COPY

REMEDIAL INVESTIGATION REPORT

Merit "RALPH" Station
1885 Atlantic Avenue & Ralph Avenue
Brooklyn, New York
NYSDEC Spill# 92-09626

June 3, 1998

Prepared For:

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1.0 INTRODUCTION

Groundwater & Environmental Services, Inc. (GES) was contracted by Merit Oil of New York, Inc. (Merit) to conduct environmental investigations at the Merit "Ralph" Station located at 1885 Atlantic Avenue, Brooklyn, New York. Figure 1 shows the Site location on an annotated USGS 7.5-minute series Quadrangle topographic map (Brooklyn, New York) including Site location, local topography, surface drainage and cultural features. The following report summarizes the investigative activities performed at the Site.

Four soil borings/soil vapor extraction points were installed in March, 1995 to delineate the subsurface soils and to perform a soil vapor extraction (SVE) test. A sensitive receptor survey was also performed within a 2,500 foot radius of the Site.

2.0 HEALTH AND SAFETY

A site-specific Health and Safety Plan (HASP) was developed for GES personnel involved in site investigative activities. The HASP outlines the required monitoring equipment, protective clothing, action levels, anticipated compounds and emergency procedures. Monitoring, sampling, and investigative activities were conducted in Level "D" protection. All GES field personnel are health and safety trained and certified in accordance with Occupational Safety and Health Administration requirements and are equipped to upgrade to Level "C" if conditions require upgrading.

3.0 PREVIOUS INVESTIGATIONS

In March 1993, a soil boring investigation was performed after a 4,000-gallon gasoline tank failed a pressure integrity test. Based on the results of this investigation, no further action was taken. In June 1993, UST closure activities were performed at the subject Site. Except for samples SB1-S (collected at 20 –

22 feet below grade) and SB1-D (collected at 28 – 30 feet below grade), the analysis of all post-excavation soil samples were reported below New York State STARS Alternative Guidance Values[1] for Volatile Organic Compounds (VOCs). During the UST closure, 980 tons of gasoline impacted soils were removed from the Site and replaced with clean fill. The impacted soils were transported to Posillico Brothers Asphalt Company of Farmingdale, New York where they were recycled into hot asphalt mix. In October 1993, March 1994 and November 1994, soil samples were collected to delineate soil. With the exception of one soil sample located in the north-northwest area of the station property, all soil samples collected had VOC concentrations below the NYSDEC Alternative Guidance Values. Refer to Figure 2 for the soil boring locations, and Appendix II for the associated boring logs. Refer to Tables 1 and 2 for a summary of previous soil sampling analytical data.

4.0 CURRENT INVESTIGATIONS

On March 30, 1995, and March 31, 1995 four soil borings/soil vapor extraction points were installed by GES to delineate the subsurface soils and to perform a soil vapor extraction (SVE) test. Drilling was supervised by Celeste Rufer, Sr. Environemental Scientist for GES. A sensitive receptor survey was also performed within a 2,500 foot radius of the Site.

4.1 Site/Area Assessment

The subject Site is located on the northwest corner of the intersection of Atlantic and Ralph Avenues. The site is approximately one-quarter acre in size and is at an elevation of 75 feet above mean sea level (Figure 1).

The Site is an active gasoline retail facility with five dispensers, kiosk and a storage building. A Site Information Plan depicting the tankfield, waste water UST location, pump islands, and Site features is presented on Figure 2. The Site is located in an area of mixed commercial, industrial and residential land use. The Site is abutted by Ralph Avenue to the east, Atlantic Avenue to the south,

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[1] STARS Memo #1: Petroleum-Contaminated Soil Guidance Policy, NY State Department of Environmental Conservation, 1992.

and commercial property to the north and west. The nearest surface water body, Prospect Lake, is located approximately 2,500 feet southwest of the Site.

Underground utilities are present along Ralph Avenue and Atlantic Avenue in the vicinity of the Site (see Local Area Map, Figure 3). On March 30, 1995 accessible utilities were surveyed for total VOCs using a Photoionization Detector (PID). The PID readings were at background levels, indicating that no VOC vapors were present. The occupants of the nearest structures, a private house and a used car business building, were not present at the time of the survey. On May 17, 1996, a second attempt to gain access to these buildings was made. Again, the occupants were not present.

4.2 Site Geology/Hydrogeology

Soil borings were drilled to a maximum depth of 42 feet below grade without encountering groundwater. Based on the U.S.G.S. maps entitled "Water-Table on Long Island, New York, March-April 1984" and the Brooklyn Quadrangle topographic map, the approximate depth to groundwater is 65 feet below grade. The regional ground water flow direction is to the south. According to a Water Supply Statement published on March 29, 1998 by the New York City Department of Environmental Protection (NYCDEP) as well as an interview with Mr. Herbert Kass, Chief of Water Supply Distribution for the NYCDEP, New York City, except for small portions of eastern Queens County, use municipal water from aboveground reservoirs in upstate New York.

Soils observed during vapor point installation consisted of brown medium grained sand with varying amounts of coarse quartz gravel and minor amounts of silt and cobbles.

5.0 SOIL SAMPLING AND ANALYSIS

On March 30 and 31, 1995, four soil borings were installed at the subject Site. The borings were completed by Lutz Environmental Drilling Company, Inc. of Linden, New Jersey, (NYSDEC Registration #1719) under the supervision of

Celeste Rufer, Sr. Environmental Scientist for GES. The placement of the soil sampling points was based on the results of the previous investigations. Refer to Figure 2 for the location of the soil borings.

During soil sampling, the presence of hydrocarbon impacted soil was assessed by field screening with a PID calibrated to a 100 parts per million (ppm) isobutylene standard calibration gas. Any petroleum hydrocarbon staining or sheen was noted. A PID response ranging from 6 to 200 ppm was observed in VP3 and VP2, respectively. The highest response for each vapor point was observed between 20 and 30 feet below grade. No separate-phase hydrocarbon sheen was observed on the soils during vapor point installation.

A total of five soil samples were collected from the undisturbed soil utilizing a split-spoon core sampler. The soil samples were submitted for Toxicity Characteristic Leaching Procedure (TCLP) analysis of Volatile Organic Compounds (VOC) via EPA Method 8021, xylenes, and naphthalene. Laboratory Resources of Teterboro, New Jersey (NYS Certification #11321) performed the sample analysis.

Soil samples were collected from 20-22 feet (VP1S), and 40-42 feet (VP1D) below grade in SB1 (VP1), and 15 feet SB3 (VP3S), and 26-28 feet (VP3D) below grade from VP3. One soil sample was collected from VP2 at 20-22 feet below grade (VP2S).

Laboratory analysis of these samples detected Total BTEX concentrations ranging from "not detected" to 532 ppb with benzene levels below the method detection limit in all five samples. Several gasoline compounds were detected above New York State STARS TCLP Extraction Guidance Values standards in soil samples VP1S, VP1D, VP2S and VP3D. Refer to Table 3 for a summary of the results.

6.0 Soil Vapor Extraction

6.1 Soil Vapor Extraction Point Installation

Vapor point 1 (VP1) was installed to 42 feet below grade with 20 feet of 2-inch diameter 0.020-inch slotted PVC well screen, and 22 feet of solid riser pipe. Vapor point 2 (VP2) was installed to 38.5 feet below grade with 20 feet of 2-inch diameter 0.020-inch slotted PVC well screen, and 18.5 feet of solid riser pipe.

Vapor point 3 (VP3) and vapor point 4 (VP4) were installed to 28 feet below grade with 15 feet of 2-inch diameter 0.020-inch slotted PVC well screen, and 13 feet of solid riser pipe. The annular space was filled with #2 Morie gravel to approximately 4 feet above the well screen in VP1 and VP2, and 2.5 feet above the well screen in VP3 and VP4. The remaining annular spaces in VP1 through VP4 were sealed with grout. Refer to Appendix III for detailed soil logs and construction specifications.

6.2 Soil Vapor Extraction Testing

On May 24, 1995, Celeste Rufer, Sr. Environmental Scientist for GES, performed a SVE test at the Site utilizing VP2 as an extraction point. A 1.5 hp regenerative blower was used to induce a vacuum at the designated extraction point. During the test, extracted air was monitored for volatile organic vapors using a PID, and an explosimeter was used to monitor lower explosive limit levels (% LEL) and oxygen levels (% O2). In addition, nearby vapor points VP1, VP3, and VP4, were monitored for pneumatic influence. Air extracted during the test was treated with vapor-phase granular activated carbon (GAC) prior to discharge. All field data collected during the SVE testing is included in Table 4. Refer to Figure 2 for the locations of the extraction points.

A vacuum of 44 to 45 inches of water was induced on VP2 for approximately five hours. Monitoring of the extracted air found the oxygen levels within a range of 3.6% to 6.9%. PID responses ranged from 970 ppm to 1,243 ppm near the end of the test. Petroleum hydrocarbons measured as a percentage of the % LEL of

gasoline ranged from 35% to 69%. Benzene levels extracted from the soil ranged from 0.0026 pounds per hour (#/hr.) to 0.0034 #/hr. A total of 0.014 pounds of benzene were extracted during the test. Air was extracted from the subsurface at an average flow volume of 9.0 cubic feet per minute (cfm).

Monitoring of nearby points for pneumatic influence was completed every 10 to 20 minutes. Pneumatic influence ranging from 0.09 to 0.5 inches of water was observed in VP1 and 1.07 to 2.6 inches of water was observed in VP3 during the SVE test. No significant pneumatic influence was detected in VP4.

The field results of the SVE testing indicate a maximum radius of pneumatic influence of 40 feet at a vacuum of approximately 45 inches of water, and an air flow of 9.0 cfm.

7.0 SUMMARY

Soil samples collected from a boring installed adjacent to the former tank field detected BTEX concentrations exceeding STARS Alternative Guidance values at a depth of 22 feet. At a depth of 30 feet in the same boring, BTEX concentrations decreased by an order of several magnitudes.

Four vapor extraction wells were installed onsite as part of the Remedial Investigation performed in March, 1995. During a soil vapor extraction test performed in March, 1995:

- A maximum radius of influence of approximately 40 feet was achieved; and

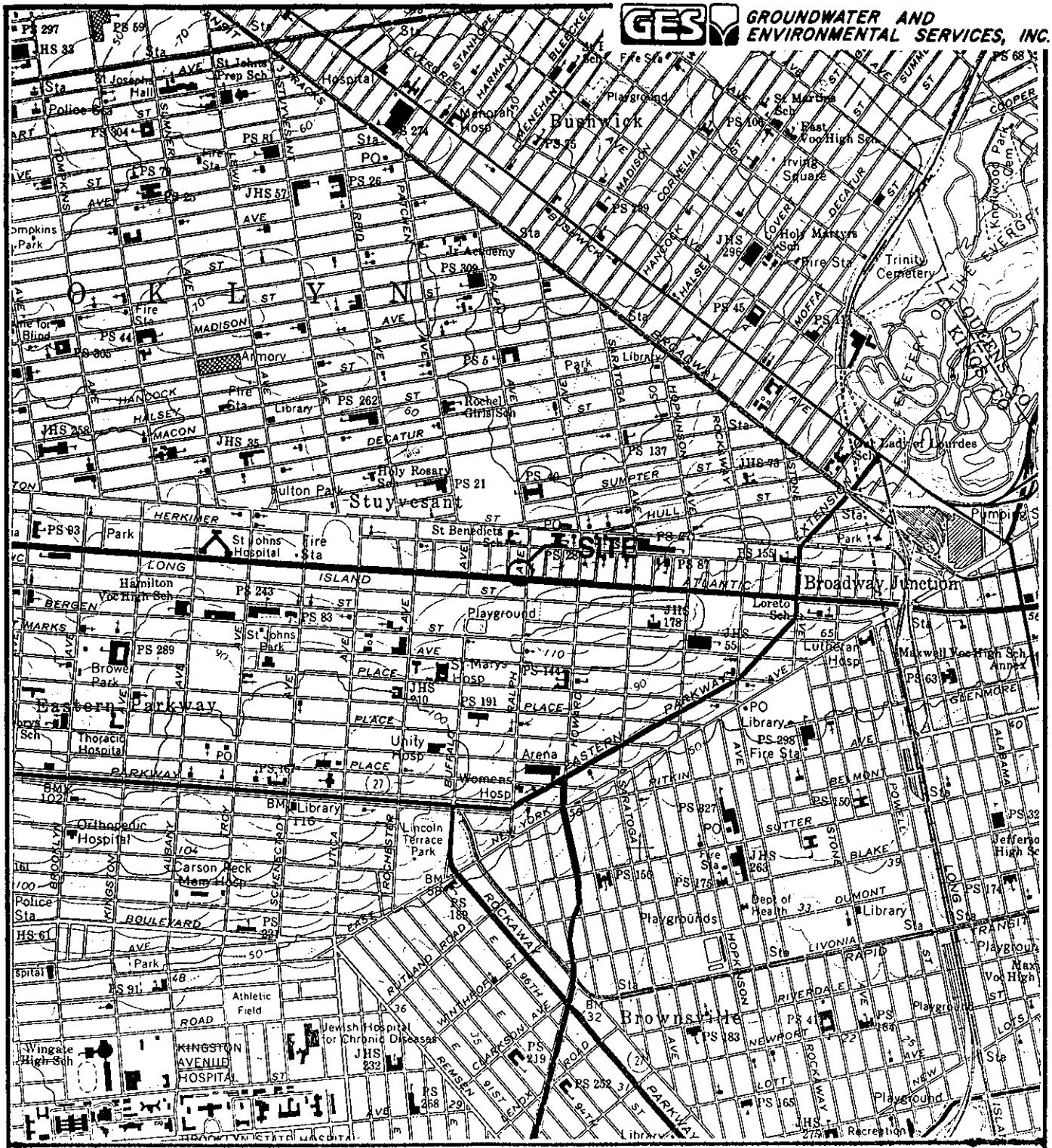
- PID and explosimeter responses recorded at the extraction well head over a period of five hours detected the removal of hydrocarbon vapors. A total of 0.014 pounds of benzene were removed during the test.

The results of the soil vapor extraction test and the soil boring program indicate the localized presence of hydrocarbon impacted soil at depths of up to 22 feet. In order to determine if onsite soil conditions have impacted groundwater, it is recommended that two monitoring wells be installed: one in the impacted soil

area of the former tankfield, and one in the downgradient (southern) portion of the Site. Groundwater samples should be collected from each well and analyzed for vocs by EPA method 602 + MTBE.

FIGURES

GES GROUNDWATER AND ENVIRONMENTAL SERVICES, INC.



NORTH

SOURCE: USGS 7.5 MINUTE SERIES
TOPOGRAPHIC QUADRANGLE 1979
BROOKLYN, NEW YORK
CONTOUR INTERVAL = 10'

0 1000 2000
FEET

QUADRANGLE LOCATION

FIGURE
SITE LOCATION MAP
MERIT OIL OF NEW YORK, INC.
1885 ATLANTIC AVENUE & RALPH AVENUE
BROOKLYN, NEW YORK

GROUNDWATER & ENVIRONMENTAL SERVICES, INC.

LEGEND

—STS— STORM SEWER LINE
—E— ELECTRIC LINE
—SS— SANITARY SEWER LINE

BUILDING

VERY BEST AUTO SALES (PARKING LOT)

VACANT LOT

PRIVATE GARAGE

VACANT AND SEALED BUILDING

MERIT GASOLINE STATION

RALPH AVENUE

PRIVATE HOMES

—STS— —STS— —STS—

ATLANTIC AVENUE

—SS— —SS— —SS—

LONG ISLAND RAILROAD TRESTLE

ATLANTIC AVENUE

—E— —E— —E—

KENTUCKY FRIED CHICKEN RESTAURANT

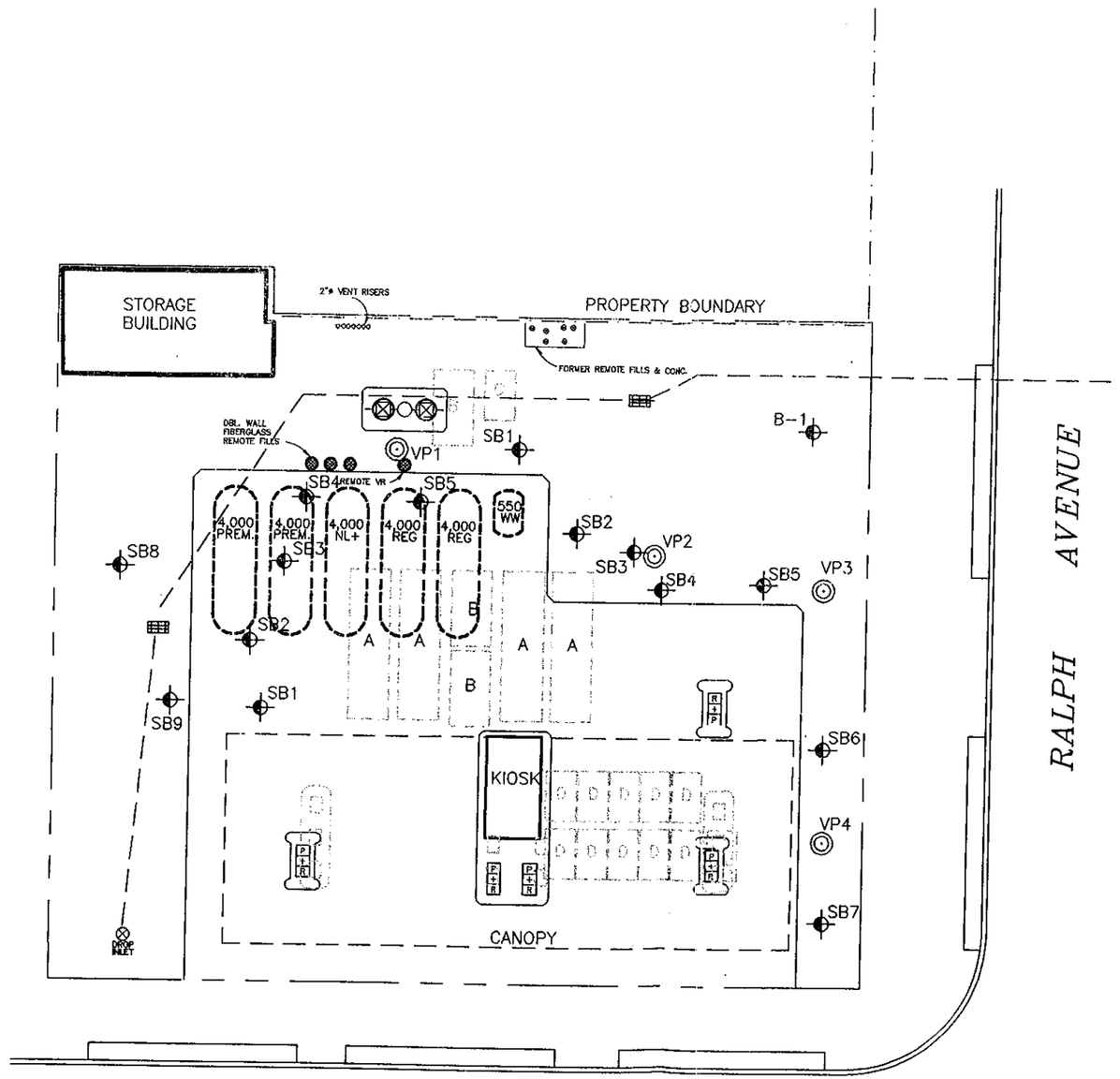
GETTY GASOLINE STATION

LOCAL AREA MAP

MERIT OIL OF NEW YORK, INC.
1885 ATLANTIC AVENUE & RALPH AVENUE
BROOKLYN, NEW YORK

NORTH	NOT TO SCALE	DATE	SOURCE
		4-13-98	B
		DWG # RL0011	FIGURE 3

GROUNDWATER & ENVIRONMENTAL SERVICES, INC.



LEGEND

- FENCE
- FORMER DISPENSER ISLAND
- A — FORMER 4,000 GAL UNDERGROUND STORAGE TANK
- B — FORMER 2,000 GAL UNDERGROUND STORAGE TANK
- C — FORMER 550 GAL UNDERGROUND STORAGE TANK
- D — FORMER 550 GAL UNDERGROUND STORAGE TANK
- E — CONCRETE ABANDONED 550 GAL UNDERGROUND STORAGE TANK
- CATCH BASIN
- EXISTING UNDERGROUND STORAGE TANK
- SOIL VAPOR POINT
- SOIL BORING LOCATION

SITE INFORMATION PLAN
MARCH 1995

MERIT OIL OF NEW YORK, INC.
1885 ATLANTIC AVENUE & RALPH AVENUE
BROOKLYN, NEW YORK

NORTH	SCALE IN FEET	DATE	SOURCE
	0 10 20	4-13-98	B
		DWG # RS0011	FIGURE 2

TABLE 1
FORMER TANK FIELD
SUMMARY OF ANALYTICAL RESULTS OF SUBSURFACE SOIL SAMPLES
MERIT "RALPH"
1885 ATLANTIC AVENUE, BROOKLYN, NEW YORK
(All results reported in parts per billion)

GES Sample Identification	TPH	Benzene	Toluene	Ethyl benzene	Total Xylenes	Total BTEX	1,2,4-tri methyl benzene	n-butyl benzene	MTBE	Naphth-alene
B1-2	35,700	<5.0	4.3 J	5.75	15.7	25.75 J	NA	NA	NA	NA
SB1-S	NA	<5.0	**44,000**	**18,300**	**80,000**	142,300	**33,700**	**46,000**	<5.0	**41,900**
SB1-D	NA	<5.0	79.5	ND	**332**	411.5	**434**	**220**	<5.0	**459**
SB2-S	NA	<500.0	<500.0	<500.0	<500.0	<500.0	<500.0	<500.0	<500.0	<500.0
SB2-D	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
SB3-S	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
SB3-D	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
SB4-S	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
SB4-D	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
SB8-S	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
SB8-D	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
SB9-S	NA	<5.0	<5.0	<5.0	27.1	27.1	69.2	83.7	<5.0	<5.0
SB9-D	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
STARS AGV	**NGV**	**14**	**100**	**100**	**100**	**NGV**	**100**	**100**	**1,000**	**200**

Sample B1-2 was collected on 10/14/93. All others were collected on 3/21 & 3/22/94.

STARS AGV = NYSDEC STARS Memo #1 Alternative Guidance Values
BTEX = Benzene, Toluene, Ethylbenzene, Xylenes
NGV = No Guidance Value
NA = Not analyzed
<= less than stated method detection limit
Exceedences are in bold

TPH = Total Petroleum Hydrocarbons
MTBE = Methyl tert Butyl Ether

TABLE 2
ORPHAN TANK FIELD
SUMMARY OF ANALYTICAL RESULTS OF SUBSURFACE SOIL SAMPLES BY METHOD 8020
MARCH 21 AND 22, 1994
MERIT "RALPH"
1885 ATLANTIC AVENUE, BROOKLYN, NEW YORK
(All results reported in parts per billion)

GES Sample Identification	Benzene	Chloro-benzene	Total Dichloro-benzene	Toluene	Ethyl-benzene	Total Xylenes
SB5-S	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
SB5-D	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
SB6-S	<5.0	<5.0	<5.0	10.4	10.8	37.9
SB6-D	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
SB7-S	<5.0	<5.0	<5.0	8.24	<5.0	<5.0
SB7-D	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
STARS AGV	**14**	**NGV**	**NGV**	**100**	**100**	**100**

STARS AGV = NYSDEC STARS Memo #1 Alternative Guidance Values
NGV = No Guidance Value
<= less than stated method detection limit

TABLE 3
SOIL VAPOR EXTRACTION POINT INSTALLATION
SUMMARY OF ANALYTICAL RESULTS OF SUBSURFACE SOIL SAMPLES
MERIT "RALPH"
1885 ATLANTIC AVENUE, BROOKLYN, NEW YORK
TCLP Analysis
(All results reported in parts per billion)

Sample #	Date	Depth (Ft.)	Benzene	Toluene	Ethyl-Benzene	Xylenes	Total BTEX	MTBE	Isopropyl-benzene
VP1S	3/30/95	21	< 2.50	**34**	**11**	**94**	139	< 2.50	3.2
VP1D	3/30/95	40	< 2.50	**85**	**12**	**84**	181	< 2.50	< 2.50
VP2S	3/31/95	23	< 2.50	3.5	3.8	**19.8**	27.1	< 2.50	< 2.50
VP3S	3/31/95	15	< 2.50	< 2.50	< 2.50	< 7.50	< 7.50	< 2.50	< 2.50
VP3D	3/31/95	28	< 2.50	**93**	**83**	**356**	532	< 2.50	< 2.50
TCLPEGV			**0.7**	**5**	**5**	**5**	**NA**	**50**	**5**

Sample #	Date	Depth (Ft.)	n-Propyl benzene	p-Isopropyl-toluene	Naphthalene	1,2,4-trimethyl-benzene	1,3,5-trimethyl-benzene	n-Butyl-benzene	sec-Butyl-benzene
VP1S	3/30/95	21	**13**	3.8	**49**	**120**	**30**	**22**	**5.2**
VP1D	3/30/95	40	< 2.50	< 2.50	6.7	2.8	< 2.50	< 2.50	< 2.50
VP2S	3/31/95	23	< 2.50	< 2.50	5.5	2.6	< 2.50	< 2.50	< 2.50
VP3S	3/31/95	15	< 2.50	< 2.50	< 2.50	< 2.50	< 2.50	< 2.50	< 2.50
VP3D	3/31/95	28	< 2.50	< 2.50	< 2.50	< 2.50	< 2.50	< 2.50	< 2.50
TCLPEGV			**5**	**5**	**10**	**5**	**5**	**5**	**5**

TCLPEGV = NYSDEC STARS Memo #1 TCLP Extraction Guidance Value
BTEX = Benzene, Toluene, Ethylbenzene, Xylenes
NGV = No Guidance Value
MTBE = Methyl tert- Butyl Ether
<= less than stated method detection limit

VP = Vapor Point
S = Shallow sample
D = Deep sample
exceedences are in bold

TABLE 4
SOIL VAPOR EXTRACTION TEST DATA
MERIT - RALPH
1885 ATLANTIC AVENUE
BROOKLYN, NEW YORK

MAY 24, 1995

VAPOR EXTRACTION WELL: VP2

ELAPSED TIME (Minutes)	SOIL VAPOR VELOCITY (fpm)	FLOW (cfm)	VACUUM H20 (Inches)	PID (ppm)	BENZENE REMOVAL (pounds per hour)	LEL %	O2 %	CARBON EFFLUENT (ppm)	DISTANCE FROM EXTRACTION WELL 40 ft. VP1 H20 (inches)	23 ft. VP3 H20 (inches)	45 ft. VP4 H20 (inches)
START	500	10.9	50	1,045	0.0034	35	3.6	---	---	---	---
5	---	---	---	---	---	---	---	---	0.24	2.4	0.0
8	440	9.6	46	970	0.0028	37	4.3	---	0.50	2.6	0.01
16	400	8.7	46	1,005	0.0026	63	3.5	4.0	0.47	2.6	0.0
30	400	8.7	46	1,030	0.0026	67	3.8	---	0.47	2.5	0.0
45	420	9.2	45	1,065	0.0029	67	4.3	---	0.35	2.5	0.06
55	420	9.2	45	1,120	0.003	66	4.6	---	0.35	2.5	0.05
70	420	9.2	45	1,072	0.0029	64	5.0	---	0.30	2.6	0.02
85	420	9.2	45	1,180	0.0032	67	5.0	3.0	0.27	2.6	0.05
100	420	9.2	45	1,194	0.0032	66	5.4	---	0.24	2.5	0.0
120	420	9.2	45	1,190	0.0032	69	6.6	---	0.09	2.1	0.02
145	390	8.5	45	1,182	0.003	68	6.1	---	0.13	2.2	0.02
175	400	8.7	45	1,216	0.0031	66	6.5	9.0	0.03	2.0	0.0
197	400	8.7	45	1,243	0.0032	67	6.0	---	0.0	1.9	0.02
220	400	8.7	44	1,200	0.0031	62	6.6	9.0	+0.02	1.8	0.02
250	390	8.5	44	1,200	0.003	64	6.9	---	0.03	1.7	0.0
265	390	8.5	44	1,133	0.0028	64	6.4	---	+0.02	1.7	0.01
280	390	8.5	45	1,150	0.0028	64	6.3	---	0.03	1.07	0.01
				Total Benzene Removed	0.014 pounds						

fpm = Feet per Minute
cfm = Cubic Feet per Minute
H20 = Water
LEL = Lower Explosive Limit
PID = Photoionization Detector
O2 = Oxygen
ppm = Parts per Million

APPENDIX I

QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

1.0 SOIL SAMPLING PROCEDURES

The following information details the sample collection procedures utilized for obtaining soil samples. This procedure represents methods that are used to address the validity of the collection and handling procedures for soil data.

Equipment:

1. A sample shuttle containing all appropriate glassware for sample parameters outlined in Section 5.0 of this Appendix
2. Photoionization Detector
3. Two plastic pails
4. Distilled water
5. Liquinox/distilled water solution
6. Nitric acid rinse (only if samples to be analyzed for metals)
7. Acetone (Only if sample is to be analyzed for organic compounds)
8. Fiber brush
9. Latex sampling gloves

Personnel:

1. Geologist/Hydrogeologist

Procedure:

1. The soil sample is collected within the sampler which is driven to the required depth in the borehole with a 140-pound hammer. Field screening methods of the soil include screening with a calibrated flame ionization detector or photoionization detector, visual observations, odors, field soil/water agitation test, and field sorption test.

2. Soil samples are collected utilizing a properly decontaminated split spoon sampler. Prior to use, the split-spoon is cleaned by scrubbing with the fiber brush, washing in a liquinox/distilled water solution, rinsing in distilled water solution, rinsing in distilled water, rinsing with acetone or acid depending on the sample parameter, air drying, and then rinsing with distilled water.

3. A label is affixed to each sample container showing the project name, sample number, depth, date, and sampler's initials.

4. The sample containers are placed in a storage cooler at 4 degrees Centigrade (blue ice) for transport to the laboratory.

5. A chain of custody is filled out for the samples.

2.0 ANALYTICAL METHODOLOGY

Parameters, sample containers, preservation, holding time, and analytical methods are presented in the following table.

TABLE OF ANALYTICAL METHODS

PARAMETER	CONTAINER	PRESERVATION	HOLDING TIME	ANALYTICAL METHOD
Volatile Organics Soil/(VOC) Sediments Aqueous	Glass, 4 oz Teflon liner	Cool, 4 deg. C dark	14 Days	SW-846, 3rd edition Vol. 1-B; GC 8010 Sludge, 8015,8020 GC/MS-8240+10

APPENDIX II

SOIL BORING LOGS-1994

Groundwater & Environmental Services, Inc.

Boring Log

Project: Merit Ralph

Location: 1885 Atlantic & Ralph Aves. Brooklyn, NY

Soil Boring #: SB-1

Drilling Method: Air Rotary

Driller: Summit Drilling Co.

Owner: Merit

Permit No.:

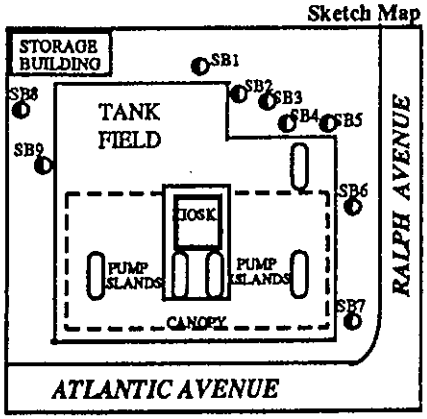
Total Depth: 32' Diameter: 6"

Sample Method: Split spoon

Log By: Jeff Campbell

Date: 3/21/94

Sketch Map



Depth (feet)	Sample No.	PID (units)	Blow Count	Lithology	
1				0'-6"	Asphalt
2				6"-3'	Sand size angular fill.
3					
4		25		15'	Brown gravelly fmc SAND. Some subrounded gravel.
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21	SB1-S	1200+	14-25-30-50	20'-22'	Brown cmF SAND, little to some Silt. Micaceous. Dry.
22					
23					
24		20		20'-30'	~~Sand size angular~~ fill.
25					
30	SB1-D	160	45-54-67-59	30'-32'	Sand size angular fill.
					End boring @ 32'
35					

Groundwater & Environmental Services, Inc. Boring Log

Project: Merit Ralph
Owner: Merit

Location: 1885 Atlantic & Ralph Aves. Brooklyn, NY
Permit No.:

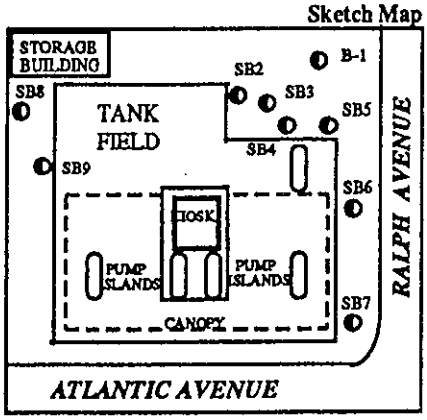
Total Depth: 53' Diameter: 6"

Soil Boring #: B-1
Sample Method: Split spoon

Drilling Method: Air Rotary
Log By: Don Griffin

Driller: Summit Drilling, Inc.
Date: 10/14/93

Sketch Map



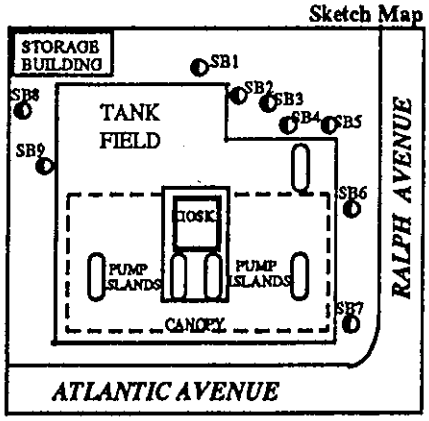
Depth (feet)	Sample No.	PID (units)	Blow Count	Lithology
2				0' - 6" Asphalt 6" - 1' Brown fine to coarse sand and silt with some rounded gravel.
4				
6				
8		0		1' - 15' Brown fine to coarse sand and silt with some rounded gravel.
10				
12				
14				
16	B1-1	0	23-20-24-19	15' - 17' Brown fine to coarse sand and silt. Trace fine gravel.
18				17' - 21' Brown fine to coarse sand and silt with some rounded gravel.
20				
22	B1-2	270	20-28-30-31	21' - 23' Brown fine to coarse sand and silt with some rounded gravel. Sample collected from 22.5' to 23'.
24				
26				23' - 30' Same.
28				
30				
32				30' - 35' Brown fine to coarse sand. Some fine to medium subangular gravel.
34				
36				
38				
40				35' - 47' Brown fine to medium sand. Some silt and some fine subangular gravel.
42				
44				
46				
48				
50				47' - 53' Brown fine to coarse sand. Dry. Hole collapsing.
52				
54				End boring @ 53'. Groundwater not encountered.
56				
58				

Groundwater & Environmental Services, Inc. Boring Log

Project: Merit Ralph
Location: 1885 Atlantic & Ralph Aves. Brooklyn, NY
Soil Boring #: SB-2
Drilling Method: Air Rotary
Driller: Summit Drilling Co.

Owner: Merit
Permit No.:
Total Depth: 37' Diameter: 6"
Sample Method: Split spoon
Log By: Jeff Campbell
Date: 3/21/94

Sketch Map



Depth (feet)	Sample No.	PID (units)	Blow Count	Lithology	
1				0'-6"	Asphalt
2				6"-3'	Dark brown fine sand and silt. Moist.
3					
4				3'-8'	Dark brown fine sand and silt. Moist.
5					
6					
7					
8					
9					
10				8'-20'	Brown cmF sand, little to some silt. Micaceous. Dry, little f subrounded gravel.
11					
12					
13					
14					
15					
16					
17					
18					
19				20'-22'	Brown cmF sand, little to some silt. Micaceous. Dry, little f subrounded gravel. Wet.
20					
21	SB2-S	2000+		20'-30'	Sand size angular fill.
22					
23				29'	Cobbles and boulders.
24		20		30'-32'	Very dense reddish brown V/LT and CLAY, little Fine sand andgravel. Appears to be stratified. Moist to wet.
25					
30				33'-34.5'	Boulder.
35	SB2-I	160			
40	SB2-D	800	44-100/3"	35'-37'	Brown very dense, silty, gravelly, fmc SAND. Little silt. Little to some subangular gravel. Moist.
45					End boring @ 37'

Groundwater & Environmental Services, Inc.

Boring Log

Project: Merit Ralph

Owner: Merit

Location: 1885 Atlantic & Ralph Aves. Brooklyn, NY

Permit No.:

Total Depth: 42' Diameter: 6"

Soil Boring #: SB-3

Sample Method: Split spoon

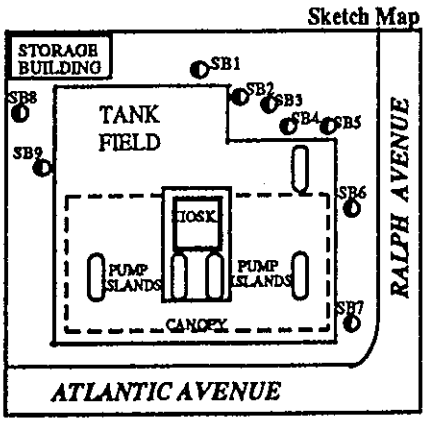
Drilling Method: Air Rotary

Log By: Jeff Campbell

Driller: Summit Drilling Co.

Date: 3/21/94

Sketch Map



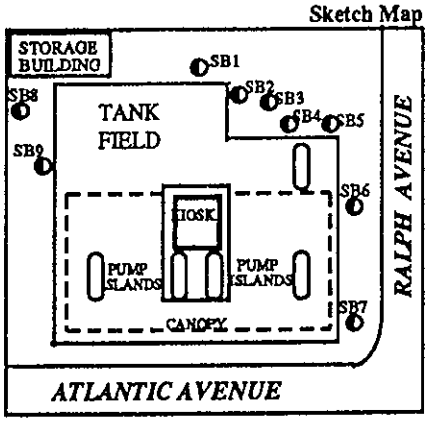
Depth (feet)	Sample No.	PID (units)	Blow Count	Lithology	
1				0'-6"	Asphalt
2				6"-9'	Brown fine SAND and SILT. Little angular gravel. Dry.
3					
4				9'-10.5'	Boulder.
5					
6					
7					
8					
9					
10					
11					
12					
13				Cuttings.	Brown fmc SAND, little silt. Little subrounded f gravel
14					
15					
16					
17					
18					
19					
20					
21	SB3-S	380+	20-23-38-46	20'-22'	Brown silty, gravelly, fine SAND. Little silt. Little to some subrounded gravel. Stratified. Dry.
22					
23					
24					
25					
30					
35					
40	SB2-D	1000	65-85-Refusal	35'-37'	Brown SAND and GRAVEL.
45					End boring @ 42'

Groundwater & Environmental Services, Inc. Boring Log

Project: Merit Ralph
Location: 1885 Atlantic & Ralph Aves. Brooklyn, NY
Soil Boring #: SB-4
Drilling Method: Air Rotary
Driller: Summit Drilling Co.

Owner: Merit
Permit No.:
Total Depth: 30' Diameter: 6"
Sample Method: Split spoon
Log By: Jeff Campbell
Date: 3/21/94

Sketch Map



Depth (feet)	Sample No.	PID (units)	Blow Count	Lithology	
1–4				0'-6"	Asphalt
5–9				6"-9'	Brown fine SAND and SILT. Little angular gravel. Dry.
10–19				Cuttings	Brown fine SAND and SILT. Little angular gravel. Dry.
20–24	SB4-S	250	20-26-32-30	20'-22'	Reddish-brown stratified silty, gravelly, fine SAND. Little silt. Some subrounded gravel. Moist. Very dense.
25–30	SB4-D	0.0	29-26-14-22	28'-30'	Reddish-brown fine SAND. Some subrounded gravel.
35–45				End boring @ 30'	

Groundwater & Environmental Services, Inc. Boring Log

Project: Merit Ralph
Owner: Merit

Location: 1885 Atlantic & Ralph Aves. Brooklyn, NY
Permit No.:

Total Depth: 30' Diameter: 6"

Soil Boring #: SB-5
Sample Method: Split spoon

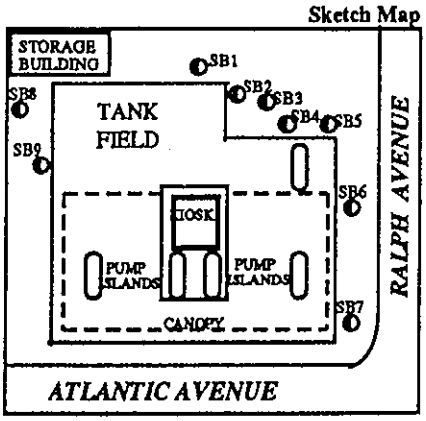
Drilling Method: Air Rotary

Log By: Jeff Campbell

Driller: Summit Drilling Co.

Date: 3/21/94

Sketch Map



Depth (feet)	Sample No.	PID (units)	Blow Count	Lithology	
1				0'-6"	Asphalt
2				6" - 5'	Orange-brown silty gravelly SAND. Fill.
3					
4					
5					
6				Cuttings.	Brown silty gravelly SAND. Little silt. Some fm subrounded gravel.
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21	SB5-S	0.0	38-55-45-47	20'-22'	Reddish-brown stratified silty, gravelly, fine SAND. Little silt. Some subrounded gravel. Moist.
22					
23					
24					
25					Reddish-brown cg GRAVELand fine SAND. Little silt
30	SB5-D	0.0	63-100/5"	28'-30'	and clay. Stratified. Dry.
35					End boring @ 30'
40					
45					

Groundwater & Environmental Services, Inc.

Boring Log

Project: Merit Ralph

Location: 1885 Atlantic & Ralph Aves. Brooklyn, NY

Soil Boring #: SB-6

Drilling Method: Air Rotary

Driller: Summit Drilling Co.

Owner: Merit

Permit No.:

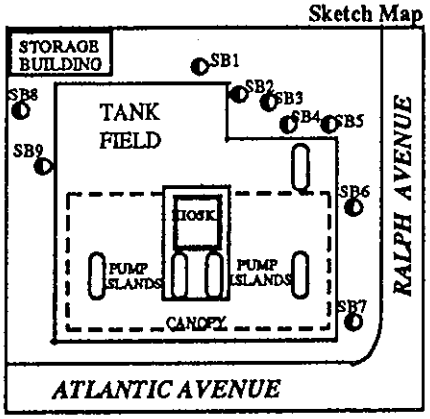
Total Depth: 30' Diameter: 6"

Sample Method: Split spoon

Log By: Jeff Campbell

Date: 3/21/94

Sketch Map



Depth (feet)	Sample No.	PID (units)	Blow Count	Lithology
1				0'-6" Asphalt
2				
3				
4				
5				
6				
7				
8				6"-9' Fill. Coarse gravel, bricks, little concrete. Water trapped in fill.
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21	SB6-S	1000	14-41-33-40	20'-22' Reddish-brown stratified silty, gravelly, fine SAND. Little silt. Some subrounded gravel. Moist.
22				
23				
24				
25				
30	SB6-D	0.0	52-47-60-51	28'-30' Light brown mC SAND. Some subangular to subrounded fine gravel. Little silt. Moist. Very dense.
35				End boring @ 30'
40				
45				

Groundwater & Environmental Services, Inc. Boring Log

Project: Merit Ralph

Location: 1885 Atlantic & Ralph Aves. Brooklyn, NY

Soil Boring #: SB-7

Drilling Method: Air Rotary

Driller: Summit Drilling Co.

Owner: Merit

Permit No.:

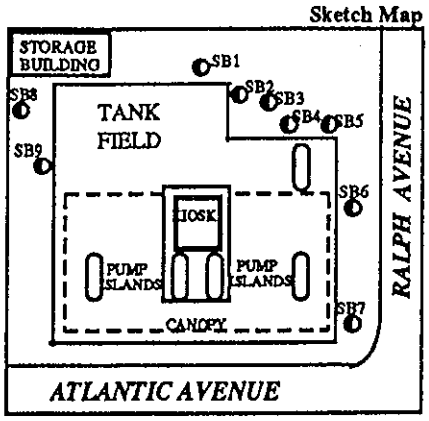
Total Depth: 30' Diameter: 6"

Sample Method: Split spoon

Log By: Jeff Campbell

Date: 3/21/94

Sketch Map



Depth (feet)	Sample No.	PID (units)	Blow Count	Lithology
1				0'-6" Asphalt
2				
3				
4				
5				
6				
7				
8				6"-9' Brown fine SAND and SILT. Little angular gravel. Dry.
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21	SB7-S	0.0	33-27-38-41	20'-22' Reddish-brown stratified silty, gravelly, fine SAND. Little silt. Some subrounded gravel. Moist.
22				
23				
24				
25				
30	SB7-D	0.0	26-21-20-30	28'-30' Brown silty, gravelly, fine SAND. Little angular to subangular fc gravel. Dry. Very dense.
35				End boring @ 30'
40				
45				

Groundwater & Environmental Services, Inc.

Boring Log

Project: Merit Ralph

Location: 1885 Atlantic & Ralph Aves. Brooklyn, NY

Soil Boring #: SB-8

Drilling Method: Air Rotary

Driller: Summit Drilling Co.

Owner: Merit

Permit No.:

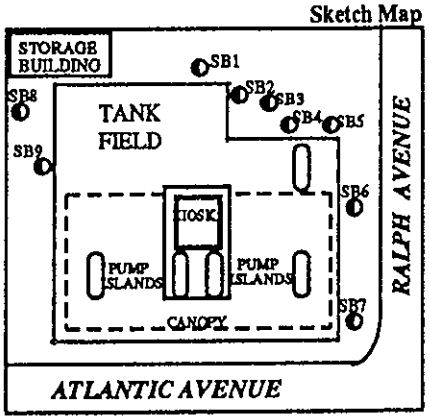
Total Depth: 30' Diameter: 6"

Sample Method: Split spoon

Log By: Jeff Campbell

Date: 3/21/94

Sketch Map



Depth (feet)	Sample No.	PID (units)	Blow Count	Lithology
1				0'-6" Asphalt
2				
3				
4				
5				
6				
7				
8				6"-8' Fill material, concrete, bricks, soil, etc. Water trapped in fill at contact.
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21	SB8-S	0.0	54-63-75-	20'-22' Reddish-brown stratified silty, gravelly, fine SAND. Little silt. Some subrounded gravel. Moist.
22				
23				
24				
25				Reddish-brown stratified silty, gravelly, fine SAND.
30	SB8-D	0.0	36-41-35-37	28'-30' Little silt. Some subrounded gravel. Moist.
35				End boring @ 30'
40				
45				

Groundwater & Environmental Services, Inc.

Boring Log

Project: Merit Ralph

Location: 1885 Atlantic & Ralph Aves. Brooklyn, NY

Soil Boring #: SB-9

Drilling Method: Air Rotary

Driller: Summit Drilling Co.

Owner: Merit

Permit No.:

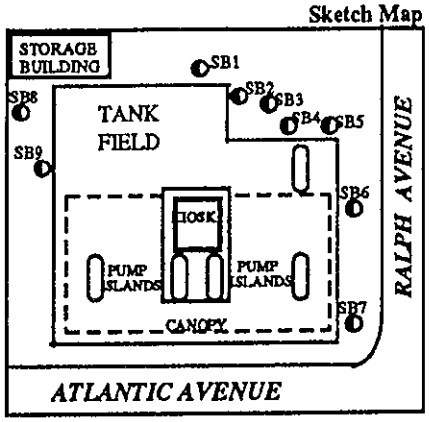
Total Depth: 30' Diameter: 6"

Sample Method: Split spoon

Log By: Jeff Campbell

Date: 3/21/94

Sketch Map



Depth (feet)	Sample No.	PID (units)	Blow Count	Lithology
1–45				0'-6" Asphalt
				6"-2' Fill material.
20–21	SB9-S	0.0	30-25-42-35	20'-22' Reddish-brown stratified silty, gravelly, fine SAND. Little silt. Some subrounded gravel. Moist.
25–30	SB9-D	0.0	30-25-42-35	28'-30' Reddish-brown stratified silty, gravelly, fine SAND. Little silt. Some subrounded gravel. Moist.
				End boring @ 30'

APPENDIX III

SOIL VAPOR EXTRACTION POINT BORING LOGS-1995

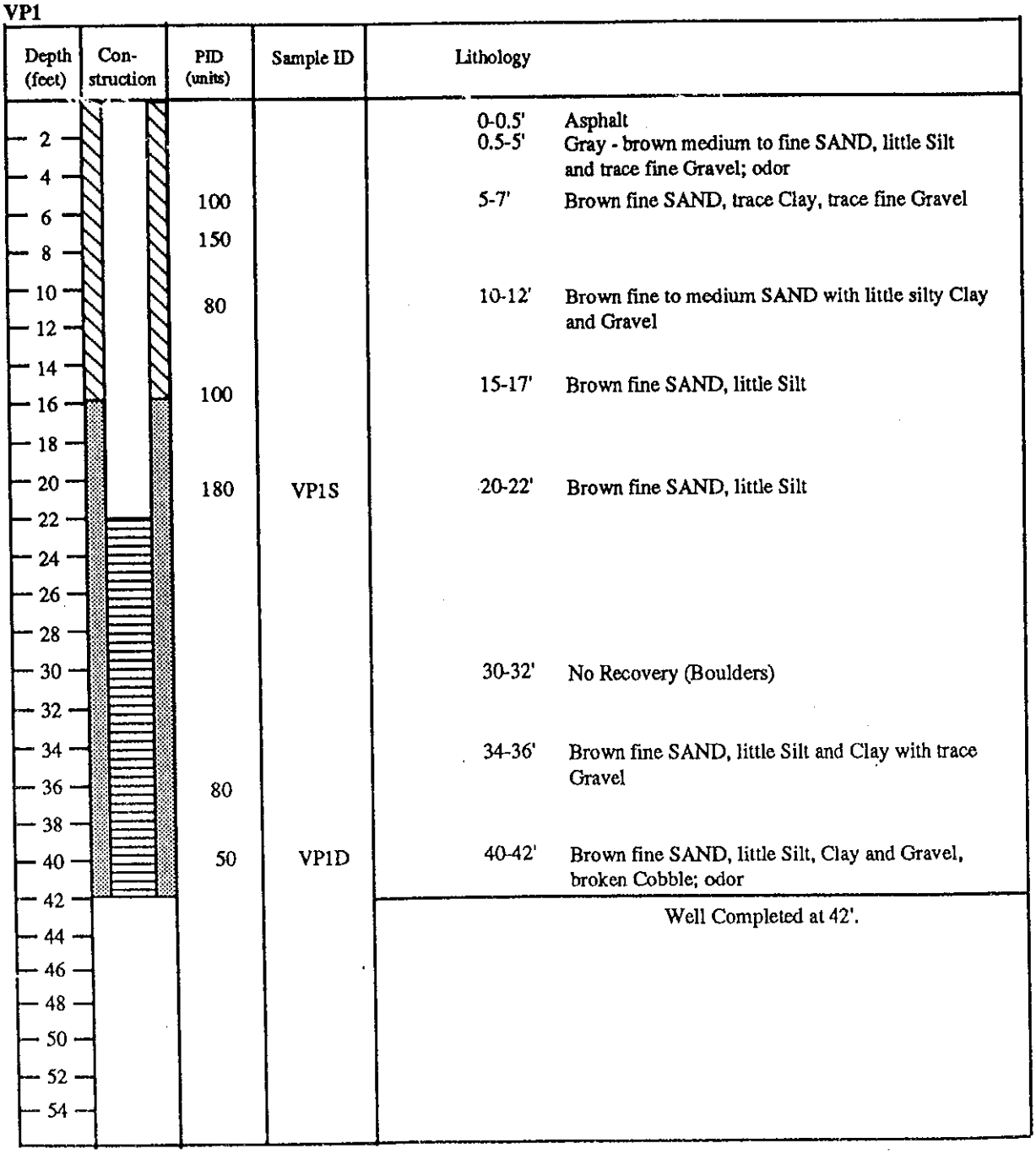
Groundwater & Environmental Services, Inc.

Well Log

Project:Merit - Ralph
Location: 1885 Atlantic, Brooklyn, NY
Total Depth: 42' Diameter: 2"
Drilling Method: Hollow Stem Auger
Driller: Lutz Environmental
Date: 3/30/95

Owner: Merit Oil
Screen Length: 20' Slot Size: 0.020"
Casing Length: 22' Type: PVC
Screen Diam.: 2" Casing Diam.: 2"
Sample Method: Split Spoon
Log By: C. Rufer

VP1



Note: VP1S and VP1D were analyzed for TCLP 8021 + Xylenes, Naphthalene

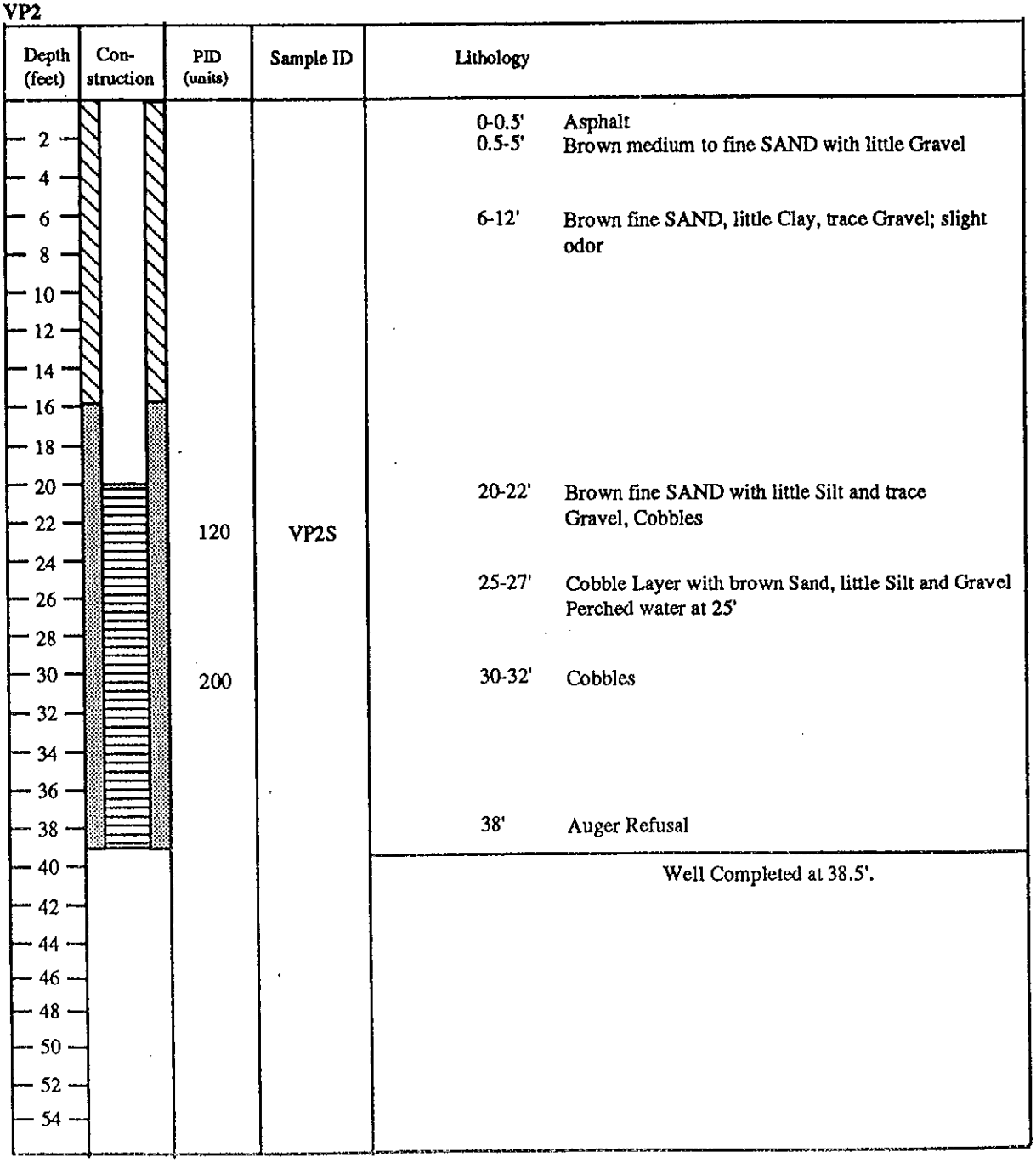
Groundwater & Environmental Services, Inc.

Well Log

Project:Merit - Ralph
Location: 1885 Atlantic, Brooklyn, NY
Total Depth: 38.5' Diameter: 2"
Drilling Method: Hollow Stem Auger
Driller: Lutz Environmental
Date: 3/30/95

Owner: Merit Oil
Screen Length: 20' Slot Size: 0.020"
Casing Length: 18.5' Type: PVC
Screen Diam.: 2" Casing Diam.: 2"
Sample Method: Split Spoon
Log By: C. Rufer

VP2



Note: VP2S was analyzed for TCLP 8021 + Xylenes, Naphthalene

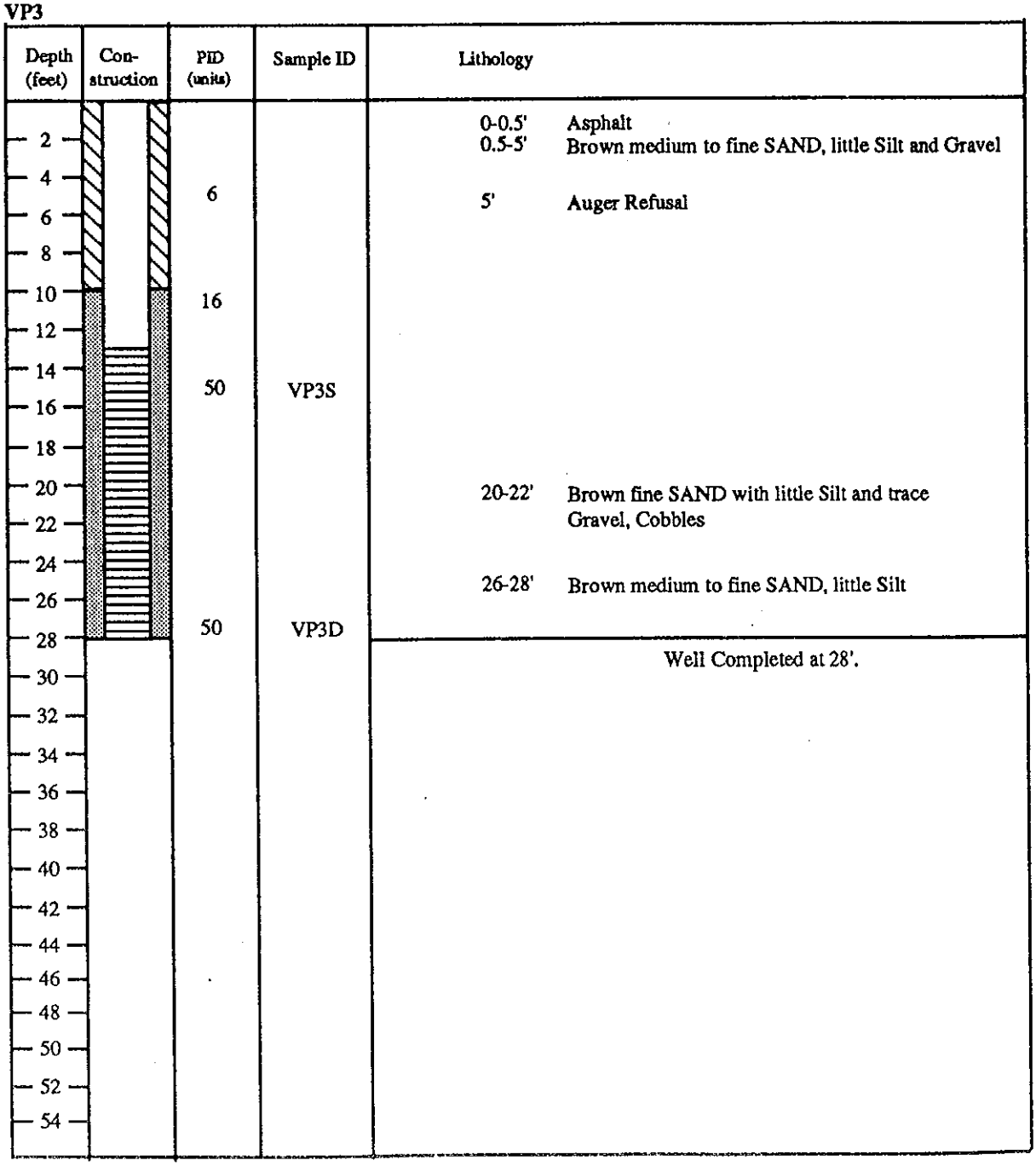
Groundwater & Environmental Services, Inc.

Well Log

Project:Merit - Ralph
Location: 1885 Atlantic, Brooklyn, NY
Total Depth: 28' Diameter: 2"
Drilling Method: Hollow Stem Auger
Driller: Lutz Environmental
Date: 3/30/95

Owner: Merit Oil
Screen Length: 15' Slot Size: 0.020"
Casing Length: 13' Type: PVC
Screen Diam.: 2" Casing Diam.: 2"
Sample Method: Split Spoon
Log By: C. Rufer

VP3



Note: VP3S and VP3D were analyzed for TCLP 8021 + Xylenes, Naphthalene

Groundwater & Environmental Services, Inc.

Well Log

Project:Merit - Ralph
Location: 1885 Atlantic, Brooklyn, NY
Total Depth: 28' Diameter: 2"
Drilling Method: Hollow Stem Auger
Driller: Lutz Environmental
Date: 3/30/95

Owner: Merit Oil
Screen Length: 15' Slot Size: 0.020"
Casing Length: 13' Type: PVC
Screen Diam.: 2" Casing Diam.: 2"
Sample Method: Split Spoon
Log By: C. Rufer

VP4