

SUBSURFACE INVESTIGATION REPORT

34 EAST POST ROAD
WHITE PLAINS, NEW YORK
NYSDEC SPILL No. 1608924
PBS No. 3-601177

PREPARED FOR:
MR. FRANK CODELLA
MARIANIA OIL CORP.
WHITE PLAINS, NEW YORK

PREPARED BY:
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March 7, 2017

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INTRODUCTION

HydroEnvironmental Solutions, Inc. (HES), on behalf of Mr. Frank Codella, has completed a Subsurface Investigation (SI) at the property located at 34 East Post Road in White Plains, New York. The SI included the installation of seven soil borings and three temporary groundwater monitoring wells across the property, currently operating as an active BP (British Petroleum) station. The SI field work was completed on January 18, 2017. The site location is shown on **Figure 1**.

The site activities completed by HES included test boring and temporary monitoring well installations, field screening soil samples for the presence of petroleum vapors with a photoionization detector (PID), collection soil and groundwater samples for laboratory analysis and surveying groundwater elevations. The field activities and results are presented below.

SITE BACKGROUND

In late 2016, New York State Department of Environmental Conservation (NYSDEC) completed an investigation pertaining to the subject property. The results of the investigation state that potential contamination to the soil and groundwater at the subject site were impacted by petroleum related constituents. Therefore, the NYSDEC recommended that a site assessment be conducted at the site. Based upon the aforementioned investigation, a spill was reported and a NYSDEC Spill Number was assigned to the property on December 21, 2016. A copy of the NYSDEC investigation letter is attached in **Appendix 1**.

HES completed the following work to further assess the extent of soil and groundwater impacts at the property.

HYDROGEOLOGIC SETTING

The unconsolidated material beneath the site is composed of silt and sand with varying amounts of clay. 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 Cortlandt Complex, consisting of diorite with hornblende and/or biotite (Fisher, 1970).



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FIELD ACTIVITIES

Test Boring Installation, Soil and Groundwater Sampling

On January 18, 2017, HES installed seven test borings and three temporary monitoring wells across the site. The test borings were designated GB-1 through GB-7 and installed with a Geoprobe® 54DT drill rig using the direct-push drilling method. During the installation of GB-1 through GB-7, undisturbed sediment samples were collected continuously in 4-foot increments at each test boring location using a 2.25-inch steel macro-core sampler and screened in the field by the on-site geologist. At each boring location, the HES geologist recorded and documented subsurface conditions. Volatile organic vapor analysis was performed on soil samples collected in the field using a calibrated MiniRAE® 3000 PID and the headspace method. The results of soil field screening are summarized on the Geologic Logs in **Appendix 2**. The test borings ranged in depth from 7.9 ftbg to 12.8 ftbg.

Soil samples were collected from three of the test boring locations and placed in appropriately labeled sample jars and transported on ice to Phoenix Environmental Laboratories, Inc. (Phoenix); a New York State certified laboratory located in Manchester, Connecticut, where they were analyzed for the presence of volatile organic compounds (VOCs) by EPA Method 8021 modified to include methyl-tertiary-butyl-ether (MTBE), semi-volatile organic compounds (SVOCs) by EPA Method 8270, and total lead. The test boring locations are shown on **Figure 2**, a generalized site plan of the subject site and photographs taken during test boring installation activities are included on **Figure 3**. Soil sampling laboratory analytical results from the test borings are summarized on **Table 1** (VOCs and SVOCs) and **Table 2** (total lead). The laboratory analytical reports are included in **Appendix 3**.

Temporary groundwater monitor wells were installed in the boreholes designated GB-1 TW, GB-3 TW and GB-4 TW. The temporary wells were constructed of 1-inch schedule 40 PVC using 20-slot well screen and solid casing. The approximate soil sampling locations are identified on **Figure 2** and their respective Geologic Logs are included in **Appendix 2**.

Groundwater was collected from the monitor well installed at boring location GB-1 TW only (as proposed). Prior to any sample collection, the wells were allowed time to equilibrate and depth to water measurements (DTW) were collected using an electronic



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interface probe. Following DTW measurements, groundwater was evacuated from GB-1 TW using a dedicated polyethylene bailer. The groundwater sample was collected in appropriately labeled glassware and in accordance with industry accepted protocols. The sample was transported on ice and received by Phoenix on January 20, 2017 to be analyzed for VOCs and SVOCs using EPA Method 8021 + MTBE and EPA Method 8270 (STARS list), respectively.

Additionally, on January 18, 2017, HES completed a survey of the temporary wells designated GB-1 TW, GB-3 TW and GB-4 TW using a transit and stadia. The wells were surveyed relative to a permanent benchmark and groundwater elevations were recorded in order to calculate groundwater elevations and flow direction.

RESULTS

Soil and Groundwater Quality

Elevated volatile organic vapors were detected during PID field screening activities. PID field screening results at the test borings reached a maximum of 1,464 parts per million (ppm) from 8-12 ftbg at GB-4. Free-phase product was observed in macro core soil samples designated GB-2 (8-12 ftbg) and GB-5 (8-12 ftbg). The results of PID field screening are summarized on the Geologic Logs included in **Appendix 2**.

Laboratory analytical results indicate that concentrations of VOCs and SVOCs in two of the soil samples collected were detected above their respective NYSDEC Unrestricted Use Soil Cleanup Objectives (UUSCOs) (in accordance with Subpart 375-6: Remedial Program Soil Cleanup Objectives) during test boring drilling activities. All soil analyzed from the boring locations contained concentrations of lead above laboratory Method Detection Limits (MDLs) but below NYSDEC-UUSCOs. The laboratory analytical results for soil are summarized on **Table 1** and **Table 2** and the analytical reports are included in **Appendix 3**.

Groundwater collected from the temporary monitor well designated GB-1 TW contained concentrations of VOC and SVOC constituents above laboratory MDLs that exceeded their respective NYSDEC Ambient Water Quality Standards (AWQS) in accordance with the Technical and Operational Guidance Series (TOGS) 1.1.1. The groundwater sampling results indicate that significant VOC and SVOC concentrations of

petroleum hydrocarbons were detected. The groundwater laboratory analytical results are summarized on **Table 3** and the laboratory analytical report is included in **Appendix 3**.

The groundwater level was inferred at an approximate depth range of 7.9 to 8.55 ftbg. Free-product was observed in groundwater collected from temporary monitoring well designated GB-3 TW. A groundwater contour map depicting the groundwater flow direction across the site is shown on **Figure 4**.

CONCLUSIONS

- Soil screening and laboratory analyses completed during SI activities at the subject site indicate that petroleum hydrocarbon impacts exist in the soil and groundwater beneath the site and are believed to be related to gasoline and not diesel fuel.
- Concentrations of ethylbenzene (32,000 µg/kg [micrograms per kilogram]), isopropylbenzene (4,500 µg/kg), n-Propylbenzene (18,000 µg/kg), 1,2,4-trimethylbenzene (16,000 µg/kg) and xylenes (11,200 µg/kg) exceeded their respective NYSDEC-UUSCOs in the soil sample designated GB-3 TW (4-8).
- Concentrations of n-Propylbenzene (6,000 µg/kg), 1,2,4-trimethylbenzene (37,000 µg/kg), 1,3,5-trimethylbenzene (9,500 µg/kg) and xylenes (6,400 µg/kg) exceeded their respective NYSDEC-UUSCOs in the soil sample designated GB-7 (8-12).
- Concentrations of lead were detected in the soil samples designated GB-3 TW (4-8) (4 µg/kg), GB-6 (4-8) (9.39 µg/kg) and GB-7 (8-12) (3.96 µg/kg) which are below the NYSDEC-UUSCO of 63 µg/kg.
- No constituents (VOCs and SVOCs) were detected above their respective NYSDEC-UUSCOs in the soil sample designated GB-6 (4-8) during this SI.
- The results of groundwater sampling, specifically from the temporary monitor well designated GB-1 TW, indicate that significant impacts to the groundwater exist beneath the site. Dissolved concentrations of VOCs and SVOCs considerably exceeded their respective NYSDEC-AWQS.
- Based on the recorded groundwater elevations at the site using temporary monitor



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wells designated GB-1, GB-3 and GB-4, the groundwater flow direction is generally to the west and depth to water ranges from 5.8 ftbg to 8.5 ftbg beneath the site.

- MTBE was not detected in any of the soil or groundwater samples analyzed during this investigation.

RECOMMENDATIONS

- Based on the results of this investigation, HES does not believe that the gasoline impacts to soil and groundwater are recent in nature. HES is unaware of any dispensing equipment failure (tanks/lines/pumps), monitoring equipment failure, any discrepancies in inventory records, any regulatory violations related to annual compliance testing and/recordkeeping required by the NYSDEC or WCDOH. Therefore, HES recommends that such records be produced and reviewed in support of this belief.
- Due to the consistent and concentrated nature of the test boring locations (and depths) where gasoline constituents (VOCs and SVOCs) exceed their respective NYSDEC-UUSCOs, HES recommends soil excavation be completed in accordance with all applicable NYSDEC and WCDOH regulations.
- Upon completion of soil remediation activities, HES recommends that a minimum of four permanent groundwater monitor wells be installed across the site by a licensed environmental well driller. The wells should be located in the immediate vicinity of the adversely impacted areas (tank fields) both up and downgradient of the regional groundwater flow direction. With these wells, quarterly groundwater monitoring and sampling should be conducted to determine a concentration gradient and compliance with NYSDEC-AWQS. The installation of these wells will allow for the assessment and evaluation of remedial actions taken to mitigate petroleum hydrocarbon impacts to the groundwater beneath the SITE.



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TABLES

TABLE 1

**34 EAST POST ROAD
WHITE PLAINS, NEW YORK
NYSDEC Spill No.: 1608924
PBS No.: 3-601177**

Summary of Soil Quality Results

Sample ID	GB-3 TW (4-8)	GB-6 (4-8)	GB-7 (8-12)	NYSDEC- UUSCOs
Lab ID No.	BX34558	BX34559	BX34560	
Depth (ftbg)	4-8	4-8	8-12	
Sample Date	01/18/2017	01/18/2017	01/18/2017	
EPA Methods 8021 & 8270				
Acenaphthene	ND ND		ND	20,000
Acenaphthylene	ND ND		ND	100,000
Anthracene	ND ND		ND	100,000
Benzo(a)Anthracene	ND ND		ND	1,000
Dibenzo(a,h)Anthracene	ND ND		ND	330
Methyl-Tert-Butyl-Ether (MTBE)	ND ND		ND	930
Benzene	ND ND		ND	60
n-Butylbenzene	12,000 ND		2,000	12,000
sec-Butylbenzene	4,900 ND		930	11,000
tert-Butylbenzene	ND ND		ND	5,900
Chrysene	ND ND		ND	1,000
Ethylbenzene	32,000	ND 380		1,000
Fluoranthene	ND ND		ND	100,000
Benzo(b)Fluoranthene	ND ND		ND	1,000
Benzo(k)Fluoranthene	ND ND		ND	800
Fluorene	ND ND		ND	30,000
Isopropylbenzene	4,500	ND 1,800		2,300
p-Isopropyltoluene	1,800 ND		550	10,000
Naphthalene	11,000 7.7		5,800	12,000
n-Propylbenzene	18,000	ND	6,000	3,900
Benzo(g,h,i)Perylene	ND ND		ND	100,000
Phenanthrene	ND ND		ND	100,000
Pyrene	ND ND		ND	100,000
Benzo(a)Pyrene	ND ND		ND	1,000
Indeno(1,2,3-cd)Pyrene	ND ND		ND	500
1,2,4-Trimethylbenzene	16,000	ND	37,000	3,600
1,3,5-Trimethylbenzene	8,200 ND		9,500	8,400
Toluene	ND ND		ND	700
Xylene (Mixed)	11,200	ND	6,400	260

Results in µg/Kg (micrograms per kilogram)

ND = Not Detected

BOLD = Exceeds NYSDEC-UUSCOs

TABLE 2

34 EAST POST ROAD
WHITE PLAINS, NEW YORK
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Summary of Soil Quality Results - Lead

Sample ID	GB-3 TW (4-8)	GB-6 (4-8)	GB-7 (8-12)	NYSDEC- UUSCOs
Lab ID No.	BX34558	BX34559	BX34560	
Depth (ftbg)	4-8	4-8	8-12	
Sample Date	01/18/2017	01/18/2017	01/18/2017	
Metals - Lead				
Lead 4		9.39	3.96	63

Results in µg/Kg (micrograms per kilogram)

ND = Not Detected

BOLD = Exceeds NYSDEC-UUSCOs

TABLE 3

**34 EAST POST ROAD
 WHITE PLAINS, NEW YORK
 NYSDEC SPILL No.: 1608924
 PBS No.: 3-601177**

Summary of Groundwater Quality Results

EPA Method 8021 including MTBE

Sample I.D.	GB-1 TW	NYSDEC Ambient Water Quality Standards
Lab I.D. No.	BX34561	
Depth (ftbg)	8.5	
Sample Date	01/18/2017	
VOLATILE ORGANIC COMPOUNDS (VOCs)		
1,2,4-Trimethylbenzene	5,000	5
1,3,5-Trimethylbenzene	1,800	5
Benzene	ND	1
Ethylbenzene	76	5
Isopropylbenzene	360	5
m&p-Xylene	280	5
Methyl t-butyl ether (MTBE)	ND	10
Naphthalene	470	10
n-Butylbenzene	120	5
n-Propylbenzene	1,100	5
o-Xylene	ND	5
p-Isopropyltoluene	59	5
sec-Butylbenzene	100	5
tert-Butylbenzene	ND	5
Toluene	ND	5
Total Xylenes	280	5

Results in µg/L (micrograms per liter)

ND = Not Detected

BOLD = Exceeds NYSDEC-AWQS

TABLE 3

**34 EAST POST ROAD
WHITE PLAINS, NEW YORK
NYSDEC SPILL No.: 1608924
PBS No.: 3-601177**

Summary of Groundwater Quality Results

EPA Method 8270

Sample I.D.	GB-1 TW	NYSDEC Ambient Water Quality Standards
Lab I.D. No.	BX34561	
Depth (ftbg)	8.5	
Sample Date	01/18/2017	
BASE NEUTRAL COMPOUNDS (SVOCs)		
2-Methylnaphthalene	170	N/A
Acenaphthene	ND	20
Acenaphthylene	ND	N/A
Anthracene	ND	50
Benz(a)anthracene	ND	0.002
Benzo(a)pyrene	ND	N/A
Benzo(b)fluoranthene	ND	0.002
Benzo(ghi)perylene	ND	N/A
Benzo(k)fluoranthene	ND	0.002
Chrysene	ND	0.002
Dibenz(a,h)anthracene	ND	N/A
Fluoranthene	ND	50
Fluorene	ND	50
Indeno(1,2,3-cd)pyrene	ND	0.002
Naphthalene	270	10
Phenanthrene	ND	50
Pyrene	ND	50

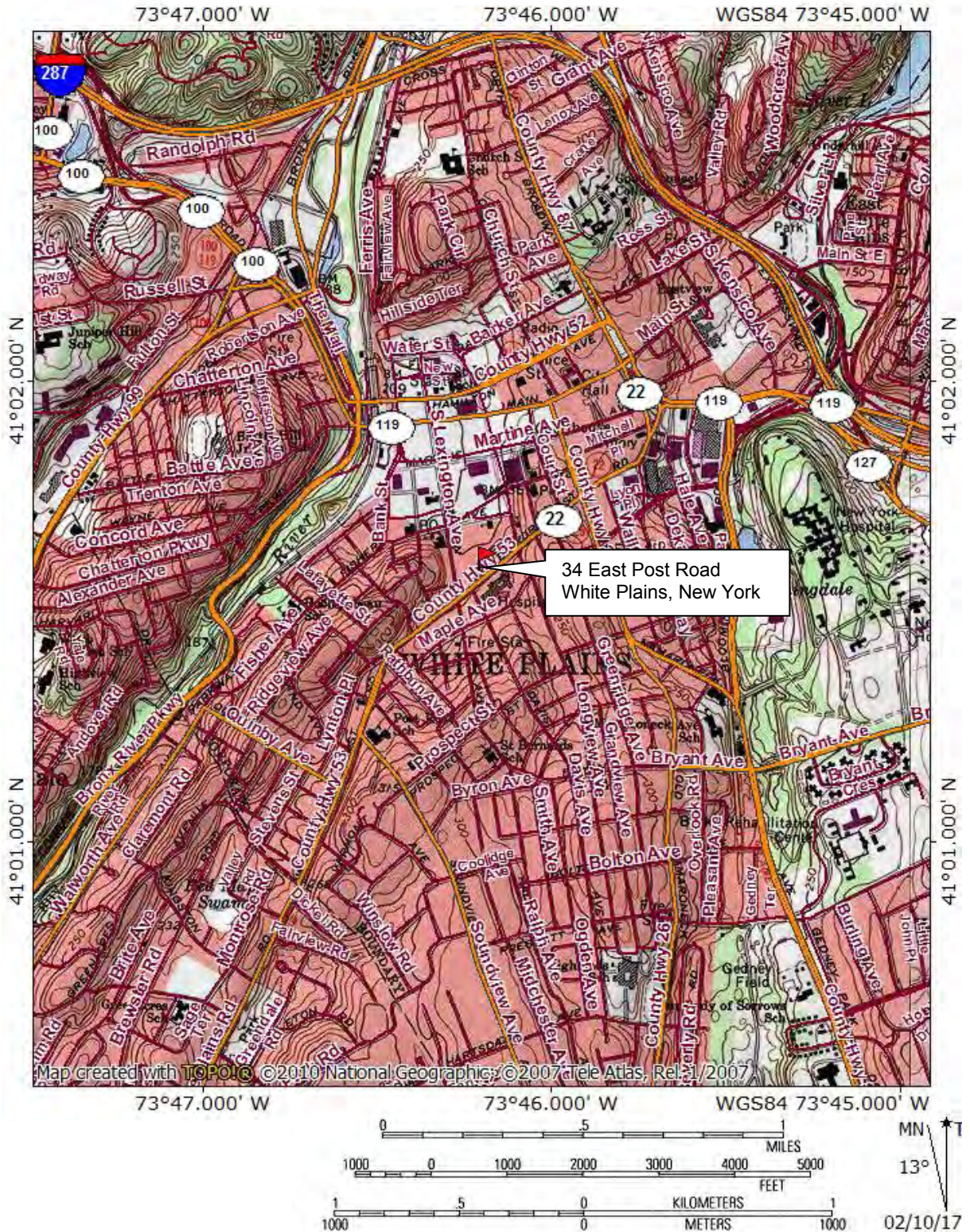
Results in µg/L (micrograms per liter)

ND = Not Detected

BOLD = Exceeds NYSDEC-AWQS

FIGURES

FIGURE 1
Site Location Map



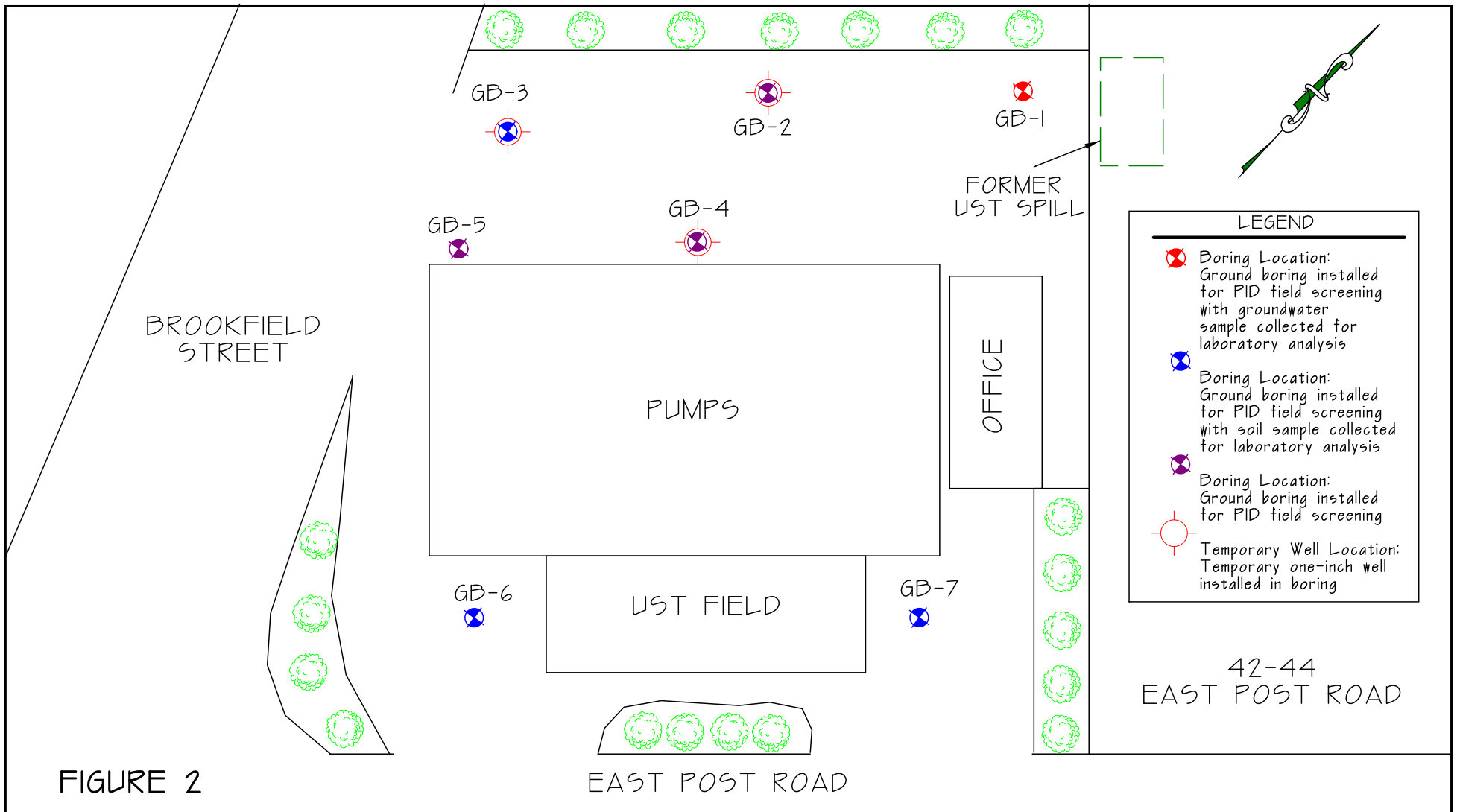


FIGURE 2

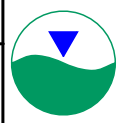
34 EAST POST ROAD WHITE PLAINS, NEW YORK NYSDEC Spill No.: 1608924 PBS No.: 3-601177	GENERALIZED SITE PLAN	NOT TO SCALE	FEBRUARY 2017	 HydroEnvironmental SOLUTIONS, INC. <i>One Deans Bridge Road Somers, New York 10589</i>
		SUBSURFACE INVESTIGATION		

FIGURE 3

**34 EAST POST ROAD
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Photograph taken during drilling activities (GB-2)



Photograph taken during drilling activities (GB-2)

Photographs taken during subsurface investigation activities on January 18, 2017
HydroEnvironmental Solutions, Inc., One Deans Bridge Road, Somers, New York 10589

FIGURE 3

**34 EAST POST ROAD
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NYSDEC Spill No.: 1608924
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Photograph taken during drilling activities (GB-4)



Photograph taken during drilling activities (GB-7)

Photographs taken during subsurface investigation activities on January 18, 2017
HydroEnvironmental Solutions, Inc., One Deans Bridge Road, Somers, New York 10589

FIGURE 3

**34 EAST POST ROAD
WHITE PLAINS, NEW YORK
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Photograph showing free-product in macro-core sample from GB-2 (8-12 ftbg)



Photograph showing free-product in groundwater from GB-3 TW

Photographs taken during subsurface investigation activities on January 18, 2017
HydroEnvironmental Solutions, Inc., One Deans Bridge Road, Somers, New York 10589

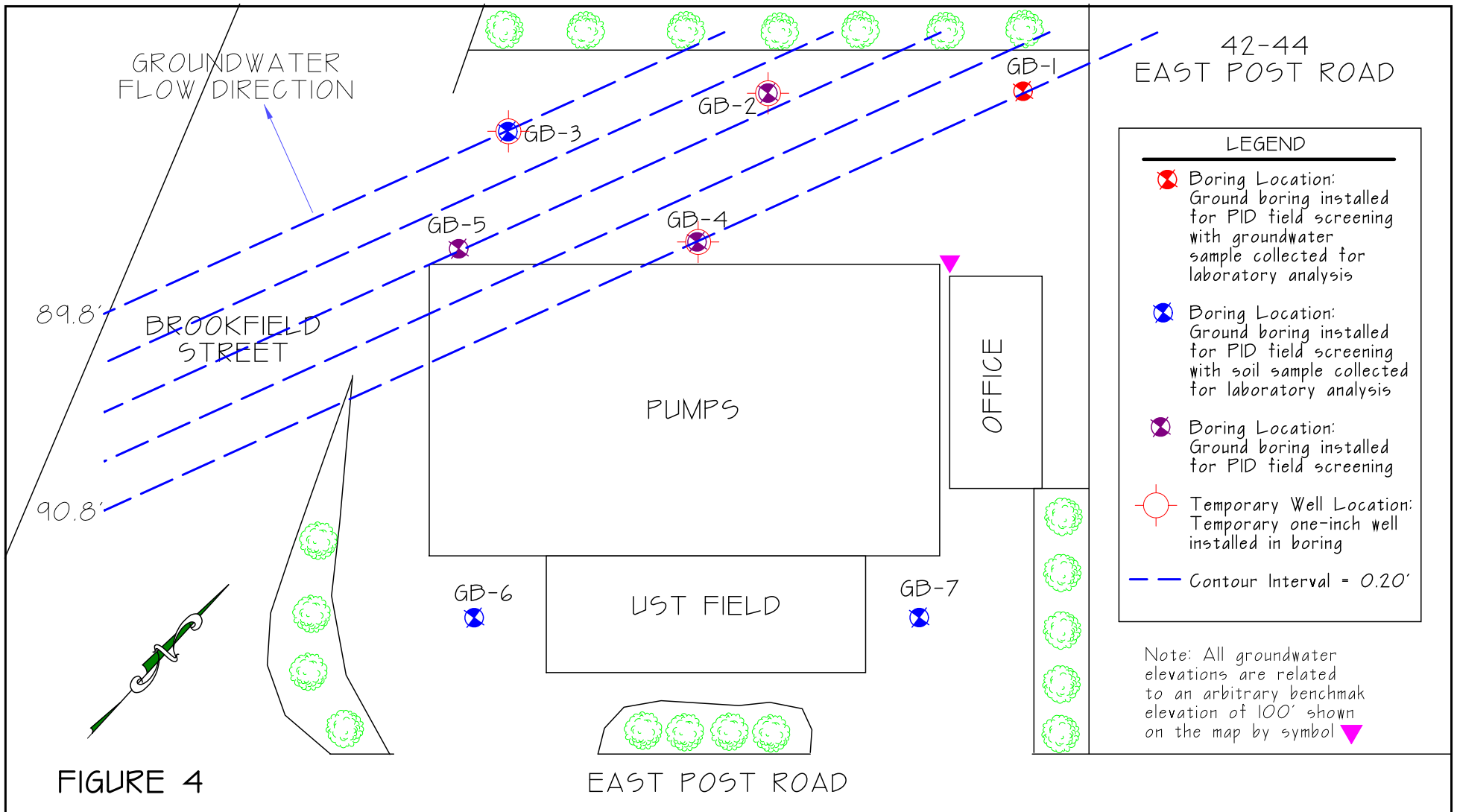


FIGURE 4

34 EAST POST ROAD
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GROUNDWATER
 CONTOUR MAP

NOT TO SCALE FEBRUARY 2017

SUBSURFACE
 INVESTIGATION



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 Somers, New York 10589*

APPENDICES

APPENDIX 1:
NYSDEC Investigation Letter

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Region 3
21 South Putt Corners Road, New Paltz, NY 12561-1620
P: (845) 256-3000 | F: (845) 255-2987
www.dec.ny.gov

Certified Mail # 7016 1370 0000 1826 0475
Return Receipt Requested

December 21, 2016

MARIANINA OIL CORP
676 MAMARONECK AVENUE
WHITE PLAINS NY 10605

RE: Spill # 16-08924
PBS # 3-601177
East Post Rd Gasmart, Inc., 34 East Post Rd., White Plains

Dear Facility Owner;

This is to advise you that as a result of an investigation by the New York State Department of Environmental Conservation (NYSDEC), you are considered a potential responsible party for the open Petroleum Spill Number, 16-08924 which identified contaminants in both the soil and groundwater down gradient of your facility. Under Article 12 of the Navigation Law, the discharge of petroleum is prohibited and any person discharging petroleum is required to immediately cleanup and remove such a discharge. Violations of Article 12 of the Navigation Law are punishable by penalties of up to \$25,000 per day.

To determine the extent of the contamination, NYSDEC requires a site assessment be conducted at your facility, followed by the appropriate remedial actions. Please prepare and submit a Site Assessment Work Plan by January 11, 2017 to my attention.

Under Section 181 of Article 12 of the Navigation Law, a person discharging petroleum is strictly liable for all cleanup and removal costs and all direct and indirect damages no matter by whom sustained. Failure to comply with the above required work may cause the DEC to hire a contractor to complete the work. The DEC will then take legal action to seek reimbursement of funds expended as well as interest and penalties under Article 12 of the Navigation Law and Articles 17 and 71 of the NYS Environmental Conservation Law.

Sincerely,


R. Daniel Bendell, P.E.
Environmental Engineer



Department of
Environmental
Conservation