

# SPILL REMEDIATION REPORT

2101 AND 2103 PALMER AVENUE  
LARCHMONT, NEW YORK  
NYSDEC SPILL No. 1006787

PREPARED FOR:

MR. RICHARD ESPOSITO  
LARCHMONT REALTY, LLC

PREPARED BY:

HYDROENVIRONMENTAL SOLUTIONS, INC.  
ENVIRONMENTAL CONSULTANTS  
ONE DEANS BRIDGE ROAD  
SOMERS, NEW YORK 10589  
(914) 276-2560  
wcanavan@hesny.com

December 2011

Prepared by:



Timothy J. Bishop  
Environmental Scientist  
Project Manager

Reviewed by:



William A. Canavan, CPG, PG  
President



*HydroEnvironmental*  
SOLUTIONS, INC.

## INTRODUCTION

HydroEnvironmental Solutions, Inc. (HES), on behalf of Mr. Richard Esposito, of Larchmont Realty, LLC (LR) the current property owner, has completed a spill remediation of petroleum impacted soil and groundwater at the property located at 2101 and 2103 Palmer Avenue in Larchmont, New York. The site location is shown on **Figure 1**. The remediation activities included the installation of an on-site dewatering and filtration system, excavation of petroleum impacted soil for off-site disposal, the drilling of seven (7) monitor wells across the subject site and an adjacent up-gradient parcel and the installation of a post-remedial impermeable barrier along the excavation border. The field work conducted by HES was completed from June through November 2011.

## BACKGROUND

The current owner of the subject property retained Tim Miller Associates, Inc. of Cold Spring, New York to conduct a Phase I Environmental Site Assessment (ESA) prior to the purchase of the subject site. The Phase I ESA was conducted in June 2006 and recommended no further environmental investigation for the subject site. The June 2006 Phase I ESA Report was previously forwarded to the New York State Department of Environmental Conservation (NYSDEC) in our August 2011 Subsurface Investigation Report (SIR).

In September 2010, Wilder Balter, a prospective buyer of the property, retained Tectonic Engineering and Surveying Consultants, PC (Tectonic) of Mountainville, New York to perform soil testing prior to the anticipated development of the subject site and to conduct a Limited Environmental Assessment of the parcel. During test pit excavation activities on September 20 and 21, 2010, Tectonic encountered petroleum hydrocarbon (PHC) impacted soils and free-phase PHC seeping into several test pits. Subsequent to test pit excavation activities, Tectonic installed ten (10) test borings using a truck mounted Geoprobe in an attempt to delineate the extent of PHC impacts to the site. The Tectonic Limited Environmental Assessment Report was previously forwarded to the NYSDEC as part of our August 2011 SIR.

Due to the findings of the Tectonic investigation and the anticipated sale of the property by the current owner, HES was retained to complete the remediation of the soil and groundwater at the site. The site activities completed by HES included the installation of nineteen (19) dewatering wells around the perimeter of the proposed excavation area, the installation of a dewatering system (including pump, fractionation tank and carbon filtration) oversight during soil excavation and removal, field screening of soil samples for the presence of petroleum vapors with a Thermo Scientific® 580B photoionization detector



(PID), collection of excavation end-point soil samples and the collection of water level measurements and groundwater samples from the seven previously installed monitor wells for laboratory analysis. The field activities and results are presented below. The work was conducted at the subject property in response to the requirements of the NYSDEC pertaining to the presence of free-phase PHCs.

## FIELD ACTIVITIES

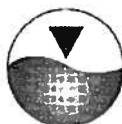
### Dewatering System Setup and Installation

On July 11 through July 13, 2011, Soil Testing, Inc. (Soil Testing) of Oxford, Connecticut installed nineteen (19) dewatering wells under the direct supervision of an HES hydrogeologist on the perimeter of the proposed excavation area. The dewatering wells were drilled to depths ranging from 15 to 19 feet below grade (ftbg) and were installed around the proposed excavation area as outlined on **Figure 2**. The wells were constructed of five to 10 feet of 2-inch 20 slot Schedule 40 PVC well screen and solid riser pipe. The wells were installed using the hollow stem auger drilling method. The annular space around each well was backfilled with No. 2 filter sand to at least one foot above the top of the well screen. The Geologic Logs and well construction details for the dewatering well array are included in **Appendix 1**.

Following the installation of the dewatering well array, HES designed and supervised the installation of a dewatering system during August 2011. The subject dewatering system consisted of a header pipe manifold and swing line well head connections to each dewatering well, a 21,000-gallon fractionation tank (settling tank), a Godwin<sup>®</sup> critically silenced model CD100MV suction pump, a Goulds<sup>®</sup> ½ horsepower transfer pump and four Carbtrol<sup>®</sup> 10 gallon per minute (gpm) granular activated carbon treatment vessels plumbed in sequence prior to proposed discharge to the Westchester County sanitary sewer located west of the site. The discharge was metered using an Elster<sup>®</sup> C700 flow meter set prior to the carbon treatment vessels. The dewatering system layout along with the location of the dewatering wells and sanitary sewer discharge location are shown on **Figure 2**. Photographs taken of the dewatering system are included on **Figure 3**.

### Dewatering System Operation

Prior to dewatering system startup, HES submitted a Remedial Action Work Plan (RAW) to the NYSDEC for approval on June 14, 2011. Additionally, as required, HES secured a discharge permit from the Westchester County Department of Environmental Facilities (WCDEF) on July 20, 2011; the WCDEF Discharge Permit is included in **Appendix 2**. As required by the discharge permit, HES collected discharge samples for laboratory analysis during dewatering activities on October 6 and 24, 2011. The collected influent and effluent (before and after carbon treatment) samples were analyzed for the



following suite of analyses:

1. Volatile Organic Compounds (VOCs) via EPA Method 8260/624 (incl. MTBE)
2. Semi-Volatile Organic Compounds (SVOCs) via EPA Method 8270 (STARS list)
3. Total Suspended Solids (TSS)
4. pH
5. Total RCRA Metals
6. Cyanide
7. Oil & Grease
8. Phenols

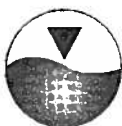
The results of discharge compliance sampling are summarized on **Table 1**, and the laboratory analytical report is included in **Appendix 3**.

On October 4, 2011, the dewatering operation commenced at the subject site and continued through November 8, 2011. During dewatering operations, HES routinely monitored the pumping and dewatering system to ensure proper operation and compliance with all applicable NYSDEC and WCDEF requirements. In general, the system was pumped at an average rate of 10 to 15 gpm for the duration of the dewatering process.

The dewatering system was operated continuously from October 4, 2011 to November 8, 2011 until the groundwater level beneath the site reached the required depth of 12 feet below grade (ftbg). Once the required groundwater level was achieved, excavation of petroleum hydrocarbon impacted soil ensued in the proposed excavation area. The approximate location of the excavation area is shown on **Figure 2**.

### **Soil Excavation, Screening and Sampling**

Following installation of the dewatering system, soil excavation began on October 6, 2011. A Permit was obtained from the Village of Larchmont to complete the proposed excavation and site work (**Appendix 2**). Excavation activities were completed by LR operators using two Komatsu PC200LC excavators. Excavated soil was stockpiled in the excavation prior to loading for off-site disposal. During excavation activities, soil samples were collected by HES field personnel for field screening purposes. The collected soil samples were screened in the field by the HES environmental scientist or hydrogeologist



on-site using a calibrated PID and the headspace method to determine the presence of PHCs. The PID screening results are included on **Table 2**.

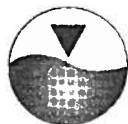
Of the thirty-six (36) soil samples collected for PID field screening, twelve (12) were collected as excavation end-points. Those samples were placed in appropriately labeled four and two-ounce sample jars in a cooler on ice and transported to York Analytical Laboratories, Inc. (York); a New York State certified laboratory located in Stratford, Connecticut, where it was analyzed for the presence of VOCs using EPA Method 8260 including MTBE (methyl tertiary butyl ether) and for SVOCs using EPA Method 8270 in accordance with NYSDEC STARS Memo Guidelines. The soil sampling locations are shown on **Figure 4**. Soil sampling laboratory analytical results are summarized on **Table 3** and the soil laboratory analytical report is included in **Appendix 4**.

### **Soil Removal and Disposal**

On October 13, 14 and 17, 2011, petroleum impacted soil was loaded by LR's operators into tri-axle dump trucks operated by Rainbow Transport Corp. (Rainbow) of Ledgewood, New Jersey. The soil was transported to Clean Earth of Carteret (Clean Earth); an approved soil processing facility located in Carteret, New Jersey. The Non-Hazardous Material Manifests and facility weight tickets are included in **Appendix 5**.

### **Backfilling and Overburden Soil Sampling**

Upon completion of soil excavation and loading activities, the backfilling of the excavation area commenced. The dewatering system remained operational until the backfilling was close to completion. A large pile of excavated overburden and material already existing on-site would be used for this purpose. However, at the request of the NYSDEC Case Manager, soil sampling of this material needed to be completed. Therefore, on October 14, 2011, composite soil samples were collected from the fill material that was stockpiled on-site. Soil samples were collected at a minimum of 6-inches below the surface at twenty-four (24) separate locations on the pile using a stainless steel trowel. The soil samples collected from the first twelve (12) locations were placed into a stainless steel mixing bowl, homogenized and immediately placed in appropriately labeled four and two-ounce sample jars in a cooler on ice, designated Overburden SS#1, and transported to York. The sampling process was then repeated and the soil sample Overburden SS#2 was collected. The two samples (Overburden SS#1 and Overburden SS#2) were analyzed for the presence of VOCs using EPA Method 8260, SVOCs using EPA Method 8270, Total RCRA Metals using EPA Method 200.7, Polychlorinated Biphenyls (PCBs) using EPA Method 8082, herbicides and pesticides using EPA Methods



8081 and 8151, respectively. The laboratory analytical results for soil samples collected from the overburden stockpile are summarized on Table 4 and the laboratory analytical report is included in Appendix 4.

## **Groundwater Monitoring & Sampling**

On February 24, March 25 and November 8 and 9, 2011, HES personnel conducted groundwater monitoring activities which included collecting groundwater samples from the seven (7) installed monitor wells and surveying the elevations of the wells as they relate to the depth to groundwater (DTW). Prior to groundwater sampling, DTW and free-phase hydrocarbon (FPHC) measurements were collected using an electronic interface probe and related to the surveyed top of each well casing (TOC) elevation. The measurements recorded and observations made during groundwater monitoring are summarized on Table 5. The groundwater monitoring data were used to calculate groundwater elevations and flow direction beneath the property. The results of the November 8, 2011 groundwater monitoring survey are included on Figure 5, a groundwater elevation contour map for the subject site.

On February 24, March 25, November 8 and 9, 2011, HES conducted groundwater sampling from the on-site monitor wells. Prior to sample collection, three standing well volumes of groundwater were evacuated from each well using a dedicated polyethylene bailer in accordance with industry accepted procedures. The groundwater was collected in appropriately labeled glassware, placed in a cooler on ice and transported to York where they were analyzed for VOCs and SVOCs using EPA Methods 8021 including MTBE and 8270, respectively. Laboratory analytical results of the groundwater sampling are summarized on Table 6 and the groundwater laboratory analytical data are included in Appendix 4.

## **RESULTS**

### **Hydrogeologic Setting**

During the post-remedial round of groundwater sampling completed on November 8 and 9, 2011, DTW measurements ranged from 3.25 fbtoc (feet below top of casing) at MW-4 to 4.91 fbtoc at MW-1. No free-phase product, PHC sheen or odors were observed at any of the monitor well locations during this monitoring event. Subsequent to each previous groundwater monitoring event, a groundwater elevation contour map was



constructed. According to the previously submitted maps (included in HES' August 2011 SIR), groundwater flows across the site predominantly from east to west at an average hydraulic gradient of 0.03 ft/ft based on the data sets used. The direction of groundwater flow indicates that groundwater flows onto the site from the two adjacent parcels located to the south and east of the subject site. Data collected during the most recent groundwater monitoring and sampling event on November 8 and 9, 2011 supports the previously determined flow direction. These results are summarized on the groundwater contour map included on **Figure 5**.

The unconsolidated material beneath the site is composed of 4 to 6 feet of historic fill including silt and sand (medium to coarse) as well as construction and demolition debris. According to the Surficial Geologic Map of New York, the native material beneath the site consists of a till, variable in texture, usually poorly sorted diamict of variable clasts (Cadwell, 1986). According to the Geologic Map of New York, the bedrock beneath the site is the Ordovician/Cambrian Hartland Formation consisting of basal amphibolite overlain by pelitic schists (Fisher, 1970).

### **Dewatering Operation**

The dewatering system was in operation from October 4, 2011 to November 8, 2011 and processed a total of 116,420 gallons of groundwater to the sanitary sewer in accordance with the WCDEF permit dated July 20, 2011. Additionally, the laboratory analytical results for discharge (effluent) water samples collected on October 6 and 24, 2011 indicate that several constituents were detected above laboratory method detection limits (MDLs); however, all were in full compliance with the sampling parameters outlined in the above referenced permit (**Appendix 2**).

### **Soil Excavation, Screening and Sampling**

During soil excavation activities on October 6, 2011 to October 17, 2011, PID field screening results indicated that VOC vapors were present in the excavation end-point soil samples at concentrations ranging from 12 ppm (parts per million) to 372 ppm. These results are summarized on **Table 2**. The results of PID field screening demonstrate that the required petroleum impacted soil observed beneath the site was removed by excavation.

Based on laboratory analytical results collected from the twelve (12) excavation end-point soil samples, all but one sample contained minor concentrations of VOCs. Soil Sample SS#7 contained xylenes at a concentration of 360 µg/kg (micrograms per kilogram) which exceeds the NYSDEC Soil Guideline of 260 µg/kg for this compound. Only the soil



sample designated BOT-8 did not contain any VOCs above laboratory MDLs. Additionally only the soil sample designated BOT-6 contained minor concentrations of SVOCs and the remaining eleven samples did not contain any SVOCs above laboratory MDLs. Eleven of the twelve end-point samples met their respective NYSDEC Soil Cleanup Levels (SCLs) in accordance with NYSDEC Guidelines (CP-51). The soil sampling laboratory results are summarized on **Table 3** and the laboratory report is included in **Appendix 4**.

### **Soil Removal and Disposal**

On October 13, 14 and 17, 2011 twenty-nine (29) trucks operated by Rainbow, removed a total of 956.67 tons of petroleum impacted soil and transported it off-site to Clean Earth. The Non-Hazardous Material Manifests and facility weight tickets are included in **Appendix 5**. Photograph taken during soil excavation and loading activities are included on **Figure 3**.

### **Backfilling and Overburden Soil Sampling**

Laboratory analytical results indicate that only minor concentrations of VOCs, SVOCs and heavy metals were detected above laboratory MDLs in the two soil samples designated Overburden SS#1 and Overburden SS#2. These concentrations were well below their respective NYSDEC-SCLs in accordance with NYSDEC Guidelines (CP-51) and Soil Cleanup Objectives (SCOs) for Restricted Residential Use (Subpart 375-6). The laboratory analytical results for soil samples collected from the overburden stockpile are summarized on **Table 4** and the laboratory analytical report is included in **Appendix 4**.

Due to the presence of free-phase product observed entering the excavation from two upgradient properties adjacent to the site, a 10-foot wide 80 mm (millimeter) thick polyethylene barrier was installed along the southern and western sidewalls during excavation backfilling operations. The barrier was installed to prevent the future migration of PHCs onto the subject site following the cleanup. Photographs of the barrier installation activities are included on **Figure 3**.

### **Groundwater Monitoring & Sampling**

During the post-remedial round of groundwater sampling completed on November 8 and 9, 2011, DTW measurements were recorded at 3.25 fbtoc at MW-4 and 4.91 fbtoc at MW-1. The groundwater monitoring & elevation results are recorded on **Table 5**. No FPHC was observed in any of the on-site wells during this monitoring event.





Laboratory analytical results of the groundwater sampled from MW-1 through MW-7 indicate that each well contained VOCs above laboratory MDLs. However, only one of the off-site wells (MW-7) sampled on March 25, 2011 contained concentrations that exceeded NYSDEC Groundwater Quality Standards (GWQS). Dissolved concentrations of n-butylbenzene (15 µg/L [micrograms per liter]), fluoranthene (9.17 µg/L), fluorene (7.98 µg/L), phenanthrene (7.47 µg/L) and pyrene (7 µg/L) were detected at MW-7 on this date and exceeded their respective NYSDEC-GWQS of 5 µg/L. The groundwater laboratory results are summarized on Table 6 and on Figure 6 and the laboratory analytical report is included in Appendix 3.

## DISCUSSION OF RESULTS

The results of the groundwater monitoring and the monitor well elevation survey confirm that groundwater flows across the site from east to west or southeast to northwest. The direction of groundwater flow is from the two adjacent off-site parcels onto the subject site. This was confirmed during four separate groundwater monitoring events. Thus, contaminants present in the soil and groundwater on the two adjacent parcels have migrated onto the subject site. A PHC sheen was detected at most monitoring well locations on multiple monitoring dates and intermittent FPHC was noted at MW-1; neither were noted during the post-remedial sampling event completed on November 8 and 9, 2011.

Soil screening and laboratory analyses completed during and after excavation activities at the subject site indicate that impacts from PHCs were detected in the excavation area; however, this soil was removed via excavation. Any residual PHCs detected above laboratory MDLs, were in compliance with their respective NYSDEC-SCLs. Additionally, the overburden material stockpiled on-site for backfilling purposes was in full compliance with all applicable NYSDEC-SCLs and SCOs for Restricted Residential Use.

The results of groundwater quality sampling indicate that minor dissolved concentrations of PHC constituents (VOCs only) were detected above laboratory MDLs in the post-remedial sampling event (November 8 and 9, 2011) at monitor wells MW-1 through MW-5. However, none of these concentrations exceeded any of their respective NYSDEC-GWQS. No SVOCs were detected during this sampling event above laboratory MDLs. Additionally, groundwater samples could not be collected from monitor well locations from the off-site parcel (MW-6 and MW-7) as access to these wells was not granted by the upgradient property owners.

Laboratory analytical results indicate that the 116,420 gallons of groundwater



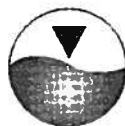
discharged by the dewatering system to the sanitary sewer were in full compliance with the requirements of the WCDEF permit dated July 20, 2011.

## CONCLUSIONS

1. Based on observations made during excavation activities, free-phase petroleum was entering the excavation with groundwater along the southern and western sidewalls. The newly installed polyethylene barrier along these sidewalls is designed to prevent future petroleum migration onto the subject site.
2. Based on soil remediation activities completed at the site, HES believes that The required amount of petroleum hydrocarbon impacted soil at the site was removed by excavation. The results of the soil end-point sampling support this conclusion.
3. Based on post-remedial monitor well sampling results collected on November 8 and 9, 2011, the groundwater beneath the site is in compliance with NYSDEC-GWQS.
4. Groundwater monitoring and survey results recorded on November 8, 2011 indicated that groundwater generally flows west from the upgradient adjacent parcels and across the subject site.
5. Laboratory analytical results indicate that the 116,420 gallons of groundwater discharged by the dewatering system to the sanitary sewer was in full compliance with the requirements of the WCDEF permit dated July 20, 2011.

## RECOMMENDATIONS

HES believes that the required amount of petroleum hydrocarbon impacted soil at the site was removed by excavation. This is supported by laboratory analytical results of the end-point soil samples collected from the completed excavation as well as post-remedial groundwater samples collected from the on-site monitor wells. In this regard, HES recommends that no further environmental work be completed at the site, and that Spill No. 1006787 be formally closed by the Region 3 Office of the NYSDEC.



## **TABLES**

TABLE 1

2101-2103 PALMER AVENUE  
LARCHMONT, NEW YORK  
NYSDEC Spill No. 1006787

Summary of Water Quality Results – Discharge (Effluent) Sampling

EPA Method 8260

Sample	Date	Benzene	Toluene	Ethylbenzene	Total Xylenes	n-Butylbenzene	MTBE	Total VOCs
System Influent	10/06/11	ND	ND	ND	ND	ND	ND	4.3 <sup>J,B</sup>
System Effluent	10/06/11	ND	ND	ND	ND	ND	1.7	5.5 <sup>J,B</sup>
System Effluent	10/24/11	ND	ND	ND	ND	ND	0.81	6.11 <sup>J,B</sup>
<b>NYSDEC Groundwater Quality Standards</b>		<b>0.7</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>10</b>	--

Results in µg/Kg (micrograms per kilogram)

ND = Not Detected

NA = Not Analyzed

**BOLD** = Exceeded NYSDEC-GWQS

<sup>J</sup> = Detected below the Reporting Limit but greater than or equal to the Method Detection Limit (MDL); therefore, the result is an estimated concentration

<sup>B</sup> = Analyte is found in the associated batch blank

**TABLE 1**

**2101-2103 PALMER AVENUE  
LARCHMONT, NEW YORK  
NYSDEC Spill No. 1006787**

**Summary of Water Quality Results – Discharge (Effluent) Sampling**

EPA Method 8270 (STARS List)

Sample	Depth (ftbg)	Acenaphthene	Anthracene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	Total SVOCs
System Influent	10/06/11	ND	ND	ND	ND	ND	ND	ND	ND
System Effluent	10/06/11	ND	ND	ND	ND	ND	ND	ND	ND
System Effluent	10/24/11	ND	ND	ND	ND	ND	ND	ND	ND
<b>NYSDEC Groundwater Quality Standards</b>		<b>20</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>10</b>	<b>5</b>	<b>5</b>	<b>-</b>

Results in µg/Kg (micrograms per kilogram)

ND = Not Detected

NA = Not Analyzed

**BOLD** = Exceeded NYSDEC-GWQS

<sup>J</sup> = Detected below the Reporting Limit but greater than or equal to the Method Detection Limit (MDL); therefore, the result is an estimated concentration

<sup>B</sup> = Analyte is found in the associated batch blank

TABLE 1

2101-2103 PALMER AVENUE  
LARCHMONT, NEW YORK  
NYSDEC Spill No. 1006787

Summary of Water Quality Results – Discharge (Effluent) Sampling

EPA Method 6010B/200.7

Sample	Arsenic	Barium	Cadmium	Total Chromium	Lead	Selenium	Silver	Mercury	Copper
System Influent (10/06/11)	ND	0.124	ND	ND	ND	ND	ND	ND	NA
System Effluent (10/06/11)	ND	0.128	ND	ND	ND	0.010	ND	ND	NA
System Effluent (10/24/11)	ND	0.130	ND	ND	ND	ND	ND	ND	ND
<b>WCDPW Local Sewer Limitations</b>	<b>0.2</b>	<b>2.0</b>	<b>2.0</b>	<b>0.7</b>	<b>0.4</b>	<b>0.2</b>	<b>0.8</b>	<b>0.2</b>	<b>2.8</b>

Results in µg/Kg (micrograms per kilogram)

Sample	Date	TSS	Cyanide	pH	Vinyl Chloride	Phenols	Nickel	Zinc	Oil & Grease
System Influent	10/06/11	0.100	ND	7.55	NA	NA	NA	NA	NA
System Effluent	10/06/11	ND	ND	6.62	NA	NA	NA	NA	NA
System Effluent	10/24/11	NA	ND	7.34	ND	ND	0.00885	0.0431	1.58
<b>WCDPW Local Sewer Limitations</b>		<b>58</b>	<b>2.6</b>	<b>1.8</b>	<b>--</b>	<b>4</b>	<b>2.8</b>	<b>1.8</b>	<b>100</b>

Results in µg/Kg (micrograms per kilogram)

ND = Not Detected

NA = Not Analyzed

**BOLD** = Exceeded NYSDEC-Standards

**TABLE 2****2101-2103 PALMER AVENUE  
LARCHMONT, NEW YORK  
NYSDEC Spill No. 1006787****Summary of PID Field Screening Results**

<b>Sample No.</b>	<b>Depth</b>	<b>PID Reading</b>	<b>Notes</b>
1	2.5	25	10/11/11
2	3	17	10/11/11
3	4	16	10/11/11
4	4.5	25	10/11/11
5	4.5	20	10/11/11
6	4.5	70	10/11/11
7	3.5	26	10/11/11
8	4	25	10/11/11
9	3	12	10/11/11
10	3	18	10/11/11
11	4.5-5	35	10/12/11, SS-1
12	5-6	50	10/12/11, SS-2
13	5	74	10/12/11, SS-3
14	10	42	10/12/11, BOT-1
15	10	100	10/12/11
16	10	40	10/12/11, BOT-2
17	5	24	10/12/11, SS-4
18	9	190	10/12/11
19	10	70	10/12/11, BOT-3
20	5	30	10/12/11
21	8	77	10/12/11
22	8	30	10/12/11
23	6	56	10/12/11, SS-5
24A	5	372	10/12/11, SS-6
24	5	196	10/13/11, SS-7
25	7	191	10/13/11, SS-8

**TABLE 2**

**2101-2103 PALMER AVENUE  
LARCHMONT, NEW YORK  
NYSDEC Spill No. 1006787**

**Summary of PID Field Screening Results**

<b>Sample No.</b>	<b>Depth</b>	<b>PID Reading</b>	<b>Notes</b>
27	10	185	10/13/11, BOT-5
28A	10	121	10/13/11, BOT-6
28	7	69	10/13/11, BOT-7
29	6	56	10/13/11, BOT-8
30	5	45	10/13/11
31	5	65	10/13/11, BOT-9
32	5	80	10/13/11, SS-9
33	5	97	10/13/11, SS-10
34	5	154	10/13/11, SS-11

PID (photoionization detector) readings in parts per million, calibration gas equivalents  
Depth in feet below grade



**TABLE 3**

**2101-2103 PALMER AVENUE  
LARCHMONT, NEW YORK  
NYSDEC Spill No. 1006787**

**Summary of Soil Quality Results – Excavation End-Point Sampling  
October 12 and 13, 2011**

EPA Method 8260

Sample	Depth (ftbg)	Benzene	Toluene	Ethylbenzene	Total Xylenes	n-Butylbenzene	MTBE	Total VOCs
SS-2	5 - 6	ND	ND	ND	ND	490 <sup>J</sup>	ND	1,135.7 <sup>B,J, B-DI</sup>
SS-4	5	ND	ND	ND	ND	120 <sup>J</sup>	ND	767.5 <sup>B,J, B-DI</sup>
SS-6	5	ND	ND	ND	ND	2,500	ND	8,257.4 <sup>B,J, B-DI</sup>
SS-7	6	ND	ND	150 <sup>J</sup>	360 <sup>J</sup>	2,200	ND	22,166.9 <sup>B,J, B-DI</sup>
SS-8	6	ND	ND	ND	ND	160 <sup>J</sup>	ND	347 <sup>B,J, B-DI</sup>
SS-10	5	ND	ND	ND	ND	55 <sup>J</sup>	ND	272 <sup>B,J, B-DI</sup>
SS-11	5	ND	ND	ND	ND	1,200	ND	3,607.5 <sup>B,J, B-DI</sup>
BOT-1	10	ND	ND	ND	ND	110	ND	962 <sup>B,J, B-DI</sup>
BOT-3	10	ND	ND	ND	ND	1,200	ND	4,787.9 <sup>B,J, B-DI</sup>
<b>NYSDEC Soil Cleanup Levels (CP-51)</b>		<b>60</b>	<b>700</b>	<b>1,000</b>	<b>260</b>	<b>12,000</b>	<b>930</b>	<b>—</b>

**TABLE 3**

**2101-2103 PALMER AVENUE  
LARCHMONT, NEW YORK  
NYSDEC Spill No. 1006787**

**Summary of Soil Quality Results – Excavation End-Point Sampling  
October 12 and 13, 2011**

Sample	Depth (ftbg)	Benzene	Toluene	Ethylbenzene	Total Xylenes	n-Butylbenzene	MTBE	Total VOCs
BOT-4	8	ND	ND	ND	ND	27 <sup>J</sup>	ND	115.3 <sup>B,J, B-DII</sup>
BOT-6	8	ND	ND	ND	ND	17 <sup>J</sup>	ND	61 <sup>B,J, B-DII</sup>
BOT-8	7	ND	ND	ND	ND	ND	ND	23 <sup>B,J, B-DII</sup>
<b>NYSDEC Soil Cleanup Levels (CP-51)</b>		<b>60</b>	<b>700</b>	<b>1,000</b>	<b>260</b>	<b>12,000</b>	<b>930</b>	—

Results in µg/Kg (micrograms per kilogram)

ND = Not Detected

ftbg = feet below grade

**BOLD** = Exceeded NYSDEC-SCLs

<sup>J</sup> = Detected below the Reporting Limit but greater than or equal to the Method Detection Limit (MDL); therefore, the result is an estimated concentration

<sup>B</sup> = Analyte is found in the associated batch blank

<sup>B-DII</sup> = Detected in method blank(s) associated with the sample analysis. This is a common lab artifact which is found at ND-25 ppb. No dilution factor has been applied to these compounds to eliminate artificially inflated results

**TABLE 3**

**2101-2103 PALMER AVENUE  
LARCHMONT, NEW YORK  
NYSDEC Spill No. 1006787**

**Summary of Soil Quality Results – Excavation End-Point Sampling  
October 12 and 13, 2011**

**EPA Method 8270 (STARS List)**

<b>Sample</b>	<b>Depth (ftbg)</b>	<b>Acenaphthene</b>	<b>Anthracene</b>	<b>Fluoranthene</b>	<b>Fluorene</b>	<b>Naphthalene</b>	<b>Phenanthrene</b>	<b>Pyrene</b>	<b>Total SVOCs</b>
SS-2	5 - 6	ND	ND	ND	ND	ND	ND	ND	ND
SS-4	5	ND	ND	ND	ND	ND	ND	ND	ND
SS-6	5	ND	ND	ND	ND	ND	ND	ND	ND
SS-7	6	ND	ND	ND	ND	420 <sup>J</sup>	ND	ND	ND
SS-8	6	ND	ND	ND	ND	ND	ND	ND	ND
SS-10	5	ND	ND	ND	ND	ND	ND	ND	ND
SS-11	5	ND	ND	ND	ND	ND	ND	ND	ND
BOT-1	10	ND	ND	ND	ND	ND	ND	ND	ND
BOT-3	10	ND	ND	ND	ND	ND	ND	ND	ND
<b>NYSDEC Soil Cleanup Levels (CP-51)</b>		<b>20,000</b>	<b>100,000</b>	<b>100,000</b>	<b>30,000</b>	<b>12,000</b>	<b>100,000</b>	<b>100,000</b>	<b>—</b>

**TABLE 3**

**2101-2103 PALMER AVENUE  
LARCHMONT, NEW YORK  
NYSDEC Spill No. 1006787**

**Summary of Soil Quality Results – Excavation End-Point Sampling  
October 12 and 13, 2011**

Sample	Depth (ftbg)	Acenaphthene	Anthracene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	Total SVOCs
BOT-4	8	ND	ND	ND	ND	ND	ND	ND	ND
BOT-6	8	ND	ND	ND	ND	15	ND	ND	ND
BOT-8	7	ND	ND	ND	ND	ND	ND	ND	ND
<b>NYSDEC Soil Cleanup Levels (CP-51)</b>		<b>20,000</b>	<b>100,000</b>	<b>100,000</b>	<b>30,000</b>	<b>12,000</b>	<b>100,000</b>	<b>100,000</b>	<b>—</b>

Results in µg/Kg (micrograms per kilogram)

ND = Not Detected

ftbg = feet below grade

**BOLD** = Exceeded NYSDEC-SCLs

<sup>J</sup> = Detected below the Reporting Limit but greater than or equal to the Method Detection Limit (MDL); therefore, the result is an estimated concentration

<sup>B</sup> = Analyte is found in the associated batch blank

<sup>B-DII</sup> = Detected in method blank(s) associated with the sample analysis. This is a common lab artifact which is found at ND-25 ppb. No dilution factor has been applied to these compounds to eliminate artificially inflated results

**TABLE 4**

**2101-2103 PALMER AVENUE  
LARCHMONT, NEW YORK  
NYSDEC Spill No. 1006787**

**Summary of Soil Quality Results – Backfill Soil Sampling  
October 14, 2011**

**EPA Method 8260**

Sample	Depth (ftbg)	Benzene	Toluene	Ethylbenzene	Total Xylenes	n-Butylbenzene	MTBE	Total VOCs
Overburden SS#1	---	ND	ND	ND	ND	ND	ND	42 <sup>B</sup>
Overburden SS#2	---	ND	ND	ND	ND	ND	ND	42 <sup>B</sup>
<b>NYSDEC Soil Cleanup Levels (CP-51)</b>		<b>60</b>	<b>700</b>	<b>1,000</b>	<b>260</b>	<b>12,000</b>	<b>930</b>	<b>---</b>

Results in µg/Kg (micrograms per kilogram)

**EPA Method 8270**

Sample	Depth (ftbg)	Acenaphthene	Anthracene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	Total SVOCs
Overburden SS#1	---	ND	1,590	12,800	ND	ND	3,950	11,900	79,022
Overburden SS#2	---	ND	345	1,770	ND	ND	756 <sup>J</sup>	2010	11,452 <sup>J</sup>
<b>NYSDEC Soil Cleanup Levels (CP-51)</b>		<b>20,000</b>	<b>100,000</b>	<b>100,000</b>	<b>30,000</b>	<b>12,000</b>	<b>100,000</b>	<b>100,000</b>	<b>---</b>

Results in µg/Kg (micrograms per kilogram)

**TABLE 4**

**2101-2103 PALMER AVENUE  
LARCHMONT, NEW YORK  
NYSDEC Spill No. 1006787**

**Summary of Soil Quality Results – Backfill Soil Sampling  
October 14, 2011**

EPA Method 200.7 & 8082

Sample	Arsenic	Barium	Cadmium	Chromium	Lead	Selenium	Silver	Mercury	PCBs
Overburden SS#1	7.46	159	ND	36.0	333	1.20	ND	ND	ND
Overburden SS#2	5.74	163	ND	32.1	142	0.702	ND	ND	ND
<b>NYSDEC Restricted Use Soil Cleanup Objectives (Subpart 375-6)</b>	<b>16</b>	<b>350</b>	<b>2.5</b>	<b>36</b>	<b>400</b>	<b>36</b>	<b>36</b>	<b>0.81</b>	<b>1</b>

Results in ppm (parts per million)  
SB = Site Background

EPA Method 8081 and 8151

Sample	Depth (ftbg)	Herbicides (Silvex & 2,4-D)	4,4'-DDD	4,4'-DDE	4,4'-DDT	Aldrin	Alpha- BHC	Beta-BHC	Chlordane (alpha)	Delta- BHC	Dieldrin
Overburden SS#1	—	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Overburden SS#2	—	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>NYSDEC Restricted Use Soil Cleanup Objectives (Subpart 375-6)</b>		<b>58</b>	<b>2.6</b>	<b>1.8</b>	<b>1.7</b>	<b>0.019</b>	<b>0.097</b>	<b>0.072</b>	<b>0.91</b>	<b>100</b>	<b>0.039</b>

Results in ppm (parts per million)

TABLE 4

2101-2103 PALMER AVENUE  
 LARCHMONT, NEW YORK  
 NYSDEC Spill No. 1006787

Summary of Soil Quality Results – Backfill Soil Sampling  
 October 14, 2011

EPA Method 8081 and 8151

Sample	Depth (ftbg)	Endosulfan I	Endosulfan II	Endosulfan Sulfate	Endrin	Endrin Aldehyde	Gamma-BHC (Lindane)	Heptachlor	Heptachlor Epoxide	Methoxychlor	Toxaphene
Overburden SS#1	0 - 20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Overburden SS#2	0 - 20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>NYSDEC Restricted Use Soil Cleanup Objectives (Subpart 375-6)</b>		<b>4.8</b>	<b>4.8</b>	<b>4.8</b>	<b>2.2</b>	---	<b>0.28</b>	<b>0.42</b>	---	---	---

Results in ppm (parts per million)

ND = Not Detected

**BOLD** = Exceeded NYSDEC-SCLs

<sup>J</sup> = Detected below the Reporting Limit but greater than or equal to the Method Detection Limit (MDL); therefore, the result is an estimated concentration

<sup>B</sup> = Analyte is found in the associated batch blank

<sup>B-Dil</sup> = Detected in method blank(s) associated with the sample analysis. This is a common lab artifact which is found at ND-25 ppb. No dilution factor has been applied to these compounds to eliminate artificially inflated results

**TABLE 5**

**2101-2103 PALMER AVENUE  
LARCHMONT, NEW YORK  
NYSDEC Spill No. 1006787**

**Summary of Groundwater Monitoring and Elevation Results**

<b>Monitor Well</b>	<b>TOC Elevation</b>	<b>Date</b>	<b>DTW</b>	<b>DTHC</b>	<b>TD</b>	<b>Groundwater Elevation</b>
<b>MW-1</b>	<b>95.35</b>	<b>2/16/11</b>	<b>1.15</b>	<b>--</b>	<b>15.15</b>	<b>94.20</b>
		<b>2/24/11</b>	<b>2.90</b>	<b>--</b>		<b>92.45</b>
		<b>3/16/11</b>	<b>1.88</b>	<b>--</b>		<b>92.36</b>
		<b>11/08/11</b>	<b>4.91</b>			<b>89.64</b>
<b>MW-2</b>	<b>95.23</b>	<b>2/16/11</b>	<b>3.02</b>	<b>--</b>	<b>9.75</b>	<b>92.20</b>
		<b>2/24/11</b>	<b>1.65</b>	<b>--</b>		<b>93.38</b>
		<b>3/16/11</b>	<b>1.30</b>	<b>--</b>		<b>92.86</b>
		<b>11/08/11</b>	<b>4.11</b>			<b>89.67</b>
<b>MW-3</b>	<b>93.58</b>	<b>2/16/11</b>	<b>2.87</b>	<b>--</b>	<b>15.75</b>	<b>90.71</b>
		<b>2/24/11</b>	<b>3.00</b>	<b>--</b>		<b>90.58</b>
		<b>3/16/11</b>	<b>2.41</b>	<b>--</b>		<b>91.17</b>
		<b>11/08/11</b>	<b>3.87</b>	<b>---</b>		<b>89.71</b>
<b>MW-4</b>	<b>92.79</b>	<b>2/16/11</b>	<b>2.13</b>	<b>--</b>	<b>9.14</b>	<b>90.66</b>
		<b>2/24/11</b>	<b>2.33</b>	<b>--</b>		<b>90.46</b>
		<b>3/16/11</b>	<b>1.76</b>	<b>--</b>		<b>91.03</b>
		<b>11/08/11</b>	<b>3.25</b>			<b>89.54</b>
<b>MW-5</b>	<b>97.89</b>	<b>3/16/11</b>	<b>2.11</b>	<b>--</b>	<b>15</b>	<b>91.45</b>
		<b>11/08/11</b>	<b>3.37</b>			<b>94.52</b>
<b>MW-6</b>	<b>97.08</b>	<b>3/16/11</b>	<b>2.92</b>	<b>--</b>	<b>15</b>	<b>92.96</b>
<b>MW-7</b>	<b>97.72</b>	<b>3/16/11</b>	<b>2.28</b>	<b>--</b>	<b>12</b>	<b>92.28</b>

TOC = Top of Casing  
 DTW = Depth to Water  
 DTHC = Depth to Hydrocarbon  
 TD = Total Depth



**TABLE 6**

**2101-2103 PALMER AVENUE  
LARCHMONT, NEW YORK  
NYSDEC Spill No. 1006787**

**Summary of Groundwater Quality Results – Monitor Well Sampling**

EPA Method 8021/8260 including MTBE

Sample	Date	Benzene	Toluene	Ethylbenzene	Total Xylenes	n-Butylbenzene	MTBE	Total VOCs
MW-1	02/24/11	ND	1.2	ND	0.81	ND	ND	9.61
MW-2	02/24/11	ND	ND	ND	ND	0.99	ND	15.32
MW-3	02/24/11	ND	ND	ND	ND	ND	1.3	4.8
MW-4	02/24/11	ND	ND	ND	ND	ND	2.9	6.4
MW-5	03/25/11	ND	0.31	ND	ND	3.2	ND	23.51
MW-6	03/25/11	ND	ND	ND	ND	1.6	ND	13.43
MW-7	03/25/11	ND	ND	ND	ND	<b>15</b>	ND	64.3
MW-1	11/08/11	ND	ND	ND	ND	ND	ND	7.2 <sup>J,B</sup>
MW-2	11/08/11	ND	ND	ND	ND	ND	ND	7.1 <sup>J,B</sup>
MW-3	11/08/11	ND	ND	ND	ND	ND	ND	5.6 <sup>J,B</sup>
MW-4	11/08/11	ND	ND	ND	ND	ND	3.0	12.1 <sup>J,B</sup>
MW-5	11/08/11	ND	ND	ND	ND	ND	ND	5.7 <sup>J,B</sup>
MW-2 DW	11/09/11	ND	ND	ND	ND	ND	ND	5.6 <sup>J,B</sup>
MW-3 DW	11/09/11	ND	ND	ND	ND	ND	ND	9.8 <sup>J,B</sup>
<b>NYSDEC Groundwater Quality Standards</b>		<b>0.7</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>10</b>	<b>--</b>

Results in µg/L (micrograms per liter)

ND = Not Detected

**BOLD = Exceeds NYSDEC-GWQS**

<sup>J</sup> = Detected below the Reporting Limit but greater than or equal to the Method Detection Limit (MDL); therefore, the result is an estimated concentration

<sup>B</sup> = Analyte is found in the associated analysis batch blank. For volatiles, methylene chloride and acetone are common lab contaminants. Data users should consider anything <10x the blank value as artifact.

**TABLE 6**

**2101-2103 PALMER AVENUE  
LARCHMONT, NEW YORK  
NYSDEC Spill No. 1006787**

**Summary of Groundwater Quality Results – Monitor Well Sampling**

EPA Method 8270

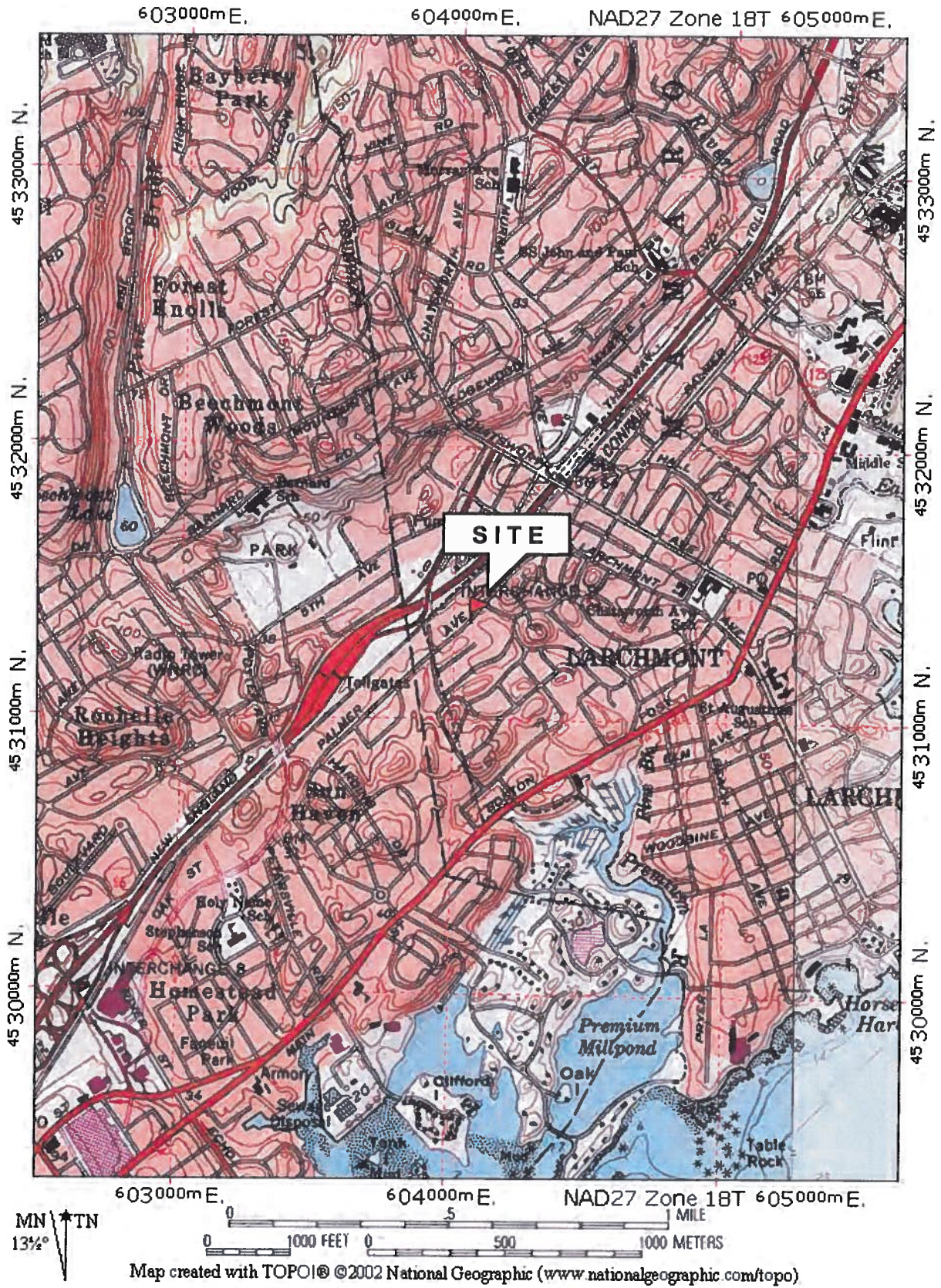
Sample	Acenaphthene	Anthracene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	Total SVOCs
MW-1 (02/24/11)	6.04	ND	2.84	ND	110	ND	ND	118.88
MW-2 (02/24/11)	ND	ND	ND	ND	ND	ND	ND	ND
MW-3 (02/24/11)	ND	ND	ND	ND	ND	ND	ND	ND
MW-4 (02/24/11)	ND	ND	ND	ND	ND	ND	ND	ND
MW-5 (02/24/11)	ND	ND	ND	ND	1.5	ND	ND	ND
MW-6 (02/24/11)	ND	ND	ND	ND	ND	ND	ND	ND
MW-7 (02/24/11)	6.58	ND	9.17	7.98	ND	7.47	7	43.26
MW-1 (11/08/11)	ND	ND	ND	ND	ND	ND	ND	ND
MW-2 (11/08/11)	ND	ND	ND	ND	ND	ND	ND	ND
MW-3 (11/08/11)	ND	ND	ND	ND	ND	ND	ND	ND
MW-4 (11/08/11)	ND	ND	ND	ND	ND	ND	ND	ND
MW-5 (11/08/11)	ND	ND	ND	ND	ND	ND	ND	ND
MW-2 DW (11/09/11)	ND	ND	ND	ND	ND	ND	ND	ND
MW-3 DW (11/09/11)	ND	ND	ND	ND	ND	ND	ND	ND
<b>NYSDEC Groundwater Quality Standards</b>	<b>20</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>10</b>	<b>5</b>	<b>5</b>	<b>–</b>

## FIGURES



# FIGURE 1 SITE LOCATION MAP

## 2101 and 2103 Palmer Avenue Larchmont, New York





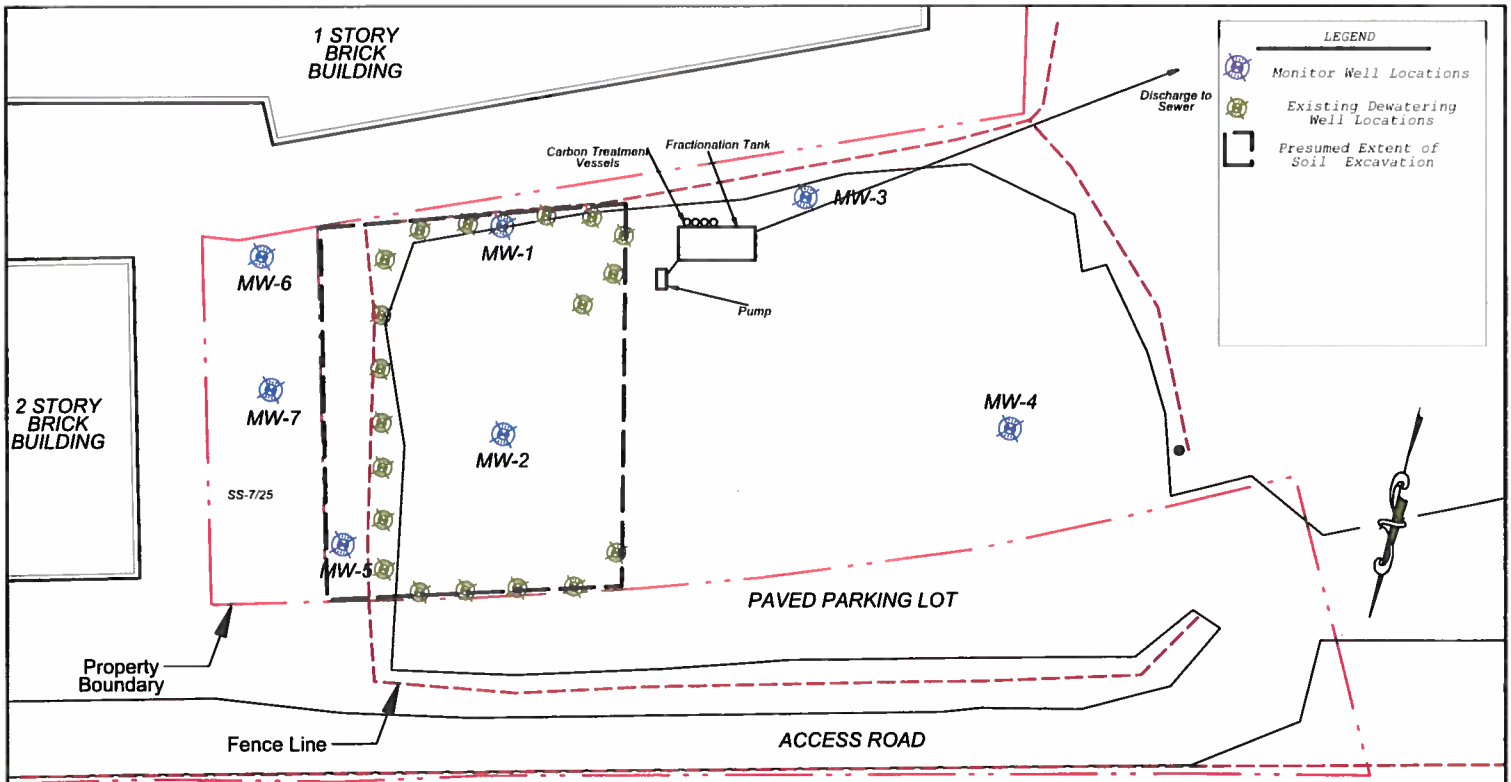
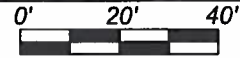


FIGURE 2

2101 & 2103 PALMER AVENUE  
LARCHMONT, NEW YORK

GENERALIZED  
SITE PLAN SHOWING  
EXISTING MONITOR  
AND DEWATERING WELL  
LOCATIONS



SPILL  
REMEDICATION

OCTOBER 2011



**HydroEnvironmental  
SOLUTIONS, INC.**  
One Deane Bridge Road  
Stamens, New York 10980

**FIGURE 3**

**2101 - 2103 PALMER AVENUE  
LARCHMONT, NEW YORK**



Photograph taken of dewatering wells and header pipe



Photograph taken of dewatering wells and header pipe during excavation activities

Photographs taken during site remediation activities in July through October 2011  
HydroEnvironmental Solutions, Inc., One Deans Bridge Road, Somers, New York 10589



**FIGURE 3**

**2101 - 2103 PALMER AVENUE  
LARCHMONT, NEW YORK**



**Photograph taken of the on-site dewatering system (pump and frac tank)**



**Photograph taken of the carbon filtration installed on the dewatering system discharge vessels**

**Photographs taken during site remediation activities in July through October 2011  
HydroEnvironmental Solutions, Inc., One Deans Bridge Road, Somers, New York 10589**



**FIGURE 3**

**2101 - 2103 PALMER AVENUE  
LARCHMONT, NEW YORK**



Photograph taken during dewatering and soil excavation activities



Photograph taken during soil excavation activities

Photographs taken during site remediation activities in July through October 2011  
HydroEnvironmental Solutions, Inc., One Deans Bridge Road, Somers, New York 10589



**FIGURE 3**

**2101 - 2103 PALMER AVENUE  
LARCHMONT, NEW YORK**



**Photograph taken during soil excavation activities**



**Photograph taken of free-phase product entering the excavation along the eastern sidewall**

**Photographs taken during site remediation activities in July through October 2011  
HydroEnvironmental Solutions, Inc., One Deans Bridge Road, Somers, New York 10589**



**FIGURE 3**

**2101 - 2103 PALMER AVENUE  
LARCHMONT, NEW YORK**



Photograph taken of free-phase product entering the excavation along the eastern sidewall



Photograph taken during soil loading and removal activities

Photographs taken during site remediation activities in July through October 2011  
HydroEnvironmental Solutions, Inc., One Deans Bridge Road, Somers, New York 10589



**FIGURE 3**

**2101 - 2103 PALMER AVENUE  
LARCHMONT, NEW YORK**

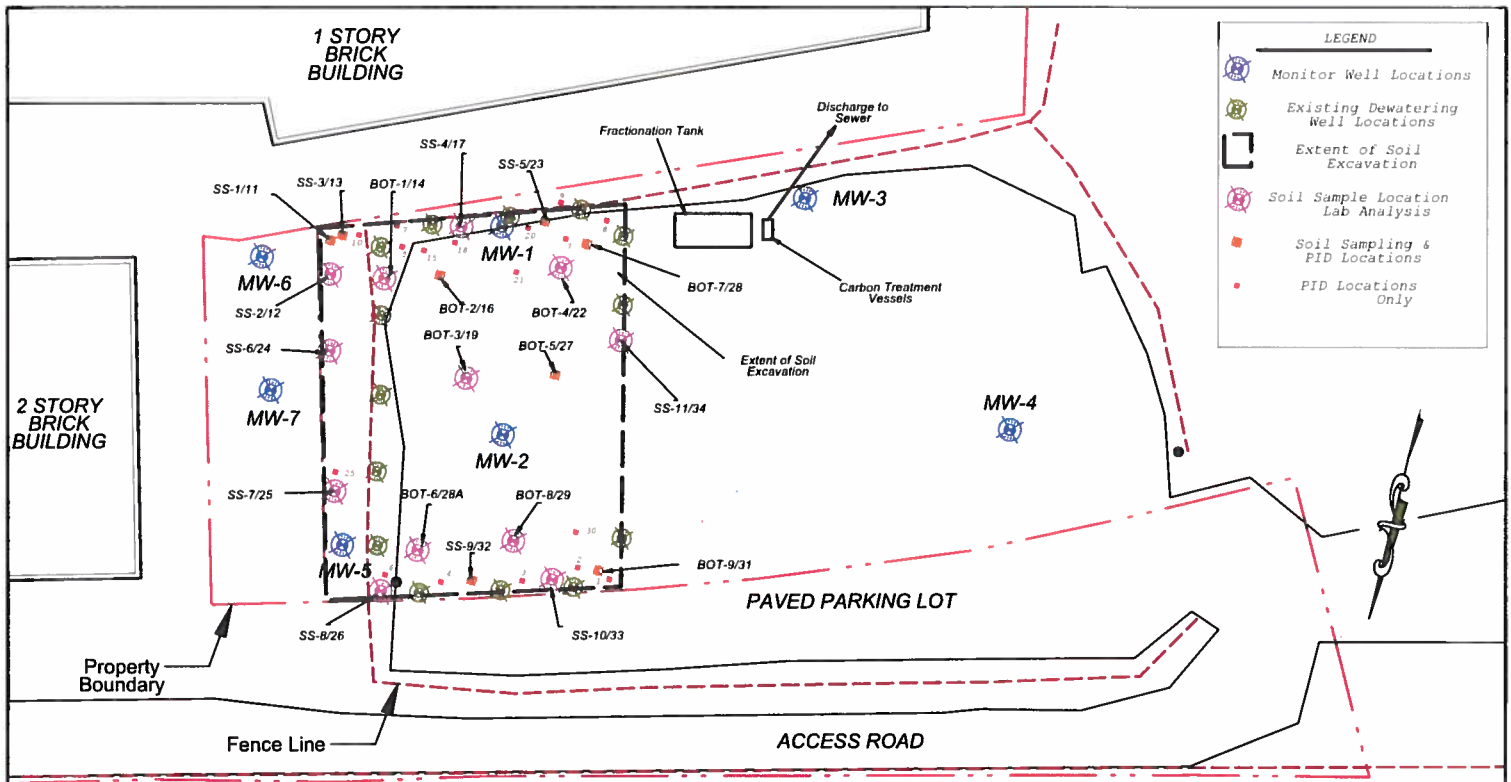


**Photograph taken during backfilling and polyethylene barrier installation along the eastern and southern sidewalls**



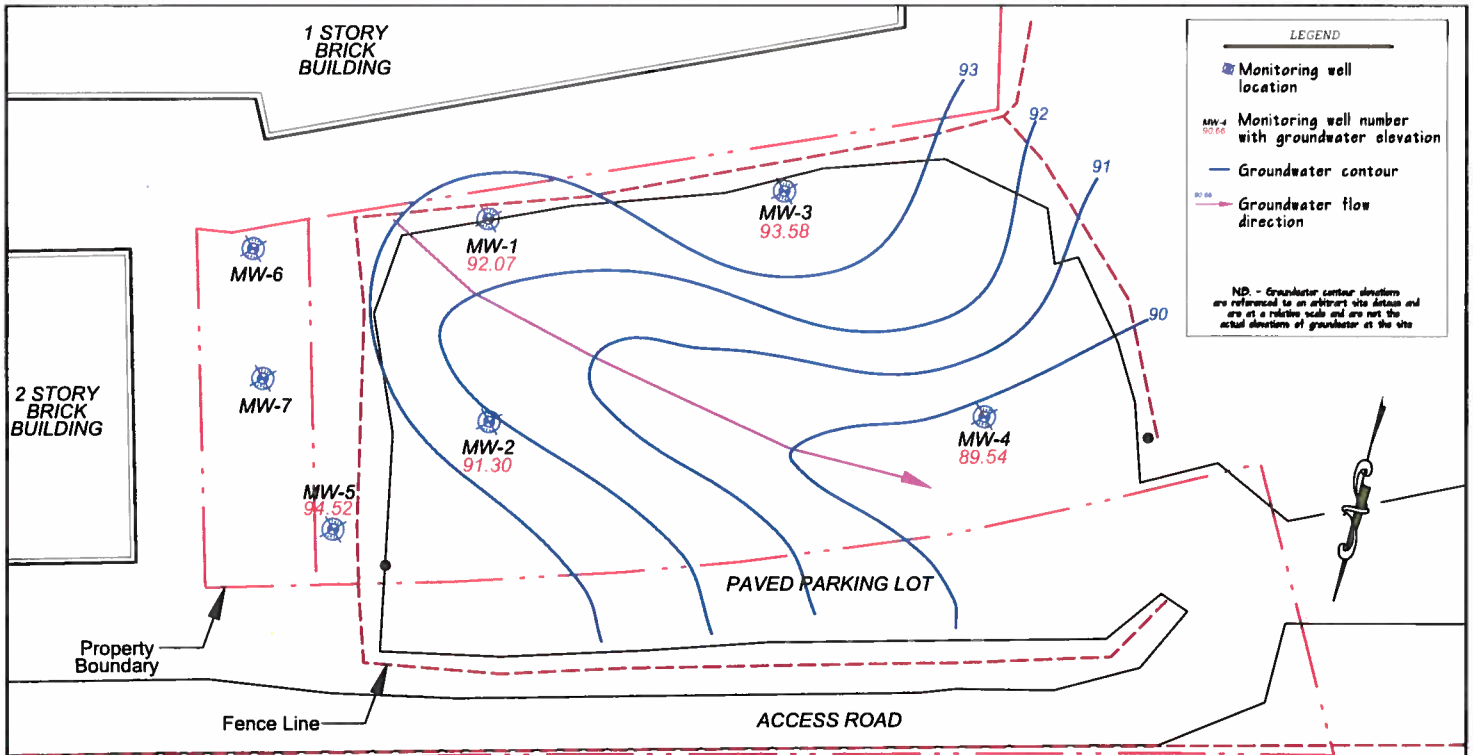
**Photograph taken during backfilling and polyethylene barrier installation**

**Photographs taken during site remediation activities in July through October 2011  
HydroEnvironmental Solutions, Inc., One Deans Bridge Road, Somers, New York 10589**



**FIGURE 4**

<p>2101 &amp; 2103 PALMER AVENUE LARCHMONT, NEW YORK</p>	<p>GENERALIZED SITE PLAN SHOWING EXISTING WELL AND SOIL SAMPLING LOCATIONS AND EXTENT OF SOIL EXCAVATION</p>	<p>0' 20' 40'</p> <p>SPILL REMEDATION</p> <p>OCTOBER 2011</p>	<p>HydroEnvironmental SOLUTIONS, INC. One Deane Bridge Road Somers, New York 10589</p>
--	--	---	--



**LEGEND**

- Monitoring well location
- Monitoring well number with groundwater elevation
- Groundwater contour
- Groundwater flow direction

ND - Groundwater contour elevations are referenced to an arbitrary site datum and are not the actual elevations of groundwater at the site

**FIGURE 5**

2101 & 2103 PALMER AVENUE LARCHMONT, NEW YORK	GROUNDWATER ELEVATION COUNTOUR MAP FOR NOVEMBER 8, 2011	0'    20'    40' 	 One Deane Bridge Road Stearns, New York 11080
		SPILL REMEDIATION	NOVEMBER 2011

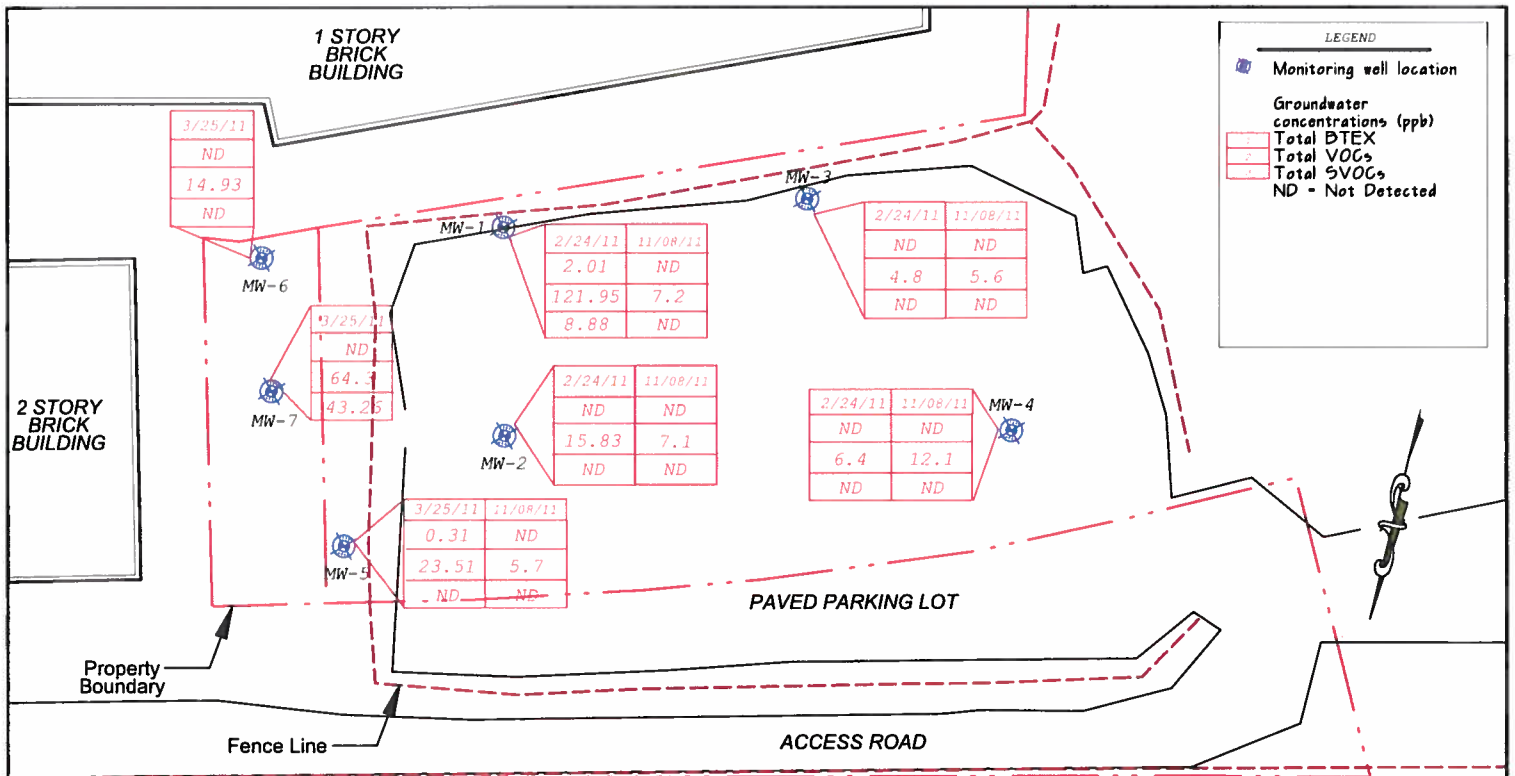
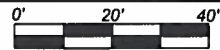


FIGURE 6

2101 & 2103 PALMER AVENUE  
LARCHMONT, NEW YORK

GENERALIZED  
SITE PLAN SHOWING  
MONITOR WELL LOCATIONS  
AND GROUNDWATER  
LABORATORY ANALYTICAL  
RESULTS



GROUNDWATER  
MONITORING

FEBRUARY -  
NOVEMBER 2011



HydroEnvironmental  
SOLUTIONS, INC.  
One Deans Bridge Road  
Somers, New York 10589

## **APPENDICES**