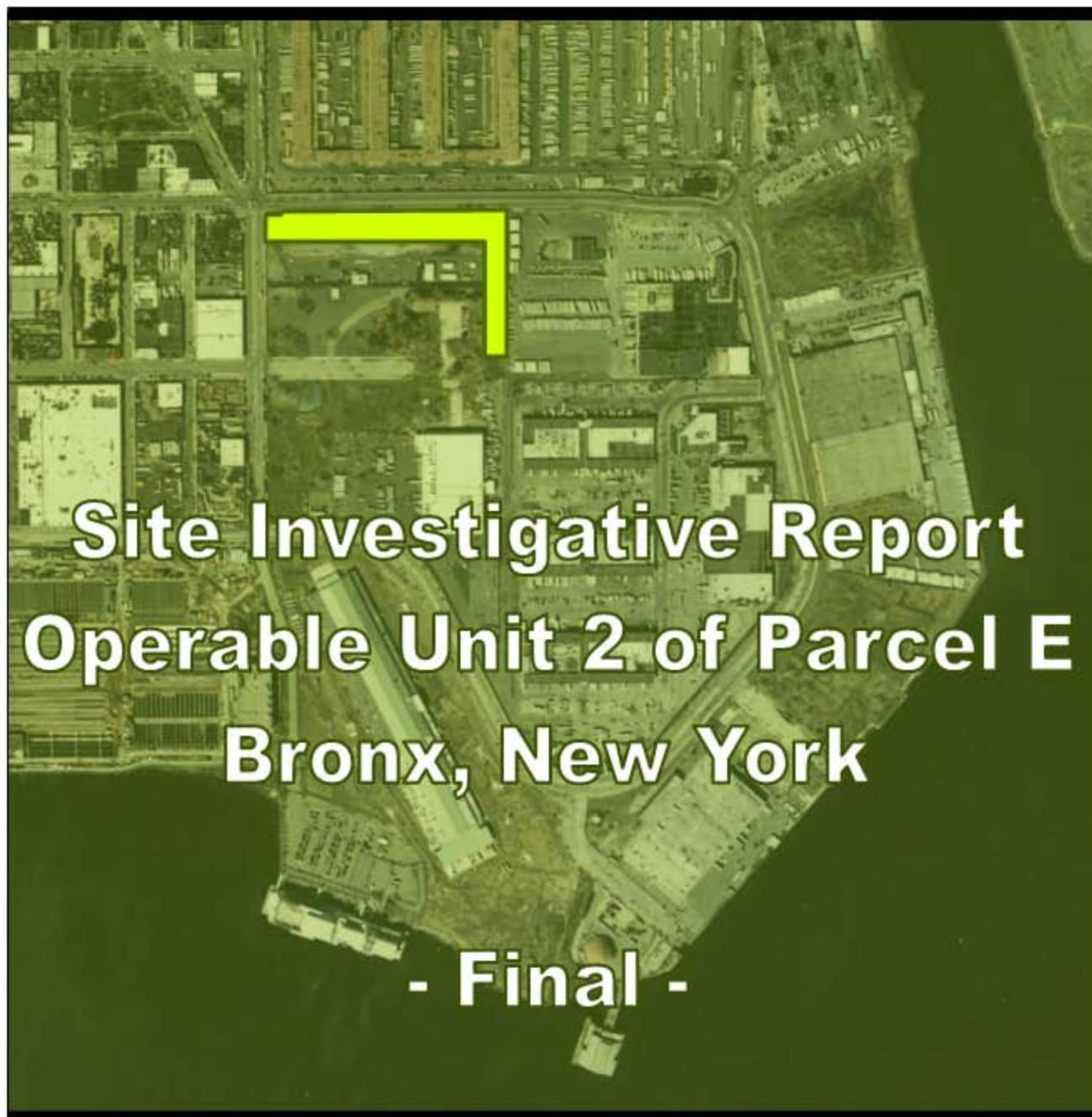


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# Hunts Point Cooperative Market Redevelopment Plan



**June 2007**

**HDR | LMS**

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# **Hunts Point Food Distribution Center Redevelopment Plan**

## **Site Investigative Report for Operable Unit 2 Portion of Parcel E, Bronx, NY**

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Prepared for:



New York City  
Economic Development  
Corporation

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**June 2007**

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## EXECUTIVE SUMMARY

Henningson, Durham & Richardson Architecture and Engineering, P.C. (HDR|LMS), under contract to the New York City Economic Development Corporation (NYCEDC), performed a subsurface investigation based on the New York State Department of Environmental Conservation (NYSDEC) approved Scope of Work (October 2004) entitled, Investigative Scope of Work for Second Operable Unit Portion of Parcel E, Bronx NY (SOW). This report presents the findings of the subsurface investigation of Parcel E Operable Unit 2 (Site E OU-2), located in the northwest portion of the Hunts Point Food Distribution Center (HPFDC) (Figure 1). The purpose of the investigation was to assess the parcel in relation to its former use as part of an operating manufactured gas plant (MGP), identify areas where potential MGP waste may be present, assess soil/fill and groundwater conditions, and prepare a recommendation for remediation, and engineering controls that will be necessary to facilitate potential development scenarios that will be protective of human health and the environment.

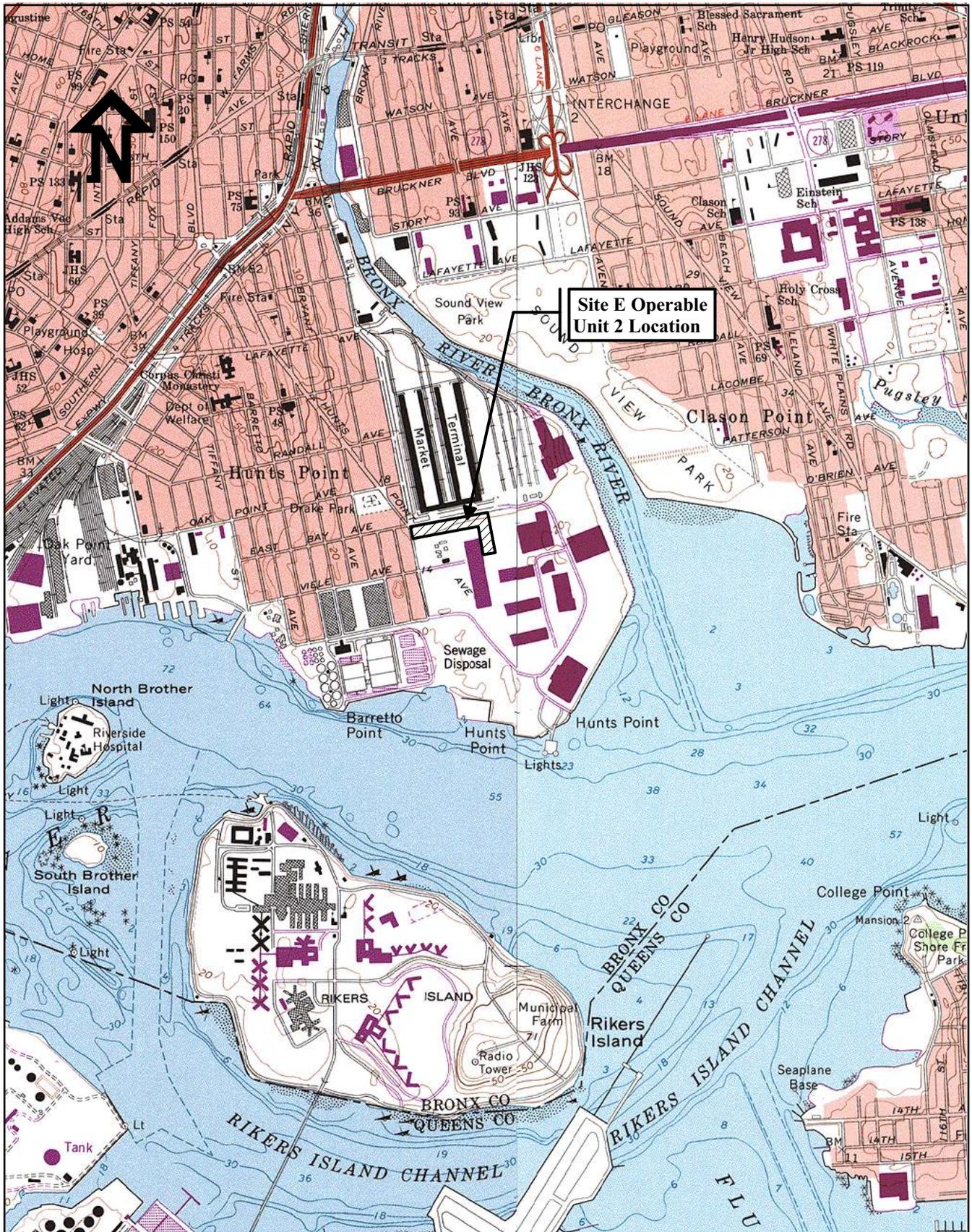
A review of site conditions and history was performed prior to preparation of the SOW. This review, in addition to a physical site inspection, was used to prepare the investigative work scope. Information reviewed to determine site history and physical setting included historic Sanborn fire insurance maps, aerial photographs, historic topographic maps, and Consolidated Edison Company of New York (Con Ed) site maps.

The investigation included several phases: The first phase consisted of a non-intrusive ground penetrating radar (GPR) survey to assess the possible presence and location of buried waste types (i.e. purifier and coal tar type waste material).

The second phase included the intrusive sampling and physical inspection of material on the site. This phase consisted of installation of ten (10) test borings and excavation of twenty (20) test pits. Samples from these areas were collected and submitted for analysis. It also included the installation of two (2) groundwater piezometers and seven (7) shallow soil gas sampling points. The final phase was the collection and analysis of samples from the installed piezometers and gas points. It also included the collection of measurement points using a Global Positioning System (GPS) to accurately document the areas where sampling was conducted. Based upon the comments received from NYSDEC on March 16, 2006 regarding the Draft Investigative Report for E OU-2, HDR|LMS performed a coal tar waste delineation in April 2006 to supplement the results of the site investigation. Twenty-seven (27) test pits were installed.

Site E OU-2 can be described as an inverted and reversed "L" shaped site. The top section lies parallel and adjacent to the southern boundary of East Bay Avenue from the intersection of Halleck Street, approximately 950 ft east. This is referred in this report to the northern portion of Site E OU-2.

The bottom leg of the parcel begins at East Bay Avenue at the eastern end of the previously described "northern section" of E OU-2, and continues south approximately 600 ft. This is referred to in this Report as the southern portion of Site E OU-2.



**Site E Operable Unit 2 Location**

0 2000 ft

~SCALE: 1" = 2000'

Map source: USGS 7.5 minute quadrangle series, Central Park, NY-NJ, 1966, photorevised 1988.

I781\029\graphics\DTP\InvestigativeReport\Final\Fig1SiteLocation.dsf



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**Site Location**  
Hunts Point • Site E OU-2

**Figure 1**

No investigation was performed on the southern section of Site E OU-2 for this Report as this entire area was previously investigated, remediated and given sign off by NYSDEC and NYSDOH under the closure for Site E OU-1.

The results of the investigative tasks and laboratory analyses across the site show that the northern portion of the E OU-2 site contains a significant amount and variety of fill material. Some areas of the site contain mixed soil and demolition material while a significant portion of the remainder of the northern portion of the site contains coal, cinders, ash and slag believed to be from the coal gas production process. Several areas within the site contained residual coal tar in the shallow test pits and at the ground surface with boils visible along the southern fence line adjacent to the Con Edison compressor station.

There were a number of locations within the northern portion of the site that were found to contain coal ash that was heavily impacted with what appeared to be coal tar. These areas were identified in the test pitting and in several probes.

The southern portion of Site E OU-2 was previously investigated during the initial site E OU-1 investigation and redevelopment of Site E OU-1. During the redevelopment there were several thousand yards of excess material excavated during the construction of the parking area of E OU-1 and that material was placed on the southern portion of E OU-2. This material was referred to in that report as the "berm". The berm amounted to several thousand yards that was relocated to Site A OU-2 to be used for replacement of material for a pending coal tar removal on Site A OU-2.

The northernmost section of this piece of E OU-2 lies between the Con Edison compressor site and E OU-1. This area is currently part of an existing right of way for the Iroquois Gas pipeline entrance into the Con Edison compressor station. It is surrounded by 8 ft high chain link fence topped with razor wire and the entrance off East Bay Avenue is restricted by an 8 ft high chain link and razor wire topped gate. This area also had material placed on it during site E OU-1 redevelopment but after sampling and analysis, it was determined that some of the material was contaminated with PCBs at a level that required removal and special disposal. The area was delineated and a removal action was performed.

Following the removal and the completion of the Iroquois Gas pipeline project, this entire northerly portion (approximately 200 ft) of Site E OU-2 was paved and surrounded with security fencing, sealing it and, making it completely inaccessible.

## INTRODUCTION

This report presents the findings of the subsurface investigation for the northern portion of Parcel E Operable Unit 2 (E OU-2) located in the northwest portion of the Market (Figure 1). The purpose of the investigation was to assess the Site for redevelopment and identify areas that will require more specific attention including remediation and engineering controls to provide an area of land that meets New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) requirements for the proposed reuse as an open air parking lot that will become part of another redevelopment project. Recommendations for additional data gathering (delineation) and remedial actions will be provided in the Response Plan.

Site E is composed of the following areas: Operable Unit 1, Operable Unit 2 and Operable Unit 3 (OU-1, OU-2 and OU-3).

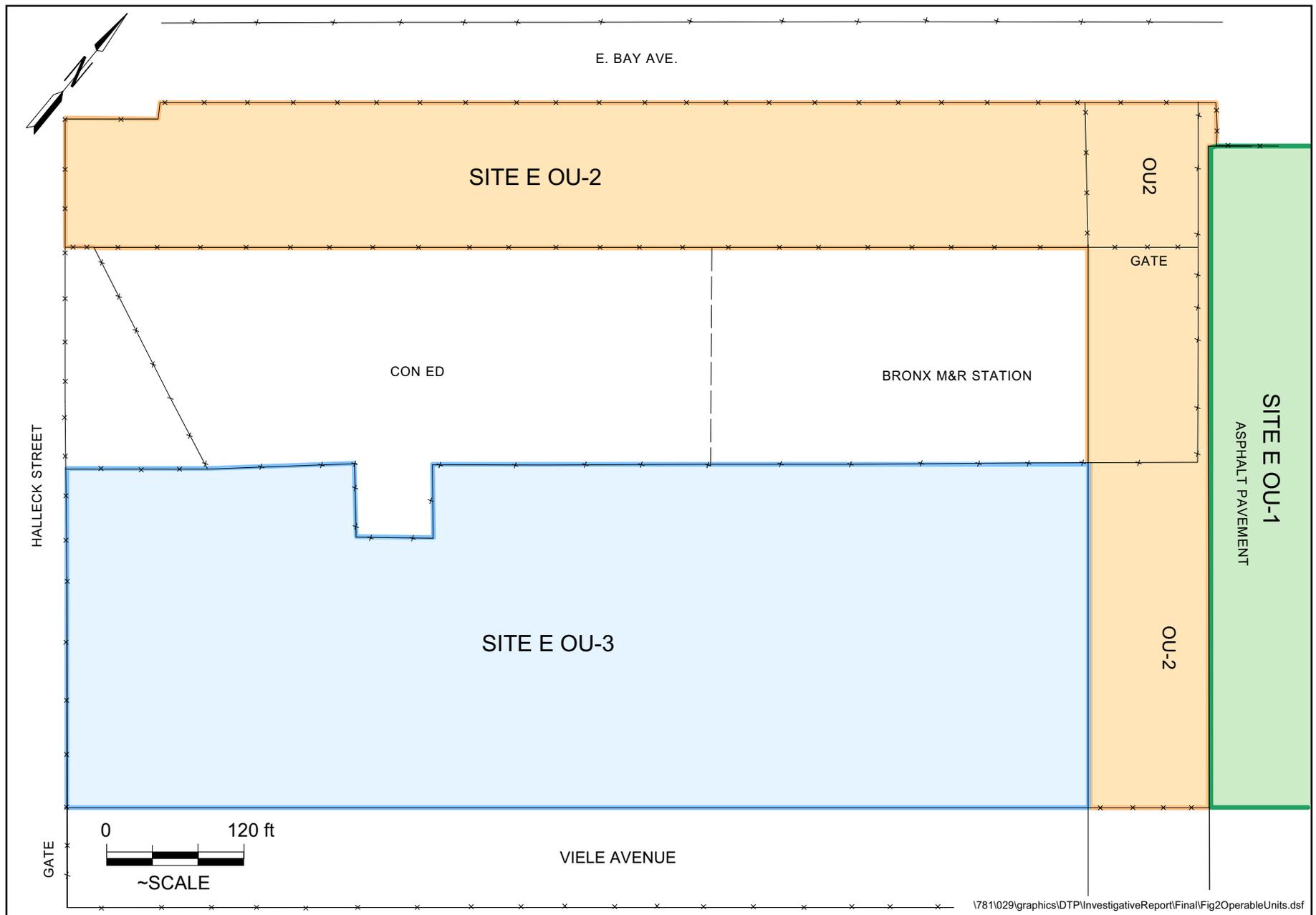
OU-1 covers the eastern portion of Site E (Figure 2) and is shaped as a north/south orientated rectangle bounded on the north by East Bay Avenue, on the east by the existing A&P distribution warehouse, on the west by OU-3 and on the south by the existing market. OU-1 has been completed and redeveloped as a truck maintenance and parking facility. Site E OU-1 also included as part of the investigation and remedial action the southern portion of Site E OU-2.

OU-2 (the Site) is an inverted and reversed L-shaped parcel formed by two rectangular areas (one oriented east-west and the second oriented north-south) referred to as the southern portion of E OU-2. Both converge at the northwest corner of OU-1 along the southern boundary of East Bay Avenue. The northern portion of OU-2 is bounded on the north by East Bay Avenue, on the south by the Consolidated Edison Facility (Con Ed), the Bronx Metering and Regulating Facility (M&R Station), on the west by Halleck Street and on the east by OU-1 (see Figure 2). The southern portion of OU-2 has been termed the "berm area" which contained excavated soils generated during the redevelopment and construction of the A&P paved parking area and truck maintenance facility. The southern portion is bordered by East Bay Avenue to the north, the meat market to the south, Con Ed facility and OU-3 to the west, and OU-1 to the east.

In total OU-2 covers approximately 3.69 acres. The berm portion of OU-2 was investigated and subsequently was part of the removal/remedial action during the OU-1 project.

OU-3 covers the southwestern portion of Site E and is shaped as an east/west orientated rectangular strip of land (see Figure 2). OU-3 is bounded on the north by the Con Ed and the M&R Station, on the west by Halleck Street, on the east by OU-2, and on the south by Viele Avenue which is currently the northern most section of the new Fulton Fish Market employee parking lot.

The northwestern portion of Site E OU-2 is nearly level with the surrounding street but slightly higher than the adjacent Con Edison facility. Debris piles and large boulders are located near the center of the Site. The area is primarily covered with tall grasses and trees



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### Site E Operable Units

Hunts Point • Site E OU-2

Figure  
 2

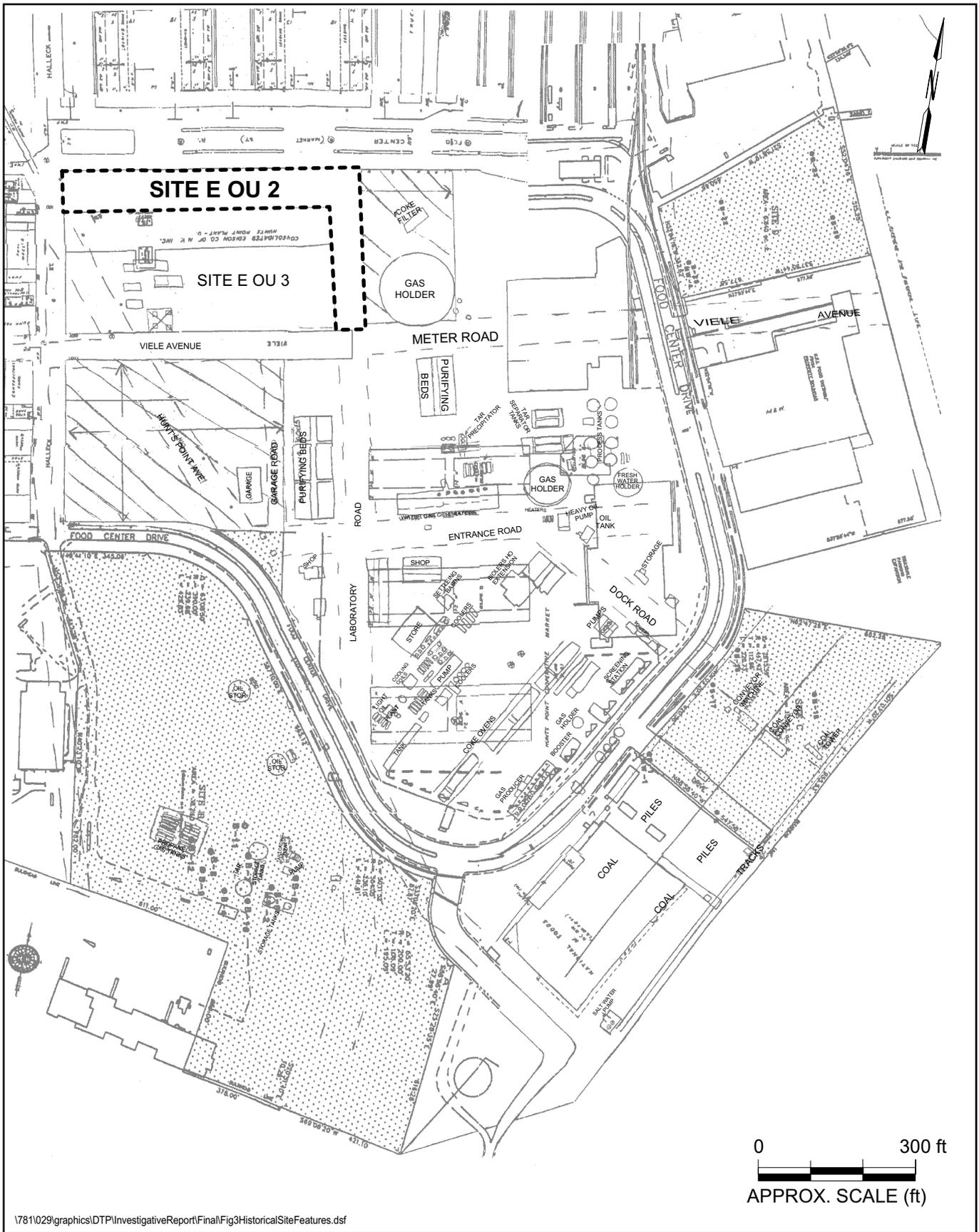
but there is a poorly maintained area of pavement in the central portion. A monitoring well from a previous investigation (MW-4) is present at the east-central portion of this area.

The southern portion of OU-2 was previously investigated in 1999 as part of the Site E OU-1 Voluntary Cleanup Agreement (VCA) investigation. Following the initial site development, a substantial volume of excess fill material was generated from Site E OU-1 and was placed on this area. The material was sampled, classified and a portion was properly disposed of at a solid waste facility; the remainder was moved to site A OU-2 for fill material. Approximately two years following the removal, the entire northern half of this portion of OU-2 was made part of a permanent easement for the Iroquois natural gas pipeline that was routed along Food Center Drive from a point approximately ½ mile from OU-2. The pipeline installation required a large trench excavation and specific engineered backfill to accommodate the large diameter (> 40") gas pipe. This trench extended from East Bay Avenue to the entrance at the Con Ed compressor station.

All excess material excavated as a result of the pipeline excavation was sampled, classified and properly disposed of. Following the completion of the pipeline installation and backfill, the surface of the Site E OU-2 easement area was capped with asphalt pavement. The entire easement area was included in the perimeter VCP remediation and received a no further action designation from NYSDEC/NYSDOH. No additional field activities were proposed for this area following the no further action designation and this easement area is covered under the Site Management Plan (SMP) for that VCP site. A summary of the analysis done for sampling in the "berm area" is provided as Table 1.

Soil samples collected from the berm area were submitted for laboratory analysis. The material sampled contained both soil and fill (cinders, coal ash). Samples were collected in laboratory-supplied containers, labeled with the appropriate sample identification, date and time of sampling, and analysis required. They were all delivered to the New York State Department of Health (NYSDOH) certified laboratory under sealed chain of custody. The samples were collected from the most visually contaminated layers of the berm and were tested for Toxicity Characteristic Leaching Procedure (TCLP) Volatile Organic Compounds (VOCs), TCLP Metals, VOCs, Semi-Volatile Organic Compounds (SVOCs) and Polychlorinated Biphenyls (PCBs). All TCLP analytical results reported concentrations below thresholds set by NYSDEC Spill Technology and Remediation Series (STARS) Memorandum No. 1 (dated August 1992) Soil Cleanup Objectives. Minor concentration exceedences were encountered in four soil samples for SVOCs and PCBs.

Historic Site and topographic maps have been reviewed and a composite showing Site conditions that were identified on those maps is included as Figure 3. Historic aerial photographs were also reviewed (see Aerial Photos 1, 2, 3, 4 and 5). The intrusive work in this report takes into account the information shown on these maps and photos performed and documented. The parcel is located northwest of the former location of the 15 million cubic feet gas holder structure and coke filter.



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### Site E Historical Features

Hunts Point • Site E OU-2

Figure  
 3



**Site E Second Operable Unit**

0 750 ft  
SCALE IN FEET  
(APPROXIMATE)

V781-029\graphics\DTP\InvestigativeReport\AerialPhoto1-5.dsf



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**Hunts Point Site E -  
1954 Aerial Photograph**

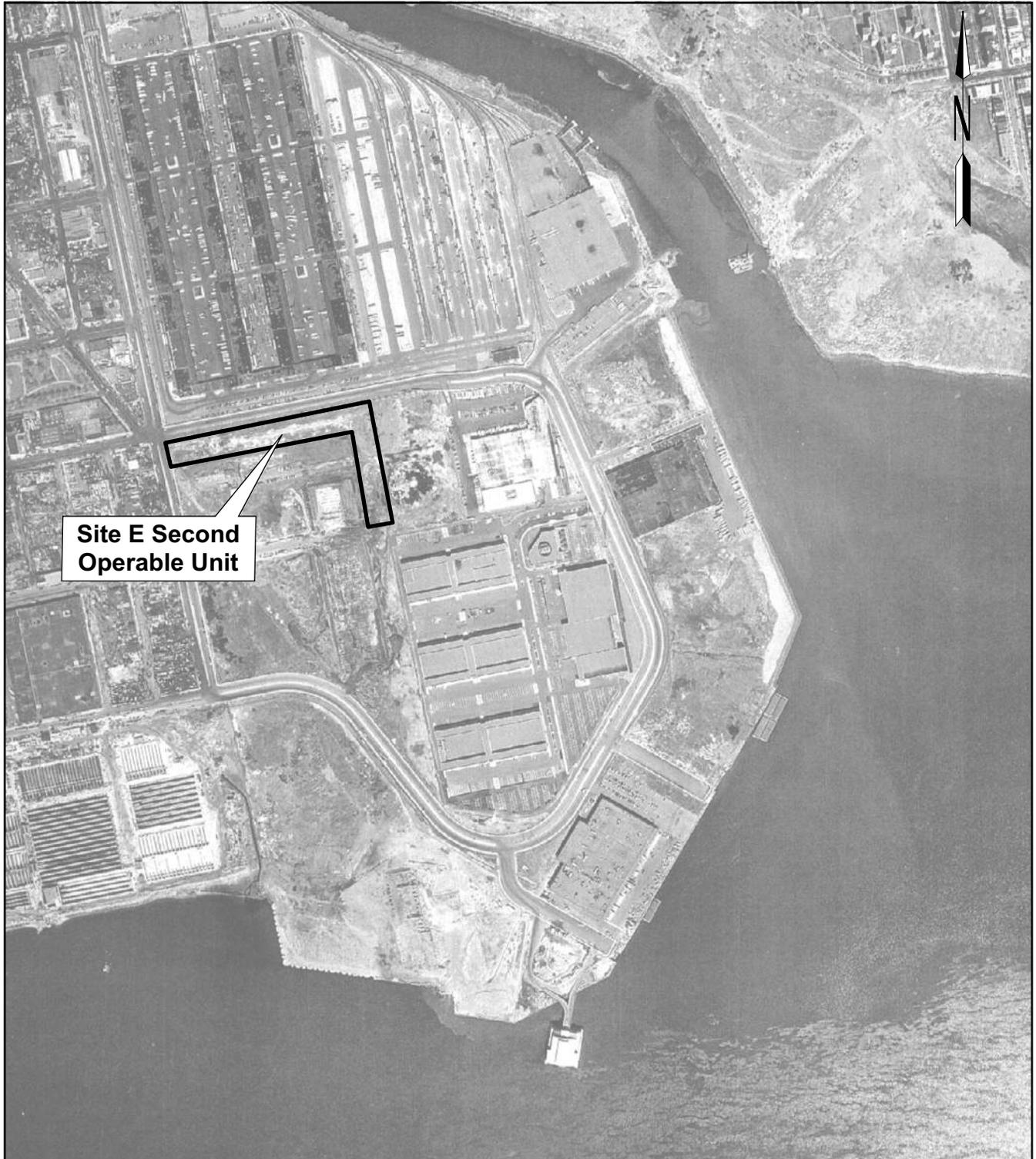
**Aerial  
Photo  
1**



**Site E Second  
Operable Unit**

0 750 ft  
SCALE IN FEET  
(APPROXIMATE)

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**Site E Second  
Operable Unit**

0 780 ft  
SCALE IN FEET  
(APPROXIMATE)

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**Hunts Point Site E -  
1975 Aerial Photograph**

**Aerial  
Photo  
3**



**Site E Second Operable Unit**

0 750 ft  
SCALE IN FEET  
(APPROXIMATE)

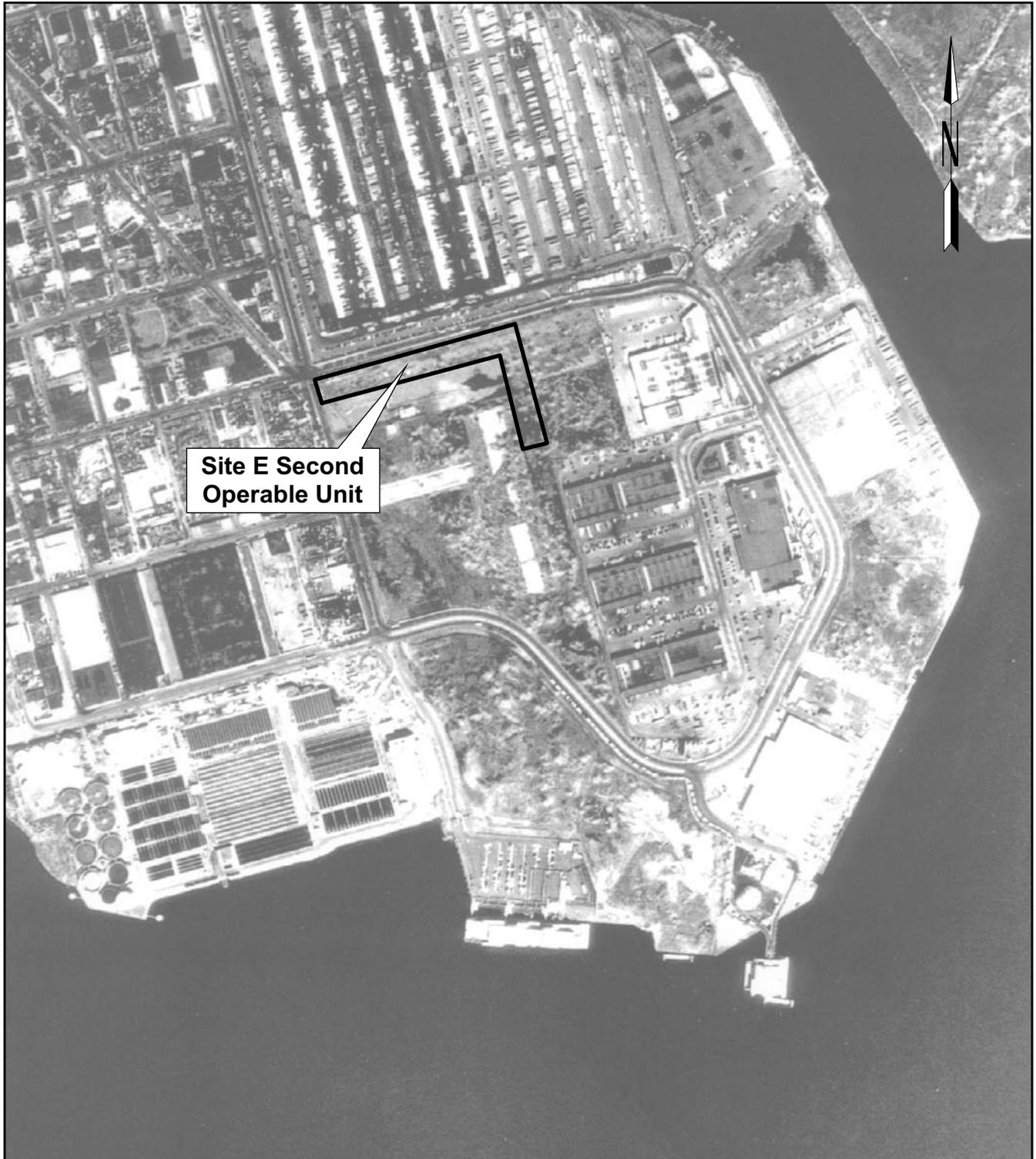
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**Hunts Point Site E -  
1984 Aerial Photograph**

**Aerial  
Photo  
4**



**Site E Second Operable Unit**

0 750 ft  
SCALE IN FEET  
(APPROXIMATE)

V781-029\graphics\DTP\InvestigativeReport\AerialPhoto1-5.dsf



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**Hunts Point Site E -  
1994 Aerial Photograph**

**Aerial  
Photo  
5**

Table 1  
Page (1 of 6)  
Hunt's Point Site E OU 2  
Berm Area Soil Sampling  
December 2002

HDR LMS Sample ID	B2-C1	B2-C2	NYSDEC STARS Memo No. 1
Date Sampled	12/16/2002	12/16/2002	
<b>TCLP VOCs (mg/L)</b>			
1,1-Dichloroethene	ND	ND	0.7
Chloroform	ND	ND	6
1,2-Dichloroethane	ND	ND	0.5
Trichloroethene	ND	ND	0.5
2-Butanone	ND	ND	NS
Tetrachloroethene	ND	ND	0.7
Chlorobenzene	ND	ND	100
Vinyl chloride	ND	ND	0.2
Benzene	ND	ND	0.5
Carbon tetrachloride	ND	ND	0.5

**Notes:**

- ND - Not detected at analytical reporting limit.
- TCLP - Toxicity Characteristic Leaching Procedure
- Note - Numbers in bold exceed STARS Memo No. 1 soil cleanup objectives
- Note - NYSDEC Spill Technology and Remediation Series (STARS) Memorandum No. 1: Hazardous Waste Regulatory Levels for Toxicity Characteristics.

Table 1  
Page (2 of 6)  
Hunt's Point Site E OU 2  
Berm Area Soil Sampling  
December 2002

HDR LMS Sample ID	B2-C1	B2-C2	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
Date Sampled	12/16/2002	12/16/2002	
<b>SVOCs (mg/kg)</b>			
Naphthalene	14	17	500 <sup>a</sup>
2-Methylnaphthalene	5.5	7	NS
Acenaphthene	7.6	5.1	500 <sup>a</sup>
Dibenzofuran	8.6	9.3	350
Fluorene	22	22	500 <sup>a</sup>
Phenanthrene	140	77	500 <sup>a</sup>
Anthracene	36	33	500 <sup>a</sup>
Fluoranthene	190	180	500 <sup>a</sup>
Pyrene	200	210	500 <sup>a</sup>
Benzo[a]anthracene	<b>89</b>	<b>80</b>	5.6
Chrysene	<b>79</b>	<b>74</b>	56
Benzo[b]fluoranthene	<b>110</b>	<b>100</b>	5.6
Benzo[k]fluoranthene	46	38	56
Benzo[a]pyrene	<b>100</b>	<b>81</b>	1 <sup>b</sup>
Benzo[g,h,i]perylene	36	30	500 <sup>a</sup>
Indeno[1,2,3-cd]pyrene	<b>36</b>	<b>31</b>	5.6
Acenaphthylene	19	21	500 <sup>a</sup>
Dibenzo(a,h)anthracene	<b>3.9</b>	<b>3.6</b>	0.56

**Notes:**

ND - Not Detected at the Reporting Limit.

NS - No Standard.

Note - Numbers in bold exceed the Track 2 soil cleanup objective(s).

a - The SCOs for commercial use were capped at a maximum value of 500 ppm (refer to NYSDEC TSD Section 9.3).

b - For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the DEC/DOH rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.

\* - NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria.

Table 1  
Page (3 of 6)  
Hunt's Point Site E OU 2  
Berm Area Soil Sampling  
December 2002

HDR LMS Sample ID	B2-C1	B2-C2	NYSDEC STARS Memo No. 1
Date Sampled	12/16/2002	12/16/2002	
<b>TCLP Metals (mg/L)</b>			
Arsenic	ND	ND	5
Barium	0.423	0.502	100
Cadmium	ND	0.0242	1
Chromium	ND	ND	5
Lead	ND	ND	5
Selenium	ND	ND	1
Silver	ND	ND	5
Sulfur	ND	ND	NS
Cyanide	0.0085	0.0284	NS

**Notes:**

ND - Not detected at analytical detection limit.

TCLP - Toxicity Characteristic Leaching Procedure

Note - Numbers in bold exceed STARS Memo No. 1 soil cleanup objectives

Note - NYSDEC Spill Technology and Remediation Series (STARS) Memorandum No. 1: Hazardous Waste Regulatory Levels for Toxicity Characteristics.

Table 1  
Page (4 of 6)  
Hunt's Point Site E OU 2  
Berm Area Soil Sampling  
December 2002

HDR LMS Sample ID	B2-C1	B2-C2	B2-G1	B2-G2	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
Date Sampled	12/16/2002	12/16/2002	12/16/2002	12/16/2002	
<b>PCBs (mg/kg)</b>					
Aroclor-1016	ND	ND	ND	ND	1
Aroclor-1232	ND	ND	ND	ND	1
Aroclor-1242	ND	ND	ND	ND	1
Aroclor-1248	ND	ND	ND	<b>3.2</b>	1
Aroclor-1254	ND	ND	ND	ND	1
Aroclor-1260	<b>1.1</b>	1	<b>1.4</b>	<b>1.4</b>	1

**Notes:**

ND - Not Detected at the Reporting Limit.

Note - Numbers in bold exceed the Track 2 soil cleanup objective(s).

\* - NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria.

Table 1  
Page (5 of 6)  
Hunt's Point Site E OU 2  
Berm Area Soil Sampling  
December 2002

HDR LMS Sample ID Date Collected	B2-G3 12/16/02	B2-G3 TCLP 12/16/02	B2-G4 12/16/02	B2-G4 TCLP 12/16/02	B2-G5 12/16/02	B2-G5 TCLP 12/16/02	B2-G6 12/16/02	B2-G6 TCLP 12/16/02	B2-G7 12/16/02	B2-G7 TCLP 12/16/02	NYSDEC BCP Track 2 Restricted Use Soil Cleanup	NYSDEC STARS Memo No. 1	
<b>VOCs (mg/kg) / TCLP VOCs (mg/L)</b>													
Benzene	ND	ND	44	0.5									
Acetone	ND	ND	0.0034	ND	0.0025	ND	ND	ND	0.002	ND	500 <sup>a</sup>	NS	
Chloromethane	ND	ND	NS	NS									
Toluene	ND	ND	500 <sup>a</sup>	NS									
Styrene	ND	ND	500 <sup>a</sup>	NS									
Xylenes (total)	ND	ND	500 <sup>a</sup>	NS									
<b>% Moisture</b>	18.5	NA	16.2	NA	17.8	NA	14.9	NA	16.4	NA	NS	NS	
<b>% Solids</b>	81.5	NA	83.8	NA	82.2	NA	85.1	NA	83.6	NA	NS	NS	

HDR LMS Sample ID Date Collected	B2-G8 12/16/02	B2-G8 TCLP 12/16/02	B2-G9 12/16/02	B2-G9 TCLP 12/16/02	B2-G10 12/16/02	B2-G10 TCLP 12/16/02	B2-G11 12/16/02	B2-G11 TCLP 12/16/02	B2-G12 12/16/02	B2-G12 TCLP 12/16/02	NYSDEC BCP Track 2 Restricted Use Soil Cleanup	NYSDEC STARS Memo No. 1	
<b>VOCs (mg/kg) / TCLP VOCs (mg/L)</b>													
Benzene	ND	ND	0.0025	ND	ND	ND	ND	ND	ND	ND	44	0.5	
Acetone	ND	ND	ND	ND	0.0039	ND	0.0028	ND	0.0026	ND	500 <sup>a</sup>	NS	
Chloromethane	ND	ND	0.0019	ND	0.0012	ND	0.0013	ND	ND	ND	NS	NS	
Toluene	ND	ND	0.0025	ND	ND	ND	ND	ND	ND	ND	500 <sup>a</sup>	NS	
Styrene	ND	ND	0.0048	ND	ND	ND	ND	ND	ND	ND	500 <sup>a</sup>	NS	
Xylenes (total)	ND	ND	0.0015	ND	ND	ND	ND	ND	ND	ND	500 <sup>a</sup>	NS	
<b>% Moisture</b>	14.2	NA	14.4	NA	18.1	NA	17.3	NA	16.5	NA	NS	NS	
<b>% Solids</b>	85.8	NA	85.6	NA	81.9	NA	82.7	NA	83.5	NA	NS	NS	

**Notes:**

NA - Not Analyzed

ND - Not detected at analytical reporting limit.

NS - No standard or guidance value

TCLP - Toxicity Characteristic Leaching Procedure

Note - Numbers in bold exceed BCP Track 2 soil cleanup objectives

Note - Numbers highlighted gray exceed STARS Memo No. 1 soil cleanup objectives

Note - NYSDEC Spill Technology and Remediation Series (STARS) Memorandum No. 1: Hazardous Waste Regulatory Levels for Toxicity Characteristics

\* - NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria.

Table 1  
Page (6 of 6)  
Hunt's Point Site E OU 2  
Berm Area Soil Sampling  
December 2002

HDR/LMS Sample ID	B-1C	B-3C	B-4C	B-5C	B-6C	B-7C	NYSDEC STARS Memo No. 1
Date Collected	12/16/2002	12/16/2002	12/16/2002	12/16/2002	12/16/2002	12/16/2002	
<b>TCLP Metals (mg/L)</b>							
Arsenic	ND	ND	ND	ND	ND	ND	5
Barium	ND	ND	ND	0.463	ND	ND	100
Cadmium	ND	ND	ND	ND	ND	ND	1
Chromium	ND	ND	ND	ND	ND	ND	5
Lead	ND	ND	ND	ND	0.363	ND	5
Selenium	ND	ND	ND	ND	ND	ND	1
Silver	ND	ND	ND	ND	ND	ND	5
Mercury	ND	ND	ND	ND	ND	ND	0.2

**Notes:**

ND - Not detected at analytical detection limit.

TCLP - Toxicity Characteristic Leaching Procedure

Note - Numbers in bold exceed STARS Memo No. 1 soil cleanup objectives

Note - NYSDEC Spill Technology and Remediation Series (STARS) Memorandum No. 1: Hazardous Waste Regulatory Levels for Toxicity Characteristics.

## **FIELD SAMPLING ACTIVITIES**

HDR|LMS began this assignment by conducting a site inspection to identify the health and safety concerns for the Site, access limitations, layout of control areas, preparation of Site-specific health and safety plan, and confirmation of on-site utilities with respect to sampling locations. The site is relatively level with some debris piles scattered across the site. It is heavily vegetated with mainly small trees and brush, although some larger trees are present. Several small coal tar boils are visible at the surface primarily along the southern fence line of the site. Sampling activities consisted of the collection of fill, soil, soil gas, and groundwater samples, and the analysis of these samples.

### **Securing the Site**

Currently the Site is fenced on three sides (east, north, and south). The west side (end) of the Site has an access area which is enclosed within the Con Ed facility. The Con Ed facility has a guarded gate entrance which restricts access to the public (Figure 2). Arrangements with Con Ed had to be made in advance to assure access to the site.

### **Ground Penetrating Radar (GPR) Survey**

As part of the investigation, a Ground Penetrating Radar Survey was conducted on March 2<sup>nd</sup> 2005 at Site E OU-2. The purpose of the survey was to identify any structures present below the ground surface and to attempt to identify and delineate pockets of waste material resembling coal tar and/or purifier type wastes within the site.

The geophysical survey was performed by Sub-Surface Informational Surveys, Inc. The method of the survey involved a SIR-3000 (sub-surface interface radar) computer, power supply, graphic recorder, video monitor, and a transmitting/receiving antenna. The antenna transmits electromagnetic signals into the sub-surface and detects and amplifies the reflection of the signal into the graphic recorder and video monitor. The antenna is moved along the surface being surveyed and a radar image of that surface is produced. This equipment is limited by the amount of plastic soils and/or clay and RCP pipes present under the surface as their signatures blend into the surrounding geology. Penetration decreases as the conductivity of the soils increase. The limitation depth is also defined by the groundwater interface.

Due to the large amount of vegetation and debris on the parcel, select traverses had to be cleared to maintain an approximate 20' grid. In some instances traverses still had to be cut short (due to debris piles), but were picked up immediately on the other side of the obstruction.

A total of forty-seven (47) traverses ran in a general north/south direction covering the area of Site E OU-2. On the western most end of the surveyed area of Site E OU-2 there is a definitive upper soil interface at 4 ft below the surface representing a clear increase in the conductivity of the soil which appears to be caused by the presence of moisture in the soil or the capillary fringe of the water table. Over most of the rest of the surveyed area a different subsurface profile appears. At  $\pm$  16 ft in from the northern fence line at Food Center Drive a compacted subsurface interface begins at a depth of 8 ft and continues along the traverse to

approximately 50 ft. The middle 30+ ft of the traverse appears to be a fill with no parabolic features. This is common for fill that contains brick and/or ash type material within the soil. The depth to very moist soil and/or the water table in the surveyed area appears to be between 4 and 8 ft. Several unknown anomalies are present throughout the data at depths between 2 and 8 ft and combined with known utility maps allowed those areas to be avoided as the subsurface investigation continued.

## **GPS Survey**

The planned locations of the soil probes were digitized using GIS and a CAD survey file as a base map. The coordinates for the locations were then downloaded into a Trimble Pathfinder Pro XRS real-time Differential Global Positioning System (DGPS) with L-band satellite differential correction. The horizontal accuracy of DGPS is  $\pm 1$  meter. The probe locations and test pits were staked in the field using the DGPS. Final probe and test pit locations were resurveyed with DGPS to obtain final coordinates since some probes were offset due to debris piles limiting access to the proposed location. The locations of the monitoring well and piezometers were finalized with DGPS as well.

The purpose of the GPS Survey and coordination with the probe locations is to allow the cross sections and subsurface information generated for this report to be able to be followed and identified in the field at any point in the future. Any future remediation, construction or site activity may require excavation into existing waste and therefore it should be able to be identified without having to repeat the investigation. The GPS survey will allow exact locations to be relocated regardless of the amount of time that passes.

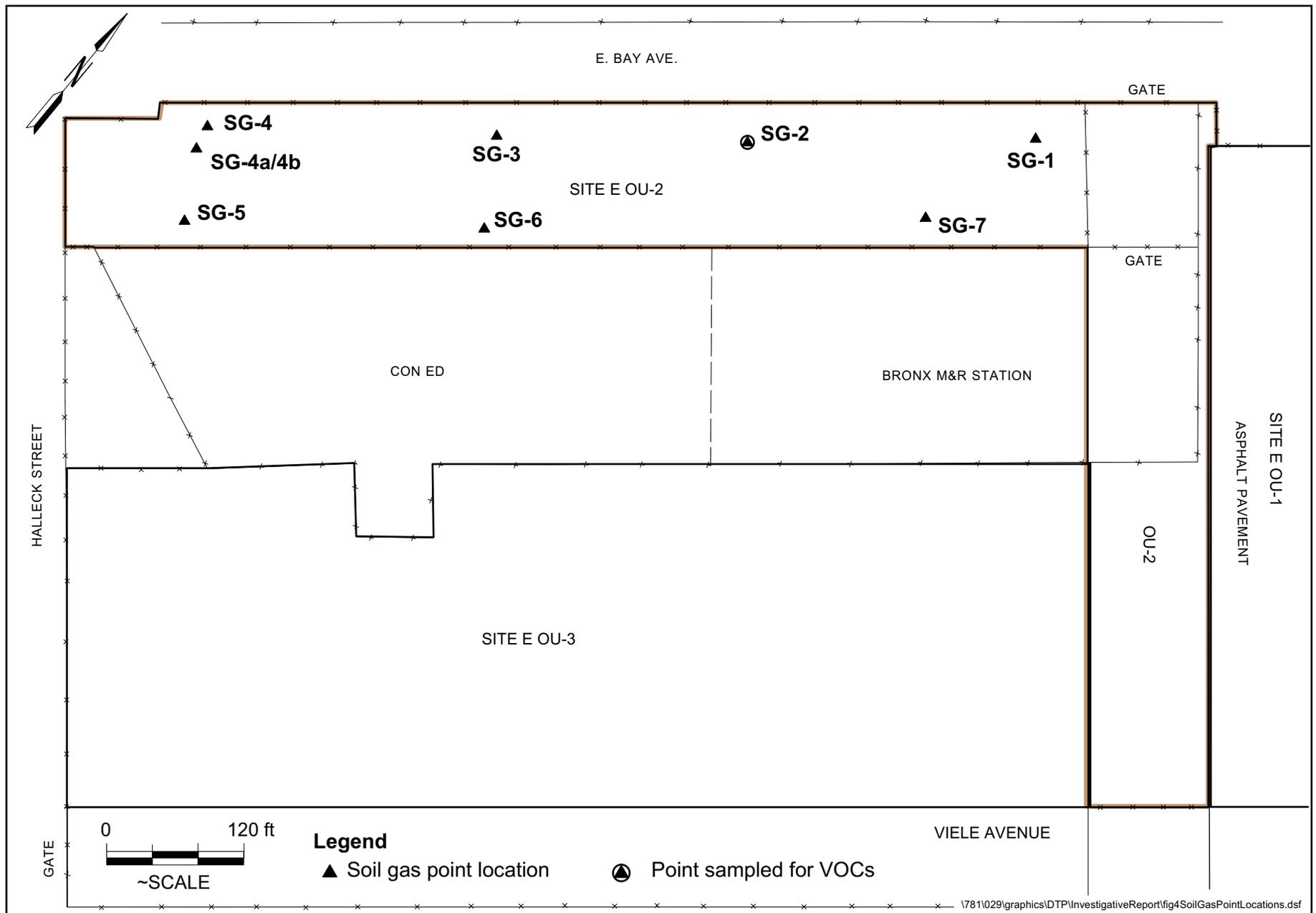
## **Soil Gas Point Installation and Sampling**

Initial soil gas point installation occurred on February 14<sup>th</sup> and 15<sup>th</sup> with seven (7) soil gas points being placed throughout Site E OU-2 (Figure 4). The points were hand driven to a depth of approximately 3 ft using the KV soil gas kit.

All soil gas points were first field screened using an air pump to fill a 1 liter Tedlar bag. The samples were analyzed using a PID, FID, and an ITX multi-gas meter that analyzed for the presence of Hydrogen Cyanide (HCN), Oxygen (O<sub>2</sub>), Hydrogen Sulfide (H<sub>2</sub>S), and lower explosive limit (LEL). The use of the Tedlar bag for the initial screening and was also done to ensure the integrity of the point, i.e. that the point was not installed in a saturated layer or would pull a vacuum when sampled. During this initial monitoring/purging all of the points were found to draw a vacuum except for SG-2.

SG-2 was sampled using 6 liter Summa canisters with pre-set 4 hour regulators and submitted for analysis of VOCs. Galson provided a SKC low-flow pump which was calibrated (using a BIOS DC-LITE 10 ml dry-cal) before and after sampling to establish the flow rate. Flow rates are needed to calculate the volume of gas that passed through the tubes. Samples were analyzed by Galson Laboratories (DOH ELAP #11626) and analyzed for VOCs using method T015.

Upon receiving notice of a new NYSDOH Soil Vapor Intrusion Guidance public comment draft issued in February 2005, a second round of soil gas points were installed. This new



round of point installation was performed using the draft guidance set forth by the NYSDOH. This new guidance required points to be set at a depth of 5 ft bgs or within 1 ft of the water table. To do this HDR|LMS used a subcontracted driller to mobilize a Geoprobe rig to probe to the proper depth of 5 ft. These new points were installed immediately adjacent to the initial points. The actual bottom in depth of the replacement points was varied due to moisture and/or saturated zones which prevent points the soil gas point from being sampled. Typical point installation included probing to the bottom depth, placing the point and tubing backfilling with approximately 3 ft of sand and topping it with granular bentonite to the surface. The tubing was sealed with modeling clay or a similar substance to prevent moisture or air infiltration from the surface.

The new points were not sampled pending the determination of the site end use (i.e. if no building or structures were proposed, there would be no issue with indoor vapor intrusion). Both the field blank (FB) as well as the successfully sampled point (SG-2) were found to contain very low overall VOC concentrations. Based on the proposed end use of the site as an open parking lot, the analysis is not warranted.

### **Test Pit Installation and Sampling**

The excavation of twenty (20) test pits was completed on site E OU-2 between April 12<sup>th</sup> and 13<sup>th</sup> 2005. A tire mounted backhoe was used to excavate small areas throughout the site to visually inspect the subsurface material and conditions of the site. The pits were generally 3 or 4 ft wide and less than 10 ft long depending on the final depth and were extended to the depth of groundwater or to a point where a clay confining layer was encountered (Figure 5).

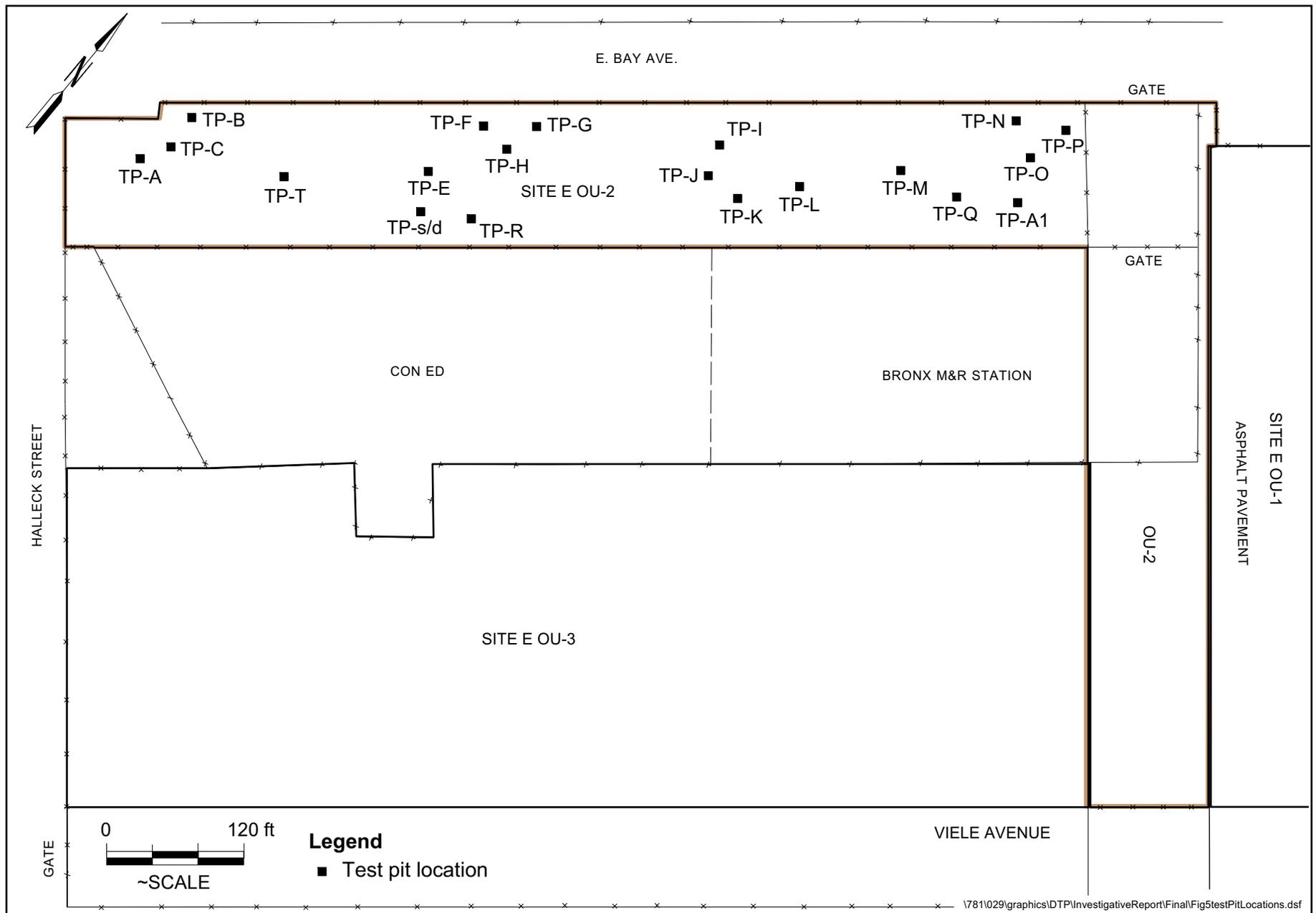
Fill excavated from the pits was screened using a photoionization detector (PID) and an ITX multi-gas meter which screened for the lower explosive limit (LEL), hydrogen cyanide (HCN), hydrogen sulfide (H<sub>2</sub>S), and Oxygen (O<sub>2</sub>). Activities and observations were logged and documented by on-site HDR|LMS geologists (Attachment A).

Samples from the pits were collected from a specific interval exhibiting the most obvious, visual signs of contamination (worst case). These samples were submitted as waste samples for analysis for SVOCs, metals, pesticides, PCBs, nitrogen, amenable cyanide, total cyanide, sulfur, total organic halides, and diesel range organics. VOC samples were collected as grab samples from an interval with the highest reading on the PID during screening of the excavated material. All pits were backfilled when sampling was completed.

Typically, a 1-2 ft thick layer of sandy topsoil/fill overlays fill that could be generally characterized as typical of MGP byproducts (ash and cinders) and which vary in thickness across the site, but is generally 5 to 7 ft thick. Groundwater was generally encountered in the pits below the fill material on top of the native clay whose depth varies from 7-12 ft bgs.

### **Probe and Temporary Piezometer Installation and Soil Sampling**

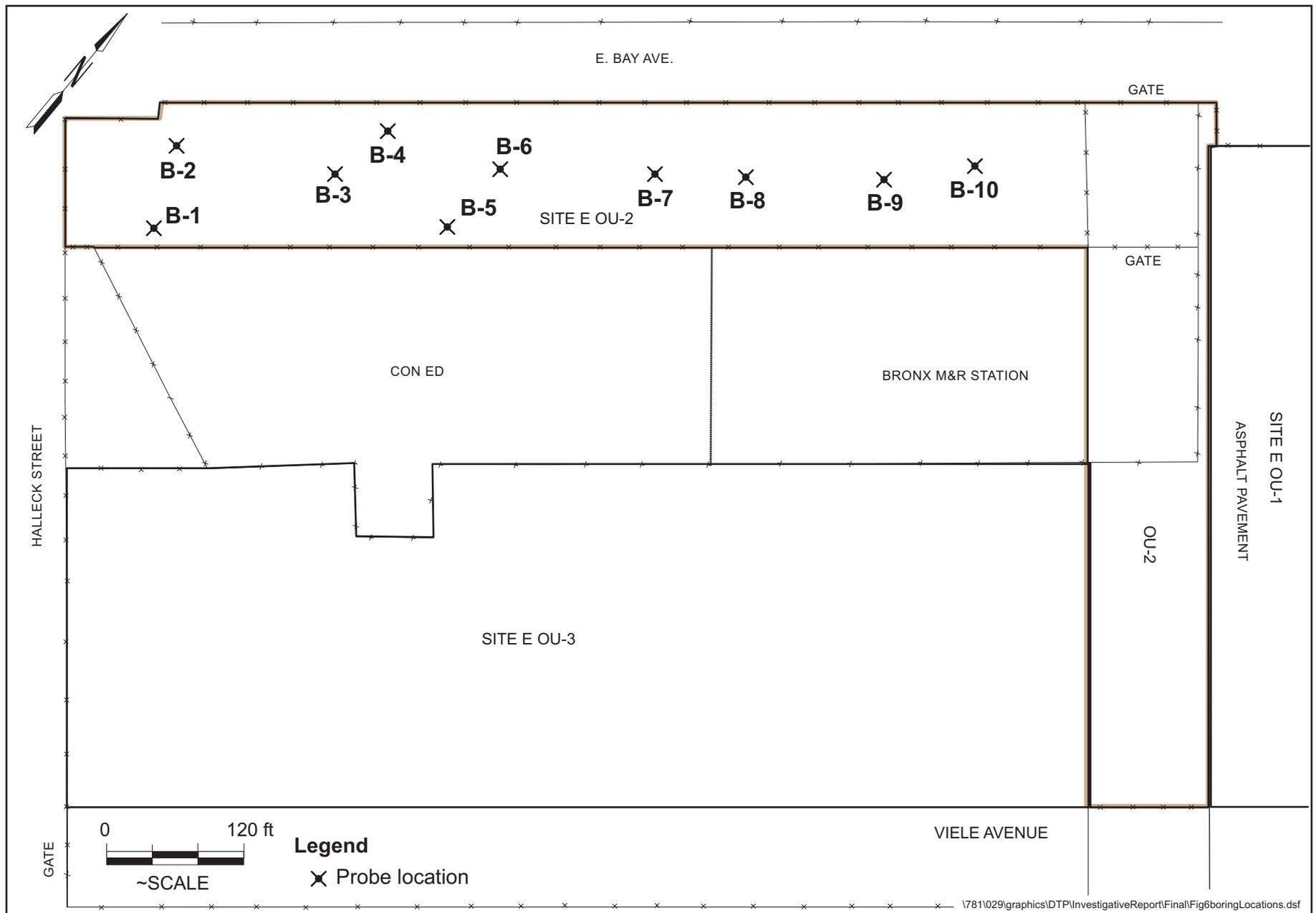
Ten (10) test probes were advanced across the site using the direct push/probe drilling method. Due to inconsistent site surface conditions the probe drill rig was mounted on an all terrain vehicle to allow for site access. Each probe was advanced to the bottom of the fill and/or to a native confining layer (clay).



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**Test Pit Locations**  
 Hunts Point • Site E OU-2

**Figure**  
**5**



Sampling was performed in continuous 4 to 5 ft intervals from grade to the bottom of the boring so the fill material could be observed. Each soil and fill sample is described on a probe log (Attachment A). The logs detail the color, material type, composition, relative grain size and distribution, presence of free moisture, evidence of contamination, and any other distinctive characteristics. Each sampling interval was screened using PID and HCN meters and the instrument readings were recorded on the probe logs.

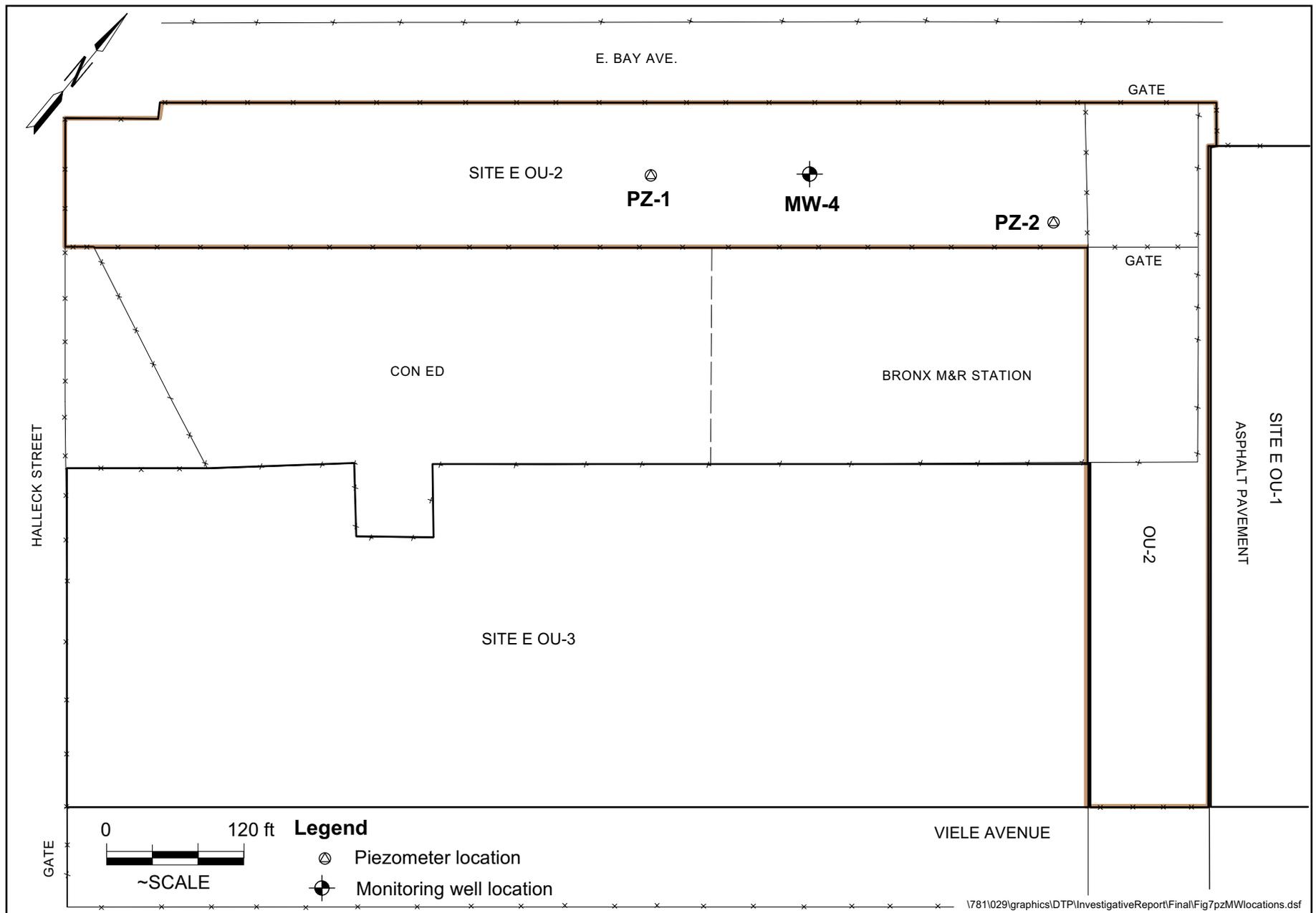
Following completion of each probe, the area was backfilled to grade using cuttings or clean sand. A GPS location survey was done and a generalized probe location map was prepared (Figure 6).

Soil/fill sampling for the probes was completed with both grab and composite sampling techniques. Ten (10) probes were advanced, of those nine (9) were sampled and submitted as soil/fill samples (B-1, B-2, B-3, B-4, B-5, B-6, B-7, B-9, and B-10). These nine (9) samples consisted mainly of black slag material and sand and were submitted for analysis for VOCs, SVOCs, PCBs, pesticides, RCRA metals, and total cyanides. One additional sample (B-8) containing coal tar type waste was also collected and submitted for the above analysis as well as ammonia, sulfur, nitrogen, diesel range organics, and total organic halides. This sample consisted of a mixture of coal tar type waste. The VOC portion of the analyses for each sample was collected from the interval exhibiting the highest PID reading. The remaining analyses listed above were run on a sample collected and submitted as a composite of the entire probe interval.

Groundwater quality was assessed using 2 temporary piezometers. The piezometers were installed on the eastern two-thirds of the Site to cover as much of the down-gradient area as possible. In addition, their locations were determined by site conditions observed in the GPR survey and test probes. Although the site is long and rectangular, for purposes of placement, the assumed groundwater flow direction is towards the Bronx River.

Piezometers were installed using direct push/probe drilling methods and tools. Since the purpose was to be able to measure and sample the shallow groundwater, they were advanced approximately 5 ft into the water table as it was identified during the installation. The piezometers were placed in boring holes and their logs describe and indicate where and at what depth the piezometers were placed. The material in the probe was examined and described on logs (Attachment A) to include color, material type and composition, relative grain size and distribution, presence of free moisture, evidence of contamination, and any other distinctive characteristics. Sampling of fill material was continuous from grade to the bottom of the probe in order to identify both the fill native material interface as well as groundwater depth in relation to both.

Each piezometer was constructed using 5 ft of 2-in. inside diameter (I.D.) Schedule 40 PVC with 0.010-in. slot screen and solid riser to grade. The piezometers were backfilled using #2 Morie sand to 2 ft above the top of the screen with a 2 ft bentonite seal, the remainder of the annulus of the probe was back filled with cuttings from the probe or clean sand to grade. Each point was then located using GPS and located on the site map prepared (Figure 7).



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### Piezometer and Monitoring Well Locations

Hunts Point • Site E OU-2

Figure  
7

The piezometers were purged after completion to remove loose sediment that was a result of the installation. This purging process could also be considered as a light development similar to what monitoring wells are subjected to. The piezometer was permitted to stabilize for a week after purging/development to allow groundwater to stabilize. Low flow sampling techniques were used to collect groundwater samples from the piezometers to minimize turbidity. The procedure included using dedicated tubing and a low flow pump to limit turbulence. Groundwater samples were collected from each piezometer and analyzed for VOCs, SVOCs (total and filtered), metals (total and filtered), cyanide (total and filtered), and pesticides/PCBs. Results of this analysis are discussed later in this report.

After completion, the elevation at the top of casings for each piezometer was surveyed. Static water level measurements were taken at each piezometer and a groundwater contour map illustrating the direction of groundwater flow was created (Figure 8). Figure 8 illustrates the mathematically calculated direction of groundwater flow on-site. The main factor that may influence the direction of groundwater flow on site is the presence of a relatively continuous layer of peat or clay that has been found under much of the Hunt's Point Market area and under this site as well. This low permeable layer undulates and varies in thickness but helps maintain a thin shallow perched water layer above it. On OU-2 the clay is relatively shallow and varies between 6 and 9 ft below grade. Perched groundwater likely follows the dips of the clay formation and accumulates in low points. Based on the simple mathematical elevation change, groundwater is noted to have a gradient in the east-northeast direction towards the Bronx River.

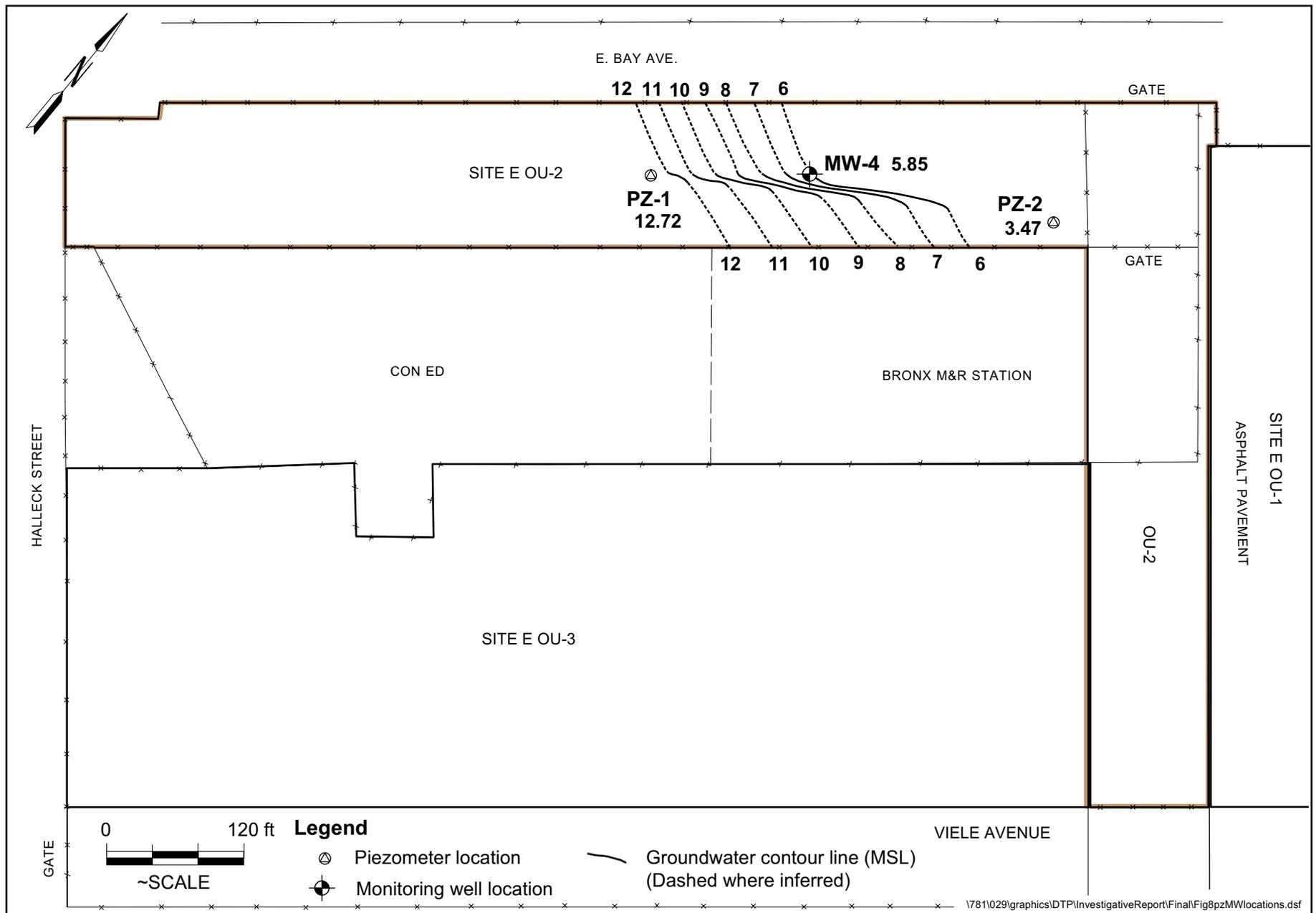
### **Coal Tar Waste Delineation**

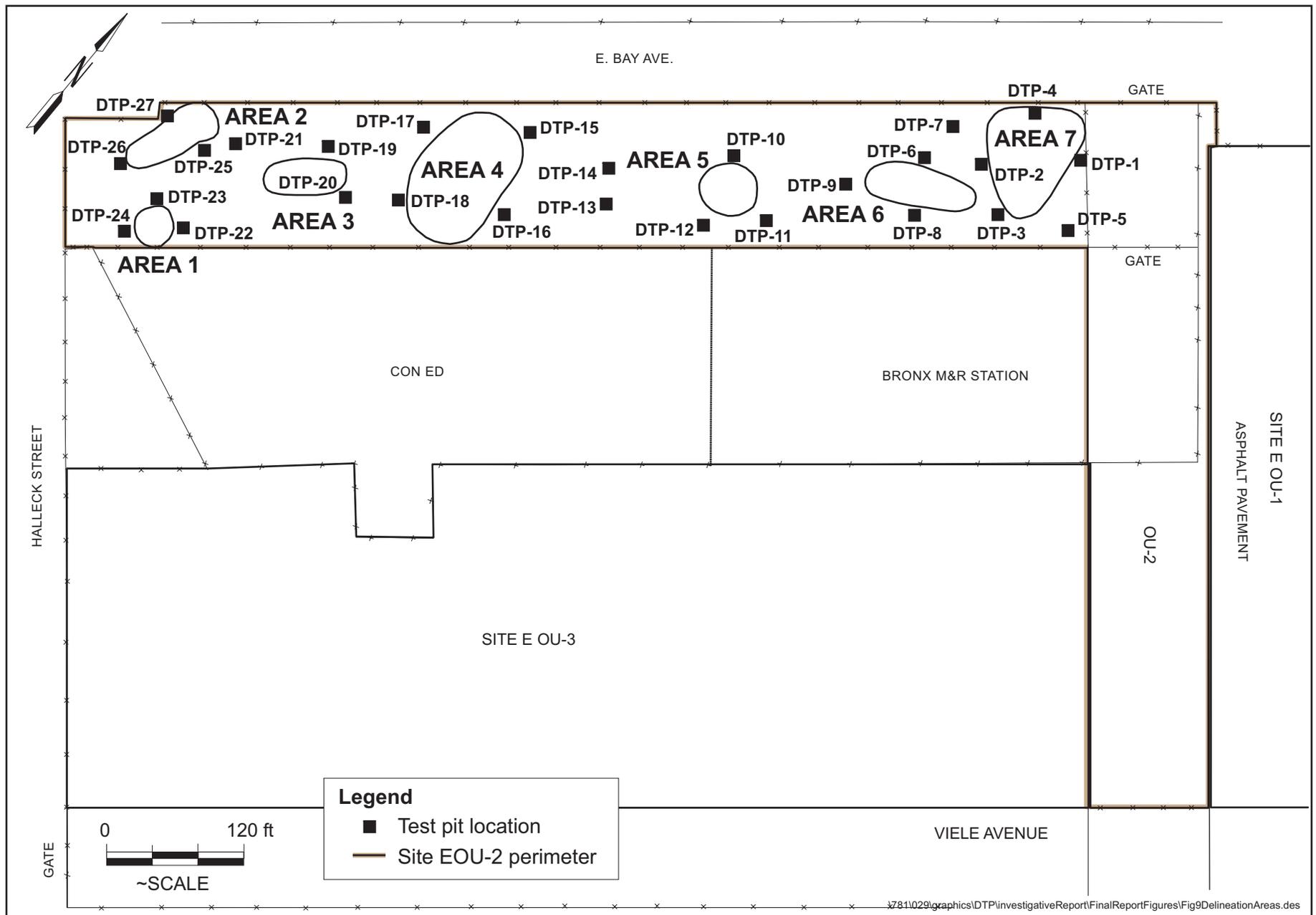
Based upon the comments received March 16, 2006 from NYSDEC on the Draft Investigative Report for E OU-2, HDR|LMS performed a coal tar waste delineation in April 2006 to supplement the results of the site investigation. Twenty-seven (27) test pits were installed and the material observed was found to contain coal tar wastes, purifier wastes as well as soil and cinders that appeared to be saturated with petroleum hydrocarbons. These areas are referred to as "hot spots".

In order to assess the amount of material that must be removed from the site, HDR|LMS conducted the delineation of areas designated as "hot spots". Seven (7) areas of the site were designated for further delineation. The areas consist of boring, test pit, and soil gas locations where the material observed during installation was characterized as coal tar or petroleum saturated material (Figure 9).

Delineation activities consisted of further test pitting in the seven (7) locations shown on Figure 9, collection of waste characterization soil samples from a sidewall of one to two test pits for each of the seven delineation areas. Following the delineation of each location, each area was remarked using GPS so the material can be found precisely, and be re-excavated and removed at a later date.

The excavation of twenty-seven (27) test pits was completed on site E OU-2 between April 10<sup>th</sup> and 13<sup>th</sup>, 2006. A tire mounted backhoe was used to excavate small areas throughout the site to visually inspect the subsurface material and conditions of the site. The pits were





\\7811029\graphics\DTP\InvestigativeReport\FinalReportFigures\Fig9DelineationAreas.des



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### Coal Tar Waste Delineation Areas and Test Pit Locations

Hunts Point • Site E OU-2

Figure  
9

generally 2 or 3 ft wide and less than 7 ft long depending on the final depth and were extended to the depth of groundwater or to a point where a clay confining layer was encountered.

Fill excavated from the pits was screened using a photoionization detector (PID). Activities and observations were logged and documented by on-site HDR/LMS geologists (Attachment A).

Samples from the pits were collected from specific intervals exhibiting the most obvious visual signs of contamination (worst case). These samples were submitted as waste samples for analysis for VOCs, SVOCs, metals, pesticides, PCBs, total cyanide, gasoline range organics, and diesel range organics. All pits were backfilled when sampling was completed.

Typically, a 1-2 ft thick layer of sandy topsoil/fill overlays fill that could be generally characterized as typical of MGP byproducts (coal tar waste, purifier waste, ash and cinders) and which vary in thickness across the site but is generally 5 to 7 ft thick. Groundwater was generally encountered in the pits above or within the fill material.

## **LABORATORY DATA**

The following sections summarize the sampling data collected during the investigation. The summaries and associated data tables highlight the chief constituents of concern. The full laboratory reports are included as Attachment B.

### **Soil Gas Sampling Results**

Six (6) of the original seven (7) Soil Gas points were found to have been installed in material that was too tight to allow air flow. SG-2 was successfully sampled. The soil gas samples were collected and submitted for analysis for VOCs and collected using 6-liter Summa canisters labeled with the date and time of sampling. The points that were installed subsequent to this were not sampled after the proposed end use was determined to be an open air parking lot and no buildings would be constructed. The analytical results of the sample and field blank are summarized and included as Table 2.

Overall VOC concentrations are elevated. SG-2 contains several compounds above the EPA Region III RBC based guidelines for ambient air. The total concentration of VOCs for SG-2 is 4,344  $\mu\text{g}/\text{m}^3$ . This includes exceedances of Benzene, Xylenes, Carbon Disulfide, and 1,3,5 and 1,2,4 – Trimethylbenzene.

The data is useable as presented by the laboratory. The field blank was found to contain low levels of several compounds suggesting background influence or contamination of the sample in the field (Attachment C).

### **Test Pit Sampling Results**

Soil samples collected from test pits were submitted for laboratory analysis. The material sampled contained both soil/fill (cinders, coal ash) and coal tar type waste. Samples were

Table 2  
Page (1 of 3)  
Hunt's Point Site E OU 2  
Soil Gas Sampling  
Volatile Organic Compound Data Summary  
(ppbv)

Sample ID Lab Sample ID Date Sampled	SG-2 609447 2/28/2005	FB 609448 2/28/2005	NIOSH (TWA)	OSHA (TWA)
<b>VOCs (ppbv)</b>				
Dichlorodifluoromethane	ND	0.66	4950	4950
Chloromethane	ND	0.51	Ca	20.7
Trichlorofluoromethane	ND	0.24	5620	5620
Benzene	140	0.44	0.319	3.19
Toluene	240	1	375	754
Ethylbenzene	44	ND	435	435
Xylene (m,p)	160	0.46	435	435
Xylene (o)	87	ND	435	435
1,3,5-Trimethylbenzene	32	ND	125	NV
1,2,4-Trimethylbenzene	58	ND	125	NV
Carbon Disulfide	7.8	ND	3	62.2
4-Ethyltoluene	33	ND	--	--
2,2,4-Trimethylpentane	ND	0.23	--	--
n-Hexane	ND	0.38	180	1800
Xylene (total)	250	0.46	435	435
<b>Total VOCs</b>	1,052	4		

**Notes:**

- ND - Indicates the compound was not detected at the method detection limit.
- FB - Field Blank
- Ca - Carcinogen
- NV - No value
- mg/m<sup>3</sup> - milligrams per cubic meter
- NIOSH - National Institute of Occupational Safety and Health
- OSHA - Occupational Safety and Health Administration
- TWA - time weighted average
- TWAs provided for propylene are actually for propane due to the potential coelution of these compounds
- Some TWAs were converted from ppm to mg/m<sup>3</sup> for consistency with other data presented in this table.
- Note - All concentrations are in parts per billion by volume (ppbv).
- Note - Only those compounds that were detected are shown on this table. All other compounds were below the method detection limit for that specific compound.
- Note - Acetone result may be biased high due to coelution with 2-methylbutane
- Note - Propylene results may be biased high due to coelution with propane.
- Note - All samples were analyzed by Galson Laboratories of East Syracuse, New York (DOH ELAP #11626).

Table 2  
Page (2 of 3)  
Hunt's Point Site E OU 2  
Soil Gas Sampling  
Volatile Organic Compound Data Summary  
(mg/m<sup>3</sup>)

Sample ID Lab Sample ID Date Sampled	SG-2 609447 2/28/2005	FB 609448 2/28/2005	NIOSH (TWA)	OSHA (TWA)
<b>VOCs (mg/m<sup>3</sup>)</b>				
Dichlorodifluoromethane	ND	0.003267	4950	4950
Chloromethane	ND	0.0010557	Ca	20.7
Trichlorofluoromethane	ND	0.0013488	5620	5620
Benzene	0.4466	0.0014036	0.319	3.19
Toluene	0.9048	0.00377	375	754
Ethylbenzene	0.19096	ND	435	435
Xylene (m,p)	0.6944	0.0019964	435	435
Xylene (o)	0.37758	ND	435	435
1,3,5-Trimethylbenzene	0.15744	ND	125	NV
1,2,4-Trimethylbenzene	0.28536	ND	125	NV
Carbon Disulfide	0.024258	ND	3	62.2
4-Ethyltoluene	0.15972	ND	--	--
2,2,4-Trimethylpentane	ND	0.0010741	--	--
n-Hexane	ND	0.0013414	180	1800
Xylene (total)	1.085	0.0019964	435	435
<b>Total VOCs</b>	4.326118	0.017253	--	--

**Notes:**

- ND - Indicates the compound was not detected at the method detection limit.
- FB - Field Blank
- Ca - Carcinogen
- NV - No value
- mg/m<sup>3</sup> - milligrams per cubic meter
- NIOSH - National Institute of Occupational Safety and Health
- OSHA - Occupational Safety and Health Administration
- TWA - time weighted average
- TWAs provided for propylene are actually for propane due to the potential coelution of these compounds
- Some TWAs were converted from ppm to mg/m<sup>3</sup> for consistency with other data presented in this table.
- Note - All concentrations are in parts per billion by volume (ppbv).
- Note - Only those compounds that were detected are shown on this table. All other compounds were below the method detection limit for that specific compound.
- Note - Acetone result may be biased high due to coelution with 2-methylbutane
- Note - Propylene results may be biased high due to coelution with propane.
- Note - All samples were analyzed by Galson Laboratories of East Syracuse, New York (DOH ELAP #11626).

Table 2  
Page (3 of 3)  
Hunt's Point Site E OU 2  
Soil Gas Sampling  
Volatile Organic Compound Data Summary  
(ug/m<sup>3</sup>)

Sample ID Lab Sample ID Date Sampled	SG-2 609447 2/28/2005	FB 609448 2/28/2005	NIOSH (TWA)	OSHA (TWA)	EPA Region III
<b>VOCs (µg/m<sup>3</sup>)</b>					
Dichlorodifluoromethane	ND	3.3	4950	4950	180
Chloromethane	ND	1.1	Ca	20.7	95
Trichlorofluoromethane	ND	1.3	5620	5620	730
Benzene	<b>450</b>	<b>1.4</b>	0.319	3.19	0.23
Toluene	900	3.8	375	754	4200
Ethylbenzene	190	ND	435	435	1100
Xylene (m,p)	<b>690</b>	2	435	435	110
Xylene (o)	<b>380</b>	ND	435	435	110
1,3,5-Trimethylbenzene	<b>160</b>	ND	125	NV	6.2
1,2,4-Trimethylbenzene	<b>290</b>	ND	125	NV	6.2
Carbon Disulfide	<b>24</b>	ND	3	62.2	730
4-Ethyltoluene	160	ND			NS
2,2,4-Trimethylpentane	ND	1.1			NS
n-Hexane	ND	1.3	180	1800	210
Xylene (total)	<b>1100</b>	2	435	435	110
<b>Total VOCs</b>	<b>4,344</b>	17			

**Notes:**

- ND - Indicates the compound was not detected at the method detection limit.
- FB - Field Blank
- Ca - Carcinogen
- NV - No value
- mg/m<sup>3</sup> - milligrams per cubic meter
- NIOSH - National Institute of Occupational Safety and Health
- OSHA - Occupational Safety and Health Administration
- TWA - time weighted average
  - TWAs provided for propylene are actually for propane due to the potential coelution of these compounds
  - Some TWAs were converted from ppm to mg/m<sup>3</sup> for consistency with other data presented in this table.
- Note - All concentrations are in parts per billion by volume (ppbv).
- Note - Only those compounds that were detected are shown on this table. All other compounds were below the method detection limit for that specific compound.
- Note - Acetone result may be biased high due to coelution with 2-methylbutane
- Note - Propylene results may be biased high due to coelution with propane.
- Note - All samples were analyzed by Galson Laboratories of East Syracuse, New York (DOH ELAP #11626).
- Note - EPA Region III: RBC based Table 4

Table 3  
Page (1 of 5)  
Hunt's Point Site E OU 2  
Test Pit Soil Sampling  
Volatile Organic Compound Data Summary  
April 2005

HDR LMS Sample ID Lab Sample ID Date Sampled	TP-N (3.5-5.4') D0423-01 4/12/2005 DF 20:1	TP-F (2.5-4.6') D0423-02 4/12/2005 DF 20:1	TP-C (1-5.5') D0423-03 4/13/2005 DF 20:1	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
<b>VOCs (mg/kg)</b>				
Methylene chloride	1.8 J	1.7 J	1.6 J	500 <sup>a</sup>
Benzene	ND	ND	29	44
Toluene	ND	ND	50	500 <sup>a</sup>
Ethylbenzene	2.3 J	2.8 J	18	390
m,p-Xylene	2.1 J	2.8 J	56	NS
o-Xylene	2.4 J	3.2 J	30	NS
Xylene (total)	4.5 J	5.9 J	86	500 <sup>a</sup>
Isopropylbenzene	ND	ND	1.8 J	NS
1,3,5-Trimethylbenzene	1.4 J	2.3 J	12	190
1,2,4-Trimethylbenzene	4.3 J	6.1 J	38	190
4-Isopropyltoluene	ND	ND	1.4 J	NS
Naphthalene	270 [DF 40:1]	<b>620 [DF 100:1]</b>	<b>2,000 [DF 400:1]</b>	500 <sup>a</sup>

**Notes:**

J - Analyte detected below quantitation limits.

DF - Dilution Factor (e.g., 10:1)

ND - Not Detected at the reporting limit

NS - No Standard

Note - Numbers in bold exceed the Track 2 soil cleanup objective(s).

a - The SCOs for commercial use were capped at a maximum value of 500 ppm (refer to NYSDEC TSD Section 9.3).

\* - NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria.

Table 3  
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Hunt's Point Site E OU 2  
Test Pit Soil Sampling  
Semi-Volatile Organic Compound Data Summary  
April 2005

HDR LMS Sample ID Lab Sample ID Date Sampled	TP-N (3.5-5.4') D0423-01 4/12/2005	TP-F (2.5-4.6') D0423-02 4/12/2005	TP-C (1-5.5') D0423-03 4/13/2005	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
<b>SVOCs (mg/kg)</b>				
Phenol	0.52 JG	ND	2.9 J	500 <sup>a</sup>
2-Methylphenol	ND	ND	35	NS
4-Methylphenol	0.46 JG	ND	53	NS
Naphthalene	<b>710 G [DF 10:1]</b>	170 G [DF 3:1]	<b>4,800 G [DF 100:1]</b>	500 <sup>a</sup>
2-Methylnaphthalene	47 G	9 G	1,200 G [DF 100:1]	NS
Acenaphthylene	24 G	10 G	<b>520 G [DF 100:1]</b>	500 <sup>a</sup>
Acenaphthene	91 G [DF 10:1]	31 G	140 JG [DF 100:1]	500 <sup>a</sup>
Dibenzofuran	84 G [DF 10:1]	30 G	<b>430 G [DF 100:1]</b>	350
Fluorene	140 G [DF 10:1]	50 G	<b>780 G [DF 100:1]</b>	500 <sup>a</sup>
Phenanthrene	500 G [DF 10:1]	180 G [DF 3:1]	<b>2,900 G [DF 100:1]</b>	500 <sup>a</sup>
Anthracene	120 G [DF 10:1]	44 G	<b>740 G [DF 100:1]</b>	500 <sup>a</sup>
Carbazole	54 G	30 G	280 G [DF 100:1]	NS
Fluoranthene	270 G [DF 10:1]	130 G [DF 3:1]	<b>1,500 G [DF 100:1]</b>	500 <sup>a</sup>
Pyrene	300 G [DF 10:1]	150 G [DF 3:1]	<b>1,700 G [DF 100:1]</b>	500 <sup>a</sup>
Benzo(a)anthracene	<b>110 G [DF 10:1]</b>	<b>64 G</b>	<b>670 G [DF 100:1]</b>	5.6
Chrysene	<b>100 G [DF 10:1]</b>	51 G	<b>660 G [DF 100:1]</b>	56
Benzo(b)fluoranthene	<b>120 G [DF 10:1]</b>	<b>59 G</b>	<b>530 G [DF 100:1]</b>	5.6
Benzo(k)fluoranthene	47 G	24 G	<b>260 G [DF 100:1]</b>	56
Benzo(a)pyrene	<b>89 G [DF 10:1]</b>	<b>45 G</b>	<b>500 G [DF 100:1]</b>	1 <sup>b</sup>
Dibenzo(a,h)anthracene	<b>9.1 G</b>	<b>5.1 G</b>	<b>41 G</b>	0.56
Benzo(g,h,i)perylene	25 G	15 G	230 JG [DF 100:1]	500 <sup>a</sup>

**Notes:**

J - Analyte detected below quantitation limits.

DF - Dilution Factor e.g., 10:1.

ND - Not Detected at the Reporting Limit.

NS - No Standard.

Note - Numbers in bold exceed the Track 2 soil cleanup objective(s).

a - The SCOs for commercial use were capped at a maximum value of 500 ppm (refer to NYSDEC TSD Section 9.3).

b - For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the DEC/DOH rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.

\* - NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria.

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Hunt's Point Site E OU 2  
Test Pit Soil Sampling  
Heavy Metals Data Summary  
April 2005

HDR/LMS Sample ID Lab Sample ID Date Sampled	TP-N (3.5-5.4')	TP-F (2.5-4.6')	TP-C (1-5.5')	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
	D0423-01 4/12/2005	D0423-02 4/12/2005	D0423-03 4/13/2005	
<b>RCRA Metals (mg/kg)</b>				
Arsenic	<b>47.6</b>	<b>26.9</b>	14.3	16 <sup>a</sup>
Barium	128	101	50.4	400
Cadmium	0.77	ND	ND	9.3
Chromium	21.6	24.2	14.8	1500 <sup>b</sup>
Lead	323	253	88.4	1000
Selenium	1.9 B	0.84 B	0.69 B	1500
Silver	ND	0.23 B	ND	1500
Mercury	1.5	1.6	0.61	2.8 <sup>c</sup>
Cyanide	<b>55.4</b>	<b>171</b>	<b>30.9</b>	27 <sup>b</sup>

**Notes:**

- B - Analyte detected below quantitation limit
- ND - Not Detected at the Reporting Limit.
- NS - No Standard.

Note - Numbers in bold exceed the Track 2 soil cleanup objective(s).

a - For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the DEC/DOH rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.

b - The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.

c - This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts) (refer to NYSDEC TSD table 5.6-1).

\* - NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria.

Table 3  
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Hunt's Point Site E OU 2  
Test Pit Soil Sampling  
Pesticides and Polychlorinated Biphenyl Data Summary  
April 2005

HDR LMS Sample ID Lab Sample ID Date Sampled	TP-N (3.5-5.4') D0423-01 4/12/2005	TP-F (2.5-4.6') D0423-02 4/12/2005	TP-C (1-5.5') D0423-03 4/13/2005	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
<b>Pesticides (mg/kg)</b>	<i>DF 10:1</i>	<i>DF 5:1</i>	<i>DF 5:1</i>	
alpha-BHC	ND G	ND G	0.011 PG	3.4
beta-BHC	ND G	ND G	0.47 G [DF 50:1]	3
delta-BHC	0.04 G	ND G	0.024 PG	500 <sup>a</sup>
Heptachlor epoxide	0.032 PG	0.017 PG	ND G	15
Dieldrin	0.016 JPG	ND G	0.023 G	1.4
4,4'-DDE	0.053 G	0.015 JPG	0.033 PG	62
4,4'-DDD	ND G	ND G	0.068 PG	92
4,4'-DDT	0.12 G	0.03 PG	0.2 PG	47
Endrin	0.13 G	ND G	ND G [DF 50:1]	89
Endosulfan II	ND G	ND G	0.046 PG	200 <sup>b</sup>
Endosulfan sulfate	0.081 PG	ND G	ND G	200 <sup>b</sup>
Methoxychlor	0.26 PG	0.056 JPG	1 PG	NS
Endrin ketone	0.1 PG	0.037 PG	0.29 PG	NS
Endrin aldehyde	0.058 G	0.028 G	0.19 G	NS
alpha-Chlordane	ND G	ND G	0.014 PG	24
gamma-Chlordane	0.2 G	ND G	0.34 G [DF 50:1]	NS
<b>PCBs (mg/kg)</b>	<i>DF 2:1</i>	<i>DF 2:1</i>	<i>DF 2:1</i>	
Aroclor-1254	0.33 P	0.27 P	ND	1

**Notes:**

- J - Analyte detected below quantitation limits.
  - P - Pesticide/Aroclor target analyte has > 25% difference for the detected concentrations between the two GC columns.
  - G - Value considered estimated based on Data Quality Review - see Attachment B
  - DF - Dilution Factor (e.g., 10:1)
  - ND - Not Detected at the Reporting Limit.
  - NS - No Standard.
- Note - Numbers in bold exceed the Track 2 soil cleanup objective(s).
- a - The SCOs for commercial use were capped at a maximum value of 500 ppm (refer to NYSDEC TSD Section 9.3).
  - b - This SCO is for the sum of Endosulfan I, Endosulfan II and Endosulfan Sulfate.
- \* - NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria.

Table 3  
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Hunt's Point Site E OU 2  
Test Pit Soil Sampling  
Additional Analyses Data Summary  
April 2005

HDR LMS Sample ID Lab Sample ID Date Sampled	TP-N (3.5-5.4')	TP-F (2.5-4.6')	TP-C (1-5.5')	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
	D0423-01 4/12/2005	D0423-02 4/12/2005	D0423-03 4/13/2005	
<b>Additional Analyses (mg/kg)</b>				
Ammonia as N	220	260	390	NS
Amenable Cyanide	ND G	45	20 G	NS
Sulfur	ND	ND	ND	NS
Total Organic Halides	ND	ND	ND	NS
Diesel Range Organics	6,400 G [DF 50:1]	4,900 G [DF 50:1]	52,000 G [DF 1000:1]	NS

**Notes:**

- G - Value considered estimated based on Data Quality Review - see Attachment B
- DF - Dilution Factor (e.g., 10:1)
- ND - Not Detected at the Reporting Limit.
- NS - No Standard.

collected in laboratory-supplied containers, labeled with the appropriate sample identification, date and time of sampling, and analysis required. They were all delivered to the New York State Department of Health certified laboratory under sealed chain of custody.

The analytical results for the test pit soil samples are included as Table 3. The samples were a mixture of soil/fill and coal tar contaminated waste collected from the most visually contaminated layers of the pit. The VOC sample was a grab collected from the portion of the pit exhibiting the highest PID reading, visual staining, or odor. A description of some of the results follows.

*Volatile Organic Compounds (VOCs):* Test pit samples submitted for analysis for VOCs were typically found to have detectable compound concentrations lower than NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria. Only the compound of Naphthalene was determined to be above the Track 2 limits in two of the test pit samples (TP-F and TP-C). Each of the test pit samples submitted for analysis of VOCs had to be diluted because of the high concentrations of Naphthalene (Attachment C); the data is usable.

*Semi-Volatile Organic Compounds (SVOCs):* SVOC concentrations were determined to be significant in all three (3) test pit samples. Compounds associated with the presence of coal tar type waste were detected at levels in excess of the NYSDEC BCP Track 2 SCOs (refer to Table 3). Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene, and Dibenzo(a,h)anthracene were found to exceed NYSDEC BCP Track 2 SCOs in all test pit samples. Other compounds were also reported above NYSDEC BCP Track 2 SCOs in one or two test pit samples. Given the fact that the collection of samples were from areas where the most visually contaminated material existed, these results are not surprising. Based upon the worst case sampling there appears to be areas of residual contamination, however the actual levels do not represent significant MGP waste contamination.

As noted in the Data Usability Summary Report (DUSR), many of the sample results for SVOCs should be considered as estimates based on the high levels of several target analytes in the samples (Attachment C). The estimated concentrations are still useful as they show the relative magnitude of those compounds in the media being analyzed. The estimated non-detects are also useful in showing that elevated levels of those compounds are not present in the media being analyzed.

*Diesel range organics (DROs):* DRO concentrations were also ran to provide background for some potential disposal options. The analytical results will be useful assisting preliminary potential disposal options. The DRO scan does not necessarily apply to NYSDEC BCP Track 2 SCOs but does indicate that there is a significant percentage of fuel range organics present. The results for diesel range organics should be considered estimates based on the high concentrations of hydrocarbons in the sample.

*Metals:* The concentrations of metals in the three (3) test pit soil samples were very similar for all of the samples (refer to Table 3). All three (3) samples had levels of Cyanide in

excess of the NYSDEC BCP Track 2 SCOs. Two (2) of the samples (TP-F and TP-C) had levels of Arsenic in excess of the NYSDEC BCP Track 2 SCOs. The metals reported exceeding the NYSDEC BCP Track 2 SCOs are also found in relation to coal and coal ash waste. The cyanide results are flagged indicating that their spike recoveries were not within control limits. For this reason the cyanide results are considered estimated but still useful when assessing the relative magnitude of the compound (Attachment C).

*Pesticides/PCBs:* Analysis results for these compounds were typical representations of samples that were analyzed from other sites within the former MGP facility (Parcels A, B, C, and D). Pesticides have not typically been encountered in concentrations that would impact site use or remedy. PCBs have typically also not been encountered in concentrations that impact treatment or handling. The sample results showed sparse and low concentrations of pesticides as well as trace concentrations of PCB isomer 1254 at a level that is below the NYSDEC BCP Track 2 SCOs. Neither of these groupings is present in concentrations that are expected to impact potential remedies.

Many of the recoveries for pesticide compounds and PCB aroclors were outside of their QC criteria. The laboratory cited matrix interference from the presence of hydrocarbons as the likely cause of the failed QC criteria (Attachment C). The pesticide and PCB results should be considered highly estimated based on this interference. The data is still useable in demonstrating the relative magnitude of a compound or that those compounds found to be non-detect are not present in the media being analyzed in high concentration.

### **Soil Probe Sampling Results**

Soil samples submitted for laboratory analysis were collected from probes that contain soil/fill or coal tar waste. Samples were collected in laboratory-supplied containers, labeled with the appropriate sample identification, date and time of sampling, and analysis required.

The analytical results for the soil probe samples were composites of soil/fill collected from the most visually contaminated layers of selected probe locations with the exception of the sample for VOC analysis which was collected from the portion of the probe exhibiting the highest PID reading, visual staining, or odor. Essentially, the sample collection methodology was devised to provide worst case analyses for comparison to criteria in order to allow the formulation of a remedial approach.

*Volatile Organic Compounds (VOCs):* Two (2) of the ten (10) soil boring samples were found to contain concentrations of Naphthalene above the NYSDEC BCP Track 2 SCOs (B-1 and B-6). Trace concentrations of Naphthalene, Carbon Disulfide, Benzene, Toluene and 1,2,4-Trimethylbenzene were also detected, however were concluded to be far below NYSDEC BCP Track 2 SCOs. The presence of Naphthalene was expected for it is typically found in association with coal tar waste (refer to Table 4). All of the probe samples submitted for analysis for VOCs had to be diluted because of the high concentration of Naphthalene (Attachment C).

*Semi-Volatile Organic Compounds:* All ten (10) soil boring samples contained several concentrations of compounds in exceedance of the NYSDEC BCP Track 2 SCOs.

Table 4  
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Hunt's Point Site E OU 2  
Soil Borings  
Volatile Organic Compound Data Summary  
March 2005

HDR LMS Sample ID	B-1 (2-2.5')	B-2 (1.8-2.3')	B-3 (5.8-6.3')	B-4 (3.8-4.3')	B-5 (2.1-2.6')	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
Lab Sample ID	D0342-03A	D0342-01A	D0342-05A	D0342-07A	D0342-09A	
Date Sampled	3/22/2005	3/22/2005	3/22/2005	3/22/2005	3/22/2005	
	DF 1000:1	DF 50:1	DF 100:1	DF 10:1	DF 40:1	
<b>VOCs (mg/kg)</b>						
Carbon disulfide	ND	ND	ND	0.71 J	ND	NS
Benzene	ND	ND	ND	ND	ND	44
Toluene	ND	ND	ND	ND	ND	500 <sup>a</sup>
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	190
Naphthalene	<b>3100</b>	220	290	55	170	500 <sup>a</sup>

HDR LMS Sample ID	B-6 (2.2-2.7')	B-7 (2.0-2.5')	B-8 (2.2-2.5')	B-9 (1.5-2.0')	B-10 (3.3-3.8')	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
Lab Sample ID	D0342-11A	D0342-13A	D0342-19A	D0342-17A	D0342-15A	
Date Sampled	3/22/2005	3/22/2005	3/23/2005	3/23/2005	3/23/2005	
	DF 100:1	DF 40:1	DF 100:1	DF 5:1	DF 100:1	
<b>VOCs (mg/kg)</b>						
Carbon disulfide	ND	ND	ND	ND	ND	NS
Benzene	ND	ND	ND	0.32 J	ND	44
Toluene	ND	ND	ND	0.34 J	ND	500 <sup>a</sup>
1,2,4-Trimethylbenzene	ND	ND	ND	0.31 J	ND	190
Naphthalene	<b>530</b>	140	340	56	310	500 <sup>a</sup>

**Notes:**

DF - Dilution Factor (e.g., 10:1)

ND - Not Detected at the reporting limit

NS - No Standard

Note - Numbers in bold exceed the Track 2 soil cleanup objective(s).

a - The SCOs for commercial use were capped at a maximum value of 500 ppm (refer to NYSDEC TSD Section 9.3).

\* - NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria.

Table 4  
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Hunt's Point Site E OU 2  
Soil Borings  
Semi-Volatile Organic Compound Data Summary  
March 2005

HDR/LMS Sample ID Lab Sample ID Date Sampled	B-1 (0-11") D0342-04A 3/22/2005 DF 5:1	B-2 (0-9.4") D0342-02A 3/22/2005 DF 10:1	B-3 (0-10.3") D0342-06A 3/22/2005 DF 10:1	B-4 (0-5") D0342-08A 3/22/2005 DF 10:1	B-5 (0-6.6") D0342-10A 3/22/2005 DF 10:1	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
<b>SVOCs (mg/kg)</b>						
Phenol	ND	1.7 J	ND	ND	0.78 J	500 <sup>a</sup>
4-Methylphenol	ND	1.3 J	ND	ND	1 J	NS
2,4-Dimethylphenol	ND	ND	ND	ND	0.48 J	NS
Naphthalene	28 G	320 G [DF 100:1]	160 G [DF 40:1]	36 G	130 G [DF 40:1]	500 <sup>a</sup>
2-Methylnaphthalene	7.3 G	96 G [DF 100:1]	11 G	14 G	22 G	NS
Acenaphthylene	7.2 G	35 g	26 G	33 G	15 G	500 <sup>a</sup>
Acenaphthene	0.92 JG	67 G [DF 100:1]	9.6 G	7.1 G	19 G	500 <sup>a</sup>
Dibenzofuran	4.6 G	100 G [DF 100:1]	28 G	12 G	30 G	350
Fluorene	7.7 G	170 G [DF 100:1]	48 G	39 G	54 G	500 <sup>a</sup>
Phenanthrene	22 G	570 G [DF 100:1]	190 G [DF 40:1]	210 G [DF 40:1]	190 G [DF 40:1]	500 <sup>a</sup>
Anthracene	7.4 G	150 G [DF 100:1]	51 G	52 G	50 G	500 <sup>a</sup>
Carbazole	2.9 G	66 G [DF 100:1]	20 G	10 G	22 G	NS
Fluoranthene	22 G	420 G [DF 100:1]	180 G [DF 40:1]	190 G [DF 40:1]	160 G [DF 40:1]	500 <sup>a</sup>
Pyrene	19 G	310 G [DF 100:1]	140 G [DF 40:1]	190 G [DF 40:1]	120 G [DF 40:1]	500 <sup>a</sup>
Benzo(a)anthracene	<b>11 G</b>	<b>170 G [DF 100:1]</b>	<b>89 G [DF 40:1]</b>	<b>100 G [DF 40:1]</b>	<b>66 G</b>	5.6
Chrysene	11 G	<b>140 G [DF 100:1]</b>	<b>74 G [DF 40:1]</b>	<b>94 G [DF 40:1]</b>	56 G	56
Bis(2-ethylhexyl)phthalate	ND G	ND G	ND G	ND G	ND G	NS
Benzo(b)fluoranthene	<b>13 G</b>	<b>160 G [DF 100:1]</b>	<b>100 G [DF 40:1]</b>	<b>120 G [DF 40:1]</b>	<b>67 G</b>	5.6
Benzo(k)fluoranthene	5.7 G	53 G	37 G	38 G	28 G	56
Benzo(a)pyrene	<b>11 G</b>	<b>140 G [DF 100:1]</b>	<b>84 G [DF 40:1]</b>	<b>91 G [DF 40:1]</b>	<b>52 G</b>	1 <sup>b</sup>
Indeno(1,2,3-cd)pyrene	<b>4.6 G</b>	<b>44 G</b>	<b>31 G</b>	<b>31 G</b>	<b>22 G</b>	5.6
Dibenzo(a,h)anthracene	<b>1.6 JG</b>	<b>14 G</b>	<b>10 G</b>	<b>10 G</b>	<b>7.4 G</b>	0.56
Benzo(g,h,i)perylene	4.5 G	44 G	32 G	32 G	23 G	500 <sup>a</sup>

**Notes:**

J - Analyte detected below quantitation limits.

G - Galue considered estimated based on Data Quality Review - see Attachment B

DF - Dilution Factor e.g., 10:1.

ND - Not Detected at the Reporting Limit.

NS - No Standard.

Note - Numbers in bold exceed the Track 2 soil cleanup objective(s).

a - The SCOs for commercial use were capped at a maximum value of 500 ppm (refer to NYSDEC TSD Section 9.3).

b - For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the DEC/DOH rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.

\* - NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria.

Table 4  
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Hunt's Point Site E OU 2  
Soil Borings  
Semi-Volatile Organic Compound Data Summary  
March 2005

HDR/LMS Sample ID Lab Sample ID Date Sampled	B-6 (0-9.5') D0342-12A 3/22/2005 DF 10:1	B-7 (0-9.5') D0342-14A 3/22/2005	B-8 (0-5.7') D0342-20A 3/23/2005 DF 10:1	B-9 (0-5') D0342-18A 3/23/2005 DF 10:1	B-10 (0-11.7') D0342-16A 3/23/2005 DF 10:1	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
<b>SVOCs (mg/kg)</b>						
Phenol	ND	ND	ND	ND	ND	500 <sup>a</sup>
4-Methylphenol	ND	ND	ND	ND	ND	NS
2,4-Dimethylphenol	ND	ND	ND	ND	ND	NS
Naphthalene	82 G [DF 40:1]	5.9 G	19 G	51 G	130 G [DF 40:1]	500 <sup>a</sup>
2-Methylnaphthalene	30 G	1 G	4.9 G	19 G	11 G	NS
Acenaphthylene	11 G	0.56 G	13 G	39 G	17 G	500 <sup>a</sup>
Acenaphthene	17 G	1.2 G	5 G	21 G	32 G	500 <sup>a</sup>
Dibenzofuran	24 G	2.5 G	11 G	24 G	30 G	350
Fluorene	48 G	4.2 G	22 G	55 G	58 G	500 <sup>a</sup>
Phenanthrene	170 G [DF 40:1]	14 G [DF 4:1]	96 G [DF 40:1]	210 G [DF 40:1]	170 G [DF 40:1]	500 <sup>a</sup>
Anthracene	37 G	3.4 G	28 G	73 G	47 G	500 <sup>a</sup>
Carbazole	18 G	2.1 G	8.9 G	17 G	20 G	NS
Fluoranthene	130 G [DF 40:1]	12 G [DF 4:1]	110 G [DF 40:1]	190 G [DF 40:1]	120 G [DF 40:1]	500 <sup>a</sup>
Pyrene	110 G [DF 40:1]	7.8 G [DF 4:1]	87 G [DF 40:1]	170 G [DF 40:1]	100 G [DF 40:1]	500 <sup>a</sup>
Benzo(a)anthracene	<b>54 G</b>	<b>4.8 G</b>	<b>51 G</b>	<b>98 G [DF 40:1]</b>	<b>58 G</b>	5.6
Chrysene	54 G	4.2 G	44 G	<b>97 G [DF 40:1]</b>	54 G	56
Bis(2-ethylhexyl)phthalate	ND	0.06 JG	ND	ND	ND	NS
Benzo(b)fluoranthene	<b>58 G</b>	4.8 G	<b>56 G</b>	<b>110 G [DF 40:1]</b>	<b>56 G</b>	5.6
Benzo(k)fluoranthene	28 G	2.1 G	22 G	34 G	25 G	56
Benzo(a)pyrene	<b>46 G</b>	<b>3.5 G</b>	<b>44 G</b>	<b>86 G [DF 40:1]</b>	<b>47 G</b>	1 <sup>b</sup>
Indeno(1,2,3-cd)pyrene	<b>16 G</b>	1.8 G	<b>19 G</b>	<b>33 G</b>	<b>18 G</b>	5.6
Dibenzo(a,h)anthracene	<b>5.4 G</b>	<b>0.6 G</b>	<b>6.8 G</b>	<b>10 G</b>	<b>6.6 G</b>	0.56
Benzo(g,h,i)perylene	17 G	1.8 G	18 G	34 G	19 G	500 <sup>a</sup>

**Notes:**

J - Analyte detected below quantitation limits.

G - Galue considered estimated based on Data Quality Review - see Attachment B

DF - Dilution Factor e.g., 10:1.

ND - Not Detected at the Reporting Limit.

NS - No Standard.

Note - Numbers in bold exceed the Track 2 soil cleanup objective(s).

a - The SCOs for commercial use were capped at a maximum value of 500 ppm (refer to NYSDEC TSD Section 9.3).

b - For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the DEC/DOH rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.

\* - NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria.

Table 4  
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Hunt's Point Site E OU 2  
Soil Borings  
Heavy Metals Data Summary  
March 2005

HDR LMS Sample ID Lab Sample ID Date Sampled	B-1 (0-11') D0342-04 3/22/2005	B-2 (0-9.4') D0342-02 3/22/2005	B-3 (0-10.3') D0342-06 3/22/2005	B-4 (0-5') D0342-08 3/22/2005	B-5 (0-6.6') D0342-10 3/22/2005	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
<b>RCRA Metals (mg/kg)</b>						
Arsenic	17.4	6.4	7	15.2	12.8	16 <sup>a</sup>
Barium	78.9	69.7	76.6	129	91.3	400
Cadmium	0.17 B	0.73	0.17 B	0.5	0.091 B	9.3
Chromium	18.8	5.7	26.3	23.3	19.2	1500 <sup>b</sup>
Lead	95.1	111	101	329	154	1000
Selenium	3.7	2	1.4 B	5.1	4.7	1500
Silver	ND	ND	0.5 B	ND	ND	1500
Mercury	0.76	0.47	0.51	2.1	0.79	2.8 <sup>c</sup>
Cyanide	1.5 NG	6 NG	29.3 NG	14 NG	30.3 NG	27 <sup>b</sup>

HDR LMS Sample ID Lab Sample ID Date Sampled	B-6 (0-9.5') D0342-12 3/22/2005	B-7 (0-9.5') D0342-14 3/22/2005	B-8 (0-5.7') D0342-20 3/23/2005	B-9 (0-5') D0342-18 3/23/2005	B-10 (0-11.7') D0342-16 3/23/2005	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
<b>RCRA Metals (mg/kg)</b>						
Arsenic	9.8	10.2	20.6	23.4	11.1	16 <sup>a</sup>
Barium	145	194	255	199	232	400
Cadmium	1.8	0.24 B	1.1	0.67	0.66	9.3
Chromium	24.1	21.8	21.9	31.1	18.4	1500 <sup>b</sup>
Lead	346	307	500	418	551	1000
Selenium	3.7	4.4	8.3	6.1	5.6	1500
Silver	ND	ND	ND	ND	ND	1500
Mercury	0.88	2.4	2.4	1.7	3.1	2.8 <sup>c</sup>
Cyanide	47.5 NG	0.93 BNG	16.5 NG	26.7 NG	60.2 NG	27 <sup>b</sup>

**Notes:**

B - Analyte detected below quantitation limit

N - Spiked sample recovery not within control limits.

G - value considered estimated based on Data Quality Review - see Attachment B

ND - Not Detected at the Reporting Limit.

NS - No Standard.

Note - Numbers in bold exceed the Track 2 soil cleanup objective(s).

a - For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the DEC/DOH rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.

b - The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.

c - This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts) (refer to NYSDEC TSD table 5.6-1).

\* - NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria.

Table 4  
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Hunt's Point Site E OU 2  
Soil Borings  
Pesticide and Polychlorinated Biphenyl Data Summary  
March 2005

HDR LMS Sample ID Lab Sample ID Date Sampled	B-1 (0-11') D0342-04A 3/22/2005	B-2 (0-9.4') D0342-02A 3/22/2005	B-3 (0-10.3') D0342-06A 3/22/2005	B-4 (0-5') D0342-08A 3/22/2005	B-5 (0-6.6') D0342-10A 3/22/2005	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
<b>Pesticides (mg/kg)</b>	<i>DF 5:1</i>	<i>DF 5:1</i>	<i>DF 5:1</i>	<i>DF 5:1</i>	<i>DF 5:1</i>	
beta-BHC	ND G	ND G	ND G	ND G	ND G	3
Heptachlor epoxide	ND G	0.011 PG	ND G	0.02 G	ND G	15
4,4'-DDD	ND G	ND G	ND G	0.048 PG	ND G	92
Endosulfan sulfate	ND G	ND G	0.033 PG	ND G	ND G	200 <sup>a</sup>
4,4'-DDT	0.035 PG	ND G	ND G	ND G	ND G	47
Endrin ketone	ND G	ND G	0.066 PG	ND G	ND G	NS
Endrin aldehyde	0.028 PG	0.027 PG	0.047 PG	0.052 PG	0.039 PG	NS
<b>PCBs (mg/kg)</b>						
Aroclor-1254	ND	ND	ND	0.23 PG	0.54 PG	1
Aroclor-1260	0.067 G	0.22 G	0.11 G	0.14 G	0.18 G	1

HDR LMS Sample ID Lab Sample ID Date Sampled	B-6 (0-9.5') D0342-12A 3/22/2005	B-7 (0-9.5') D0342-14A 3/22/2005	B-8 (0-5.7') D0342-20A 3/23/2005	B-9 (0-5') D0342-18A 3/23/2005	B-10 (0-11.7') D0342-16A 3/23/2005	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
<b>Pesticides (mg/kg)</b>	<i>DF 5:1</i>	<i>DF 5:1</i>	<i>DF 5:1</i>	<i>DF 5:1</i>	<i>DF 5:1</i>	
beta-BHC	ND	0.029 PG	ND	ND	ND	3
Heptachlor epoxide	ND	ND	ND	ND	ND	15
4,4'-DDD	ND	ND	ND	ND	ND	92
Endosulfan sulfate	ND	ND	ND	ND	ND	200 <sup>a</sup>
4,4'-DDT	ND	ND	ND	ND	ND	47
Endrin ketone	ND	ND	ND	ND	ND	NS
Endrin aldehyde	0.036 PG	ND	0.033 PG	0.024 PG	0.028 PG	NS
<b>PCBs (mg/kg)</b>						
Aroclor-1254	1.2 G	ND	ND	0.49 G	0.49 G	1
Aroclor-1260	ND	ND	1.1 G	0.13 PG	0.22 G	1

**Notes:**

P - Pesticide/Aroclor target analyte has > 25% difference for the detected concentrations between the two GC columns.

G - value considered estimated based on Data Quality Review - see Attachment B

DF - Dilution Factor (e.g., 10:1)

ND - Not Detected at the Reporting Limit.

NS - No Standard.

Note - Numbers in bold exceed the Track 2 soil cleanup objective(s).

<sup>a</sup> - This SCO is for the sum of Endosulfan I, Endosulfan II and Endosulfan Sulfate.

\* - NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria.

Table 4  
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Hunt's Point Site E OU 2  
Soil Borings  
Additional Analyses Data Summary  
March 2005

<b>HDR LMS Sample ID</b>  <b>Lab Sample ID</b> <b>Date Sampled</b>	<b>B-8 (0-5.7')</b> <b>D0342-20</b> <b>3/23/2005</b>	<b>NYSDEC BCP</b> <b>Track 2 Restricted Use</b> <b>Soil Cleanup Objectives</b> <b>(Commercial) *</b>
<b>Additional Analyses (mg/kg)</b> Ammonia as N Amenable Cyanide Sulfur Total Organic Halides Diesel Range Organics	42 ND G ND ND 2800 G [DF 100:1]	NS NS NS NS NS

**Notes:**

- G - Value considered estimated based on Data Quality Review - see Attachment B
- DF - Dilution Factor (e.g., 10:1)
- ND - Not Detected at the Reporting Limit.
- NS - No Standard.

However, concentrations were within ranges typically seen from similar material sampled as part of projects in the vicinity and a significant number of the compounds were within acceptable criteria limits. The compounds exhibiting the highest concentrations include, Benzo(a)anthracene, Chrysene, Benzo(a)pyrene, Benzo(b)fluoranthene, and Benzo(k)fluoranthene. The samples containing the highest total SVOC concentrations (B-2, B-4, and B-9) were located in areas containing either purifier waste or visibly impacted soil (refer to Table 4).

As noted in the Data Usability Summary Report (DUSR), many of the sample results for SVOCs should be considered estimates based on the high levels of many of the target analytes in the samples (Attachment C). The estimated concentrations are still useful as they show the relative magnitude of those compounds in the media being analyzed. The estimated non-detects are also useful in showing that elevated levels of those compounds are not present in the media being analyzed.

*Diesel range organics (DROs):* DROs were also ran to provide background for some potential disposal options. The analytical results did not indicate the petroleum content would be overly restrictive for material disposal. The result for the sample submitted for diesel range organics (B-8) should be considered an estimate based on the high concentration of hydrocarbons in the sample.

*Metals:* Six (6) of the ten (10) samples were reported to contain metals above NYSDEC BCP Track 2 SCOs. Arsenic concentrations exceeded by less than one magnitude in three (3) samples (B-1, B-8 and B-9). Cyanide concentrations exceeded by one to two magnitudes in three (3) other samples (B-5, B-6 and B-10). One (1) sample also exhibited a minor exceedence of the Mercury SCO (B-10).

As noted in the Data Usability Summary Report (DUSR) (Attachment C), all of the cyanide MS recoveries in the boring samples were outside of control limits. Spike recoveries were also outside control limits for cyanide, and sample results are considered estimates. The estimated concentrations are useable as reported as well as show the relative magnitude of the compound in the sample.

*Pesticides/PCBs:* PCB isomers 1254 and/or 1260 were detected at minimal concentrations in every sample. No PCBs were reported in exceedance of the NYSDEC BCP Track 2 SCOs. Pesticides were also detected at minimal concentrations in every sample, including Endrin aldehyde in all but one sample (B-7). All pesticide concentrations were determined to be well below NYSDEC BCP Track 2 SCOs. Other pesticides detected at minimal concentrations in the samples include, Beta-BHC (B-7), Heptachlor epoxide (B-2 and B-4), 4,4'-DDD (B-4), Endosulfan sulfate (B-3), 4,4'-DDT (B-1), and Endrin ketone (B-3) (refer to Table 4). All four (4) samples containing more than one pesticide compound (B-1, B-2, B-3, and B-4) were located in areas containing significant percentages of slag and cinder material.

Surrogate, MS, and MSD recoveries for virtually all pesticide/PCB samples were outside QC criteria. LCS recoveries, used to show lab can analyze in a clean matrix, were within control limits. Therefore, matrix interference (likely from presence of hydrocarbons) is the likely

source of failed QC controls. The pesticide and PCB results are considered highly estimated, but are still useable as reported and are useful in determining the relative magnitude of the pesticide/PCB compounds in the samples (Attachment C).

## **Groundwater Sampling Results**

The subsurface investigation of Site E OU-2 also included the installation and sampling of two (2) piezometers. An existing monitoring well (MW-4) was also utilized for groundwater sampling in the investigation.

After installation, the piezometers were first purged or lightly developed to lower the turbidity in the well in addition to ensuring the presence of formation water in the well for sampling. After allowing the wells to stabilize for a week, the piezometers were sampled for VOCs, SVOCs (total and filtered), metals (total and filtered), cyanides (total and filtered), PCBs, and pesticides. The piezometers were also monitored for several parameters during sampling and a record of the results is provided in Attachment D.

Samples were collected with dedicated sampling equipment and transferred to laboratory-supplied containers, labeled with the appropriate sample identification, date and time of sampling, and analysis required.

Overall, the shallow groundwater quality was not found to have been degraded by the overlying material to a degree that would necessitate treatment or remediation. Although there were several SVOC compounds inorganic analytes above class GA criteria, the groundwater in the entire area is not now used nor are there plans to use it as a resource. The results of the samples analyzed are summarized below as well as in Table 5.

*Volatile Organic Compounds (VOCs):* No compounds were detected in either MW-4 or PZ-1. One VOC, Naphthalene, was reported in PZ-2 at a concentration of 3 µg/l. This was below the class GA Drinking Water Standard.

The Data Usability Summary Report (DUSR) shows that the VOC analysis of all the groundwater recoveries were within QC requirements and the data is useable as reported by the laboratory (Attachment C).

*Semi-Volatile Organic Compounds (SVOCs):* There were no compounds detected in MW-4 or PZ-1 in either the filtered or unfiltered samples. Several SVOCs were reported in estimated concentrations in the unfiltered PZ-2 sample, each was below the quantitation limit. Three (3) of the compounds were reported above guidance values. It should be noted that no SVOCs were reported in the filtered PZ-2 sample. All samples submitted for analysis of SVOCs were within their QC requirements with the exception of a two LCS (laboratory control spike). They were slightly low but require no qualification to the data (Attachment C).

*Metals:* Several metals exceeded the NYS GW standards in each sample, filtered and unfiltered. Iron, Manganese and Sodium are over the NYS GW standards in every sample.

Table 5  
Page (1 of 4)  
Hunt's Point Site E OU 2  
Groundwater Sampling  
Volatile Organic Compounds Data Summary  
May 2005

Sample ID Lab Sample Number Date Collected	MW-4 DO593-02A 5/19/2005	PZ-1 DO593-03A 5/19/2005	PZ-2 DO593-01A 5/19/2005	NYSDEC Class GA Standards <sup>(b)</sup>
<b>VOCs (ug/L)</b>				
Vinyl Chloride	ND	ND	ND	2
Bromomethane	ND	ND	ND	5
Chloroethane	ND	ND	ND	5
Acetone	ND	ND	ND	50 GV
Carbon Disulfide	ND	ND	ND	60 GV
Methylene Chloride	ND	ND	ND	5
Methyl tert-butyl ether	ND	ND	ND	10
Vinyl acetate	ND	ND	ND	N/A
2-Butanone	ND	ND	ND	50
Chloroform	ND	ND	ND	7
Benzene	ND	ND	ND	1
Toluene	ND	ND	ND	5
Ethylbenzene	ND	ND	ND	5
m,p-Xylene	ND	ND	ND	5
o-Xylene	ND	ND	ND	5
Xylene (total)	ND	ND	ND	5
Naphthalene	ND	ND	3 J	10
1,2,3-Trichlorobenzene	ND	ND	ND	5
Total VOCs	ND	ND	3	

**Note:**

(b) - This value applies to the total of all organic substances listed in the New York State Groundwater Effluent Limitations table from the Division of Water Technical and Operational Guidance Series (1.1.1) with a groundwater effluent limitation less than 100 ug/l.

- Division of Water Technical and Operational Guidance Series (1.1.1) June 1998.

GV - Value taken from NYSDEC Class GA Guidance Value.

J - Estimated concentration; compound present below quantitation limit.

N/A - Not applicable.

ND - Not detected at analytical reporting limit.

Note - Numbers in bold exceed standard.

Table 5  
Page (2 of 4)  
Hunt's Point Site E OU 2  
Groundwater Sampling  
Semi-Volatile Organic Compounds Data Summary  
May 2005

Sample ID Lab Sample ID Date Collected	MW-4 DO593-02B 5/19/2005	MW-4F D0593-02E 5/19/2005	PZ-1 D0593-03B 5/19/2005	PZ-1F DO593-03B 5/19/2005	PZ-2 DO593-01B 5/19/2005	PZ-2F DO593-01E 5/19/2005	NYSDEC Class GA Standards <sup>(b)</sup>
<b>SVOCs (ug/L)</b>							
Naphthalene	ND	ND	ND	ND	4 J	ND	10 GV
2-Methylnaphthalene	ND	ND	ND	ND	2 J	ND	N/A
Fluorene	ND	ND	ND	ND	2 J	ND	50 GV
Phenanthrene	ND	ND	ND	ND	5 J	ND	50 GV
Anthracene	ND	ND	ND	ND	1 J	ND	50 GV
Fluoranthene	ND	ND	ND	ND	4 J	ND	50 GV
Pyrene	ND	ND	ND	ND	4 J	ND	50 GV
Benzo(a)anthracene	ND	ND	ND	ND	<b>2 J</b>	ND	.002 GV
Chrysene	ND	ND	ND	ND	<b>2 J</b>	ND	.002 GV
Benzo(b)fluoranthene	ND	ND	ND	ND	<b>2 J</b>	ND	.002 GV
Benzo(a)pyrene	ND	ND	ND	ND	1 J	ND	ND
Total SVOCs	ND	ND	ND	ND	29	ND	

**Note:**

- (b) - This value applies to the total of all organic substances listed in the New York State Groundwater Effluent Limitations table from the Division of Water Technical and Operational Guidance Series (1.1.1) with a groundwater effluent limitation less than 100 ug/l.
- Division of Water Technical and Operational Guidance Series (1.1.1) June 1998.
- GV - Value taken from NYSDEC Class GA Guidance Value.
- J - Estimated concentration; compound present below quantitation limit.
- N/A - Not applicable.
- ND - Not detected at analytical reporting limit.
- Note - Numbers in bold exceed standard.

Table 5  
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Hunt's Point Site E OU 2  
Groundwater Sampling  
Heavy Metals Data Summary  
May 2005

Sample ID Lab Sample ID Date Collected	MW-4 D0593-01 5/19/2005	MW-4F D0593-01 5/19/2005	PZ-1 D0593-03 5/19/2005	PZ-1F D0593-03 5/19/2005	PZ-2 D0593-01 5/19/2005	PZ-2F D0593-01 5/19/2005	NYSDEC Class GA Standards <sup>(b)</sup>
<b>METALS (µg/l)</b>							
Aluminum	222	27.9 B	242	26.3 B	280	40.3 B	N/A
Antimony	1.4 B	2.8 B	2.2 B	1.6 B	2.8 B	1.6 B	3
Arsenic	13.9 B	11 B	24.7	<b>25.3</b>	ND	ND	25
Barium	152 B	143 B	42.9 B	38.1 B	280	259	1000
Beryllium	ND	ND	ND	ND	ND	ND	3
Cadmium	0.34 B	0.39 B	0.48 B	0.53 B	0.17 B	ND	5
Calcium	70100	71000	110000	108000	87900	85200	N/A
Chromium	ND	ND	ND	ND	ND	ND	50
Cobalt	0.88 B	1 B	1.3 B	1.1 B	0.91 B	0.59 B	N/A
Copper	6.7 B	ND	ND	ND	13.1 B	ND	200
Iron	<b>30900</b>	<b>25600</b>	<b>44800</b>	<b>45300</b>	<b>5690</b>	<b>5260</b>	300
Lead	3.9 B	1.5 B	6.3 B	2.9 B	<b>28.9</b>	ND	25
Magnesium	9240	9250	11900	11700	9510	9140	35000 GV
Manganese	<b>962</b>	<b>936</b>	<b>1270</b>	<b>1250</b>	<b>406</b>	<b>387</b>	300
Nickel	2.6 B	4.3 B	ND	ND	0.96 B	ND	100
Potassium	6920	6940	8980	9000	6320	6290	N/A
Selenium	ND	ND	ND	ND	ND	ND	10
Silver	24.3 B	23.3 B	23.3 B	17.2 B	13.1 B	21.9 B	50
Sodium	<b>22400</b>	<b>22800</b>	<b>32300</b>	<b>31700</b>	<b>25900</b>	<b>25600</b>	20000
Thallium	<b>5.7 B</b>	<b>2.6 B</b>	<b>2.8 B</b>	<b>6 B</b>	<b>4.6 B</b>	<b>3.9 B</b>	0.5 GV
Vanadium	0.67 B	ND	1.9 B	1.4 B	1.4 B	0.72 B	N/A
Zinc	60.6	11.1 B	ND	ND	3.4 B	ND	2000 GV
Mercury	ND	ND	ND	ND	ND	ND	0.7
Cyanide	43	39.2	104	103	31.8	30	200

**Note:**

(b) - This value applies to the total of all organic substances listed in the New York State Groundwater Effluent Limitations table from the Division of Water Technical and Operational Guidance Series (1.1.1) with a groundwater effluent limitation less than 100 ug/l.

- Division of Water Technical and Operational Guidance Series (1.1.1) June 1998.

GV - Value taken from NYSDEC Class GA Guidance Value.

J - Estimated concentration; compound present below quantitation limit.

F - Samples were Field Filtered

B - Indicates a "trace" concentration below the reporting limit and equal to or above the detection limit.

N/A - Not applicable.

ND - Not detected at analytical reporting limit.

Note - Numbers in bold exceed standard.

Table 5  
Page (4 of 4)  
Hunt's Point Site E OU 2  
Groundwater Sampling  
Pesticides and Polychlorinated Biphenyl Data Summary  
May 2005

Sample ID Lab Sample ID Date Collected	MW-4 D0593-02B 5/19/2005	PZ-1 D0593-03B 5/19/2005	PZ-2 D0593-01B 5/19/2005	NYSDEC Class GA Standards <sup>(b)</sup>
<b>Pesticides (µg/L)</b>				
alpha-BHC	ND G	ND G	ND G	0.01
beta-BHC	ND G	ND G	ND G	0.04
delta-BHC	ND G	ND G	ND G	0.04
gamma-BHC (Lindane)	ND G	ND G	ND G	0.05
Aldrin	ND G	ND G	ND G	ND
Dieldrin	ND G	ND G	ND G	0.004
Endrin aldehyde	ND G	ND G	ND G	5
gamma-Chlordane	ND G	ND G	ND G	0.05
<b>PCBs (ug/L)</b>				
Aroclors	ND G	ND G	ND G	

**Note:**

- (b) - This value applies to the total of all organic substances listed in the New York State Groundwater Effluent Limitations table of the Division of Water Technical and Operational Guidance Series (1.1.1) with a groundwater effluent limitation less than 1 mg/L - Division of Water Technical and Operational Guidance Series (1.1.1) June 1998.
- GV - Value taken from NYSDEC Class GA Guidance Value.
- GV - Value considered estimated based on Data Quality Review - see Attachment B
- N/A - Not applicable.
- ND - Not detected at analytical reporting limit.
- Note - Numbers in bold exceed standard.

The consistency in the concentrations of each piezometer is likely due to the consistency of the material in which they were installed. Piezometers 1 and 2 along with a test pit (TP-L) adjacent to MW-4 were all installed in locations with abundant slaggy material and coal ash.

The metals analysis met all QC and method protocol requirements and the data is useable as reported (Attachment C).

*Pesticides/PCBs:* No pesticides or PCBs were detected in any of the groundwater samples submitted.

The calibration verification standards were outside criteria for each of the samples analyzed for pesticides. They were reanalyzed and showed similar findings. Pesticides were not found in any of the samples analyzed, but the non-detects should be considered estimates based on the difficulty in analysis (Attachment C). The non-detects are useful in showing that high concentrations of pesticides are not present in the groundwater.

The PCB analysis met all QC and method protocol requirements and the data is useable as reported by the laboratory.

### **Coal Tar Delineation Sampling Results**

Soil samples collected from delineation test pits were submitted for laboratory analysis. The material sampled contained both soil and fill (coal tar waste, purifier waste, cinders, coal ash). Samples were collected in laboratory-supplied containers, labeled with the appropriate sample identification, date and time of sampling, and analysis required. They were all delivered to the New York State Department of Health certified laboratory under sealed chain of custody. The analytical results for the test pit soil samples are included as Table 6. The samples were a mixture of soil, fill, purifier-contaminated and coal tar-contaminated waste collected from the most visually contaminated layers of the pit. A description of some of the results follows.

*Volatile Organic Compounds (VOCs):* Of the thirteen (13) test pit soil samples collected, only one (1) sample was found to contain concentrations of Benzene above NYSDEC BCP Track 2 SCOs (DTP-4). Most of the test pit soil samples submitted for analysis for VOCs had to be diluted because of the heightened concentrations of Naphthalene.

*Semi-Volatile Organic Compounds (SVOCs):* Of the thirteen (13) test pit samples and seven (7) additional re-analyses of selected samples, all samples were found to contain concentrations of several compounds in exceedence of NYSDEC BCP Track 2 SCOs. The compounds exhibiting the highest concentrations in exceedence the SCOs included Naphthalene, Phenanthrene, Flouranthene, Benzo(a)anthracene, Chrysene, Benzo(b)anthracene, Benzo(k)anthracene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene and Dibenzo(a,h)anthracene. The samples containing the highest total SVOC concentrations (DTP-4, DTP-6, DTP-13, DTP-22 and DTP-24) were located in areas containing either purifier waste or visibly impacted soil.

*Diesel range organics (DROs) and gasoline range organics (GROs):* Samples of both DROs and GROs were also ran to provide background for some potential disposal options.

Table 6  
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Hunt's Point Site E OU 2  
Coal Tar Delineation  
Volatile Organic Compound Data Summary  
April 2006

Sample ID Lab Sample ID Date Sampled	DTP-2 (7-7.5') E0451-07B 4/10/2006 DF 1:1	DTP-4 (3-5') E0451-06B 4/10/2006 DF 1:1	DTP-5 (3-4') E0451-02E 4/10/2006 DF 1:1	DTP-6 (2-4') E0451-05B 4/10/2006 DF 1:1	DTP-8 (1-3') E0451-03E 4/11/2006 DF 1:1	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
<b>VOCs (mg/kg)</b>						
Acetone	ND	0.063	ND	0.052	0.025	500 <sup>a</sup>
Carbon Disulfide	ND	0.023	ND	0.021	0.009	NS
2-Butanone	ND	ND	ND	ND	ND	500 <sup>a</sup>
Chloroform	0.002 J	0.002 J	ND	ND	ND	350
Benzene	ND	<b>71 UD [DF 100:1]</b>	ND	0.005 J	0.002 J	44
Toluene	ND	0.12	ND	0.007 J	0.004 J	500 <sup>a</sup>
Ethylbenzene	ND	18 DJ [DF 100:1]	ND	0.088	0.002 J	390
m,p-Xylene	ND	15 DJ [DF 100:1]	ND	0.02	0.005 J	NS
o-Xylene	ND	17 DJ [DF 100:1]	ND	0.037	0.004 J	NS
Xylene (Total)	ND	32 DJ [DF 100:1]	ND	0.057	0.009	500 <sup>a</sup>
Styrene	ND	ND	ND	0.002 J	ND	NS
Isopropylbenzene	ND	0.17	ND	0.025	ND	NS
n-Propylbenzene	ND	0.15	ND	0.026	ND	500 <sup>a</sup>
1,3,5-Trimethylbenzene	ND	71 UD [DF 100:1]	ND	0.063	0.003 J	190
1,2,4-Trimethylbenzene	ND	35 DJ [DF 100:1]	ND	0.17	0.006	190
4-Isopropyltoluene	ND	0.11	ND	ND	0.003 J	NS
Naphthalene	0.003 JB	<b>1700 DB [DF 100:1]</b>	0.013 B	21 DB [DF 1:1]	12 DB [DF 1:1]	500 <sup>a</sup>
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	NS

**Notes:**

- J - Analyte detected below quantitation limits.
- D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- E - Indicates the analyte's concentration exceeds the calibrated range of the GC/MS instrument for that specific analysis.
- B - Indicates the analyte was found in the blank as well as the sample; report as "12B".
- ND - Non-Detectable Concentration
- DF - Dilution Factor (e.g., 10:1)
- ND - Not Detected at the reporting limit
- NS - No Standard
- Note - Numbers in bold exceed the Track 2 soil cleanup objective(s).
- a - The SCOs for commercial use were capped at a maximum value of 500 ppm (refer to NYSDEC TSD Section 9.3).
- \* - NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria.

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Hunt's Point Site E OU 2  
Coal Tar Delineation  
Volatile Organic Compound Data Summary  
April 2006

Sample ID Lab Sample ID Date Sampled	DTP-13 (0-1.5') E0451-01E 4/11/2006 DF 1:1	DTP-14 (1.5-3') E0451-04B 4/11/2006 DF 1:1	DTP-18 (2-3.5') E0466-03B 4/12/2006 DF 1:1	DTP-19 (5-6') E0466-05B 4/12/2006 DF 1:1	DTP-20 (3-4') E0466-04B 4/12/2006 DF 1:1	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Restricted)
<b>VOCs (mg/kg)</b>						
Acetone	ND	ND	0.08	0.062	0.057	500 <sup>a</sup>
Carbon Disulfide	ND	ND	ND	ND	ND	NS
2-Butanone	ND	ND	ND	ND	ND	500 <sup>a</sup>
Chloroform	0.002 J	0.001 J	ND	ND	ND	350
Benzene	0.003 J	ND	0.017	0.026	0.014	44
Toluene	0.005 J	ND	0.027	0.038	0.011	500 <sup>a</sup>
Ethylbenzene	ND	ND	0.24	0.043	0.12	390
m,p-Xylene	0.004 J	ND	0.066	0.057	0.037	NS
o-Xylene	0.002 J	ND	0.08	0.051	0.045	NS
Xylene (Total)	0.006 J	ND	0.15	0.11	0.082	500 <sup>a</sup>
Styrene	ND	ND	ND	ND	ND	NS
Isopropylbenzene	ND	ND	0.036	0.006	0.017	NS
n-Propylbenzene	ND	ND	ND	0.005 J	0.007	500 <sup>a</sup>
1,3,5-Trimethylbenzene	0.003 J	ND	0.056	0.021	0.021	190
1,2,4-Trimethylbenzene	0.003 J	ND	0.12	0.051	0.056	190
4-Isopropyltoluene	ND	ND	0.054	ND	ND	NS
Naphthalene	0.016 B	0.016 B	110 DB [DF 10:1]	47 DB [DF 8:1]	65 DB [DF 8:1]	500 <sup>a</sup>
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	NS

**Notes:**

- J - Analyte detected below quantitation limits.
- D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- E - Indicates the analyte's concentration exceeds the calibrated range of the GC/MS instrument for that specific analysis.
- B - Indicates the analyte was found in the blank as well as the sample; report as "12B".
- ND - Non-Detectable Concentration
- DF - Dilution Factor (e.g., 10:1)
- ND - Not Detected at the reporting limit
- NS - No Standard
- Note - Numbers in bold exceed the Track 2 soil cleanup objective(s).
- a - The SCOs for commercial use were capped at a maximum value of 500 ppm (refer to NYSDEC TSD Section 9.3).
- \* - NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria.

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Hunt's Point Site E OU 2  
Coal Tar Delineation  
Volatile Organic Compound Data Summary  
April 2006

Sample ID Lab Sample ID Date Sampled	DTP-21 (2-4') E0466-06B 4/12/2006 DF 1:1	DTP-22 (0-3') E0466-02B 4/13/2006 DF 1:1	DTP-24 (0-4') E0466-01B 4/13/2006 DF 1:1	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Restricted)
<b>VOCs (mg/kg)</b>				
Acetone	ND	0.13	ND	500 <sup>a</sup>
Carbon Disulfide	ND	ND	ND	NS
2-Butanone	ND	0.002	ND	500 <sup>a</sup>
Chloroform	ND	ND	ND	350
Benzene	0.004 J	ND D [DF 50:1]	0.02	44
Toluene	0.002 J	ND D [DF 50:1]	0.042	500 <sup>a</sup>
Ethylbenzene	0.001 J	0.15	0.038	390
m,p-Xylene	0.003 J	5.8 DJ [DF 50:1]	0.097	NS
o-Xylene	0.002 J	ND D [DF 50:1]	0.091	NS
Xylene (Total)	0.005 J	5.8 DJ [DF 50:1]	0.19	500 <sup>a</sup>
Styrene	ND	ND D [DF 50:1]	ND	NS
Isopropylbenzene	ND	0.011	0.003 J	NS
n-Propylbenzene	ND	0.011	ND	500 <sup>a</sup>
1,3,5-Trimethylbenzene	0.004 J	0.1	0.044	190
1,2,4-Trimethylbenzene	0.006	4.2 DJ [DF 50:1]	0.099	190
4-Isopropyltoluene	ND	ND	ND	NS
Naphthalene	2.1 DB [DF 1:1]	450 DB [DF 50:1]	59 DB [DF 8:1]	500 <sup>a</sup>
1,2,3-Trichlorobenzene	ND	ND	ND	NS

**Notes:**

- J - Analyte detected below quantitation limits.
- D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- E - Indicates the analyte's concentration exceeds the calibrated range of the GC/MS instrument for that specific analysis.
- B - Indicates the analyte was found in the blank as well as the sample; report as "12B".
- ND - Non-Detectable Concentration
- DF - Dilution Factor (e.g., 10:1)
- ND - Not Detected at the reporting limit
- NS - No Standard
- Note - Numbers in bold exceed the Track 2 soil cleanup objective(s).
- <sup>a</sup> - The SCOs for commercial use were capped at a maximum value of 500 ppm (refer to NYSDEC TSD Section 9.3).
- \* - NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria.

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Hunt's Point Site E OU 2  
Coal Tar Delineation  
Semi-Volatile Organic Compound Data Summary  
April 2006

Sample ID Lab Sample ID Date Sampled	DTP-2 (7-7.5') E0451-07A 4/10/2006 DF 1:1	DTP-4 (3-5') E0451-06A 4/10/2006 DF 10:1	DTP-5 (3-4') E0451-02A 4/10/2006 DF 1:1	DTP-5 (3-4') RE E0451-02ARE 4/10/2006 DF 1:1	DTP-6 (2-4') E0451-05A 4/10/2006 DF 10:1	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
<b>SVOCs (mg/kg)</b>						
Phenol	ND	ND	0.059 J	ND	ND	500 <sup>a</sup>
2-Methylphenol	ND	ND	ND	ND	ND	NS
4-Methylphenol	ND	ND	0.09 J	ND	ND	NS
2,4-Dimethylphenol	ND	ND	ND	ND	ND	NS
Naphthalene	17	<b>1000 D</b> [DF 20:1]	3.2	2.8	140	500 <sup>a</sup>
4-Chloroaniline	ND	ND	ND	ND	ND	NS
2-Methylnaphthalene	3.1 J	76	2.1	3.8	23 J	NS
Acenaphthylene	4.5 J	54	2.5	3.3	84	500 <sup>a</sup>
Acenaphthene	2.9 J	150	0.6	0.86 J	190	500 <sup>a</sup>
Dibenzofuran	4.3 J	130	0.74	1.2 J	120	350
Fluorene	8.1	240	2.4	4.9	230	500 <sup>a</sup>
Phenanthrene	27	<b>670</b>	130 D [DF 4:1]	22	<b>760 D</b> [DF 20:1]	500 <sup>a</sup>
Anthracene	8.1	210	3.6	4	260	500 <sup>a</sup>
Carbazole	2.5 J	77	0.47 J	0.47 J	66	NS
Di-n-butylphthalate	ND	ND	120 J	ND	ND	NS
Fluoranthene	25	450	18 D [DF 4:1]	26	<b>580</b>	500 <sup>a</sup>
Pyrene	20	350	23 D [DF 4:1]	21	490	500 <sup>a</sup>
Benzo(a)anthracene	<b>11</b>	<b>180</b>	<b>9.6 D</b> [DF 4:1]	<b>11</b>	<b>270</b>	5.6
Chrysene	10	<b>170</b>	10 D [DF 4:1]	12	<b>240</b>	56
bis(2-Ethylhexyl)phthalate	ND	ND	0.35 J	0.98 J	ND	NS
Benzo(b)fluoranthene	<b>11</b>	<b>170</b>	<b>12 D</b> [DF 4:1]	<b>12</b>	<b>280</b>	5.6
Benzo(k)fluoranthene	4.8	<b>78</b>	3.8	5.1	<b>110</b>	56
Benzo(a)pyrene	<b>10</b>	<b>160</b>	<b>7.8</b>	<b>8.6</b>	<b>260</b>	1 <sup>b</sup>
Indeno(1,2,3-cd)pyrene	<b>6</b>	<b>74</b>	3.7	<b>5.6</b>	<b>110</b>	5.6
Dibenzo(a,h)anthracene	<b>1.8 J</b>	<b>26 J</b>	<b>1.2</b>	<b>1.7 J</b>	<b>38 J</b>	0.56
Benzo(g,h,i)perylene	7.7	79	4.1	6.2	120	500 <sup>a</sup>

**Notes:**

J - Analyte detected below quantitation limits.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

DF - Dilution Factor e.g., 10:1.

ND - Not Detected at the Reporting Limit.

NS - No Standard.

Note - Numbers in bold exceed the Track 2 soil cleanup objective(s).

a - The SCOs for commercial use were capped at a maximum value of 500 ppm (refer to NYSDEC TSD Section 9.3).

b - For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the DEC/DOH rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.

\* - NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria.

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Semi-Volatile Organic Compound Data Summary  
April 2006

Sample ID Lab Sample ID Date Sampled	DTP-8 (1-3') E0451-03A 4/11/2006 DF 5:1	DTP-13 (0-1.5') E0451-01A 4/11/2006 DF 10:1	DTP-14 (1.5-3') E0451-04A 4/11/2006 DF 5:1	DTP-18 (2-3.5') E0466-03A 4/12/2006 DF 10:1	DTP-18 (2-3.5') RE E0466-03ARE 4/12/2006 DF 4:1	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
<b>SVOCs (mg/kg)</b>						
Phenol	ND	ND	ND	0.82 J	ND	500 <sup>a</sup>
2-Methylphenol	ND	ND	ND	ND	ND	NS
4-Methylphenol	0.54 J	ND	ND	980 J	ND	NS
2,4-Dimethylphenol	ND	ND	ND	ND	ND	NS
Naphthalene	30	43	13 J	110 D [DF 40:1]	150	500 <sup>a</sup>
4-Chloroaniline	ND	ND	ND	ND	ND	NS
2-Methylnaphthalene	13 J	15 J	2.7 J	15	34	NS
Acenaphthylene	29	78	18 J	13	27	500 <sup>a</sup>
Acenaphthene	5 J	8.3 J	3.4 J	18	35	500 <sup>a</sup>
Dibenzofuran	9.6 J	17 J	6.3 J	27	48	350
Fluorene	23	36 J	12 J	46	90	500 <sup>a</sup>
Phenanthrene	120	220	66	130 D [DF 40:1]	260	500 <sup>a</sup>
Anthracene	39	78	21	44	77	500 <sup>a</sup>
Carbazole	4.3 J	8.4 J	4.2 J	19	34	NS
Di-n-butylphthalate	ND	ND	ND	ND	ND	NS
Fluoranthene	150	370	85	98 D [DF 40:1]	190	500 <sup>a</sup>
Pyrene	120	270	75	79 D [DF 40:1]	160	500 <sup>a</sup>
Benzo(a)anthracene	<b>72</b>	<b>160</b>	<b>44</b>	<b>46</b>	<b>81</b>	5.6
Chrysene	<b>68</b>	<b>160</b>	44	37	<b>81</b>	56
bis(2-Ethylhexyl)phthalate	ND	18 J	ND	ND	ND	NS
Benzo(b)fluoranthene	<b>76</b>	<b>180</b>	<b>53</b>	<b>42</b>	<b>70</b>	5.6
Benzo(k)fluoranthene	32	<b>84</b>	20 J	20	28	56
Benzo(a)pyrene	<b>62</b>	<b>160</b>	<b>46</b>	<b>36</b>	<b>61</b>	1 <sup>b</sup>
Indeno(1,2,3-cd)pyrene	<b>34</b>	<b>78</b>	<b>27</b>	<b>16</b>	<b>27</b>	5.6
Dibenzo(a,h)anthracene	<b>11 J</b>	<b>24 J</b>	<b>8.8 J</b>	<b>5.7</b>	<b>9.8 J</b>	0.56
Benzo(g,h,i)perylene	37	85	31	16	29	500 <sup>a</sup>

**Notes:**

J - Analyte detected below quantitation limits.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

DF - Dilution Factor e.g., 10:1.

ND - Not Detected at the Reporting Limit.

NS - No Standard.

Note - Numbers in bold exceed the Track 2 soil cleanup objective(s).

a - The SCOs for commercial use were capped at a maximum value of 500 ppm (refer to NYSDEC TSD Section 9.3).

b - For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the DEC/DOH rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.

\* - NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria.

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Semi-Volatile Organic Compound Data Summary  
April 2006

Sample ID Lab Sample ID Date Sampled	DTP-19 (5-6') E0466-05A 4/12/2006 DF 10:1	DTP-19 (5-6') RE E0466-05ARE 4/12/2006 DF 4:1	DTP-20 (3-4') E0466-04A 4/12/2006 DF 1:1	DTP-20 (3-4') RE E0466-04ARE 4/12/2006 DF 4:1	DTP-21 (2-4') E0466-06A 4/12/2006 DF 1:1	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
<b>SVOCs (mg/kg)</b>						
Phenol	ND	ND	0.53 J	ND	0.058 J	500 <sup>a</sup>
2-Methylphenol	ND	ND	ND	ND	0.19 J	NS
4-Methylphenol	ND	ND	0.63 J	ND	0.18 J	NS
2,4-Dimethylphenol	ND	ND	ND	ND	ND	NS
Naphthalene	24	27	80 D [DF 4:1]	63	20 D [DF 4:1]	500 <sup>a</sup>
4-Chloroaniline	ND	ND	ND	ND	ND	NS
2-Methylnaphthalene	4.3	6.5 J	20	19	4.2	NS
Acenaphthylene	10	11 J	17	14 J	2.5	500 <sup>a</sup>
Acenaphthene	5.8	7.2 J	22	30	1.4	500 <sup>a</sup>
Dibenzofuran	7.3	9 J	24	24	1.5	350
Fluorene	16	22	45	51	3.6	500 <sup>a</sup>
Phenanthrene	59	74	200 D [DF 4:1]	190	12 D [DF 4:1]	500 <sup>a</sup>
Anthracene	22	23	63	60	3.3	500 <sup>a</sup>
Carbazole	4.6	7.5 J	24	20	1.2	NS
Di-n-butylphthalate	ND	ND	ND	ND	ND	NS
Fluoranthene	59	59	180 D [DF 4:1]	180	8.9 D [DF 4:1]	500 <sup>a</sup>
Pyrene	49	54	140 D [DF 4:1]	160	9.4 D [DF 4:1]	500 <sup>a</sup>
Benzo(a)anthracene	<b>27</b>	<b>26</b>	<b>75 D [DF 4:1]</b>	<b>76</b>	4.7	5.6
Chrysene	26	25	<b>65</b>	<b>78</b>	4.6	56
bis(2-Ethylhexyl)phthalate	ND	ND	ND	ND	0.096 J	NS
Benzo(b)fluoranthene	<b>29</b>	<b>25</b>	<b>61</b>	<b>72</b>	3.9	5.6
Benzo(k)fluoranthene	13	11 J	21	29	1.4	56
Benzo(a)pyrene	<b>26</b>	<b>22</b>	<b>53</b>	<b>66</b>	<b>3.4</b>	1 <sup>b</sup>
Indeno(1,2,3-cd)pyrene	<b>13</b>	<b>13 J</b>	<b>26</b>	<b>30</b>	1.7	5.6
Dibenzo(a,h)anthracene	<b>3.9</b>	<b>3.7 J</b>	<b>8.3</b>	<b>9.3 J</b>	<b>0.58</b>	0.56
Benzo(g,h,i)perylene	14	16	28	34	2.1	500 <sup>a</sup>

**Notes:**

J - Analyte detected below quantitation limits.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

DF - Dilution Factor e.g., 10:1.

ND - Not Detected at the Reporting Limit.

NS - No Standard.

Note - Numbers in bold exceed the Track 2 soil cleanup objective(s).

a - The SCOs for commercial use were capped at a maximum value of 500 ppm (refer to NYSDEC TSD Section 9.3).

b - For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the DEC/DOH rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.

\* - NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria.

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Coal Tar Delineation  
Semi-Volatile Organic Compound Data Summary  
April 2006

Sample ID Lab Sample ID Date Sampled	DTP-21 (2-4') RE E0466-06ARE 4/12/2006 DF 1:1	DTP-22 (0-3') E0466-02A 4/13/2006 DF 10:1	DTP-22 (0-3') RE E0466-02ARE 4/13/2006 DF 5:1	DTP-24 (0-4') E0466-01A 4/13/2006 DF 10:1	DTP-24 (0-4') RE E0466-01ARE 4/13/2006 DF 10:1	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
<b>SVOCs (mg/kg)</b>						
Phenol	ND	4.9	ND	ND	ND	500 <sup>a</sup>
2-Methylphenol	ND	3.5 J	2.1 J	ND	ND	NS
4-Methylphenol	ND	8.4	5.6 J	ND	ND	NS
2,4-Dimethylphenol	0.63 J	5.1	ND	ND	ND	NS
Naphthalene	21	290 D [DF 50:1]	<b>690 D</b> [DF 20:1]	220	59	500 <sup>a</sup>
4-Chloroaniline	ND	ND	ND	73	ND	NS
2-Methylnaphthalene	8.8	76 D [DF 50:1]	160	49	23 J	NS
Acenaphthylene	5.7	61	110	82	81	500 <sup>a</sup>
Acenaphthene	3 J	12	24	19 J	12 J	500 <sup>a</sup>
Dibenzofuran	2.3 J	52	96	38	30 J	350
Fluorene	7.8	78 D [DF 50:1]	140	64	54	500 <sup>a</sup>
Phenanthrene	29	220 D [DF 50:1]	400 D [DF 20:1]	210	210	500 <sup>a</sup>
Anthracene	7.8	70 D [DF 50:1]	130	81	78	500 <sup>a</sup>
Carbazole	2 J	32	55	21 J	19 J	NS
Di-n-butylphthalate	ND	ND	ND	ND	ND	NS
Fluoranthene	24	150 D [DF 50:1]	270	260	310	500 <sup>a</sup>
Pyrene	26	120 D [DF 50:1]	210	230	270	500 <sup>a</sup>
Benzo(a)anthracene	<b>14</b>	<b>61</b>	<b>110</b>	<b>160</b>	<b>170</b>	5.6
Chrysene	14	<b>58</b>	<b>96</b>	<b>120</b>	<b>160</b>	56
bis(2-Ethylhexyl)phthalate	ND	ND	ND	ND	ND	NS
Benzo(b)fluoranthene	<b>13</b>	<b>48</b>	<b>94</b>	<b>160</b>	<b>190</b>	5.6
Benzo(k)fluoranthene	4.8	23	40	<b>64</b>	<b>80</b>	56
Benzo(a)pyrene	<b>11</b>	<b>45</b>	<b>86</b>	<b>140</b>	<b>170</b>	1 <sup>b</sup>
Indeno(1,2,3-cd)pyrene	5.1	<b>18</b>	<b>37</b>	<b>67</b>	<b>86</b>	5.6
Dibenzo(a,h)anthracene	<b>1.8 J</b>	<b>6.4</b>	<b>12 J</b>	<b>22 J</b>	<b>29 J</b>	0.56
Benzo(g,h,i)perylene	6	18	39	70	91	500 <sup>a</sup>

**Notes:**

J - Analyte detected below quantitation limits.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

DF - Dilution Factor e.g., 10:1.

ND - Not Detected at the Reporting Limit.

NS - No Standard.

Note - Numbers in bold exceed the Track 2 soil cleanup objective(s).

a - The SCOs for commercial use were capped at a maximum value of 500 ppm (refer to NYSDEC TSD Section 9.3).

b - For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the DEC/DOH rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.

\* - NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria.

Table 6  
Page (8 of 12)  
Hunt's Point Site E OU 2  
Coal Tar Delineation  
Diesel-Range and Gasoline-Range Organics Data Summary  
April 2006

<b>Sample ID</b>	<b>DTP-5 (3-4')</b>	<b>DTP-8 (0-3')</b>	<b>DTP-13 (0-1.5')</b>	<b>DTP-18 (2-3.5')</b>	<b>DTP-20 (3-4')</b>	<b>DTP-21 (2-4')</b>	<b>DTP-22 (0-3')</b>
<b>Lab Sample ID</b>	<b>E0451-02</b>	<b>E0451-03</b>	<b>E0451-01</b>	<b>E0466-03D</b>	<b>E0466-04D</b>	<b>E0466-06D</b>	<b>E0466-02D</b>
<b>Date Sampled</b>	<b>4/10/2006</b>	<b>4/11/2006</b>	<b>4/11/2006</b>	<b>4/12/2006</b>	<b>4/12/2006</b>	<b>4/12/2006</b>	<b>4/13/2006</b>
<b>DRO (mg/kg)</b>	DF 10:1	DF 10:1	DF 10:1	DF 10:1	DF 10:1	DF 10:1	DF 10:1
Diesel-Range Organics	2000	3900	7100	6300 B	4000 B	1000 B	6300 B
<b>GRO (mg/kg)</b>	DF 1:1	DF 1:1	DF 1:1	DF 1:1	DF 1:1	DF 1:1	DF 1:1
Gasoline-Range Organics	15 B	14 B	10 B	69 B	53 B	15 B	130 B

**Notes:**

B - Indicates the analyte was found in the blank as well as the sample; report as "12B".  
DF - Dilution Factor e.g., 10:1.

Table 6  
Page (9 of 12)  
Hunt's Point Site E OU 2  
Coal Tar Delineation  
Heavy Metals Data Summary  
April 2006

Sample ID Lab Sample ID Date Sampled	DTP-2 (7-7.5') E0451-07 4/10/2006 DF 1:1	DTP-4 (3-5') E0451-06 4/10/2006 DF 1:1	DTP-5 (3-4') E0451-02 4/10/2006 DF 1:1	DTP-6 (2-4') E0451-05 4/10/2006 DF 1:1	DTP-8 (1-3') E0451-03 4/11/2006 DF 1:1	DTP-13 (0-1.5') E0451-01 4/11/2006 DF 1:1	DTP-14 (1.5-3') E0451-04 4/11/2006 DF 1:1	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
<b>Metals (mg/kg)</b>								
Arsenic	<b>24.2</b> **	<b>72.4</b> **	<b>17.6</b> **	14.7 **	14.3 **	10.6 **	6.8 **	16 <sup>a</sup>
Barium	207	120	287	104	110	112	110	400
Cadmium	0.75 E **	0.12 BE **	0.27 BE **	0.21 BE **	ND	0.051 BE **	ND	9.3
Chromium	25.5	25.2	29.2	20.9	16.2	20.9	17.3	1500 <sup>b</sup>
Lead	554 E **	488 E **	679 E **	492 E **	426 E **	386 E **	522 E **	1000
Selenium	1.5	6.4	1 B	0.39 B	1.4	ND	0.67 B	1500
Silver	ND	ND	ND	ND	ND	ND	ND	1500
Mercury	2 N	2.5 N	<b>3 N</b>	2.5 N	2.6 N	<b>2.9 N</b>	1.7 N	2.8 <sup>c</sup>
Cyanide	NA	NA	<b>95.6</b>	NA	11.6	21.4	NA	27 <sup>b</sup>

**Notes:**

B - Indicates the analyte was found in the blank as well as the sample; report as "12B".

H - Parameter analyzed outside of hold time

N - Matrix spike recovery falls outside of the control limit.

E - Indicates the analyte's concentration exceeds the calibrated range of the GC/MS instrument for that specific analysis.

DF - Dilution Factor e.g., 10:1.

NA - Not Analyzed

ND - Not Detected at the Reporting Limit.

NS - No Standard.

Note - Numbers in bold exceed the Track 2 soil cleanup objective(s).

a - For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the DEC/DOH rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.

b - The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.

c - This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts) (refer to NYSDEC TSD table 5.6-1).

\* - NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria.

\*\* - Relative Percent Difference for duplicate analyses is outside of the control limit.

Table 6  
Page (10 of 12)  
Hunt's Point Site E OU 2  
Coal Tar Delineation  
Heavy Metals Data Summary  
April 2006

Sample ID Lab Sample ID Date Sampled	DTP-18 (2-3.5') E0466-03D 4/12/2006 DF 1:1	DTP-19 (5-6') E0466-05A 4/12/2006 DF 1:1	DTP-20 (3-4') E0466-04D 4/12/2006 DF 1:1	DTP-21 (2-4') E0466-06D 4/12/2006 DF 1:1	DTP-22 (0-3') E0466-02D 4/13/2006 DF 1:1	DTP-24 (0-4') E0466-01D 4/13/2006 DF 1:1	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
<b>Metals (mg/kg)</b>							
Arsenic	9.8	8.9	8.3	9.4	11.5	11.5	16 <sup>a</sup>
Barium	98.4	129	150	60.8	197	110	400
Cadmium	ND	0.23	0.19 B	ND	0.67	0.14 B	9.3
Chromium	17.3	19.7	23.4	6.4	21.2	19.3	1500 <sup>b</sup>
Lead ****	216	363	600	94.1	452	385	1000
Selenium	0.48 B	ND	ND	1.9	0.41	0.15 B	1500
Silver	ND	ND	ND	ND	ND	ND	1500
Mercury	1	0.92	2.5	0.32	0.78	0.69	2.8 <sup>c</sup>
Cyanide ***	14.9	NA	22 H	5.2	2.5	NA	27 <sup>b</sup>

**Notes:**

B - Indicates the analyte was found in the blank as well as the sample; report as "12B".

H - Parameter analyzed outside of hold time

N - Matrix spike recovery falls outside of the control limit.

E - Indicates the analyte's concentration exceeds the calibrated range of the GC/MS instrument for that specific analysis.

DF - Dilution Factor e.g., 10:1.

NA - Not Analyzed

ND - Not Detected at the Reporting Limit.

NS - No Standard.

Note - Numbers in bold exceed the Track 2 soil cleanup objective(s).

a - For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the DEC/DOH rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.

b - The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.

c - This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts) (refer to NYSDEC TSD table 5.6-1).

\* - NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria.

\*\* - Relative Percent Difference for duplicate analyses is outside of the control limit.

Table 6  
Page (11 of 12)  
Hunt's Point Site E OU 2  
Coal Tar Delineation  
Pesticide and Polychlorinated Biphenyl Data Summary  
April 2006

Sample ID	DTP-2 (7-7.5')	DTP-4 (3-5')	DTP-5 (3-4')	DTP-6 (2-4')	DTP-8 (1-3')	DTP-13 (0-1.5')	DTP-14 (1.5-3')	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
Lab Sample ID	E0451-07A	E0451-06A	E0451-02A	E0451-05A	E0451-03A	E0451-01A	E0451-04A	
Date Sampled	4/10/2006	4/10/2006	4/10/2006	4/10/2006	4/11/2006	4/11/2006	4/11/2006	
<b>Pesticides (mg/kg)</b>	DF 1:1	DF 10:1	DF 10:1	DF 10:1	DF 5:1	DF 5:1	DF 5:1	
beta-BHC	ND	ND	ND	ND	0.015 P	ND	ND	3
Heptachlor epoxide	ND	ND	ND	0.025 P	ND	ND	0.017	15
Dieldrin	ND	0.046 P	ND	ND	ND	ND	ND	1.4
4,4-DDE	ND	ND	ND	0.14 P	0.042 P	0.028 P	ND	62
4,4-DDD	0.017 P	ND	0.19 P	0.53 P	0.22 P	ND	0.033 P	92
Endosulfan sulfate	0.005	0.061	ND	0.18 P	0.091	0.063 P	ND	200 <sup>a</sup>
4,4-DDT	0.012	0.1	0.7	0.16 P	0.12	0.11 P	0.045	47
Methoxychlor	ND	ND	ND	ND	ND	ND	0.56	NS
Endrin ketone	0.013	ND	0.11	0.18 P	0.25	0.088 P	0.05	NS
Endrin aldehyde	0.0062	ND	ND	ND	ND	ND	ND	NS
gamma-Chlordane	0.0044 P	0.063 P	ND	0.15 P	0.056 P	0.036 P	0.032 P	NS
<b>PCBs (mg/kg)</b>	DF 1:1	DF 1:1	DF 1:1	DF 1:1	DF 1:1	DF 1:1	DF 1:1	
Aroclor-1254	0.084	0.6 P	0.4 P	0.61 P	0.66 P	0.44 P	0.76	1
Aroclor-1260	0.064	0.53	0.41	0.4 P	0.66	0.22 P	0.29 P	1

**Notes:**

- P - Pesticide/Aroclor target analyte has > 25% difference for the detected concentrations between the two GC columns.
- E - Indicates the analyte's concentration exceeds the calibrated range of the GC/MS instrument for that specific analysis.
- DF - Dilution Factor (e.g., 10:1)
- ND - Not Detected at the Reporting Limit.
- NS - No Standard.
- Note - Numbers in bold exceed the Track 2 soil cleanup objective(s).
- a - This SCO is for the sum of Endosulfan I, Endosulfan II and Endosulfan Sulfate.
- \* - NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria.

Table 6  
Page (12 of 12)  
Hunt's Point Site E OU 2  
Coal Tar Delineation  
Pesticide and Polychlorinated Biphenyl Data Summary  
April 2006

Sample ID Lab Sample ID Date Sampled	DTP-18 (2-3.5') E0466-03D 4/12/2006	DTP-19 (5-6') E0466-05A 4/12/2006	DTP-20 (3-4') E0466-04D 4/12/2006	DTP-21 (2-4') E0466-06D 4/12/2006	DTP-22 (0-3') E0466-02D 4/13/2006	DTP-24 (0-4') E0466-01D 4/13/2006	NYSDEC BCP Track 2 Restricted Use Soil Cleanup Objectives (Commercial) *
<b>Pesticides (mg/kg)</b>	DF 5:1	DF 5:1	DF 5:1	DF 5:1	DF 5:1	DF 5:1	
beta-BHC	0.018 P	ND	ND	ND	ND	ND	3
Heptachlor epoxide	0.045	0.014 P	0.048	ND	ND	ND	15
Dieldrin	ND	ND	ND	ND	ND	ND	1.4
4,4-DDE	ND	ND	0.069	ND	ND	ND	62
4,4-DDD	0.11 P	0.14 P	0.096 P	0.16 PE	ND	0.04 P	92
Endosulfan sulfate	ND	ND	ND	0.023	0.032 P	0.039 P	200 <sup>a</sup>
4,4-DDT	0.033 P	0.084	0.18	0.038	0.032 P	0.029	47
Methoxychlor	0.21 P	0.25	ND	0.11 P	ND	ND	NS
Endrin ketone	0.072	0.038 P	ND	ND	0.043	0.071 P	NS
Endrin aldehyde	0.036 P	ND	ND	0.024 P	ND	ND	NS
gamma-Chlordane	0.082 P	0.032 P	0.083 P	ND	0.032 P	0.033 P	NS
<b>PCBs (mg/kg)</b>	DF 1:1	DF 1:1	DF 5:1	DF 1:1	DF 1:1	DF 1:1	
Aroclor-1254	0.28	0.39	<b>3.4</b>	ND	0.2	0.32	1
Aroclor-1260	0.15	0.42	<b>1.4</b>	ND	0.12	0.13 P	1

**Notes:**

P - Pesticide/Aroclor target analyte has > 25% difference for the detected concentrations between the two GC columns.

E - Indicates the analyte's concentration exceeds the calibrated range of the GC/MS instrument for that specific analysis.

DF - Dilution Factor (e.g., 10:1)

ND - Not Detected at the Reporting Limit.

NS - No Standard.

Note - Numbers in bold exceed the Track 2 soil cleanup objective(s).

a - This SCO is for the sum of Endosulfan I, Endosulfan II and Endosulfan Sulfate.

\* - NYSDEC Brownfield Cleanup Program (BCP) Restricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health under restricted commercial scenarios (Track 2) (as per NYSDEC Revised Public Review Draft Brownfield Cleanup Program Guide, dated June 2006) cleanup criteria.

The analytical results did not indicate the petroleum content would be overly restrictive for material disposal.

*RCRA Metals (Metals):* Four (4) of the thirteen (13) samples were reported to contain metals above the NYSDEC BCP Track 2 SCOs. Arsenic, Mercury and/or Cyanide concentrations exceeded Track 2 thresholds in samples DTP-2, DTP-4, DTP-5 and DTP-13.

*Pesticides/PCBs:* Of the thirteen (13) samples analyzed for PCBs, only one (1) sample (DTP-20) was found to contain concentrations in exceedence of NYSDEC BCP Track 2 SCOs. Aroclor-1254 and Aroclor-1260 were detected at concentrations of 3.4 and 1.4 mg/kg, thus exceeding the SCOs of 1 mg/kg. Although detectable levels of PCBs were obtained in other samples, no other locations exhibited concentrations in exceedence. All of the thirteen (13) samples analyzed for Pesticides were found to contain concentrations well below NYSDEC BCP Track 2 SCOs.

## CONCLUSIONS AND RECOMMENDATIONS

HDR|LMS reviewed all of the information that has been made available for Site E OU-2, and following completion of the field sampling program, has made the following observations:

The field sampling program included an extensive examination of fill material from ten (10) test probes and twenty (20) sampling test pits, twenty-seven (27) waste delineation test pits and the collection and analysis of samples from both the test pits and probes that appeared to be in or adjacent to areas with the most obvious signs of contamination. Soil gas sampling was initially assessed with the installation of seven (7) soil gas points and sampling of one (1) point. Groundwater was monitored using three (3) points, the installation of two (2) temporary piezometers and an existing monitoring well (MW-4). All were sampled to document groundwater quality for the investigation. The results of the soil/fill, soil gas, and groundwater investigations at Site E OU-2 revealed significant areas of fill throughout the site and areas of shallow fill that has been impacted with petroleum compounds associated with coal tar and purifier type waste contamination.

During the course of the initial investigation, there was one separate location where purifier type waste was excavated (Figures 10, 11 and 12). A small amount of material exhibiting the characteristic "Prussian blue" color was excavated in boring B-9, this material was placed back in the hole when the pit was backfilled. B-9 is located within an area that was reinvestigated during waste delineation activities. During the waste delineation activities, five (5) additional test pit locations encountered purifier type waste (DTP-3, DTP-5, DTP-8, DTP-14 and DTP-15). The purifier type waste thickness ranged between 0.3 and 1.0 feet. The material is partially mixed with other coal ash material and segregation will be based on the purifier waste indicators of composition and color.

Conditions documented during the investigation revealed that residual petroleum contamination is present in fill material. The contamination is assumed to be related to former activities from the manufactured gas plant (MGP) although no documentation is available to indicate the origin or source of it. Coal ash and cinder fill is present throughout the site (Figures 10, 11 and 12). Portions of that coal ash material exhibit signs of petroleum contamination and in several areas it appears to be heavier coal tar like contamination. The "worst case" sampling still did not indicate that concentrations were dramatically above the most current criteria. The majority of this impacted and heavily impacted material is located above the water table with one area identified at a depth that extended several feet beneath the measured water table interface. Generally, coal tar deposits on other Hunts Point VCP sites have been marked at the surface by product "boiling" from the ground and visible at the surface. These locations have potential for other buried deposits. Several "boils" were noted during the initial investigation along the area of the southern fence line with the Con Edison site, as well as along the western portion of the Site and in two small isolated areas along the eastern portion of the Site during the waste delineation activities. The coal tar observed thickness ranged between 0.5 and 2.7 feet. They were not excavated into or probed due to their close proximity. There were several other very small isolated spots of surface coal tar that were not associated with deeper deposits. Several areas of buried "hot spot" coal tar were observed during excavation of the test pits. These varied from less than 0.5 ft in thickness to over several feet in a few locations. The majority of this material was found in

and among coal ash and slag waste buried throughout the site. Conditions in the impacted waste were very similar to what was encountered at Site B (Fish Market).

Following a review of the boring, test pit and waste delineation logs, a review of the analytical data and the prior remediation procedures that were followed as well as conditions that were encountered at Site B (Fish Market), it is apparent that Site E OU-2 has a similar condition to portions of that site. Basically the site is composed of fill above and in some areas below the water table.

The fill material is composed of similar material to what has been encountered and documented on other portions of the former MGP site, soil, mixed demolition material and coal, coal ash and slag deposits. Within the coal and ash deposits there are small deposits of residual coal tar that has become mixed with that material. Other coal ash has been impacted to lesser degrees as the coal tar impacted material has a fairly distinct boundary that can be visually identified. Odors are present in the coal ash material and these are believed to be residual naphthalene and other aromatic odors that are present in the void space. This condition was found to be fairly typical in previous excavations on Site B. Samples taken from coal ash adjacent to excavations of coal tar that were initially found to contain distinct odors were analyzed and the results indicated much lower levels of contamination were present. This indicated that concentrations of volatile low odor threshold compounds were present in pore space and then were found to rapidly dissipate.

This is also evident in the soil gas and groundwater analyses. Although there not significant numbers of samples that were analyzed, the results were very low.

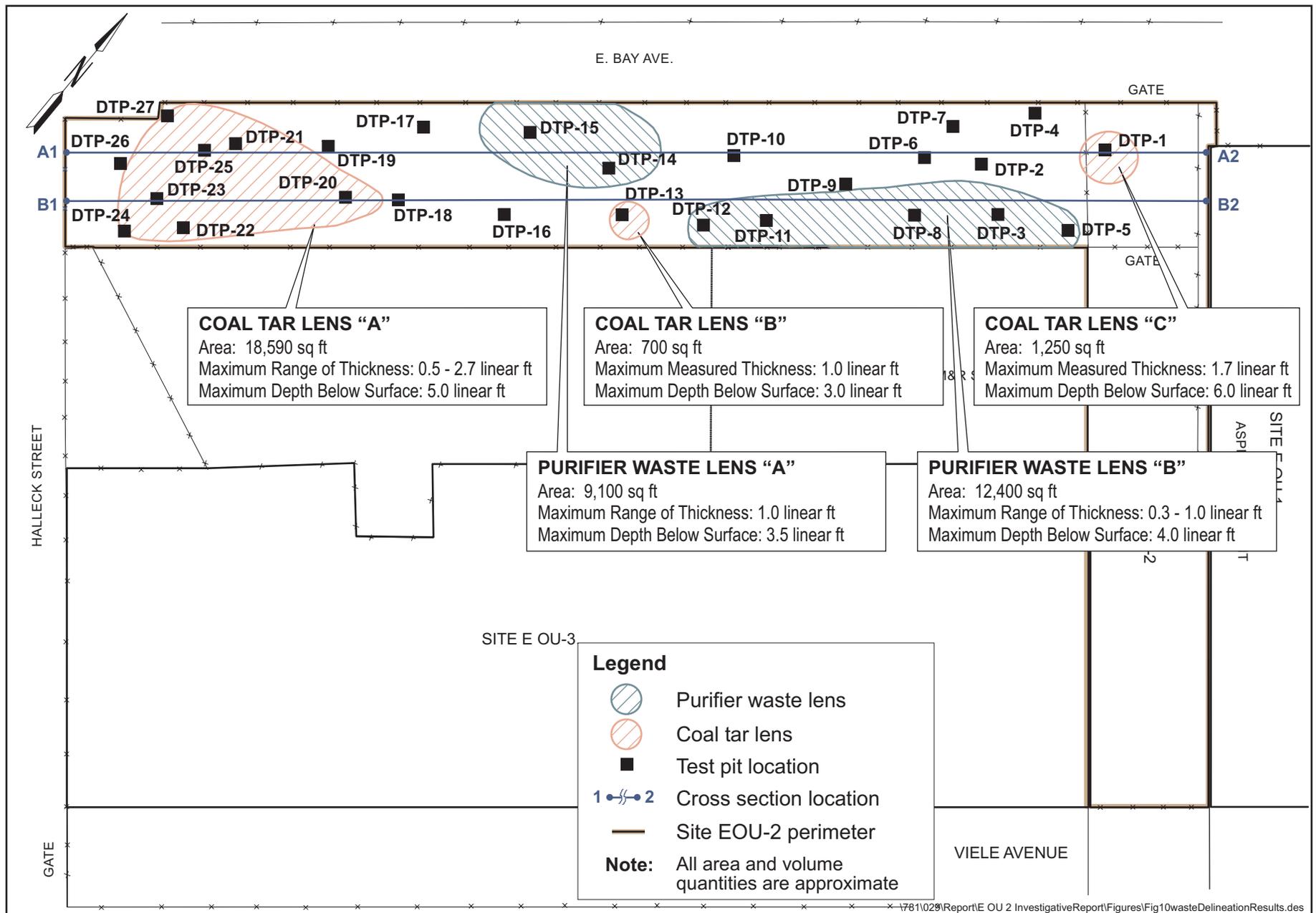
Samples that were collected for solid analysis were consistently from “worst case” areas in order to gather data to assist in the planning for any remedial action and engineering control efforts. Sample results indicate that hot spot areas do exist in shallow fill, but that the majority of the data is below the most recent NYSDEC cleanup criteria for specified land use.

The soil gas VOC concentration in the successfully sampled point was very low. It is not expected to require a specific action or remedy beyond what will already be addressed as part of the Response Plan. The proposed use will not include structures that avail themselves to vapor intrusion.

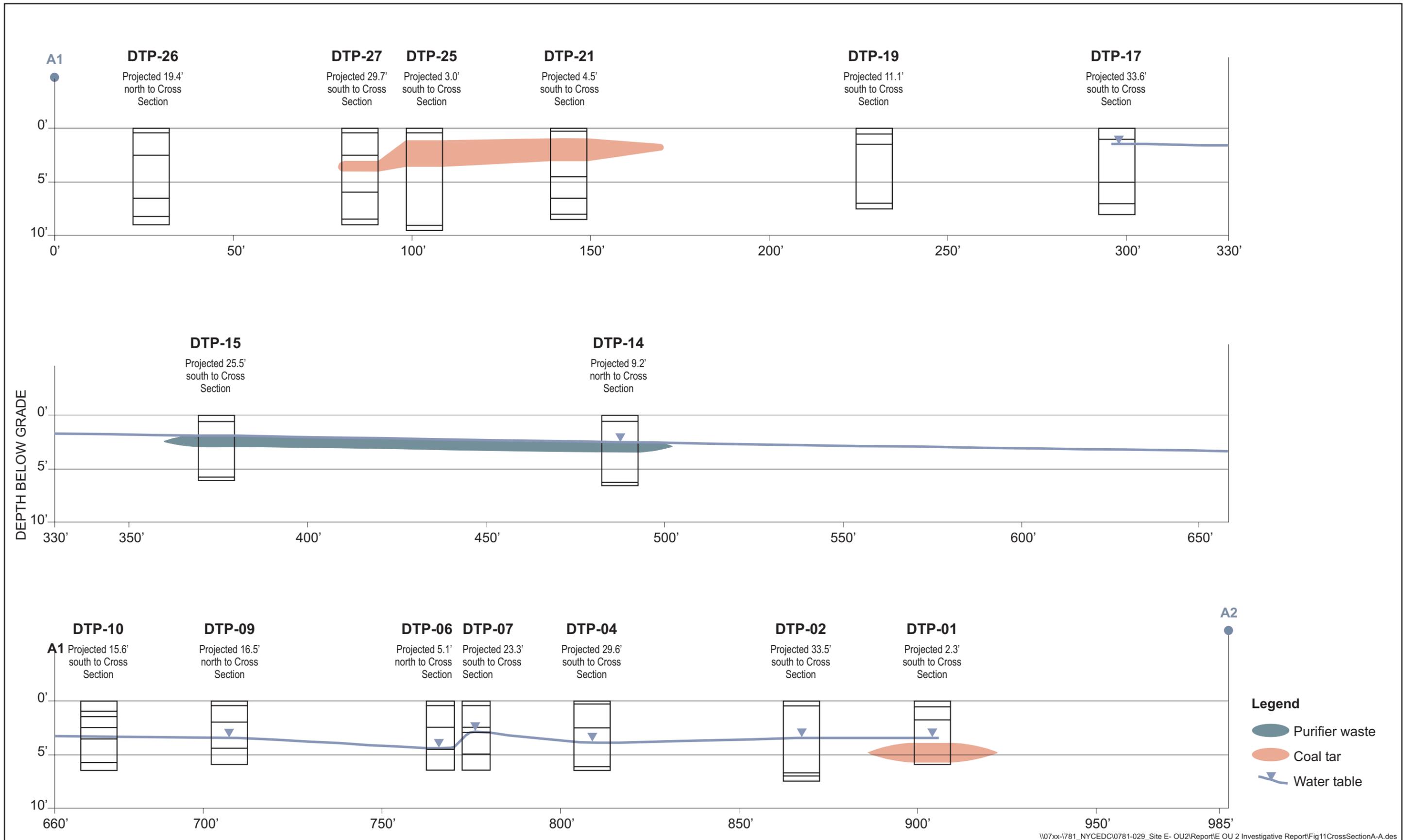
Metals concentrations also show a correlation to the dominant coal tar waste on-site. Arsenic, Cyanide, and Mercury were the metals that exceeded the NYSDEC BCP Track 2 SCOs. Barium and Lead levels were elevated in some samples as well.

PCBs and pesticides were detected in every soil sample submitted. Levels did not exceed the NYSDEC BCP Track 2 SCOs in any sample. PCBs were detected in small quantities in all but 2 soil samples B-7 and TP-C. Sample DTP-20 exhibited a small PCB exceedence due to Aroclor-1254 and Aroclor-1260 concentrations.

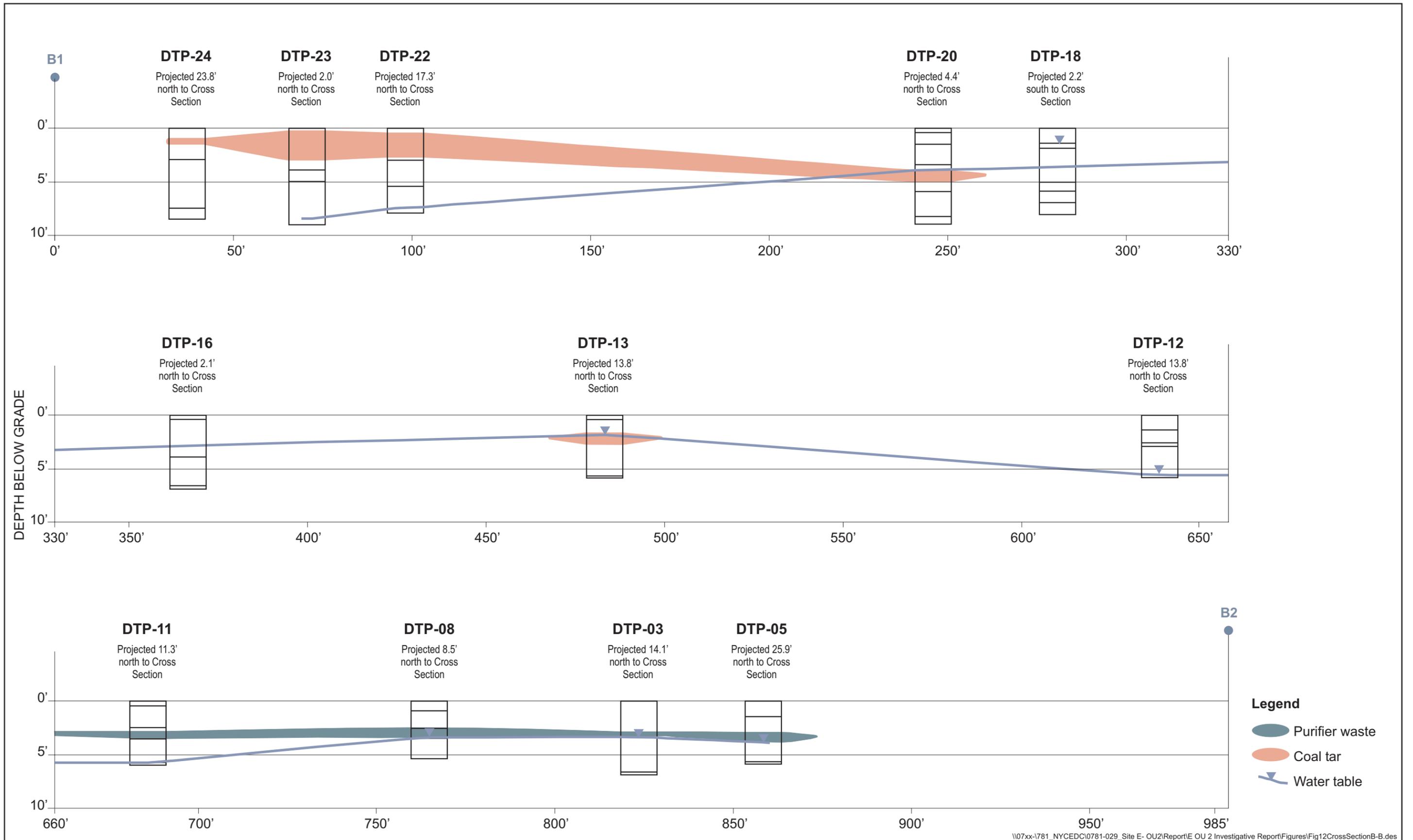
The overall results of soil sampling activities during the investigation indicate that the prevalent waste material on-site that may require further remedial action are the coal tar and purifier type waste hot spots.



17811029\Report\E OU 2 Investigative\Report\Figures\Fig10wasteDelineationResults.des



\\07xx-1781\_NYCEDC\0781-029\_Site E-OU2\Report\E OU 2 Investigative Report\Fig11CrossSectionA-A.des



\\07xx-1781\_NYCEDC\0781-029\_Site E- OU2\Report\E OU 2 Investigative Report\Figures\Fig12CrossSectionB-B.des

Groundwater contains virtually no VOCs or SVOCs. Only one (1) of the three (3) groundwater samples (PZ-2) contained any VOCs and its total concentration was only 3 µg/L. PZ-2 is also the only sample to contain any SVOCs. The total concentration of SVOCs in PZ-2 was 29 µg/L, however the field filtered sample submitted for PZ-2 (PZ-2F) was total non-detect for SVOCs. All three (3) groundwater samples, filtered and unfiltered, contained metals in exceedance of the NYSDEC Class GA Standard. Iron, Manganese, Sodium, and Thallium exceeded the standard in every sample and most samples also contained metals Calcium, Magnesium, Potassium, and Cyanide at elevated levels.

No pesticides or PCBs were detected in any of the groundwater samples collected and submitted for analysis. Following this report shall be further remedial activities to prepare the site for development as a commercial food-stuff distribution facility owned by the City of New York and to be operated as a member of the Hunts Point Food Distribution Center.

# **ATTACHMENT A**

## **BORING, PIEZOMETER AND TEST PIT LOGS**







# ENGINEERS FIELD TEST PIT LOG

BORING NO.	DTP-3
SHEET	1 OF 1
DATE: START	04/10/06 @ 11:10
END	04/10/06 @ 11:25
G.S. ELEV	

PROJECT NAME NYSDEC: Site EOU-2: Coal Tar Delineation

BORING LOCATION Site E OU-2, Hunts Point, Bronx, New York

OPERATOR NAME / COMPANY Matt / Metro Environmental

COORDINATES 234223.493' N, 1018282.158' E

EXCAVATION METHODS Backhoe

MONITORING INSTRUMENTATION DataRam / PID

HDRILMS FIELD INSPECTOR C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks
0	TOPSOIL, some sand and silt, trace roots and fragments (brick and wood), brown to dark brown, damp	Rounded cobbles observed
2		
3.0		
3.3	PURIFIER STAIN, some sand & silt, trace wooden timber frags, dk teal blue, damp	Strong odor
4	UNCONSOLIDATED MIXTURE of SLAG, CINDERS and COAL TAR (SOLIDIFIED), charcoal gray to black, damp to wet	
6		
6.7		
	CLAY, some silt, olive-green gray, damp	
	Bottom of Hole @ 7.0' bgs	
8		
10		

NOTES: No samples collected



# ENGINEERS FIELD TEST PIT LOG

<b>BORING NO.</b>	DTP-4
<b>SHEET</b>	1 OF 1
<b>DATE: START</b>	04/10/06 @ 12:40
<b>END</b>	04/10/06 @ 13:00
<b>G.S. ELEV</b>	

**PROJECT NAME** NYSDEC: Site EOU-2: Coal Tar Delineation

**BORING LOCATION** Site E OU-2, Hunts Point, Bronx, New York

**OPERATOR NAME / COMPANY** Matt / Metro Environmental

**COORDINATES** 234305.24' N, 1018252.621' E

**EXCAVATION METHODS** Backhoe

**MONITORING INSTRUMENTATION** DataRam / PID

**HDRILMS FIELD INSPECTOR** C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks
0	TOPSOIL, some sand & silt, trace roots & fragments (brick & wood), br - dk br, damp	
0.4		Rounded cobbles observed to BOH
	SILT, some sand, trace organics & fragments (brick & decomp schist), dark brown, damp	
2		
2.5		Slight asphalt odor
	UNCONSOLIDATED MIXTURE of SLAG, CINDERS and COAL TAR (SOLIDIFIED), charcoal gray to black, damp to wet	Unconsol. Mix. layer pinches out at north end of pit
4		GW seepage w/sheen @ 4.0' bgs
6		
6.2		
	SILT, some sand, trace organics & fragments (brick & decomp schist), dark brown, damp	
	Bottom of Hole @ 6.5' bgs	
8		
10		

**NOTES:** Collected soil samples @ XXX' bgs for XXX



# ENGINEERS FIELD TEST PIT LOG

BORING NO.	DTP-5	
SHEET	1	OF 1
DATE: START	04/10/06 @ 14:15	
END	04/10/06 @ 14:30	
G.S. ELEV		

PROJECT NAME NYSDEC: Site EOU-2: Coal Tar Delineation

BORING LOCATION Site E OU-2, Hunts Point, Bronx, New York

OPERATOR NAME / COMPANY Matt / Metro Environmental

COORDINATES 234218.233' N, 1018318.789' E

EXCAVATION METHODS Backhoe

MONITORING INSTRUMENTATION DataRam / PID

HDRILMS FIELD INSPECTOR C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks
0	TOPSOIL, some sand & silt, trace roots & fragments (brick & wood), br - dk br, damp	Rounded cobbles observed Slight purifier waste odor
1.5	SILT, some sand, trace organics & fragments (brick & decomp schist), dark brown, damp	
2		
3.0	PURIFIER WASTE, little sand, royal blue to teal blue, moist	Strong purifier waste odor
4		
4.0	GRANULAR COAL ASH, little to trace fragments (decomposed schist and brick), light-brownish gray, moist to wet	GW seepage w/sheen @ 4.0' bgs
5.8		
6	CLAY, some silt, olive-green gray, damp	
6	Bottom of Hole @ 6.0' bgs	
8		
10		

NOTES: Collected soil samples @ 3.0-4.5' bgs for VOC, SVOC, RCRA Metals, PCB, Pesticides, DRO, GRO & Cyanide



# ENGINEERS FIELD TEST PIT LOG

<b>BORING NO.</b>	DTP-6
<b>SHEET</b>	1 OF 1
<b>DATE: START</b>	04/10/06 @ 14:30
<b>END</b>	04/10/06 @ 15:00
<b>G.S. ELEV</b>	

**PROJECT NAME** NYSDEC: Site EOU-2: Coal Tar Delineation

**BORING LOCATION** Site E OU-2, Hunts Point, Bronx, New York

**OPERATOR NAME / COMPANY** Matt / Metro Environmental

**COORDINATES** 234263.662' N, 1018217.99' E

**EXCAVATION METHODS** Backhoe

**MONITORING INSTRUMENTATION** DataRam / PID

**HDRILMS FIELD INSPECTOR** C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks
0	TOPSOIL, some sand & silt, trace roots & fragments (brick & wood), br - dk br, damp	
0.5	SILT, some sand, trace organics & fragments (brick & decomp schist), dark brown, damp	
2		
2.5	UNCONSOLIDATED MIXTURE of SLAG, CINDERS and COAL TAR (SOLIDIFIED), charcoal gray to black, damp to wet	Slight asphalt odor
4		
4.5	GRANULAR COAL ASH, little to trace sand, silt and fragments (decomposed schist and brick), light-browny gray, moist to wet	GW seepage w/sheen @ 4.5' bgs
6		
	Bottom of Hole @ 6.5' bgs	
8		
10		

**NOTES:** No samples collected



# ENGINEERS FIELD TEST PIT LOG

BORING NO.	DTP-7	
SHEET	1	OF 1
DATE: START	04/11/06 @ 9:30	
END	04/11/06 @ 10:00	
G.S. ELEV		

PROJECT NAME NYSDEC: Site EOU-2: Coal Tar Delineation

BORING LOCATION Site E OU-2, Hunts Point, Bronx, New York

OPERATOR NAME / COMPANY Matt / Metro Environmental

COORDINATES 234293.017' N, 1018220.713' E

EXCAVATION METHODS Backhoe

MONITORING INSTRUMENTATION DataRam / PID

HDRILMS FIELD INSPECTOR C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks
0	TOPSOIL, some sand & silt, trace roots & fragments (brick & wood), br - dk br, damp	
0.5	SILT, some sand, trace organics & fragments (brick & decomp schist), dark brown, damp	
2		
3.0	UNCONSOLIDATED MIXTURE of COAL ASH, SLAG, CINDERS and COAL TAR (SOLIDIFIED), some sand and silt, dark brown to charcoal gray, moist to wet	GW seepage w/sheen @ 3.0' bgs Slight asphalt odor
4		
6	Bottom of Hole @ 5.0' bgs	
8		
10		

NOTES: No samples collected



# ENGINEERS FIELD TEST PIT LOG

<b>BORING NO.</b>	DTP-8
<b>SHEET</b>	1 OF 1
<b>DATE: START</b>	04/11/06 @ 8:45
<b>END</b>	04/11/06 @ 9:00
<b>G.S. ELEV</b>	

**PROJECT NAME** NYSDEC: Site EOU-2: Coal Tar Delineation

**BORING LOCATION** Site E OU-2, Hunts Point, Bronx, New York

**OPERATOR NAME / COMPANY** Matt / Metro Environmental

**COORDINATES** 234218.471' N, 1018223.625' E

**EXCAVATION METHODS** Backhoe

**MONITORING INSTRUMENTATION** DataRam / PID

**HDRILMS FIELD INSPECTOR** C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks
0	TOPSOIL, some sand & silt, trace roots & fragments (brick & wood), br - dk br, damp	
1.0	SILT, some sand, little 3"-12" malleable coal tar lenses, trace "coke glass" dark brown to black, charcoal gray, damp	Slight asphalt odor One 3' coal tar lense 0.5-1.0' bgs
2.6	PURIFIER WASTE, some sand, trace wood chips, royal blue to teal blue, moist to wet	Slight purifier waste odor
3.5	SILT, some sand, little to trace cinders and slag, dark brown, moist to wet	GW seepage w/sheen @ 3.5' bgs
5.5	Bottom of Hole @ 5.5' bgs	

**NOTES:** Collected soil samples @ 1.0-3.0' bgs for VOC, SVOC, RCRA Metals, PCB, Pesticides, DRO, GRO & Cyanide



# ENGINEERS FIELD TEST PIT LOG

BORING NO.	DTP-9
SHEET	1 OF 1
DATE: START	04/11/06 @ 10:25
END	04/11/06 @ 10:40
G.S. ELEV	

PROJECT NAME NYSDEC: Site EOU-2: Coal Tar Delineation

BORING LOCATION Site E OU-2, Hunts Point, Bronx, New York

OPERATOR NAME / COMPANY Matt / Metro Environmental

COORDINATES 234241.561' N, 1018160.824' E

EXCAVATION METHODS Backhoe

MONITORING INSTRUMENTATION DataRam / PID

HDRILMS FIELD INSPECTOR C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks
0	TOPSOIL, some sand & silt, trace roots & fragments (brick & wood), br - dk br, damp	GW seepage w/sheen @ 3.5' bgs
0.5	SILT, some sand, trace organics & fragments (brick & decomp schist), dark brown, damp	
2	UNCONSOLIDATED MIXTURE of COAL ASH, CINDERS and COAL TAR (SOLIDIFIED), some sand and silt, dark brown to charcoal gray, damp	
4.5	UNCONSOLIDATED MIXTURE of COAL ASH and SLAG, some sand and silt, brown, wet	
6	Bottom of Hole @ 6.0' bgs	
8		
10		

NOTES: No samples collected



# ENGINEERS FIELD TEST PIT LOG

BORING NO.	DTP-10
SHEET	1 OF 1
DATE: START	04/11/06 @10:35
END	04/11/06 @10:50
G.S. ELEV	

PROJECT NAME NYSDEC: Site EOU-2: Coal Tar Delineation

BORING LOCATION Site E OU-2, Hunts Point, Bronx, New York

OPERATOR NAME / COMPANY Matt / Metro Environmental

COORDINATES 234266.591' N, 1018119.023' E

EXCAVATION METHODS Backhoe

MONITORING INSTRUMENTATION DataRam / PID

HDRILMS FIELD INSPECTOR C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks
0	TOPSOIL, some sand & silt, trace roots & fragments (brick & wood), br - dk br, damp	* Note: No GW observed in pit  Slight asphalt odor
1.0	UNCONSOLIDATED MIXTURE of SOIL and SMALL COAL TAR LENSES (SOLIDIFIED), some sand & silt, dk brown to charcoal gray, damp	
1.5	UNCONSOLIDATED MIXTURE of COAL ASH and CINDER, some sand and silt, brown to dark brown, damp	
2		
2.5	CINDERS, some sand and silt, dark brown to charcoal gray, damp	
3.5	GRANULAR COAL ASH, little to trace slag fragments, light-brownish gray, damp	
4		
5.8		
6	CLAY, some silt, olive-green gray, damp	
	Bottom of Hole @ 6.5' bgs	
8		
10		

NOTES: No samples collected



# ENGINEERS FIELD TEST PIT LOG

BORING NO.	DTP-11
SHEET	1 OF 1
DATE: START	04/11/06 @ 11:20
END	04/11/06 @ 11:45
G.S. ELEV	

PROJECT NAME NYSDEC: Site EOU-2: Coal Tar Delineation

BORING LOCATION Site E OU-2, Hunts Point, Bronx, New York

OPERATOR NAME / COMPANY Matt / Metro Environmental

COORDINATES 234201.469' N, 1018146.201'E

EXCAVATION METHODS Backhoe

MONITORING INSTRUMENTATION DataRam / PID

HDRILMS FIELD INSPECTOR C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks
0	TOPSOIL, some sand & silt, trace roots & fragments (brick & wood), br - dk br, damp	Strong purifier odor
0.5	CINDERS, some sand and silt, dark brown to charcoal gray, damp	
2		
2.9	PURIFIER WASTE, little sand, royal blue to teal blue, moist	
3.5	GRANULAR COAL ASH, little-trace slag fragments, light-brownny gray, damp-moist	
4		GW seepage w/sheen @ 5.8' bgs
5.8	CLAY, some silt, olive-green gray, damp	
6	Bottom of Hole @ 6.0' bgs	
8		
10		

NOTES: No samples collected



# ENGINEERS FIELD TEST PIT LOG

BORING NO.	DTP-12
SHEET	1 OF 1
DATE: START	04/11/06 @ 11:50
END	04/11/06 @ 12:15
G.S. ELEV	

PROJECT NAME NYSDEC: Site EOU-2: Coal Tar Delineation

BORING LOCATION Site E OU-2, Hunts Point, Bronx, New York

OPERATOR NAME / COMPANY Matt / Metro Environmental

COORDINATES 234193.479' N, 1018099.827'E

EXCAVATION METHODS Backhoe

MONITORING INSTRUMENTATION DataRam / PID

HDRILMS FIELD INSPECTOR C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks
0	TOPSOIL, some sand & silt, trace roots & fragments (brick & wood), br - dk br, damp	
1.5		
2	CINDERS, some sand and silt, dark brown to charcoal gray, damp	
2.8		
3.0	PURIFIER WASTE, little sand, royal blue to teal blue, moist	Strong purifier odor
4	GRANULAR COAL ASH, little-trace slag fragments, light-brownish gray, damp-moist	
5.8		
6	CLAY, some silt, olive-green gray, damp	GW seepage w/sheen @ 5.8' bgs
6.0	Bottom of Hole @ 6.0' bgs	
8		
10		

NOTES: No samples collected



# ENGINEERS FIELD TEST PIT LOG

<b>BORING NO.</b>	DTP-13
<b>SHEET</b>	1 OF 1
<b>DATE: START</b>	04/11/06 @ 12:52
<b>END</b>	04/11/06 @ 13:20
<b>G.S. ELEV</b>	

**PROJECT NAME** NYSDEC: Site EOU-2: Coal Tar Delineation

**BORING LOCATION** Site E OU-2, Hunts Point, Bronx, New York

**OPERATOR NAME / COMPANY** Matt / Metro Environmental

**COORDINATES** 234162.594' N, 1017947.411' E

**EXCAVATION METHODS** Backhoe

**MONITORING INSTRUMENTATION** DataRam / PID

**HDRILMS FIELD INSPECTOR** C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks
0	TOPSOIL, some sand & silt, trace roots & fragments (brick & wood), br - dk br, damp	Coal tar lenses less than 12" x 12"
0.5	SILT, some sand and small malleable coal tar lenses, dark brown, damp	
1.8	MALLEABLE COAL TAR, black, damp	
2.8	GRANULAR COAL ASH, little to trace slag and brick fragments, light brown to light-browny gray, damp	
5.8	CLAY, some silt, olive-green gray, damp	
6	Bottom of Hole @ 6.0' bgs	Very slow GW seepage @ 2.0' bgs Strong asphalt odor
8		
10		

**NOTES:** Collected soil samples @ 0.0-1.5' bgs for VOC, SVOC, RCRA Metals, PCB, Pesticides, DRO, GRO & Cyanide



# ENGINEERS FIELD TEST PIT LOG

BORING NO.	DTP-14
SHEET	1 OF 1
DATE: START	04/11/06 @ 13:30
END	04/11/06 @ 13:50
G.S. ELEV	

PROJECT NAME NYSDEC: Site EOU-2: Coal Tar Delineation

BORING LOCATION Site E OU-2, Hunts Point, Bronx, New York

OPERATOR NAME / COMPANY Matt / Metro Environmental

COORDINATES 234209.281' N, 1017943.416' E

EXCAVATION METHODS Backhoe

MONITORING INSTRUMENTATION DataRam / PID

HDRILMS FIELD INSPECTOR C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks
0	TOPSOIL, some sand & silt, trace roots & fragments (brick & wood), br - dk br, damp	
0.5		
	UNCONSOLIDATED MIXTURE of COAL ASH, SLAG, CINDERS and COAL TAR (SOLIDIFIED), some sand and silt, dark brown to charcoal gray, damp	
2		
2.5		Very slow GW seepage @ 2.5' bgs Strong purifier waste odor
	PURIFIER WASTE, little sand, rust orange or royal to teal blue, damp	
3.5		
4	GRANULAR COAL ASH, little-trace fragments (slag and brick), light-brownish gray, damp-moist	
6		
6.2		
	CLAY, some silt, olive-green gray, damp	
	Bottom of Hole @ 6.5' bgs	
8		
10		

NOTES: Collected soil samples @ 1.5-3.0' bgs for VOC, SVOC, RCRA Metals, PCB, and Pesticides



# ENGINEERS FIELD TEST PIT LOG

BORING NO.	DTP-15
SHEET	1 OF 1
DATE: START	04/11/06 @ 14:10
END	04/11/06 @ 14:30
G.S. ELEV	

PROJECT NAME NYSDEC: Site EOU-2: Coal Tar Delineation

BORING LOCATION Site E OU-2, Hunts Point, Bronx, New York

OPERATOR NAME / COMPANY Matt / Metro Environmental

COORDINATES 234223.034' N, 1017825.903' E

EXCAVATION METHODS Backhoe

MONITORING INSTRUMENTATION DataRam / PID

HDRILMS FIELD INSPECTOR C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks
0	TOPSOIL, some sand & silt, trace roots & fragments (brick & wood), br - dk br, damp	* Note: No GW observed in pit Coal tar lenses less than 8" x 8" Slight purifier waste odor Purifier waste pinches out at south end of pit X 14.8' south of fence
0.5	UNCONSOLIDATED MIXTURE of CINDERS and COAL TAR (MALLEABLE), some sand and silt, trace fragments (decomposed schist and brick), dark brown, damp	
2.0	PURIFIER WASTE, little sand, rust orange or royal to teal blue, damp	
3.0	GRANULAR COAL ASH, little-trace fragments (slag and brick), light-browny gray, damp-moist	
5.7	CLAY, some silt, olive-green gray, damp	
6	Bottom of Hole @ 6.0' bgs	
8		
10		

NOTES: No samples collected



# ENGINEERS FIELD TEST PIT LOG

BORING NO.	DTP-16
SHEET	1 OF 1
DATE: START	04/11/06 @ 14:30
END	04/11/06 @ 14:50
G.S. ELEV	

PROJECT NAME NYSDEC: Site EOU-2: Coal Tar Delineation

BORING LOCATION Site E OU-2, Hunts Point, Bronx, New York

OPERATOR NAME / COMPANY Matt / Metro Environmental

COORDINATES 234153.097' N, 1017830.357' E

EXCAVATION METHODS Backhoe

MONITORING INSTRUMENTATION DataRam / PID

HDRILMS FIELD INSPECTOR C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks
0	TOPSOIL, some sand & silt, trace roots & fragments (brick & wood), br - dk br, damp	* Note: No GW observed in pit  Slight asphalt odor
0.5	SILT, some sand, trace organics and brick fragments, brown to dark brown, damp	
2		
2.5	UNCONSOLIDATED MIXTURE of CINDERS and COAL TAR (SOLIDIFIED), some sand and silt, dark brown to charcoal gray, damp to moist	
4	GRANULAR COAL ASH, little-trace fragments (slag and brick), light-brownish gray, damp-moist	
6		
6.7	CLAY, some silt, olive-green gray, damp	
	Bottom of Hole @ 7.0' bgs	
8		
10		

NOTES: No samples collected



# ENGINEERS FIELD TEST PIT LOG

BORING NO.	DTP-17	
SHEET	1	OF 1
DATE: START	04/12/06 @ 8:10	
END	04/12/06 @ 8:30	
G.S. ELEV		

PROJECT NAME NYSDEC: Site EOU-2: Coal Tar Delineation

BORING LOCATION Site E OU-2, Hunts Point, Bronx, New York

OPERATOR NAME / COMPANY Matt / Metro Environmental

COORDINATES 234217.127' N, 1017748.903' E

EXCAVATION METHODS Backhoe

MONITORING INSTRUMENTATION DataRam / PID

HDRILMS FIELD INSPECTOR C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks
0	TOPSOIL, some cinders, trace roots, dark brown, damp	
1.0	UNCONSOLIDATED MIXTURE of CINDERS and SOLIDIFIED COAL TAR, little slag, trace brick fragments & misc. fill materials (metal, pottery, bottles, etc.), damp	Strong asphalt odor GW very slow seepage @ 1.5' bgs Rounded cobbles observed
2		
4		
5.0	GRANULAR COAL ASH, gray-brown, damp	
6		
7.0	CLAY, some silt, olive-green gray, damp	
8	Bottom of Hole @ 8.0' bgs	
10		

NOTES: No samples collected



# ENGINEERS FIELD TEST PIT LOG

<b>BORING NO.</b>	DTP-18	
<b>SHEET</b>	1	<b>OF</b> 1
<b>DATE: START</b>	04/12/06 @ 8:40	
<b>END</b>	04/12/06 @ 9:00	
<b>G.S. ELEV</b>		

**PROJECT NAME** NYSDEC: Site EOU-2: Coal Tar Delineation

**BORING LOCATION** Site E OU-2, Hunts Point, Bronx, New York

**OPERATOR NAME / COMPANY** Matt / Metro Environmental

**COORDINATES** 234142.003' N, 1017745.687' E

**EXCAVATION METHODS** Backhoe

**MONITORING INSTRUMENTATION** DataRam / PID

**HDRILMS FIELD INSPECTOR** C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks
0	TOPSOIL, some cinders, trace roots, dark brown, damp	* Note: No GW observed in pit
1.5		
1.5	UNCONSOLIDATED MIXTURE of CINDERS and COAL TAR (SOLIDIFIED), charcoal gray to black, damp	Slight asphalt odor
2.0		Strong asphalt odor
2.0	UNCONSOLIDATED MIXTURE of CINDERS, COAL TAR (SOLIDIFIED) and COAL ASH, little brick fragments, trace fill debris (rebar strips, etc.), gray, damp	
4		
6		
6.0	CLAY, some silt, olive-green gray, damp	
7.0		
7.0	Bottom of Hole @ 7.0' bgs	
8		
10		

**NOTES:** Collected soil samples @ 2.0-3.5' bgs for VOC, SVOC, RCRA Metals, PCB, Pesticides, DRO, GRO and Cyanide



# ENGINEERS FIELD TEST PIT LOG

BORING NO.	DTP-19
SHEET	1 OF 1
DATE: START	04/12/06 @ 9:30
END	04/12/06 @ 9:50
G.S. ELEV	

PROJECT NAME NYSDEC: Site EOU-2: Coal Tar Delineation

BORING LOCATION Site E OU-2, Hunts Point, Bronx, New York

OPERATOR NAME / COMPANY Matt / Metro Environmental

COORDINATES 234182.846' N, 1017686.102' E

EXCAVATION METHODS Backhoe

MONITORING INSTRUMENTATION DataRam / PID

HDRILMS FIELD INSPECTOR C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks
0	TOPSOIL, some sand and silt, little organics, trace fragments (decomposed schist and brick), dark brown, damp	* Note: No GW observed in pit
0.5	SILT, some sand, trace organics, fragments (decomposed schist and brick), solidified coal tar and cinders, dark brown, damp	
1.5	UNCONSOLIDATED MIXTURE of CINDERS and COAL TAR (SOLIDIFIED), little to trace sand, charcoal gray to black, damp	
2		
4		
5.0	GRANULAR COAL ASH, some sand and silt, little to trace fragments (slag and brick), light brown to light-brownish gray, damp	
6		
7.0	CLAY, some silt, olive-green gray, damp	
8	Bottom of Hole @ 7.5' bgs	
10		

NOTES: Collected soil samples @ 5.0-6.0' bgs for VOC, SVOC, RCRA Metals, PCB, and Pesticides



# ENGINEERS FIELD TEST PIT LOG

<b>BORING NO.</b>	DTP-20
<b>SHEET</b>	1 OF 1
<b>DATE: START</b>	04/12/06 @ 10:20
<b>END</b>	04/12/06 @ 10:45
<b>G.S. ELEV</b>	

**PROJECT NAME** NYSDEC: Site EOU-2: Coal Tar Delineation

**BORING LOCATION** Site E OU-2, Hunts Point, Bronx, New York

**OPERATOR NAME / COMPANY** Matt / Metro Environmental

**COORDINATES** 234129.17° N, 1017712.578° E

**EXCAVATION METHODS** Backhoe

**MONITORING INSTRUMENTATION** DataRam / PID

**HDRILMS FIELD INSPECTOR** C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks	
0	TOPSOIL, some sand and silt, little organics, trace fragments (decomposed schist and brick), dark brown, damp	Rounded cobbles observed	
0.5	SILT, some sand, trace organics, fragments (decomposed schist and brick), brown to dark brown, damp		
1.5	UNCONSOLIDATED MIXTURE of BRICK FRAGMENTS, CINDERS and COAL TAR (SOLIDIFIED), little to trace sand, dark brown, damp		
2			
3.5			
4	UNCONSOLIDATED MIXTURE of CINDERS and COAL TAR (SOLIDIFIED), little to trace sand, charcoal gray to black, damp		Very slow GW seepage @ 4.0' bgs
4.0	COAL TAR (MALLEABLE & SOLIDIFIED), black, damp to moist		
5.0	UNCONSOLIDATED MIXTURE of COAL ASH, CINDER, SLAG AND BRICK, gray to brownish gray, damp to moist		
6.0	GRANULAR COAL ASH, some sand and silt, little-trace fragments (slag and brick), light-brownish gray, damp-moist		
6			
8	CLAY, some silt, olive-green gray, damp		
8.3			
	Bottom of Hole @ 9.0' bgs		
10			

**NOTES:** Collected soil samples @ 3.0-4.0' bgs for VOC, SVOC, RCRA Metals, PCB, Pesticides, DRO, GRO and Cyanide



# ENGINEERS FIELD TEST PIT LOG

BORING NO.	DTP-21
SHEET	1 OF 1
DATE: START	04/12/06 @ 11:10
END	04/12/06 @ 11:40
G.S. ELEV	

PROJECT NAME NYSDEC: Site EOU-2: Coal Tar Delineation

BORING LOCATION Site E OU-2, Hunts Point, Bronx, New York

OPERATOR NAME / COMPANY Matt / Metro Environmental

COORDINATES 234160.939' N, 1017603.069' E

EXCAVATION METHODS Backhoe

MONITORING INSTRUMENTATION DataRam / PID

HDRILMS FIELD INSPECTOR C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks
0	TOPSOIL, some sand/silt, little root, trace frags (decomp schist/brick), dk.br, damp	* Note: No GW observed in pit  Strong asphalt odor
	SILT, some sand, trace organics, fragments (decomposed schist and brick), brown to dark brown, damp	
	MALLEABLE COAL TAR, black, damp	
2		
	UNCONSOLIDATED MIXTURE of CINDERS and SOLIDIFIED COAL TAR, black to charcoal gray, damp	
4		
	CINDERS, some coal ash, trace fragments (slag and brick), charcoal gray to black, damp	
6		
	GRANULAR COAL ASH, some sand and silt, little to trace fragments (slag, brick and cinders), light brown to light-brownish gray, damp	
8		
	CLAY, some silt, olive-green gray, damp	
	Bottom of Hole @ 8.5' bgs	
10		

NOTES: Collected soil samples @ 2.0-4.0' bgs for VOC, SVOC, RCRA Metals, PCB, Pesticides, DRO, GRO and Cyanide



# ENGINEERS FIELD TEST PIT LOG

BORING NO.	DTP-22
SHEET	1 OF 1
DATE: START	04/13/06 @ 9:05
END	04/13/06 @ 9:40
G.S. ELEV	

PROJECT NAME NYSDEC: Site EOU-2: Coal Tar Delineation

BORING LOCATION Site E OU-2, Hunts Point, Bronx, New York

OPERATOR NAME / COMPANY Matt / Metro Environmental

COORDINATES 234089.889' N, 1017569.34' W

EXCAVATION METHODS Backhoe

MONITORING INSTRUMENTATION DataRam / PID

HDRILMS FIELD INSPECTOR C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks
0	TOPSOIL, some sand and silt, little organics, trace fragments (decomposed schist and brick), dark brown, damp	
0.5	COAL TAR (STIFF and MALLEABLE), black, damp	
2		
2.7	CLAY, some silt, little-trace slag frags, brown-gray to olive-green gray, damp	
3.0	GRANULAR COAL ASH, some sand and silt, little to trace fragments (slag, brick and cinders), light brown to light-brown gray, damp	
4		
6	UNCONSOLIDATED MIXTURE of CINDER and SLAG FRAGMENTS, some sand, trace brick fragments, rust brown to charcoal gray, damp to wet	
		GW seepage w/sheen @ 7.5' bgs
8	Bottom of Hole @ 8.0' bgs	
10		

NOTES: Collected soil samples @ 0.0-4.0' bgs for VOC, SVOC, RCRA Metals, PCB, Pesticides, DRO, GRO and Cyanide



# ENGINEERS FIELD TEST PIT LOG

BORING NO.	DTP-23
SHEET	1 OF 1
DATE: START	04/13/06 @ 10:10
END	04/13/06 @ 10:40
G.S. ELEV	

PROJECT NAME NYSDEC: Site EOU-2: Coal Tar Delineation

BORING LOCATION Site E OU-2, Hunts Point, Bronx, New York

OPERATOR NAME / COMPANY Matt / Metro Environmental

COORDINATES 234099.944' N, 1017539.184' W

EXCAVATION METHODS Backhoe

MONITORING INSTRUMENTATION DataRam / PID

HDRILMS FIELD INSPECTOR C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks
0	TOPSOIL, some sand/silt, little root, trace frags (decomp schist/brick), dk.br, damp	
0.3	COAL TAR (STIFF and MALLEABLE), black, damp	
2		
3.0	UNCONSOLIDATED MIXTURE of COAL ASH and BRICK/CEMENT, some sand and silt, light brown, damp	
4.0	UNCONSOLIDATED MIXTURE of COAL ASH and GRAVEL, some sand and silt, light brown, damp	
5.0	CINDERS, some coal ash, trace solidified coal tar, charcoal gray, damp to wet	GW seepage w/sheen @ 8.5' bgs
6		
8		
	Bottom of Hole @ 9.0' bgs	
10		

NOTES: No samples collected



# ENGINEERS FIELD TEST PIT LOG

BORING NO.	DTP-24
SHEET	1 OF 1
DATE: START	04/13/06 @ 10:45
END	04/13/06 @ 11:10
G.S. ELEV	

PROJECT NAME NYSDEC: Site EOU-2: Coal Tar Delineation

BORING LOCATION Site E OU-2, Hunts Point, Bronx, New York

OPERATOR NAME / COMPANY Matt / Metro Environmental

COORDINATES 234072.5' N, 1017510.176' W

EXCAVATION METHODS Backhoe

MONITORING INSTRUMENTATION DataRam / PID

HDRILMS FIELD INSPECTOR C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks
0	TOPSOIL, some sand and silt, little organics, trace fragments (decomposed schist and brick), dark brown, damp	* Note: No GW observed in pit  Slight asphalt odor
1.0	COAL TAR (SOLIDIFIED), black, damp	
1.5	UNCONSOLIDATED MIXTURE of COAL ASH and BRICK FRAGMENTS, some sand and silt, light brown to light-brownish gray, damp	
3.0	UNCONSOLIDATED MIXTURE of CINDERS and SLAG, some sand, charcoal gray to black, damp	
7.5	CLAY, some silt, olive-green gray, damp	
8	Bottom of Hole @ 8.5' bgs	
10		

NOTES: Collected soil samples @ 0.0-4.0' bgs for VOC, SVOC, RCRA Metals, PCB, and Pesticides



# ENGINEERS FIELD TEST PIT LOG

BORING NO.	DTP-25
SHEET	1 OF 1
DATE: START	04/12/06 @ 12:45
END	04/12/06 @ 13:20
G.S. ELEV	

PROJECT NAME NYSDEC: Site EOU-2: Coal Tar Delineation

BORING LOCATION Site E OU-2, Hunts Point, Bronx, New York

OPERATOR NAME / COMPANY Matt / Metro Environmental

COORDINATES 234152.127' N, 1017563.266' E

EXCAVATION METHODS Backhoe

MONITORING INSTRUMENTATION DataRam / PID

HDRILMS FIELD INSPECTOR C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks
0	TOPSOIL, some sand/silt, little root, trace frags (decomp schist/brick), dk.br, damp	* Note: No GW observed in pit  Strong asphalt odor
	SILT, some sand, trace organics, fragments (decomposed schist and brick), brown to dark brown, damp	
	STIFF COAL TAR, black, damp	
2		
	SOLIDIFIED COAL TAR, little cinders, charcoal gray to black, damp	
	GRANULAR COAL ASH, some sand and silt, little to trace fragments (slag, brick and cinders), light brown to light-brownish gray, damp	
4		
6		
8		
	CLAY, some silt, olive-green gray, damp	
10	Bottom of Hole @ 9.5' bgs	

NOTES: No samples collected



# ENGINEERS FIELD TEST PIT LOG

BORING NO.	DTP-26
SHEET	1 OF 1
DATE: START	04/12/06 @ 14:05
END	04/12/06 @ 14:20
G.S. ELEV	

PROJECT NAME NYSDEC: Site EOU-2: Coal Tar Delineation

BORING LOCATION Site E OU-2, Hunts Point, Bronx, New York

OPERATOR NAME / COMPANY Matt / Metro Environmental

COORDINATES 234116.277' N, 1017491.956' E

EXCAVATION METHODS Backhoe

MONITORING INSTRUMENTATION DataRam / PID

HDRILMS FIELD INSPECTOR C. Friedman / S. Nakai

Depth (ft.)	Description	Remarks
0	TOPSOIL, some sand/silt, little root, trace frags (decomp schist/brick), dk.br, damp	* Note: No GW observed in pit
	SILT, some sand, trace organics, fragments (decomposed schist and brick), brown to dark brown, damp	
2		
	UNCONSOLIDATED MIXTURE of SLAG and CINDERS, charcoal gray to rust brown, damp	
4		
6		
	GRANULAR COAL ASH, some sand and silt, little to trace fragments (slag, brick and cinders), light brown to light-brownish gray, damp	
8		
	CLAY, some silt, olive-green gray, damp	
10	Bottom of Hole @ 9.0' bgs	

NOTES: No samples collected















# LMS

## Test Boring Log

Boring No.: Pit F

Sheet 1 of 1

Project Name: Hunt's Point Site E OU-2

Project No.: 781-029

Client: EDC

Date: 4/12/05

Driller:

Drilling Method: CAP rental extendahoe

Total Depth: 7'

Boring Location: Site E OU-2

Depth To Water:

Coordinates:

Surf. Elevation:

Logged By: C. Friedman

Hole Diameter:

Monitoring Instrument(s): PID / ITX Multi-gas meter

Depth (ft)	Blows On Sampler				Recovery (ft)	Instrument Reading	Sample Retained		Classification Of Material f - fine and - 35-50% m - medium some - 20-35% c - coarse little - 10-20% trace - 0-10%	Remarks
	0"-6"	6"-12"	12"-18"	18"-24"						
0								0	Topsoil and fill material. Soil: c-brown sand Fill: Black cindery material, slsg, ash, brick, and misc. garbage.	Perched water @ 2'
								2.5'	Coal Tar Waste. Strong odor.	
								4.6'	Coal ash and black cindery material.	
								7'	Gray-green clay	







# LMS

## Test Boring Log

Boring No.: Pit J

Sheet 1 of 1

Project Name: Hunt's Point Site E OU-2

Project No.: 781-029

Client: EDC

Date: 4/12/05

Driller:

Drilling Method: CAP rental extendahoe

Total Depth: 6.5'

Boring Location: Site E OU-2

Depth To Water:

Coordinates:

Surf. Elevation:

Logged By: C. Friedman

Hole Diameter:

Monitoring Instrument(s): PID / ITX Multi-gas meter

Depth (ft)	Blows On Sampler				Recovery (ft)	Instrument Reading	Sample Retained		Classification Of Material f - fine and - 35-50% m - medium some - 20-35% c - coarse little - 10-20% trace - 0-10%	Remarks
	0"-6"	6"-12"	12"-18"	18"-24"						
0								0	Topsoil and fill material. Soil: c-brown sand. Fill: brick, blk cindery material, bottles, and misc. garbage.	no sheen no odor
								2.5	Black cindery material.	
								3.6	Coal ash	
								6.4	Water above a gray-green clay layer.	

# LMS

## Test Boring Log

Boring No.: Pit K

Sheet 1 of 1

Project Name: Hunt's Point Site E OU-2

Project No.: 781-029

Client: EDC

Date: 4/12/05

Driller:

Drilling Method: CAP rental extendahoe

Total Depth: 4.8'

Boring Location: Site E OU-2

Depth To Water:

Coordinates:

Surf. Elevation:

Logged By: C. Friedman

Hole Diameter:

Monitoring Instrument(s): PID / ITX Multi-gas meter

Depth (ft)	Blows On Sampler				Recovery (ft)	Instrument Reading	Sample Retained		Classification Of Material f - fine and - 35-50% m - medium some - 20-35% c - coarse little - 10-20% trace - 0-10%	Remarks
	0"-6"	6"-12"	12"-18"	18"-24"						
0								0	Topsoil: c-brown sand and roots.	no sheen no odor
								3.2	Coal ash (reddish Fe stain), trace brick.	
									Water	
								4.8'		



































# LMS

## Test Boring Log

<b>Project Name:</b> NYCEDC HUNTS POINT SITE E OU-2	<b>Boring No.:</b> B-1
<b>Client:</b> NYCEDC	<b>Sheet</b> 1 <b>of</b> 1
<b>Driller:</b> Aquifer Drilling and Testing, Inc.	<b>Project No.:</b> 781029
<b>Drilling Method:</b> Direct Push Probe	<b>Date:</b> Start 3/22/05
<b>Boring Location:</b> Site E OU-2	Finish 3/23/05
<b>Coordinates:</b>	<b>Total Depth:</b> 15'
<b>Logged By:</b> C. Friedman	<b>Depth To Water:</b> 10'
	<b>Surf. Elevation:</b>
	<b>Hole Diameter:</b> 2"

**Monitoring Instrument(s):** PID, ITX Multi-Gas meter (HCN, H<sub>2</sub>S, LEL, O<sub>2</sub>)

Depth (ft)	Blows On Sampler				Recovery	Instrument Reading	Sample Retained		Classification Of Material f - fine and - 35-50% m - medium some - 20-35% c - coarse little - 10-20% trace - 0-10%	Remarks
	0"-6"	6"-12"	12"-18"	18"-24"						
0-5'					4				c-brown sand and organics. Trace pebbles.	
								0.400	c-brown sand and a light colored crushed sandy rock.	
								0.6	Black slaggy material and c-sand Trace brick and concrete.	
								1	Black slaggy and cindery material. Trace concrete. Strong tar-like odor.	moist
								2.4	c-brown sand and cindery material and concrete. Trace brick.	PID = 44ppm at 2' HCN = .2 at 2'
								3	Fine cindery material some m-f sand Trace brick, slight odor.	
5-10'					3			5		
								5.6	f-cindery material and ground-up concrete. Little wood chunks. Tar like odor.	moist PID = 41ppm at 5.6'
								6	Black slaggy material some pebbles	
								6.3	Black slaggy material	very moist
								7.6	Rounded steel balls (rust color), little c-sand, trace brick.	
								7.9	c-brown-grey sand and slaggy material. Trace brick and concrete.	
10-15'					3.6			10	Black slaggy material and pebble bits. Slight asphaly odor.	wet





# LMS

## Test Boring Log

**Boring No.:** B-3

**Sheet** 1 **of** 2

**Project Name:** NYCEDC HUNTS POINT SITE E OU-2

**Project No.:** 781029

**Client:** NYCEDC

**Date:** Start 3/22/05

**Driller:** Aquifer Drilling and Testing, Inc.

Finish 3/23/05

**Drilling Method:** Direct Push Probe

**Total Depth:** 15'

**Boring Location:** Site E OU-2

**Depth To Water:** 5.5'

**Coordinates:**

**Surf. Elevation:**

**Logged By:** C. Friedman

**Hole Diameter:** 2"

**Monitoring Instrument(s):** PID, ITX Multi-Gas meter (HCN, H<sub>2</sub>S, LEL, O<sub>2</sub>)

Depth (ft)	Blows On Sampler				Recovery	Instrument Reading	Sample Retained		Classification Of Material f - fine and - 35-50% m - medium some - 20-35% c - coarse little - 10-20% trace - 0-10%	Remarks
	0"-6"	6"-12"	12"-18"	18"-24"						
0-5'					4.2				m-c brown sand and organics.	
								0.3	Black slaggy material, some brick little concrete pieces and trace c-sand.	
								1	Black slaggy material, trace brick and pebbles. Strong asphalt odor.	moist to wet PID = 24ppm at 1.6'
								3.5	Concrete dust, some cindery/slaggy material.	
								3.8	Black slaggy material, trace sand and brick. Pieces of rubber, slight petroleum odor.	moist
5-10'					3.6			5		
								5.3	Brick	
								5.4	Black slaggy material, trace brick. Strong petroleum odor.	wet PID = 33ppm at 6'
								6.3	Black cindery material and brick. Little c-sand.	
								6.8	Black slaggy material and c-sand, trace brick.	
								7.3	Dark-brown silt/clay, trace m-f sand and pebbles. Slight odor.	moist
								7.5	c-brown sand and black cindery material, little brick.	
								8.4	Black slaggy material and concrete, asphalt pieces. Some c-brown sand.	moist



# LMS

## Test Boring Log

**Boring No.:** B-4  
**Sheet** 1 of 1  
**Project No.:** 781029  
**Date:** Start 3/22/05  
 Finish 3/23/05  
**Total Depth:** 10'  
**Depth To Water:** 5.5'  
**Surf. Elevation:**  
**Hole Diameter:** 2"

**Project Name:** NYCEDC HUNTS POINT SITE E OU-2  
**Client:** NYCEDC  
**Driller:** Aquifer Drilling and Testing, Inc.  
**Drilling Method:** Direct Push Probe  
**Boring Location:** Site E OU-2  
**Coordinates:**  
**Logged By:** C. Friedman

**Monitoring Instrument(s):** PID, ITX Multi-Gas meter (HCN, H<sub>2</sub>S, LEL, O<sub>2</sub>)

Depth (ft)	Blows On Sampler				Recovery	Instrument Reading	Sample Retained		Classification Of Material f - fine and - 35-50% m - medium some - 20-35% c - coarse little - 10-20% trace - 0-10%	Remarks
	0"-6"	6"-12"	12"-18"	18"-24"						
0-5'					4.3				c-brown sand, some black slaggy material. Slight asphalt odor.	moist
								1.500	c-brown sand, some black slaggy material and little pebbles. Slight asphalt odor.	wet
								2.5	Black slaggy material, trace brick. Strong asphalt odor.	PID = 20ppm at 3.8'
								4	Black slaggy material and concrete/ asphalt pieces. Strong asphalt odor.	
5-10'					4.2			5	Black slaggy material in water. No odor.	very wet
								7	Mixture of c-sand, black slaggy material, and brick.	moist
								8	Dark grey clay.	moist
									EOB = 10'	PID = 0-5ppm btw 5-10'
										VOCs - (3.8-4.3') SVOCs, PCBs, Pest, RCRA Metals, and Total Cyanides - (0-5')

LMS	Test Boring Log	Boring No.: B-5
		Sheet 1 of 1
Project Name: NYCEDC HUNTS POINT SITE E OU-2		Project No.: 781029
Client: NYCEDC		Date: Start 3/22/05
Driller: Aquifer Drilling and Testing, Inc.		Finish 3/23/05
Drilling Method: Direct Push Probe		Total Depth: 10'
Boring Location: Site E OU-2		Depth To Water: 4.5
Coordinates:		Surf. Elevation:
Logged By: C. Friedman		Hole Diameter: 2"
Monitoring Instrument(s): PID, ITX Multi-Gas meter (HCN, H <sub>2</sub> S, LEL, O <sub>2</sub> )		

Depth (ft)	Blows On Sampler				Recovery	Instrument Reading	Sample Retained		Classification Of Material f - fine and - 35-50% m - medium some - 20-35% c - coarse little - 10-20% trace - 0-10%	Remarks
	0"-6"	6"-12"	12"-18"	18"-24"						
0-5'					3.2				c-brown sand and organics, some black slaggy material. Trace pebbles.	moist
								0.8	Black slaggy material some c-brown sand, little pebbles. Strong asphalt odor.	
								1.9	Black slaggy material in pieces. Strong asphalt odor.	
								2.3	Very oily black slaggy material (coal tar) Strong odor.	moist
								2.5	Black slaggy material and strong asphalt odor.	wet
5-10'					3.8			5	Very oily black slaggy material and m-f sand. Strong asphalt odor.	
								5.8	c-sand and bits of fill material.	
								6.6	Dark grey clay.	
									EOB = 10'	
										VOCs - (2.1-2.6') SVOCs, PCBs, Pest, RCRA Metals, and Total Cyanides - (0-6.6')

# LMS

## Test Boring Log

Boring No.: B-6

Sheet 1 of 1

Project Name: NYCEDC HUNTS POINT SITE E OU-2

Project No.: 781029

Client: NYCEDC

Date: Start 3/22/05

Driller: Aquifer Drilling and Testing, Inc.

Finish 3/23/05

Drilling Method: Direct Push Probe

Total Depth: 10'

Boring Location: Site E OU-2

Depth To Water: 5'

Coordinates:

Surf. Elevation:

Logged By: C. Friedman

Hole Diameter: 2"

Monitoring Instrument(s): PID, ITX Multi-Gas meter (HCN, H<sub>2</sub>S, LEL, O<sub>2</sub>)

Depth (ft)	Blows On Sampler				Recovery	Instrument Reading	Sample Retained		Classification Of Material f - fine and - 35-50% m - medium some - 20-35% c - coarse little - 10-20% trace - 0-10%	Remarks
	0"-6"	6"-12"	12"-18"	18"-24"						
0-5'					4				c-brown sand and organics.	
								0.2	Crushed concrete pieces.	
								0.5	Black slaggy material, some c-sand, trace pebbles. Slight asphalt odor.	
								0.9	Black slaggy material and c-brown sand, some pebbles.	
								1.2	Black fine cindery material, trace c-sand and pebbles. Slight asphalt odor.	
								1.8	Black slaggy material, some brick. Asphalt odor. Little remains of steel ball bearings? Very densely packed. Stronger odor w/ depth towards the end of the tube.	moist  PID = 18ppm at 2.4'
5-10'					3.6			5		wet PID = 8ppm at 5.9'
								7.2	Concrete or asphalt dust	
								7.7	Concrete/asphalt and black cindery material.	
								8	Black slaggy material and c-brown sand, little gravel. Slight asphalt odor.	
								8.6	Dark grey clay.  EOB = 10'	VOCs - (2.2-2.7') SVOCs, PCBs, Pest, RCRA Metals, and Total Cyanides - (0-9.5')

# LMS

## Test Boring Log

<b>Boring No.: B-7</b>	
<b>Sheet 1 of 2</b>	
<b>Project Name: NYCEDC HUNTS POINT SITE E OU-2</b>	<b>Project No.: 781029</b>
<b>Client: NYCEDC</b>	<b>Date: Start 3/22/05</b>
<b>Driller: Aquifer Drilling and Testing, Inc.</b>	<b>Finish 3/23/05</b>
<b>Drilling Method: Direct Push Probe</b>	<b>Total Depth: 15'</b>
<b>Boring Location: Site E OU-2</b>	<b>Depth To Water: 10'</b>
<b>Coordinates:</b>	<b>Surf. Elevation:</b>
<b>Logged By: C. Friedman</b>	<b>Hole Diameter: 2"</b>
<b>Monitoring Instrument(s): PID, ITX Multi-Gas meter (HCN, H<sub>2</sub>S, LEL, O<sub>2</sub>)</b>	

Depth (ft)	Blows On Sampler				Recovery	Instrument Reading	Sample Retained	Classification Of Material f - fine and - 35-50% m - medium some - 20-35% c - coarse little - 10-20% trace - 0-10%	Remarks
	0"-6"	6"-12"	12"-18"	18"-24"					
0-5'					3.7			c-brown sand, some organics, concrete, black cindery material and trace pebble and brick.	
								0.6 Black slaggy material and c-brown sand, little brick. Slight asphalt odor.	moist
								2.1 c-brown sand, some black slaggy material. Slight asphalt odor.	
								2.4 Black slaggy material w/ some stained silt/clay. Slight asphalt odor.	PID = 4ppm at 2.4'
								3 Stained clay layer, little black slaggy material, trace brick.	
								3.4 Mixture of fill material (brick, concrete, and porcelain) and c-brown sand.	
5-10'					2.8			5 Stained clay layer, little slag, trace brick.	
								5.3 Black slaggy material and fill mixture (brick, concrete), some c-brown sand.	
								7 Dark grey clay (stained) w/ some black slaggy material. Slight asphalt odor.	moist
								7.3 Fill mixture (brick and concrete).	moist
								7.5 Dark grey clay.	wet
								7.7 Fill mixture (brick and concrete)	wet





# LMS

## Test Boring Log

<b>Boring No.:</b> B-9
<b>Sheet</b> 1 of 1
<b>Project No.:</b> 781029
<b>Date:</b> Start 3/22/05
Finish 3/23/05
<b>Total Depth:</b> 10'
<b>Depth To Water:</b>
<b>Surf. Elevation:</b>
<b>Hole Diameter:</b> 2"

**Project Name:** NYCEDC HUNTS POINT SITE E OU-2  
**Client:** NYCEDC  
**Driller:** Aquifer Drilling and Testing, Inc.  
**Drilling Method:** Direct Push Probe  
**Boring Location:** Site E OU-2  
**Coordinates:**  
**Logged By:** B. Montroy  
**Monitoring Instrument(s):** PID, ITX Multi-Gas meter (HCN, H<sub>2</sub>S, LEL, O<sub>2</sub>)

Depth (ft)	Blows On Sampler				Recovery	Instrument Reading	Sample Retained		Classification Of Material f - fine and - 35-50% m - medium some - 20-35% c - coarse little - 10-20% trace - 0-10%	Remarks
	0"-6"	6"-12"	12"-18"	18"-24"						
0-5'					4'				Topsoil, roots. dark brown f-sand and silt	
								0.400	Black (fill) - slag, ash, cinders, brick coal w/ some to trace f-m sand and silt.	PID = 5.8ppm btw 1.5-2'
								2.6	Purifier waste noted.	
								2.8	Black (fill) - slag, ash, cinders, brick coal w/ some to trace f-m sand and silt.	
5-10'					5			0	same as above	PID = 1ppm btw 5-10'
								3.4	Gray/green clay.	
									EOB = 10'	
										VOCs - (1.5-2') SVOCs, PCBS, Pest, RCRA Metals, and Total Cyanide - (0-11.7')

# LMS

## Test Boring Log

**Boring No.:** B-10  
**Sheet** 1 of 1  
**Project No.:** 781029  
**Date:** Start 3/22/05  
 Finish 3/23/05  
**Total Depth:** 15'  
**Depth To Water:** 5-6'  
**Surf. Elevation:**  
**Hole Diameter:** 2"

**Project Name:** NYCEDC HUNTS POINT SITE E OU-2  
**Client:** NYCEDC  
**Driller:** Aquifer Drilling and Testing, Inc.  
**Drilling Method:** Direct Push Probe  
**Boring Location:** Site E OU-2  
**Coordinates:**  
**Logged By:** C. Friedman  
**Monitoring Instrument(s):** PID, ITX Multi-Gas meter (HCN, H<sub>2</sub>S, LEL, O<sub>2</sub>)

Depth (ft)	Blows On Sampler				Recovery	Instrument Reading	Sample Retained		Classification Of Material f - fine and - 35-50% m - medium some - 20-35% c - coarse little - 10-20% trace - 0-10%	Remarks
	0"-6"	6"-12"	12"-18"	18"-24"						
0-5					4.2				Black slaggy material, some c-brown sand, trace brick and pebbles. Very densely packed, asphalt odor.	PID = 8.9ppm at 1.8' PID = 6ppm at 2.5'
								2.6	Black slaggy material, some c-brown sand. Little concrete pieces and wood chunks. Asphalt odor.	moist PID = 13ppm at 3.6'
									↓ continues to water btw 5-6'. water has a sheen and slight asphalt odor. Same fill material below water.	
5-10'					3.3			5	Fill material: black slaggy material, brick, c-brown sand, concrete mixture Slight odor.	
								10	Fill mixture continues in water. The water's sheen not as noticable. Asphalt odor remains.	
10-15'					1.9			11.7	Dark gray clay w/some organic material mixed in.	
									EOB = 15'	
										VOCs - (3.3-3.8') SVOCs, PCBs, Pest, RCRA Metals, and Total Cyanide - (0-11.7')

# **ATTACHMENT B**

## **LABORATORY DATA PACKAGE**

# **ATTACHMENT C**

## **DATA USABILITY SUMMARY REPORT (DUSR)**

**HUNTS POINT SITE E (OU-2)**  
**HUNTS POINT BRONX, NEW YORK**  
**DATA USABILITY SUMMARY REPORT**

This data usability summary report (DUSR) covers the analytical results, submitted by Mitkem Corporation (Mitkem) of Warwick, Rhode Island, a New York State Department of Health (NYSDOH)-certified laboratory, for the soil, groundwater and soil gas samples collected during the investigation at the Hunts Point Site E Parcel located in Bronx, New York.

The analytical results submitted by Mitkem, standard delivery groups (SDGs) D0342, D0423, D0593, and D0318 were reviewed by HDR | LMS. Analytical data was examined in regards to the protocol requirements and assessed against the project data quality objectives (DQOs) in preparation of this report. The following items were reviewed:

- Custody documentations,
- Holding times,
- Instrument performances and detection limits,
- Calibration and continuing calibration,
- Data completeness,
- Blanks,
- Serial dilutions,
- Spike recoveries, duplicate correlations,

The laboratories performed all the necessary actions in order to provide the most representative data. Overall, the data submitted by Mitkem met the project DQOs, and are appropriate to characterize the levels of contamination in soil, groundwater, and soil gas samples collected from the project site.

**SOILS**

A total of thirteen (13) soil samples (ten borings and three test pit soils) were collected for laboratory analyses and reported in SDG-D0342 and SDG-D0423. Samples collected were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyl aroclors (PCBs), Resource Conservation and Recovery Act (RCRA) metals and cyanide.

In addition, one (1) soil sample from SDG-D0342 and three (3) samples from SDG-D0423 were analyzed for the following wet chemistry parameters: Ammonia as nitrogen, amenable cyanide, sulfur, total organic halides and diesel range organics. All of the analyses were conducted in accordance with the New York State Department of Environmental Conservation (NYSDEC) Analytical Services Protocol (ASP), June 2000 revision. Samples were analyzed by various EPA SW-846 methods in accordance with the applicable NYSDEC ASP method requirements with Category B deliverables.

Soil samples were analyzed by the following methods observing NYSDEC ASP method and QC requirements:

- VOCs, 8260B; methanol extraction
- SVOCs, 8270C; extraction method 3550B
- Pesticides, 8081A, and PCBs, 8082; extraction method 3550B
- Metals, 6010B/7471A
- Cyanide, 9010B
- Amenable Cyanide, 9012B
- Ammonia as Nitrogen, Standard Methods 4500-NH3
- Sulfur, ASTM D129
- Total Organic Halides, 9020B
- Diesel range Organics, GC-FID

### **Sample Receipt**

All samples were received under proper chain-of-custody within applicable holding times. Samples were processed within the technical holding time requirements (from the date of sample collection until the date of extraction and analysis).

### **Volatile Organic Compound Results**

In the volatile analyses, holding times and calibrations met the protocol criteria and all recoveries were within QC requirements with the following exceptions: Due to high concentrations of naphthalene the following samples were analyzed at a dilution:

Sample	Dilution
B-9(1.5-2.0')	5x
B-6(2.2-2.7')	100x

B-4(3.8-4.3')	10x
B-7(2.9-2.5')	40x
B-5(2.1-2.6')	40x
B-2(1.8-2.3')	50x
B-3(5.8-6.3')	100x
B-10(3.3-3.8')	100x
B-1(2.0-2.5')	1000x
TP-N	60x
TP-C(1-5.5')	400x
TP-F	100x

The sample results are useable as reported noting the elevated quantitation limits for analytes reported as non-detect. The percent recovery of dichlorodifluoromethane, trichlorofluoromethane and hexchlorobutadiene in laboratory control sample (LCS) of SDG-D0423 at 136%, 132%, and 116%, respectively, were slightly above QC limits of 58-131%, 63-126%, and 58-115%, respectively. The relative percent differences (RPD) on the replicate analysis were within limits. The compound dichlorodifluoromethane, trichlorofluoromethane and hexchlorobutadiene were not detected in samples associated with this SDG. No qualification to the data is required.

The compounds carbon disulfide (one sample) and methylene chloride (three samples) were detected at very low concentrations, estimated below quantitation limit in project samples. Both of these compounds are common laboratory contaminants and their presence in the soil samples may not be representative of site conditions.

Field and equipment blanks were not collected for this project. In every other respect of data review, no further problems were found in the VOC analyses and the reported results for the samples are useable as presented by the laboratory.

### **Semivolatile Organic Compound Results**

In the semivolatile analysis, holding times and calibrations met the protocol criteria and all recoveries were within QC requirements with the following exceptions: In SDG-D0342 the surrogate recoveries in sample B-7(0-9.5') were slightly low for terphenyl-d14 (60% recovery versus QC limits of 61-113%). Surrogates were diluted out in the diluted samples of B-7(0-9.5'), B-3(0-10.3'), B-4(0-5.0'), B-2(0-9.4'), B-5(0-6.6'), B-6(0-9.5'), B-9(0-5'), B-8(0-5.7'), and B-10(0-11.7'). There is no qualification to the data required based solely on the lack of surrogate recoveries due to sample dilution.

Matrix spike (MS) and Matrix Spike Duplicate (MSD) analyses were performed on project sample B-9(0-5') in SDG-D0342 and TP-N in SDG-D0423. MS recoveries for a number of analytes were well below criteria as a likely result of elevated concentrations of target analytes in the samples. In addition, there was no recoveries in the MS and MSDs for hexachlorocyclopentadiene, 2,4-dinitrophenol, 4,6-dinitro-2-methylphenol, and pentachlorophenol in both SDGs. LCS recoveries, however, which are used to verify that the laboratory can perform the analysis in a clean matrix, were within control limits with the exception of the recovery for 4-nitroaniline at 135% which was above the QC limits of 35-124% in SDG-D0342.

Sample results for the following compounds in SDG-D0342 and SDG-D0423 should be considered estimated: naphthalene, 2-methylnaphthalene, acenaphthylene, acenaphthene, dibenzofuran, fluorene, 4-nitroaniline, phenanthrene, anthracene, carbazole, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dieno(a,h)anthracene, benzo(g,h,i)perylene.

Sample results for hexachlorocyclopentadiene, 2,4-dinitrophenol, 4,6-dinitro-2-methylphenol, and pentachlorophenol were non-detect in the project samples, however, nondetect should be considered as highly estimated as the laboratory could not detect these compounds in the spiked project samples.

The estimated numerical values are useable to show the relative magnitude of these compounds in the soil samples. Non-detects when estimated are useful to indicate those elevated levels of these compounds were not present in the affected samples.

Due to high concentrations of non-target analytes, the following samples were analyzed at dilution:

Sample	SDG	Initial Dilution	Subsequent Dilution
B-10(0-11.7)	D0342	10x	40x
B-1(0-11)	D0342	5x	----
B-2(0-9.4)	D0342	10x	100x
B-3(0-10.3)	D0342	10x	40x
B-4(0-5')	D0342	10x	40x
B-5(0-6.6')	D0342	10x	40x
B-6(0-9.5')	D0342	10x	40x
B-8(0-5.7')	D0342	10x	40x

Sample	SDG	Initial Dilution	Subsequent Dilution
B-9(0-5')	D0342	10x	40x
TP-C(0-5.5')	D0423	10x	1000x
TP-N	D0423	10x	100x
TP-F	D0423	10x	30x

Internal standard area counts were outside of criteria for the initial analyses of TP-C(0-5.5') and on the dilution analyses for samples TP-N and TP-F. Sample results presented from the undiluted sample of TP-C(0-5.5') and the diluted samples of TP-N and TP-F are considered estimated. The estimated numerical values are useable to show the relative magnitude of these compounds in the soil samples.

Calibration verification for the diluted sample analyses for sample TP-C(0-5.5') was low for pentachlorophenol with a %D of greater than 40%. Pentachlorophenol was not detected in the project sample and therefore no qualification to the data is necessary.

In every other respect of data review, no further problems were found in the SVOC analyses and the reported results for the samples are useable as presented by the laboratory.

### **Pesticide Results**

In the pesticide analysis, holding times and calibrations met the protocol criteria and all the recoveries were within QC requirements with the following exceptions: Surrogate recoveries were well outside of criteria for all the samples analyzed in samples from both SDG-D0342 and D-0423. LCS recoveries, which are used to verify that the laboratory can perform the analysis in a clean matrix, were within control limits.

In addition, the MS and MSD recoveries and RPD% for a number of compounds in both SDGs were outside of criteria. The laboratory reports likely matrix interference from the presence of hydrocarbons. Sample results for pesticides in SDG-D0342 and SDG-D0423 should be considered highly estimated due to likely matrix interference. The estimated numerical values are useable to show the relative magnitude of these compounds in the soil samples.

Note: due to likely matrix interferences, all pesticide analyses for SDG-D0342 were performed at a 5x dilution and the following dilutions for samples analyzed as part of SDG-D0423

Sample	Dilution
TP-N	10x
TP-F	5x
TP-C(0-5.5')	5x / 50x

For certain samples in both SDG-D0342 and SDG-D0423, the reported concentration between the dual columns was greater than 25%. Per method requirements the samples are appropriately flagged with a “p” qualifier and the lower of the two values is reported.

In every other respect of data review, no further problems were found in the pesticide analyses and the reported results for the samples are useable as presented by the laboratory.

### ***PCB Results***

In the PCB analysis, holding times and calibrations met the protocol criteria and all the recoveries were within QC requirements with the following exceptions. In SDG-D0342 the surrogate tetrachloro-m-xylene was elevated in one column and the surrogate decachlorobiphenyl was also elevated in one column for samples B-2(0-9.4), B-3(0-10.3), B-4(0-5), B-7(0-9.5), B-10(0-11.7), B-1(0-11), B-5(0-6.6), and B-9(0-5). In addition, tetrachloro-m-xylene recovery was low in one column, high in the other and decachlorobiphenyl recovery was high for sample B-8(0-5.7) and the associated MS and MSD samples. Matrix interference was cited by the laboratory as the likely cause. LCS recoveries, which are used to verify that the laboratory can perform the analysis in a clean matrix, were within control limits. All positive sample results for PCBs in SDG-D0342 are considered estimated. The estimated numerical values are useable to show the relative magnitude of these compounds in the soil samples.

MS and MSD recoveries performed on project sample B-8(0-5.7') in SDG-D0342 were within criteria with the exception of a low recovery of Aroclor 1016 in both MS and MSD and low recovery of Aroclor 1260 in the MSD. Replicate RPD for Aroclor 1260 which at 112% was well above the QC limit of 40%. Sample results are already reported as estimated and therefore no additional qualification to the data is required.

In SDG-D0423 the surrogate tetrachloro-m-xylene was slightly elevated in one column for a method blank analysis. All other surrogates were within QC limits. No data qualification is required and the PCB results for SDG-D0423 are useable as reported.

Note: due to likely matrix interferences, all PCB analyses for SDG-D0342 were performed at a 2x dilution. For certain samples in both SDG-D0342 and SDG-D0423, the reported concentration between the dual columns was greater than 25%. Per method requirements the samples are appropriately flagged with a “p” qualifier and the lower of the two values is reported.

In every other respect of data review, no further problems were found in the PCB analyses and the reported results for the samples are useable as presented by the laboratory.

### **Diesel Range Organics**

Surrogate recoveries were diluted out of the project sample and associated MS and MSD performed on project sample B-8(0-5.7) in SDG-D0342 and project sample TP-N in SDG-D0423 due to elevated sample concentrations. Surrogate recoveries in the method blank and LCS were within criteria. MS and MSD recoveries were also outside of criteria for both SDGs due to the high concentrations of hydrocarbons in the sample. The project sample B-8(0-5.7) in SDG-D0423 was analyzed at a 100:1 dilution and the project samples in SDG-D0423 were analyzed at the following dilutions:

Sample	Dilution
TP-N(3.5-5.4)	50x
TP-F(2.5-4.6)	50x
TP-C(1-5.5)	1000x

The sample results from SDG-D0342 and SDG-D0423 are considered estimated. The estimated numerical values are useable to show the relative magnitude of diesel range organics in the samples.

### **Inorganic Results**

In the inorganic analysis, holding times, calibrations, spike recoveries, post digest spike recovery, duplicate correlations, and serial dilution results were within the required control limits with a few exceptions. When results of the QC samples did not meet the protocol's criteria, the associated results of the SDG samples were reported by the laboratory with quality qualifiers. These qualifiers are presented in the data summary tables when applicable and indicate that the numerical values can be estimated. The qualifier "n" indicates that spiked sample/post digestion spiked sample recovery was not within control limits, the "\*" qualifier indicates that duplicate correlation was not within control limits, and "e" qualifier is applied when the serial dilution correlation was outside the

control limits.

MS recoveries of cyanide on project sample B-8(0-5.7) in SDG-D0342 and on project sample TP-N in SDG-D0423 were outside criteria. Data is appropriately flagged with an “N” qualifier as per analytical protocol. The spike recovery for cyanide in SDG-D0342 was greater than 126%. Sample results associated with this data package are considered estimated. The estimated numerical values are useable to show the relative magnitude of these compounds in the soil samples.

Spike recovery in SDG-D0423 was also outside of criteria however the spiking concentration was less than 4 times the sample concentration. Therefore, the data is useable as reported and no qualification to the data is required.

### **Wet Chemistry Results**

In the wet chemistry analysis holding times, calibrations, and QC requirements met the protocol criteria with the following exceptions. The sample analysis for amenable cyanide in SDG-D0342 and a majority of the samples in SDG-D0423 showed a higher level of cyanide in the post-chlorination analysis than the total analysis. The laboratory postulates that sample heterogeneity or possibly a matrix effect may be the cause. In addition there was no recovery of amenable cyanide in the project MS for both SDGs and no recovery in the MSD for SDG-D0342. Positive sample results for amenable cyanide should be considered estimated. Non-detects are also considered estimated and highly questionable. Samples reported as non-detect are useable to indicate that elevated concentrations of amenable cyanide are not present but are not useable to determine the presence of low-level concentrations of amenable cyanide.

### **GROUNDWATER**

A total of three (3) groundwater samples were collected for laboratory analyses and were reported in SDG-D0593. Samples collected were analyzed for VOCs, pesticides, PCBs, filtered and unfiltered SVOCs, and filtered and unfiltered metals. All of the analyses were conducted in accordance with the New York State Department of Environmental Conservation (NYSDEC) Analytical Services Protocol (ASP), June 2000 revision. Samples were analyzed by various EPA SW-846 methods in accordance with the applicable NYSDEC ASP method requirements with Category B deliverables.

Groundwater samples were analyzed by the following methods observing NYSDEC ASP method and QC requirements:

- VOCs, 8260B
- SVOCs, 8270C; extraction method 3520C
- Pesticides, 8081A; extraction method 3510C
- PCBs, 8082; extraction method 3510C
- Metals, 6010B/7470
- Cyanide , 9012B

### **Sample Receipt**

All samples were received under proper chain-of-custody within applicable holding times. Samples were processed within the technical holding time requirements (from the date of sample collection until the date of extraction and analysis). Trip and field blank samples were not collected as part of this investigation. Project related MS and MSD samples were only analyzed on the total mercury sample.

### **Volatile Organic Compound Results**

In the volatile analyses, holding times and calibrations met the protocol criteria and all recoveries were within QC requirements. Data is useable as reported.

### **Semivolatile Organic Compound Results**

In the semivolatile analyses, holding times and calibrations met the protocol criteria and all recoveries were within QC requirements with the following exceptions. The spike recovery of hexachlorocyclopentadiene in the LCS S2DLCS and S2DLCSD were slightly low. Replicate RPDs were within acceptable limits. No qualification to the data is warranted and the data is useable as reported.

### **Pesticide Results**

In the pesticide analyses, holding times and calibrations met the protocol criteria and all the recoveries were within QC limits with the exception of a low surrogate recovery of decachlorobiphenyl in sample PZ-1 and the reanalysis of PZ-1 (42% and 47%, respectively versus control limits of 54-130%). In addition there were slightly low recoveries of delta-HC in the LCS

samples (42% versus WC limits of 50-137%) and slightly high recoveries of heptachlor epoxide (130% versus QC limits of 65-125%), 4,4'-DDE (150% versus QC limits of 52-144%), endrin ketone (165% versus QC limits of 70-135%) and alpha-chlordane (140% versus QC limits of 64-122%). Calibration verification standards were outside of criteria for each of the samples analyzed. Per methodology, the samples were reanalyzed to confirm the effect of sample matrix. The re-analyses showed similar findings. Pesticides were not detected in the project samples. Sample results are presented as non-detect at an estimated quantitation limit. Samples reported as non-detect at estimated quantitation limits are useable to indicate that elevated concentrations of pesticides are not present in the samples.

### **PCB Results**

In the PCB analyses, holding times and calibrations met the protocol criteria and all the recoveries were within QC limits. Data is useable as reported.

### **Inorganic Results**

In the inorganic analysis, holding times, calibrations, spike recoveries, post digest spike recovery, duplicate correlations, and serial dilution results were within the required control limits and the data is useable as reported.

### **SOIL GAS**

A single (1) soil gas sample was collected (along with 1 field blank) for laboratory analyses and were reported in SDG-D0318 (Severn Trent Laboratories, Inc SDG-105636). The sample collected was analyzed for VOCs by EPA Method T0-15.

### **Sample Receipt**

The samples were received under proper chain-of-custody within applicable holding times. Samples were processed within the technical holding time requirements (from the date of sample collection until the date of extraction and analysis). A field blank sample was also collected as part of this investigation.

## **Volatile Organic Compound Results**

In the volatile analyses, holding times and calibrations met the protocol criteria and all recoveries were within QC requirements with the following exceptions. Recovery in the blank spike sample S6LCS for hexachlorobutadiene (150% versus QC limits of 70-130%), isopropyl alcohol (62% versus QC limits of 70-130%), 1,4-dioxane (66% versus QC limits 70-130%) and tert-butyl alcohol (66% versus QC limits of 70-130%) were outside QC limits. All other spike recoveries were within control limits. The data is useable as reported.

The percent difference (%D) in the responses of the compounds hexachlorobutadiene in a continuing calibration check at 32.9% exceeded the maximum QC limit of 30.0%. The compound hexachlorobutadiene was not detected in the project sample; therefore, the reported result for the soil gas sample is useable as presented by the laboratory

Low-level concentrations of dichlorodifluoromethane, chloromethane, trichlorofluoromethane, benzene, toluene, xylene(m,p), 2,2,4 trimethylpentane, and n-hexane were detected in the associated field blank. The presence of these compounds in the field blank indicates a possible background influence or contamination of the sample in the field.

# **ATTACHMENT D**

## **PIEZOMETER GROUNDWATER SAMPLING LOGS**







***END OF REPORT***