPL was also observed in one well west of and proximate to the tank area, and, identified via fingerprint analyses performed in 2008 and 2015, as a lubricating or motor oil. The extents of documented petroleum impacts are shown on Figure 6.

A qualitative human health exposure assessment (QHHEA) has been completed in accordance with Section 3.3(c)4 of DER-10 and is included Attachment 1.

Figures

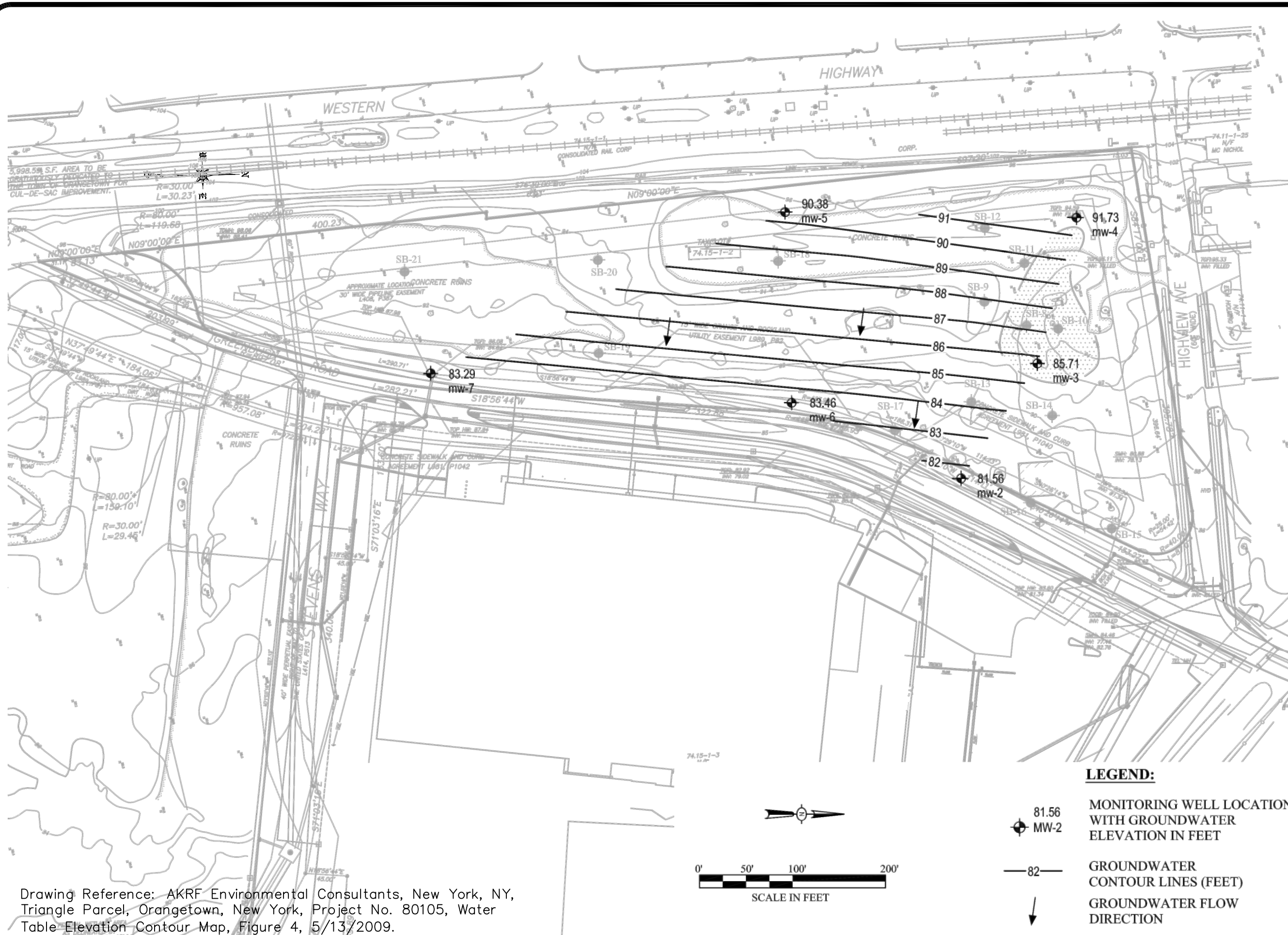
RE: USGS NYACK-NY QUADRANGLE, 2013



DETAIL LOCATION



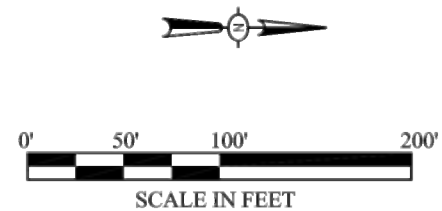
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LOCATION: 5 GREENBUSH ROAD ORANGETOWN, NY		
TENEN ENVIRONMENTAL, LLC 121 West 27th Street Suite 303 New York, NY 10001 O: 646-606-2332 F: 646-606-2379		



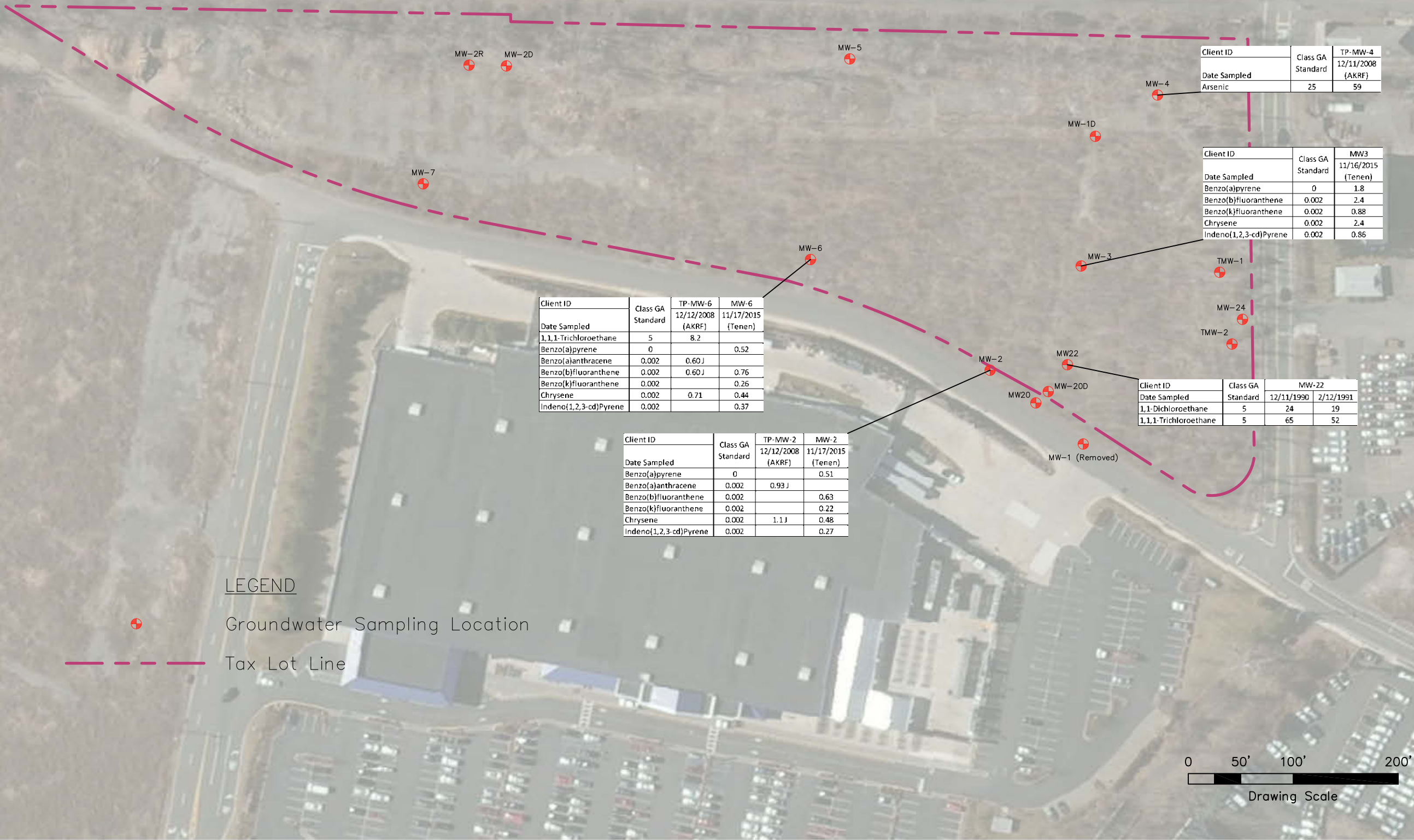
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LEGEND:

- 81.56 MW-2 MONITORING WELL LOCATION WITH GROUNDWATER ELEVATION IN FEET
- 82 GROUNDWATER CONTOUR LINES (FEET)
- GROUNDWATER FLOW DIRECTION



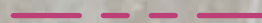
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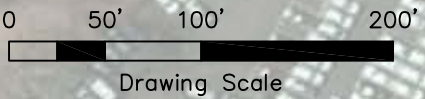
LEGEND



Groundwater Sampling Location



Tax Lot Line



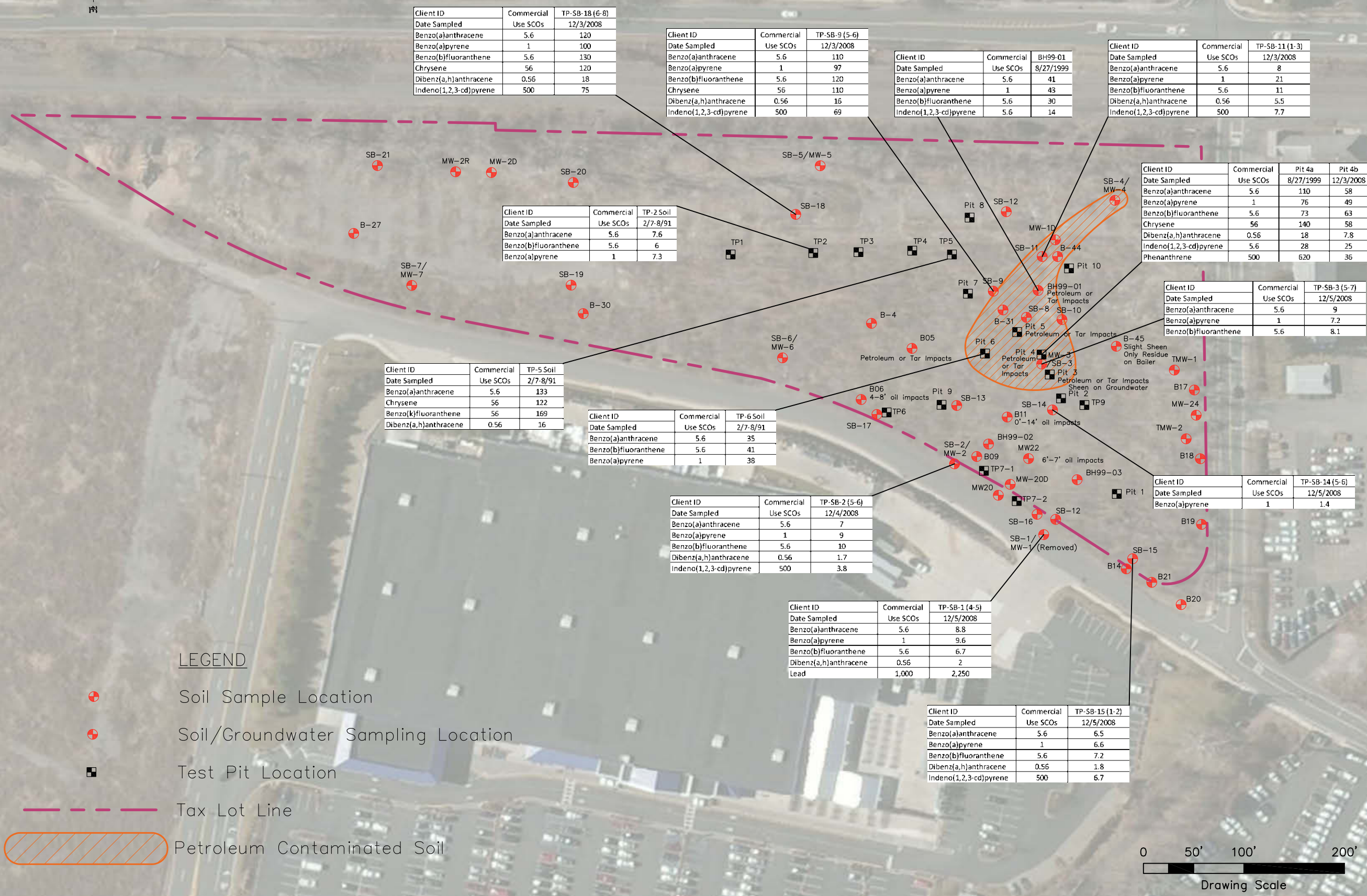
5 GREENBUSH ROAD
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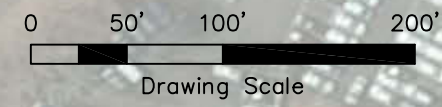
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- Soil Sample Location
- ⊕ Soil/Groundwater Sampling Location
- Test Pit Location
- Tax Lot Line
- Petroleum Contaminated Soil



Client ID	Commercial Use SCOs	TP-SB-18 (6-8) 12/3/2008
Benzo(a)anthracene	5.6	120
Benzo(a)pyrene	1	100
Benzo(b)fluoranthene	5.6	130
Chrysene	56	120
Dibenz(a,h)anthracene	0.56	18
Indeno(1,2,3-cd)pyrene	500	75

Client ID	Commercial Use SCOs	TP-SB-9 (5-6) 12/3/2008
Benzo(a)anthracene	5.6	110
Benzo(a)pyrene	1	97
Benzo(b)fluoranthene	5.6	120
Chrysene	56	110
Dibenz(a,h)anthracene	0.56	16
Indeno(1,2,3-cd)pyrene	500	69

Client ID	Commercial Use SCOs	BH99-01 8/27/1999
Benzo(a)anthracene	5.6	41
Benzo(a)pyrene	1	43
Benzo(b)fluoranthene	5.6	30
Indeno(1,2,3-cd)pyrene	5.6	14

Client ID	Commercial Use SCOs	TP-SB-11 (1-3) 12/3/2008
Benzo(a)anthracene	5.6	8
Benzo(a)pyrene	1	21
Benzo(b)fluoranthene	5.6	11
Dibenz(a,h)anthracene	0.56	5.5
Indeno(1,2,3-cd)pyrene	500	7.7

Client ID	Commercial Use SCOs	TP-2 Soil 2/7-8/91
Benzo(a)anthracene	5.6	7.6
Benzo(b)fluoranthene	5.6	6
Benzo(a)pyrene	1	7.3

Client ID	Commercial Use SCOs	Pit 4a 8/27/1999	Pit 4b 12/3/2008
Benzo(a)anthracene	5.6	110	58
Benzo(a)pyrene	1	76	49
Benzo(b)fluoranthene	5.6	73	63
Chrysene	56	140	58
Dibenz(a,h)anthracene	0.56	18	7.8
Indeno(1,2,3-cd)pyrene	5.6	28	25
Phenanthrene	500	620	36

Client ID	Commercial Use SCOs	TP-5 Soil 2/7-8/91
Benzo(a)anthracene	5.6	133
Chrysene	56	122
Benzo(k)fluoranthene	56	169
Dibenz(a,h)anthracene	0.56	16

Client ID	Commercial Use SCOs	TP-6 Soil 2/7-8/91
Benzo(a)anthracene	5.6	35
Benzo(b)fluoranthene	5.6	41
Benzo(a)pyrene	1	38

Client ID	Commercial Use SCOs	TP-SB-2 (5-6) 12/4/2008
Benzo(a)anthracene	5.6	7
Benzo(a)pyrene	1	9
Benzo(b)fluoranthene	5.6	10
Dibenz(a,h)anthracene	0.56	1.7
Indeno(1,2,3-cd)pyrene	500	3.8

Client ID	Commercial Use SCOs	TP-SB-1 (4-5) 12/5/2008
Benzo(a)anthracene	5.6	8.8
Benzo(a)pyrene	1	9.6
Benzo(b)fluoranthene	5.6	6.7
Dibenz(a,h)anthracene	0.56	2
Lead	1,000	2,250

Client ID	Commercial Use SCOs	TP-SB-15 (1-2) 12/5/2008
Benzo(a)anthracene	5.6	6.5
Benzo(a)pyrene	1	6.6
Benzo(b)fluoranthene	5.6	7.2
Dibenz(a,h)anthracene	0.56	1.8
Indeno(1,2,3-cd)pyrene	500	6.7

Client ID	Commercial Use SCOs	TP-SB-14 (5-6) 12/5/2008
Benzo(a)pyrene	1	1.4

5 GREENBUSH ROAD
ORANGEBURG, NY

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CONSULTANT

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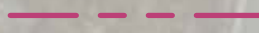


SG18 - 10/25/1990
PCE 2,442 ug/m³

LEGEND

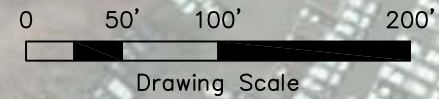


Soil Vapor Sample Location



Tax Lot Line

*Only SG-18 sample contained detectable concentrations of VOCs.



Drawing Scale

CONSULTANT



TENEN ENVIRONMENTAL, LLC
121 West 27th Street
Suite 303
New York, NY 10001
O: 646-606-2332
F: 646-606-2379

SITE

5 GREENBUSH ROAD
ORANGEBURG, NY

DRAWN BY

LM

CHECKED BY

MC

DATE

JUNE 2016

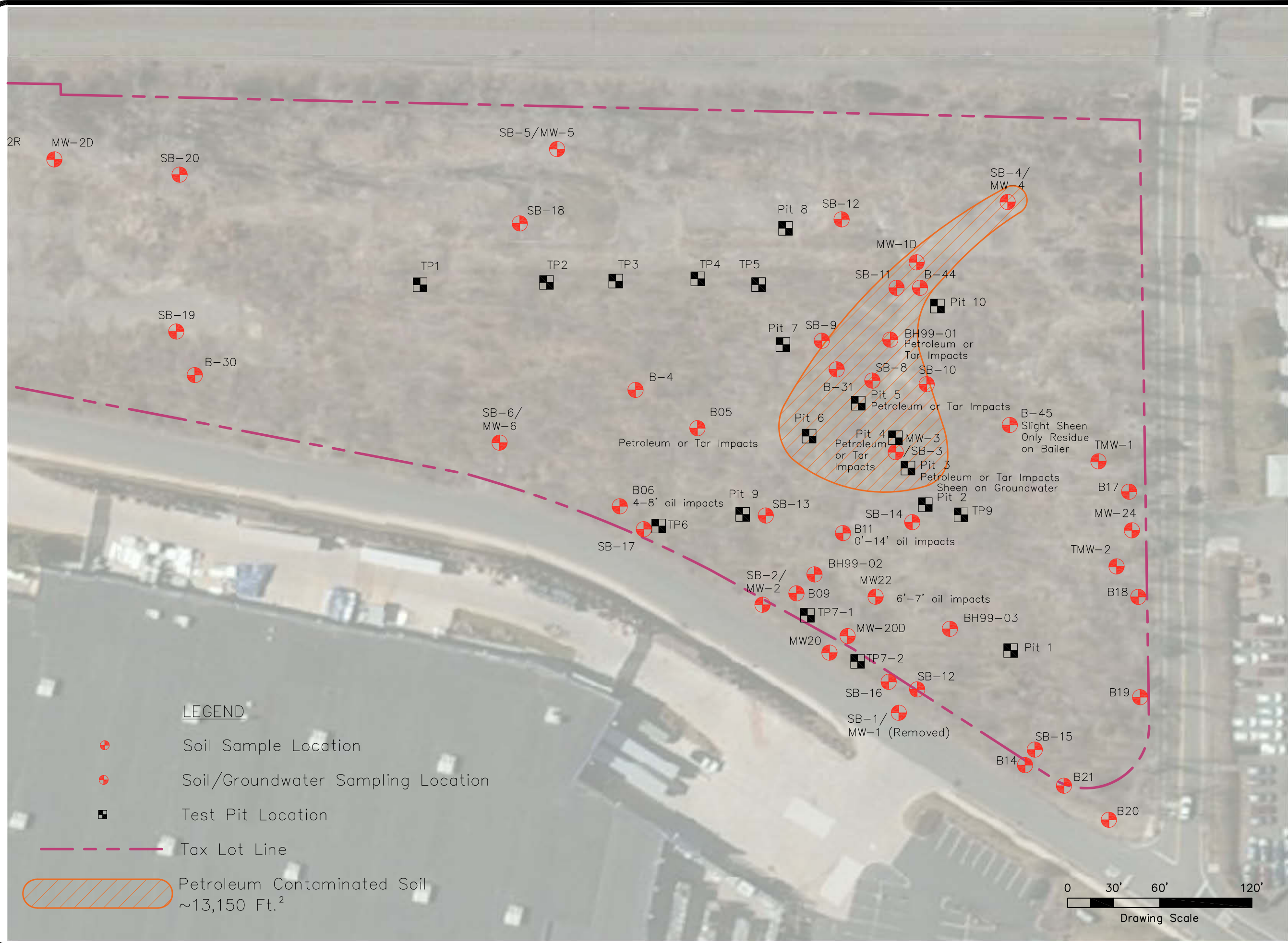
SCALE:

AS NOTED

DRAWING TITLE:
SOIL VAPOR SAMPLE
LOCATIONS

DRAWING NO.

FIGURE 5




SITE		5 GREENBUSH ROAD ORANGEBURG, NY	
CONSULTANT		 TENEN ENVIRONMENTAL, LLC 121 West 27th Street Suite 303 New York, NY 10001 O: 646-606-2332 F: 646-606-2379	
DRAWN BY	LM	CHECKED BY	MC
DRAWING TITLE:	EXTENT OF PETROLEUM IMPACTS		
DRAWING NO.	FIGURE 6		
DATE	JUNE 2016		
SCALE:	AS NOTED		

Table 1
Summary of Detected Compounds in Groundwater

Table 1 - Summary of Detected Compounds

Orangeburg Triangle Parcel

ANALYTE	SAMPLE ID:	MW5			MW3			MW6			MW2			TMW1			TMW2			TRIP BLANK			
		LAB ID:	L1530151-01			L1530151-02			L1530151-03			L1530151-04			L1530151-05			L1530151-06			L1530151-07		
			COLLECTION DATE:	11/16/2015			11/16/2015			11/17/2015			11/17/2015			11/17/2015			11/17/2015			11/17/2015	
(ug/l)	Conc	Q		MDL	Conc	Q	MDL	Conc	Q	MDL	Conc	Q	MDL	Conc	Q	MDL	Conc	Q	MDL	Conc	Q	MDL	
VOLATILE ORGANICS																							
1,1-Dichloroethane	5	ND	0.7		ND	0.7		1	J	0.7	ND	0.7		ND	0.7		ND	0.7		ND	0.7		
Chloroform	7	ND	0.7		ND	0.7		ND		0.7	ND	0.7		ND	0.7		0.72	J	0.7	ND		0.7	
Tetrachloroethene	5	ND	0.18		ND	0.18		0.34	J	0.18	ND	0.18		ND	0.18		ND		0.18	ND		0.18	
1,1,1-Trichloroethane	5	ND	0.7		ND	0.7		0.84	J	0.7	ND	0.7		ND	0.7		ND		0.7	ND		0.7	
Acetone	50	ND	1.5		ND	1.5		ND		1.5	1.5	J	1.5	ND		1.5	ND		1.5	ND		1.5	
Total VOCs								2.18			1.5						0.72						
SEMIVOLATILE ORGANICS																							
Acenaphthene	20	ND	0.04		5.7	0.07		ND		0.04	12		0.04	ND		0.04	ND		0.04	ND		0.04	
Fluoranthene	50	ND	0.04		5.7	0.08		0.45		0.04	1.5		0.04	ND		0.04	ND		0.04	ND		0.04	
Naphthalene	10	ND	0.04		ND	0.09		ND		0.04	0.08	J	0.04	ND		0.04	ND		0.04	ND		0.04	
Benzo(a)anthracene	NA	ND	0.02		2.4	0.03		0.38		0.02	0.41		0.02	ND		0.02	ND		0.02	ND		0.02	
Benzo(a)pyrene	0	ND	0.04		1.8	0.08		0.52		0.04	0.51		0.04	ND		0.04	ND		0.04	ND		0.04	
Benzo(b)fluoranthene	0.002	ND	0.02		2.4	0.03		0.76		0.02	0.63		0.02	ND		0.02	ND		0.02	ND		0.02	
Benzo(k)fluoranthene	0.002	ND	0.04		0.88	0.08		0.26		0.04	0.22		0.04	ND		0.04	ND		0.04	ND		0.04	
Chrysene	0.002	ND	0.04		2.4	0.08		0.44		0.04	0.48		0.04	ND		0.04	ND		0.04	ND		0.04	
Acenaphthylene	NA	ND	0.04		ND	0.07		ND		0.04	0.22		0.04	ND		0.04	ND		0.04	ND		0.04	
Anthracene	50	ND	0.04		0.98	0.07		0.05	J	0.04	0.48		0.04	ND		0.04	ND		0.04	ND		0.04	
Benzo(ghi)perylene	NA	ND	0.04		0.89	0.08		0.4		0.04	0.35		0.04	ND		0.04	ND		0.04	ND		0.04	
Fluorene	50	ND	0.04		4.2	0.07		ND		0.04	5.3		0.04	ND		0.04	ND		0.04	ND		0.04	
Phenanthrene	50	ND	0.02		0.2	J	0.03	0.06	J	0.02	0.11	J	0.02	ND		0.02	ND		0.02	ND		0.02	
Dibenzo(a,h)anthracene	NA	ND	0.04		0.3	J	0.08	0.11	J	0.04	0.11	J	0.04	ND		0.04	ND		0.04	ND		0.04	
Indeno(1,2,3-cd)Pyrene	0.002	ND	0.04		0.86	0.08		0.37		0.04	0.27		0.04	ND		0.04	ND		0.04	ND		0.04	
Pyrene	50	ND	0.04		6.6	0.08		0.49		0.04	3.2		0.04	ND		0.04	ND		0.04	ND		0.04	
Total SVOCs					35.31			4.29			25.87												
PESTICIDES																							
trans-Chlordane	NA							0.013	J	0.006	0.01	J	0.006										
METALS, DISSOLVED																							
Aluminum, Dissolved	NA							3.6	J	1.69	5.65	J	1.69										
Antimony, Dissolved	3							0.72	J	0.06	0.28	J	0.06										
Arsenic, Dissolved	25							0.21	J	0.12	3.85		0.12										
Barium, Dissolved	1000							249.5		0.06	233.9		0.06										
Cadmium, Dissolved	5							0.27		0.05	ND		0.05										
Calcium, Dissolved	NA							159000		640	180000		640										
Chromium, Dissolved	50							1.74	J	0.25	1.33	J	0.25										
Cobalt, Dissolved	NA							0.23		0.06	7.51		0.06										
Copper, Dissolved	200							1.39		0.26	ND		0.26										
Iron, Dissolved	300							15.9	J	12	2090		12										
Magnesium, Dissolved	35000							25500		22.3	26000		22.3										
Manganese, Dissolved	300							2984		6.04	5018		6.04										
Nickel, Dissolved	100							5.89		0.08	7.34		0.08										
Potassium, Dissolved	NA							2300		19.3	2660		19.3										
Sodium, Dissolved	20000							94500		322	175000		322										
Vanadium, Dissolved	NA							0.82	J	0.55	ND		0.55										
Zinc, Dissolved	2000							ND		2.56	13.1		2.56										
METALS, TOTAL																							
Aluminum, Total	NA							1220		33.8	523		33.8										
Antimony, Total	3							ND		0.06	0.09	J	0.06										
Arsenic, Total	25							1.55		0.12	6.68		0.12										
Barium, Total	1000							286.7		0.06	269.8		0.06										
Cadmium, Total	5							0.31		0.05	0.09	J	0.05										
Calcium, Total	NA							147000		640	182000		640										
Chromium, Total	50							2.57		0.25	2.26		0.25										
Cobalt, Total	NA							0.98		0.06	8.34		0.06										
Copper, Total	200							5.14		0.26	1.98		0.26										
Iron, Total	300							1730		12	5850		12										
Lead, Total	25							1.76		0.12	0.72	J	0.12										
Magnesium, Total	35000							27000		22.3	26600		22.3										
Manganese, Total	300							3288		6.04	5008		6.04										
Nickel, Total	100							7.12		0.08	8.82		0.08										
Potassium, Total	NA							2580		19.3	2790		19.3										
Sodium, Total	20000							91600		322	164000		322										
Vanadium, Total	NA							4.78	J	0.55	2.1	J	0.55										
Zinc, Total	2000							5.94	J	2.56	17.72		2.56										

Cells highlighted in yellow exceed the NY-AWQS: New York TOGS 111 Ambient Water Quality Standards (AWQS) criteria.
Cells highlighted in grey contain method detection limits (MDLs) above the AWQS.

Attachment 1
Qualitative Human Health Exposure Assessment

Attachment 2
Previous Reports