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SITE CHARACTERIZATION REPORT
for
ROBINSON TERMINAL
1 Oronoco Street
Alexandria, Virginia 22308
PC# 2006-3131

Prepared for:

Mr. Willie Taylor
Robinson Terminal Warehouse Corporation
2 Duke Street
Alexandria, Virginia 22314

Submitted to:

Mr. Jay D. Green
Senior Hydrogeologist
Virginia Department of Environmental Quality
Northern Regional Office
13907 Crown Court
Woodbridge, Virginia 22193

Prepared by:

Total Environmental Concepts, Inc.
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January 25, 2007
TEC# 650.002

Prepared by:

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January 25, 2007

Mr. Jay D. Green
Senior Hydrogeologist
Virginia Department of Environmental Quality
Northern Regional Office
13907 Crown Court
Woodbridge, Virginia 22193

Re: **PC#2006-3131; Site Characterization Report for Robinson Terminal**
1 Oronoco Street, Virginia 22308
TEC #650.002

Dear Mr. Green:

Total Environmental Concepts, Inc. (TEC) is pleased to present this Site Characterization Report (SCR) for the Robinson Terminal in Alexandria, Virginia. In a directive dated December 30, 2005, the Virginia Department of Environmental Quality (VDEQ) requested that a SCR be prepared for this Pollution Complaint (PC) Number 2006-3131.

The purpose of this investigation was to determine possible source areas for gasoline and solvent-type contamination. This SCR summarizes TEC's research of past releases, the history of the site and surrounding area, the findings from thirteen direct-push probes, and the installation of seven groundwater monitoring wells on the Robinson Terminal property. The SCR also evaluates risk from the contaminants and offers recommendations for further investigation.

If you have any questions concerning this report, please call us at 703-567-4346.

Sincerely,

Anna Weatherly
Environmental Scientist

Enclosures

cc: Willie Taylor

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1.0 INTRODUCTION

1.1 SITE LOCATION AND DESCRIPTION

The Robinson Terminal Warehouse, hereinafter refereed to as the "subject site" or "site", borders the Potomac River approximately ½-mile east of the George Washington Parkway in the City of Alexandria, Virginia (Figure 1). The site lies on the northeastern corner of Oronoco Street and North Union Street intersection. The closest surface water bodies are, the Potomac River bordering the eastern edge of the property and Oronoco Bay bordering the northern edge of the property, both eventually flow into the Chesapeake Bay.

The Robinson Terminal Warehouse property is mostly paved with concrete. There is a one story, pole barn building with slab-on grade construction (i.e., no basements), a small wooden shed, and an expansive concrete dock accessed by trucks. The building includes an office, a storage closet, and the remainder of the building is utilized for commercial storage. An 8,000-gallon gasoline underground storage tank (UST) and two 8,000-gallon diesel fuel USTs are located end to end in a grassy area at the northeastern corner of the property along the Potomac River. Train tracks are located at the northern side of the building for loading and offloading freight train cars. The dispenser island and wooden shed lie approximately 45 feet southeast of the USTs. Access to the site is gained from Oronoco Street on the southern edge of the property and by railway on the northern edge (Figure 2).

The tank pit monitoring wells (TPMWs) adjacent to the USTs were installed during the installation of the three fiberglass tanks in the 1970's. There are two 8,000-gallon diesel USTs and one 8,000-gallon gasoline UST on site. The two diesel USTs are currently in use to fill up delivery trucks and the gasoline UST is occasionally used to fill up the lawn mower. This SCR summarizes TEC's findings after 13 probes, the installation of seven monitoring wells, soil and groundwater sampling, and research of other local PC cases.

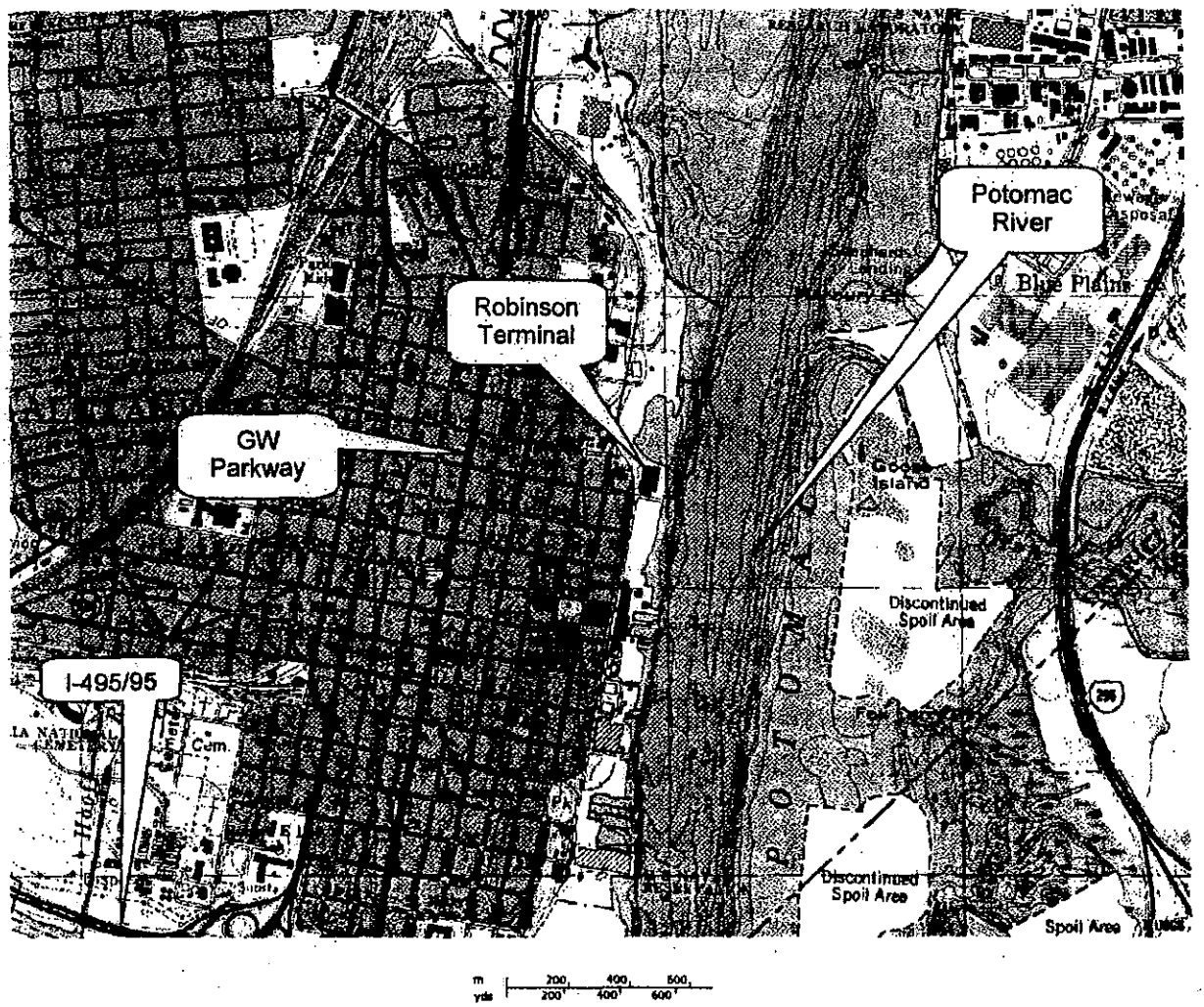
The topography is relatively level with a slight rise at the northeastern corner around the USTs. The front of the building, facing North Union Street, lies approximately elevation (EL) 10 feet above mean sea level (amsl).

1.2 DESCRIPTION OF RELEASE

During a routine check of the tank pit monitoring wells it was discovered that water levels in the wells were above the surrounding groundwater elevation. To remedy this condition, Robinson Terminal contracted a vacuum truck operator to evacuate the wells with a vacuum truck. Twelve ounces of diesel fuel was encountered in the water extracted from TPMW-2. This discovery was reported to the VDEQ on November 8, 2005. A directive was issued from the VDEQ December 20, 2005, requesting the owner, Robinson Terminal Warehouse Corporation, to investigate the source, extent, and risk posed by the petroleum release in a SCR.

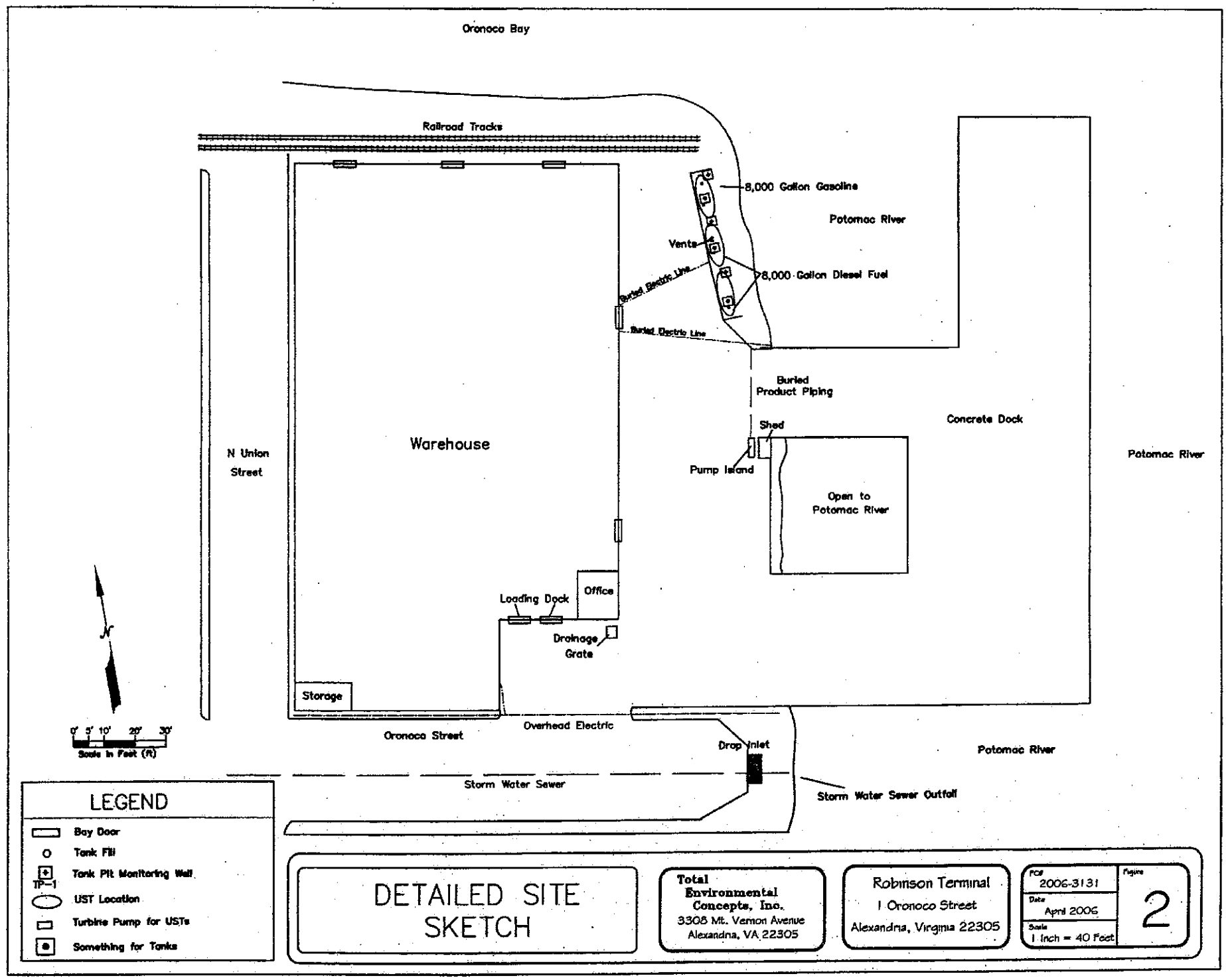
Following detection of the free product in the vacuum truck, Robinson Terminal Incorporated had the UST system precision tested. The tanks and lines passed the precision test. The source of the free product is unknown.

Topographic Map
Robinson Terminal
Alexandria, VA



N

Total Environmental Concepts, Inc. 3308 Mt. Vernon Ave., Alexandria, VA 22305 U.S.G.S. 1984 Alexandria, VA Quadrangle Map Obtained Online: www.terraserver-usa.com Scale: As Shown	**SITE LOCATION MAP** **1 Oronoco Street** **Alexandria, Virginia** **PC# 2006-3131**	**Figure No.** **1**


Oronoco Bay
Railroad Tracks
8,000 Gallon Gasoline
Potomac River
Vents
8,000 Gallon Diesel Fuel
Buried Electric Line
Buried Electric Line
Buried
Product Piping
Concrete Dock
Shed
Warehouse
N Union
Street
Pump Island
Potomac River
Open to
Potomac River
Loading Dock
Office
Drainage
Grate
Storage
Oronoco Street
Overhead Electric
Drop Inlet
Potomac River
Storm Water Sewer
Storm Water Sewer Outfall
N
0' 5' 10' 20' 30'
Scale in Feet (ft)
LEGEND
Bay Door
Tank Fill
TP-1
Tank Pit Monitoring Well
UST Location
Turbine Pump for USTs
Something for Tanks
DETAILED SITE SKETCH
Total Environmental Concepts, Inc.
3308 Mt. Vernon Avenue
Alexandria, VA 22305
Robinson Terminal
1 Oronoco Street
Alexandria, Virginia 22305
PO# 2006-3131
Date April 2006
Scale 1 Inch = 40 Feet
Figure 2

2.0 HISTORICAL RELEASES

The VDEQ Pollution Complaint files were researched at the Northern Regional Office in Woodbridge, Virginia, on April 26, 2006, to determine if other petroleum releases had occurred within a ¼ mile radius of the site. The search revealed seven PC numbers with an open or closed status in the vicinity of the site (Figure 3).

- **PC#2003-3290 – 399 Pendleton Street, Annie B. Rose House:** A 275-gallon UST failed a precision tightness test in June 2003. The UST was removed and replaced with an aboveground storage tank (AST). Two soil samples were collected and returned with detectable petroleum concentrations below 100 mg/kg. If any soil had been impacted it was excavated when the UST was removed. Case closed in April 2005.

- **PC#1998-3568 – 601 North Fairfax Street, Sheet Metal Workers National Pension Fund Head Quarters:** Workers detected petroleum odors during construction activities in June 1997. Less than three cubic yards of black and gray soil was removed along with one, 250-gallon and one 550-gallon diesel steel USTs. No holes or visible corrosion was apparent on the USTs. Two soil samples were collected below the USTs. Results returned with petroleum concentrations 550 mg/kg and 250 mg/kg. The VDEQ case manager determined the case should be closed due to the fact the tank pit was over excavated during the UST removal. Most if not all of the contaminated soil was removed. Any remaining contamination was not excessive. Case closed in June 1999.

- **PC#1995-4041 – 600 North Royal Street, WMATA Metro Bus Yard:** Free product detected in a MW during tank removal to upgrade the USTs. A ground penetrating survey was conducted in February 1996 to detect any other USTs on site. An abandoned UST was discovered. A direct push event was conducted in February and March 1995, 15 borings were drilled around the abandoned sand filled 3,000-gallon UST. No contaminated soil or groundwater was encountered. A soil vapor extraction test was performed in May 1996 to evaluate the effectiveness of using a high vacuum SVE blower to remediate petroleum-impacted soils. Eleven monitoring wells were drilled on site to a maximum depth of 22 feet. A dual phase, vacuum enhanced free product and groundwater recovery system was operational on site October 24, 1999. Since free product was encountered in only one of the wells since the system had been operational, the system was shut down in December 2002 and ten of the monitoring wells were closed in June 2003. Vacuum trucks, absorbent socks, and a top loading recovery pump were utilized to get the remaining free product from the MW. No product had been detected in the well since January 2003 and the case was closed in January 2004. An Initial Abatement Report was submitted in September 1994, an SCR in June 1995, a Corrective Action Plan in June 1996, and a Tank Closure report was submitted in April 1998. All of the reports can be found in the case file at the VDEQ NRO.

- **PC#1975-0049, 1976-0050, and 1987-0767, Oronoco Street Storm Sewer Outfall:** All three of the PC numbers are for the same site. 1976-0050 was closed sometime before August 1994, exact date unknown, the other two remain open. In September 1975, an oil-like discharge was observed at the outfall. Creosote and other coal tar derivatives have been flowing from the storm sewer into the Potomac River since the mid 1970's. The probable source is believed to be the former Alexandria Town Gas coal gasification facility. The City had taken a number of measures in attempt to cease the flow. In May 2000 the Site was eligible for participation in the Voluntary Remediation Program (VRP). The City

installed a tidal boom extending from either side of the outfall and approximately 150 feet out into the Potomac as well as a double layer of sorbent boom within the tidal boom. Both of these booms are still maintained on a regular basis. A Preliminary Site Investigation Report Draft copy dated January 25, 2001 and an SCR Draft Final Dated April 2006 can be found in the VDEQ Richmond office.

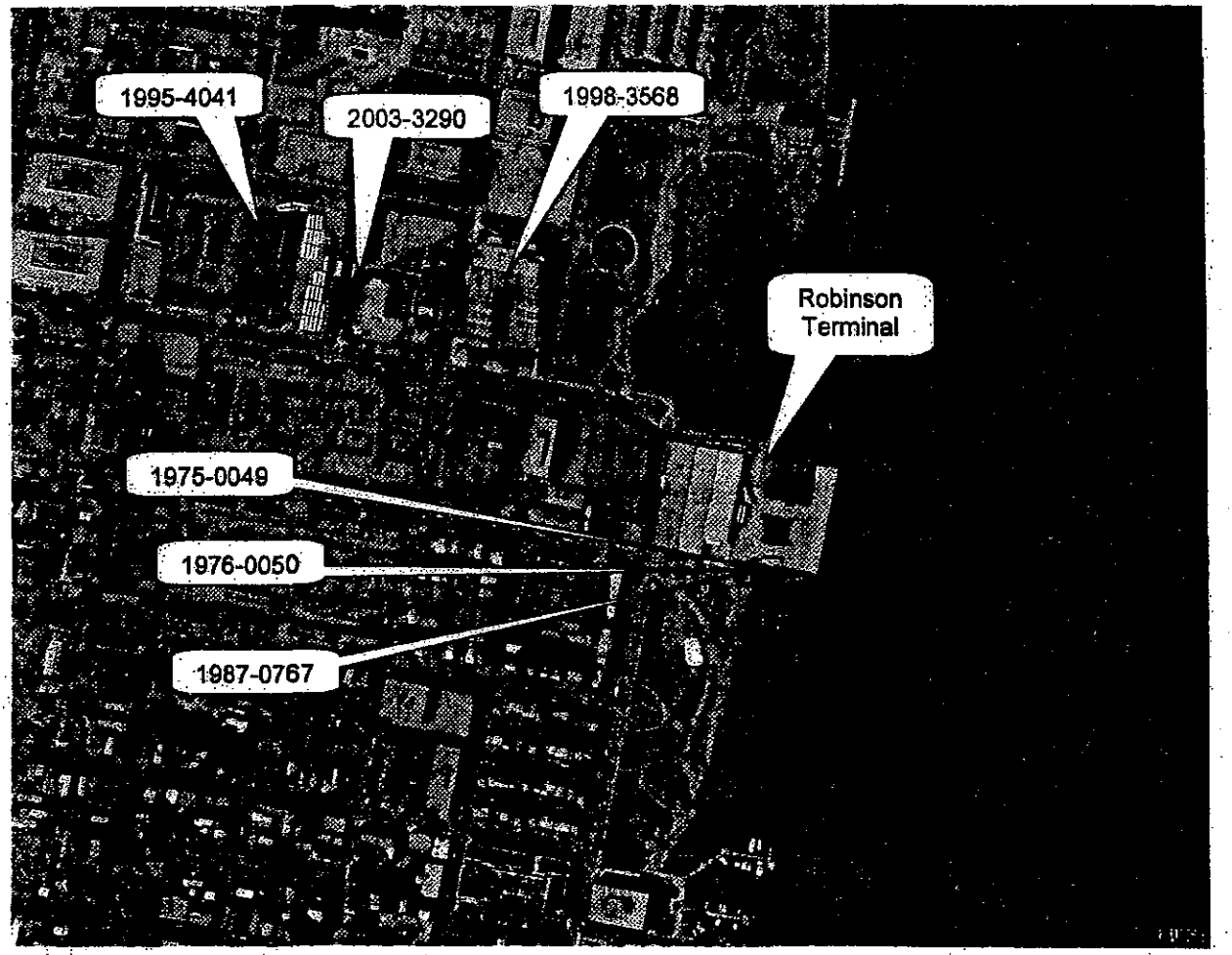
2.1 UTILITIES

Overhead electric power lines and telephone cables are strung from poles along the northern side of Oronoco Street. Electric lines and telephone lines extend from one of these poles to the south side of the building (Figure 2). TEC hired Utility Search of Manassas, Virginia to detect the onsite product and electric lines for the UST system. Two buried electric lines originate from eastern side of the building and run to the turbine pumps for the UST system and to the lights along the concrete dock. The UST piping system originates from the pump island running north to the USTs. A drainage grate was observed onsite at the southern edge of the property, presumably flowing into the sewer system beneath Oronoco Street. One curb inlet to the storm sewer system was observed at the end of Oronoco Street (Figure 2). Flow in this storm sewer is to the east into the Potomac River.

2.2 RECEPTOR SURVEY AND ADJACENT WATER USE

Potential receptors from this release would be the, groundwater, Potomac River, Oronoco Bay and the building. The building does not have a basement as it sits on a concrete slab. The drainage grate is approximately 400 feet southwest and topographically downgradient of the USTs, and presumably flows into the storm sewer system. The site is served by municipal water and sewer system. No supply wells were observed within 500 feet of the site.

Historical PC Locations
Robinson Terminal
Alexandria, VA



m 50 100 150
yds 50 100 150

N

Total Environmental Concepts, Inc. 3308 Mt. Vernon Ave., Alexandria, VA 22305 U.S.G.S. 1984 Alexandria, VA Quadrangle Map Obtained Online: www.terraserver-usa.com Scale: As Shown	**HISTORICAL PC LOCATION MAP** **1 Oronoco Street** **Alexandria, Virginia** **PC# 2006-3131**	**Figure No.** **3**

3.0 SITE ASSESSMENT

3.1 SUBSURFACE INVESTIGATION

Thirteen borings were advanced in areas around the USTs, product piping, and the dispenser. Seven of the thirteen boring were converted to monitoring wells. The specific data obtained from each installation and sampling is summarized in the following sections.

3.1.1 Soil Sampling

Between April 27 and April 28, 2006, VISTA Environmental of Richmond, Virginia, advanced thirteen borings with a truck mounted direct-push Geoprobe to obtain subsurface soil samples from 12. The thirteen locations were concentrated in areas around the USTs, product piping, and the dispensers (Figure 4). Depths of each boring ranged from 10 to 16 feet below ground surface (BGS) depending upon where refusal or groundwater was encountered. For the purposes of this SCR, refusal is assumed to represent competent rock.

The direct push logs revealed different types of fill from lean and fat clays, to sandy clays and gravel. The soil samples were collected using a 60 inch, 1.5 inch diameter Macro-Core Soil plastic sample tube at the intervals depicted on the boring logs (Appendix A). Soil types, lithologies, and PID readings are recorded on the boring logs.

A moderate petroleum odor was detected by olfactory senses in boring B6 between 6.6 and 7.6 feet BGS and a moderate petroleum odor was encountered in boring B9 at a depth of 13 feet. Because a petroleum odor was detected in B9 it was determined a thirteenth boring was needed north of B9, at the northern edge of the UST field.

A total of thirteen soils samples were collected and twelve were analyzed for total petroleum hydrocarbons – diesel range organics (TPH-DRO) and total petroleum hydrocarbons – gasoline range organics (TPH-GRO). A portion of each soil sample was placed into a plastic bag and allowed to volatilize adsorbed-phase hydrocarbons. After volatilizing for a minimum of five minutes, the samples were screened for hydrocarbons using a PID. PID values are presented on Table 1 and the direct-push logs included in Attachment A. Final samples were selected for laboratory analysis based on location, soil/groundwater interface depth and PID readings.

The soil samples chosen for laboratory analysis were placed in factory-cleaned jars, labeled, logged onto a chain-of-custody form, and shipped in an ice-filled cooler via courier to Phase Separation Science, Inc. (PSS) in Baltimore, Maryland, for analysis. Soil Analytical Results are summarized in Table 1. Certificates of Analysis and Chain of Custody Forms are included as Appendix B. The results are discussed below.

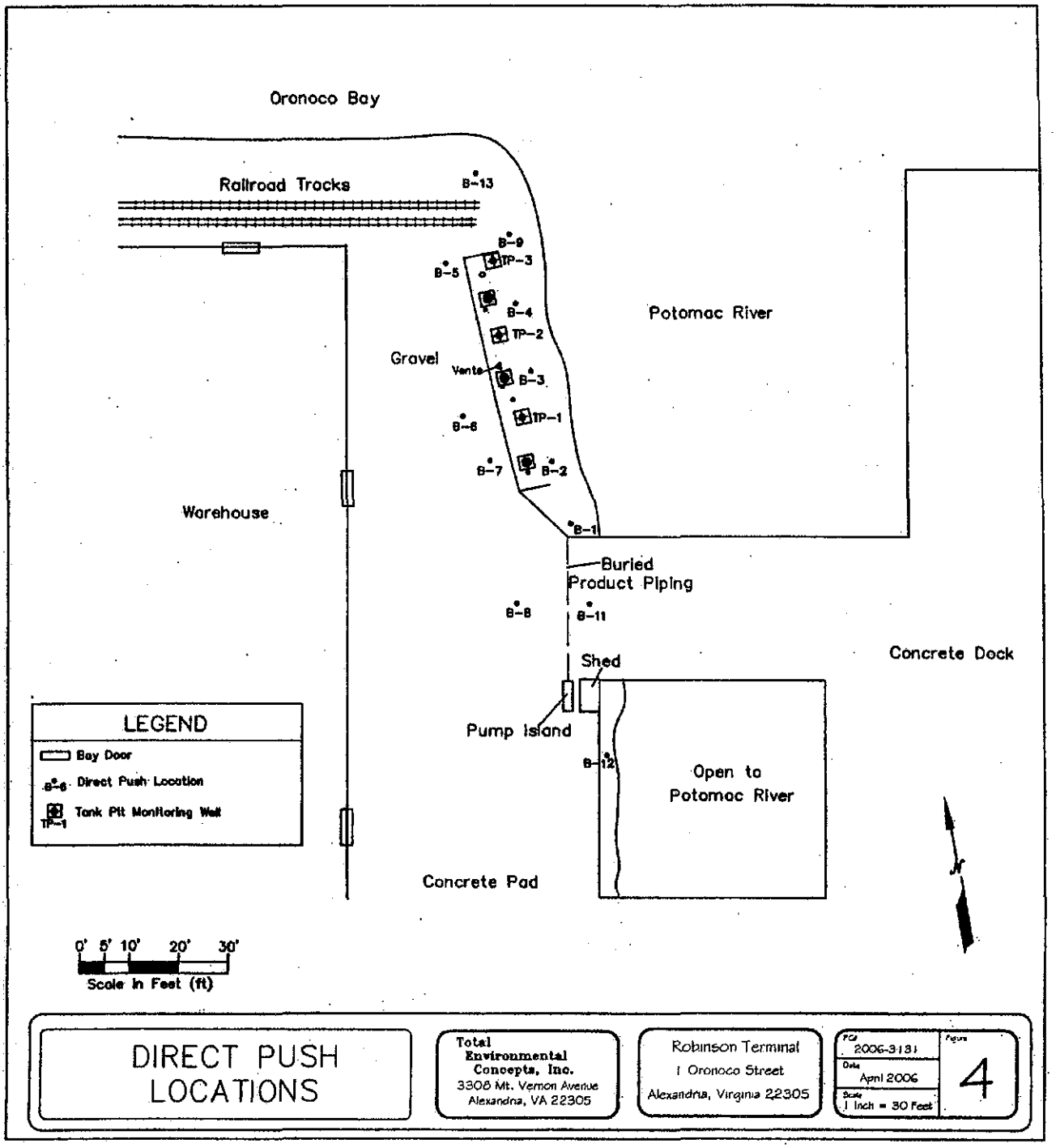

Oronoco Bay
Railroad Tracks
B-13
B-9
TP-3
B-5
B-4
TP-2
Potomac River
Gravel
Vents
B-3
TP-1
B-6
B-7
B-2
B-1
Warehouse
Buried
Product Piping
B-8
B-11
Concrete Dock
Shed
Pump Island
B-12
Open to
Potomac River
Concrete Pad
LEGEND
Bay Door
B-6 Direct Push Location
TP-1 Tank Pit Monitoring Well
0' 5' 10' 20' 30'
Scale in Feet (ft)
DIRECT PUSH LOCATIONS
Total Environmental Concepts, Inc.
3308 Mt. Vernon Avenue
Alexandria, VA 22305
Robinson Terminal
1 Oronoco Street
Alexandria, Virginia 22305
FCI 2006-3131
Date April 2006
Scale 1 Inch = 30 Feet
Figure 4

TABLE 1. Soil Analytical Results
Robinson Terminal
PC#2006-3131

Sample Location	Date Collected	Depth (feet)	TPH-DRO (mg/kg)	TPH-GRO (µg/kg)	PID Reading (parts per million)
B1	4/26/2006	11-12'	ND	ND	0.0
B2	4/26/2006	12-16'	ND	ND	0.0
B3	4/26/2006	11-12'	ND	ND	0.0
B4	4/26/2006	9-10'	ND	ND	1.4
B5	4/26/2006	7-12'	NT	NT	0.0
B6	4/26/2006	11-12'	ND	ND	0.8
B7	4/26/2006	10-12'	ND	ND	0.0
B8	4/26/2006	7-8'	ND	ND	1.0
B9	4/26/2006	12-14'	17	620	49.2
B10	4/26/2006	11-12'	ND	ND	0.2
B11	4/27/2006	9-11'	ND	ND	0.0
B12	4/27/2006	7-8'	LF/HF 220	950	0.0
B13	4/27/2006	11-12'	HF 19	ND	1.4

ND = Not detected at or above reporting limits
NT = Not tested
LF/HF = Lighter and heavier fuel/oil patterns observed in sample
mg/kg = milligrams per kilogram (equivalent to ppm)
µg/kg = micrograms per kilogram (equivalent to ppb)

3.1.2 Monitoring Well Installation

Seven of the thirteen borings we converted into monitoring wells (MW-1 through MW-7). The monitoring wells were installed in areas around the USTs and one in between the dispenser and the Potomac River (Figure 5). Because an odor was detected in B9, a decision was made to convert B13 into a monitoring well, MW-6. The construction for the seven one-inch diameter wells consisted of a solid, threaded end cap placed at the bottom of slotted well screen (size 0.010-inch), and PVC solid riser casing with a locking cap under flush-mounted manhole covers. Well construction diagrams are included as Appendix C.

Each of the wells were developed using a PVC bailer acting as a surge block and several well volumes were removed. The casing elevations were surveyed to the nearest 0.01 foot using EL 10 as the baseline (approximate elevation for the northwest corner of the warehouse obtained from Figure 1).

3.1.3 Groundwater Sampling

On May 1, 2006, TEC gauged each well for water and/or free product levels using an oil/water interface probe. Groundwater depths/elevations are recorded in Table 2. Three well volumes were calculated based on water levels and well depths, and each well was purged in the same manner as it was developed. The groundwater from the seven new monitoring wells was sampled, placed in factory-cleaned jars, and shipped by courier to PSS for analysis. Analytical parameters and results are discussed in Section 3.3 below.

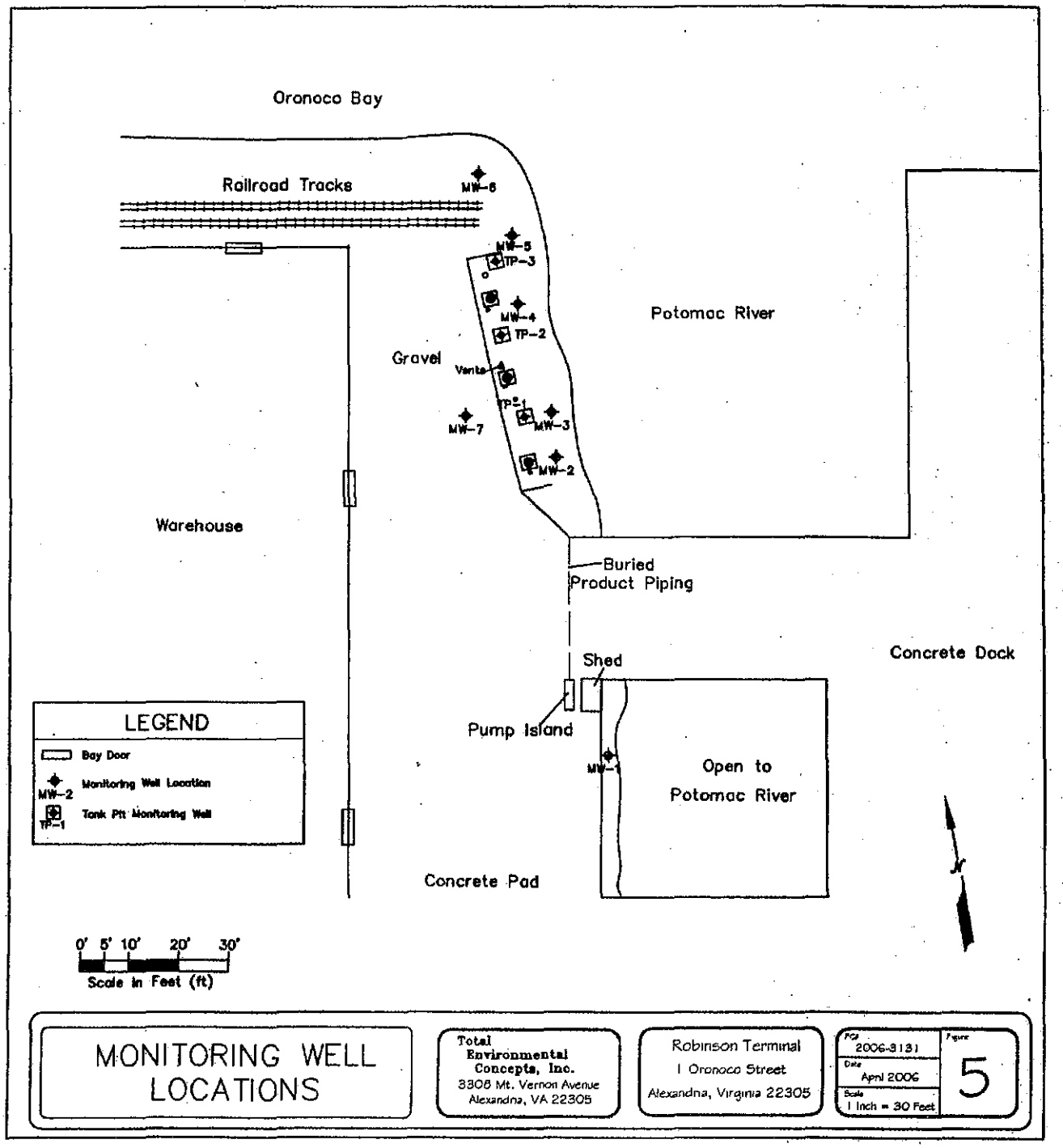
3.2 GEOLOGY AND HYDROGEOLOGY

The Robinson Terminal lies on the western margin of the Atlantic Coastal Plain Physiographic Province of Virginia. This province consists of an eastward thickening wedge of unconsolidated and over-consolidated sediments ranging from Cretaceous Age to the Pleistocene Epoch. Crystalline rocks of the Piedmont Physiographic Province underlie much of the western portion of the Coastal Plain province. The line at which the Coastal Plain and Piedmont provinces meet is called the "Fall Line." The Fall Line generally coincides with Interstate I-95 (and I-395) on the eastern seaboard states, especially through Virginia and Maryland.

The nearest surface water is the Potomac River bordering the eastern edge of the property, and Oronoco Bay bordering the northern edge of the property. The following sections further describe the site specific geology and hydrogeology.

3.2.1 Site Geology

According to U.S.G.S. Professional Paper 1344 (Obermeier & Langer, 1986), the site is mapped within a general geologic unit referred to in the text as "Colluvium and Gravel." This unit consists of soil, saprolite, and angular rock fragments generally found on or at the base of hillsides. "Upland Gravel" overlies this unit and consists of pebbles and cobbles with interstitial sand, silt, and clay. Flood plain and valley-fill "Alluvium" underlie the colluvium and gravel layer and are generally found along stream channels, consisting of sand, silt, clay, gravel, and boulders transported by streams on valley bottoms or lowland areas. The map from Professional Paper 1344 is large-scaled and covers all of Fairfax and Arlington Counties.



MONITORING WELL LOCATIONS

Total Environmental Concepts, Inc.
3308 Mt. Vernon Avenue
Alexandria, VA 22305

Robinson Terminal
1 Oronoco Street
Alexandria, Virginia 22305

PCE 2006-3131
Date April 2006
Scale 1 Inch = 30 Feet
Figure 5

TABLE 2. Potentiometric and Gauging Data
Robinson Terminal
PC#2006-3131

MW	Date	Depth to Hydro-carbon (feet)	Depth to Water (feet)	Top of Casing Elevation (feet)	Hydrocarbon Surface Elevation (feet)	Water Surface Elevation (feet)	Hydro-carbon Thickness (feet)	Potentiometric Surface Elevation (feet)
MW-1	5/1/2006	NA	6.50	9.54	NA	3.04	NA	3.04
	5/4/2006	NA	5.64	9.54	NA	3.90	NA	3.90
MW-2	5/1/2006	NA	6.90	10.60	NA	3.70	NA	3.70
	5/4/2006	NA	6.79	10.60	NA	3.81	NA	3.81
MW-3	5/1/2006	NA	7.02	10.83	NA	3.81	NA	3.81
	5/4/2006	NA	7.00	10.83	NA	3.83	NA	3.83
MW-4	5/1/2006	NA	7.07	10.88	NA	3.81	NA	3.81
	5/4/2006	NA	7.05	10.88	NA	3.83	NA	3.83
MW-5	5/1/2006	NA	7.89	9.29	NA	1.40	NA	1.40
	5/4/2006	NA	7.98	9.29	NA	1.31	NA	1.31
MW-6	5/1/2006	NA	6.15	9.14	NA	2.99	NA	2.99
	5/4/2006	NA	6.40	9.14	NA	2.74	NA	2.74
MW-7	5/1/2006	NA	6.50	10.32	NA	3.82	NA	3.82
	5/4/2006	NA	6.49	10.32	NA	3.83	NA	3.83
TPMW-1	4/27/2006	NA	7.18	NA	NA	NA	NA	NA
	5/1/2006	NA	7.43	NA	NA	NA	NA	NA
	5/4/2006	NA	DRY	NA	NA	NA	NA	NA
TPMW-2	4/27/2006	7.02	7.03	NA	NA	NA	0.01	NA
	5/1/2006	NA	DRY	NA	NA	NA	NA	NA
	5/4/2006	NA	7.71	NA	NA	NA	NA	NA
TPMW-3	5/1/2006	NA	6.73	NA	NA	NA	NA	NA
	5/4/2006	NA	7.4	NA	NA	NA	NA	NA

NA = Not Applicable, or no product encountered in well

No site-specific geologic map for the Alexandria/Arlington Quadrangle was immediately available to TEC, but the information given corroborates knowledge gained from the site-specific boring log data. Based on the soil borings, the stratigraphy consists of a thin mantle of fill materials similar to the natural soil beneath, loose, brown and orange sand with silt lean clay underlain by sand with silt and clay lenses to approximately 16 feet.

3.2.2 Site Hydrogeology

The first signs of groundwater in the borings were encountered above the confining layer within the sand and clay lens unit between 8 and 16 feet below ground surface. If the general rule-of-thumb is applied, that groundwater flow mimics topography, the flow direction would be towards the north and east towards the Potomac River and Oronoco Bay.

Groundwater appears to be flowing east with a northeastern direction at MW-5. A groundwater potentiometric map was made using gauging data from May 1 and 4, 2006 (See Table 2). Figure 6 depicts the groundwater flow from gauging data obtained May 1, 2006, before well development, at 8:00 am, after low tide at 5:35 am and before high tide at 11:27 am. Figure 7 depicts a northeastern groundwater flow using gauging data from May 4, 2006, at 5:00 pm after high tide at 2:00 pm and before low tide at 9:00 pm.

3.3 CHEMICAL ANALYSES

TEC analyzed 12 soil samples and seven groundwater samples for petroleum-related compounds. Table 1 summarizes the laboratory results for the soil samples and Table 3 summarizes the laboratory results for the groundwater samples. Laboratory analysis results are included in Appendix B.

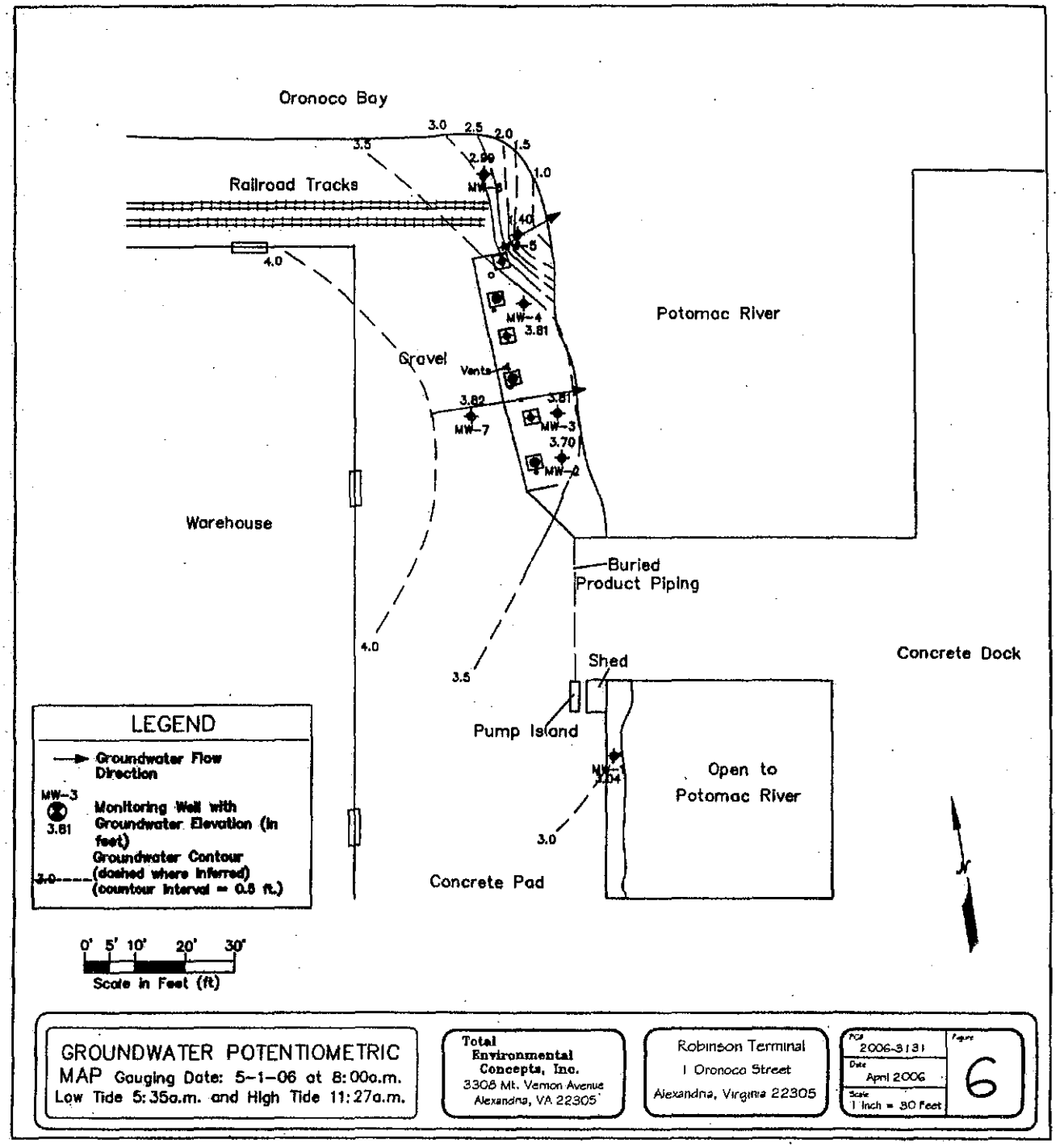
3.3.1 Soil Sample Results

PSS analyzed 12 soil samples from the borings for TPH-GRO and TPH-DRO using EPA Method 8015b under normal turnaround times. Table 1 summarizes sample locations, depths, laboratory results, and lists the corresponding PID result for each sample analyzed. A petroleum odor was detected between 6.6 and 7.6 feet BGS in B6 and between 13 and 14 feet BGS in B9.

The sample collected from B13 had the lowest concentration at not detected (ND) microgram per kilogram (µg/kg) TPH-GRO and HF 19 mg/kg for TPH-DRO. B12 had the highest at 950 µg/kg TPH-GRO and lighter and heavier fuel/oil patterns were observed (LF/HF) 220 mg/kg TPH-DRO. Monitoring well B9 had 620 µg/kg TPH-GRO and 17 mg/kg TPH-DRO.

3.3.2 Water Sample Results

Table 3 summarizes laboratory results for the sampling of the seven monitoring wells on site. PSS analyzed the samples for TPH-GRO and TPH-DRO using EPA Method 8015B, BTEX, naphthalene, and MTBE using EPA Method 8021B. TEC developed, purged, and sampled the seven monitoring wells for the petroleum constituents on May 1, 2006.

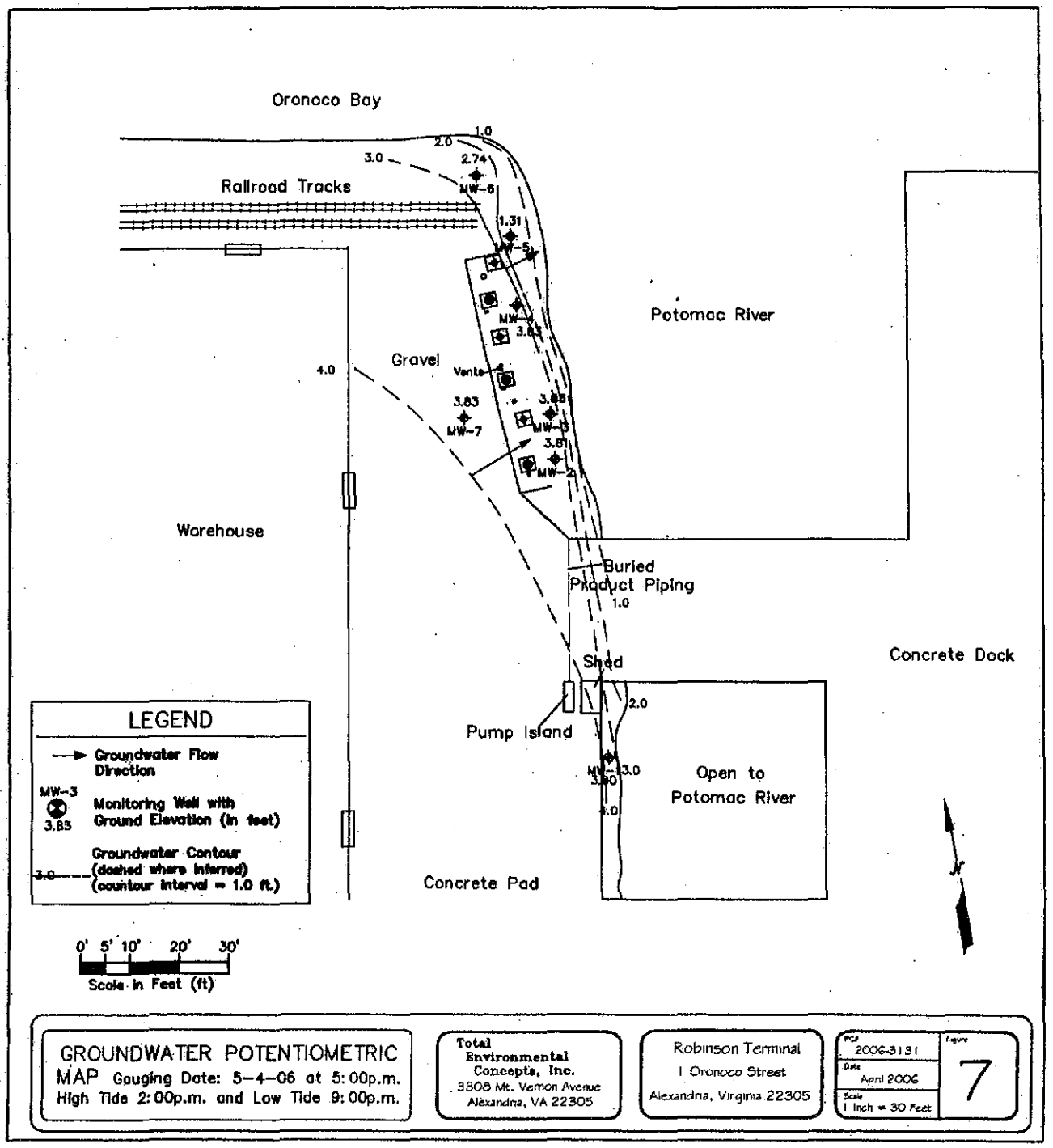


GROUNDWATER POTENTIOMETRIC MAP Gauging Date: 5-1-06 at 8:00a.m. Low Tide 5:35a.m. and High Tide 11:27a.m.

Total Environmental Concepts, Inc.
3308 Mt. Vernon Avenue
Alexandria, VA 22305

Robinson Terminal
1 Oronoco Street
Alexandria, Virginia 22305

PCE 2006-3131
Date April 2006
Scale 1 Inch = 30 Feet
Figure 6



GROUNDWATER POTENTIOMETRIC MAP Gauging Date: 5-4-06 at 5:00p.m. High Tide 2:00p.m. and Low Tide 9:00p.m.

Total Environmental Concepts, Inc.
3308 Mt. Vernon Avenue
Alexandria, VA 22305

Robinson Terminal
1 Oronoco Street
Alexandria, Virginia 22305

PGS 2006-3131
Date April 2006
Scale 1 Inch = 30 Feet
Figure 7

TABLE 3. Ground Water Analytical Results
Robinson
PC# 2006-3131

Sample Location	Date Collected	TPH-DRO (mg/L)	TPH-GRO (µg/L)	MTBE (µg/L)	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL-BENZENE (µg/L)	XYLENE (µg/L)	Total BTEX (µg/L)	NAPHTHALENE (µg/L)
MW-1	5-1-2006	ND	ND	2	ND	ND	ND	ND	ND	ND
MW-2	5-1-2006	ND	ND	2	ND	ND	ND	ND	ND	ND
MW-3	5-1-2006	ND	ND	1	ND	ND	ND	ND	ND	ND
MW-4	5-1-2006	ND	ND	67	ND	ND	ND	ND	ND	ND
MW-5	5-1-2006	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6	5-1-2006	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-7	5-1-2006	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND - Not at or above reporting limits
µg/L-micrograms per liter
mg/L - milligrams per liter

All seven wells returned with ND for TPH-GRO, TPH-DRO, total BTEX and naphthalene, however MW-1 through MW-4 returned with detectable concentrations of MTBE. Ranging from 1 µg/L in MW-3 to 67 µg/L in MW-4, concentrations are shown in Table 3.

3.4 SITE ASSESSMENT SUMMARY

3.4.1 Vapor-Phase Hydrocarbons

PID readings were measured from soil samples and from the cuttings generated by the borings. PID readings are incorporated on the boring logs in Appendix A. PID readings above 0 ppm were detected in B4, B6, B8, B9, B10, and B13 ranging from 0.2 to 49.2 ppm.

3.4.2 Residual-Phase Hydrocarbons

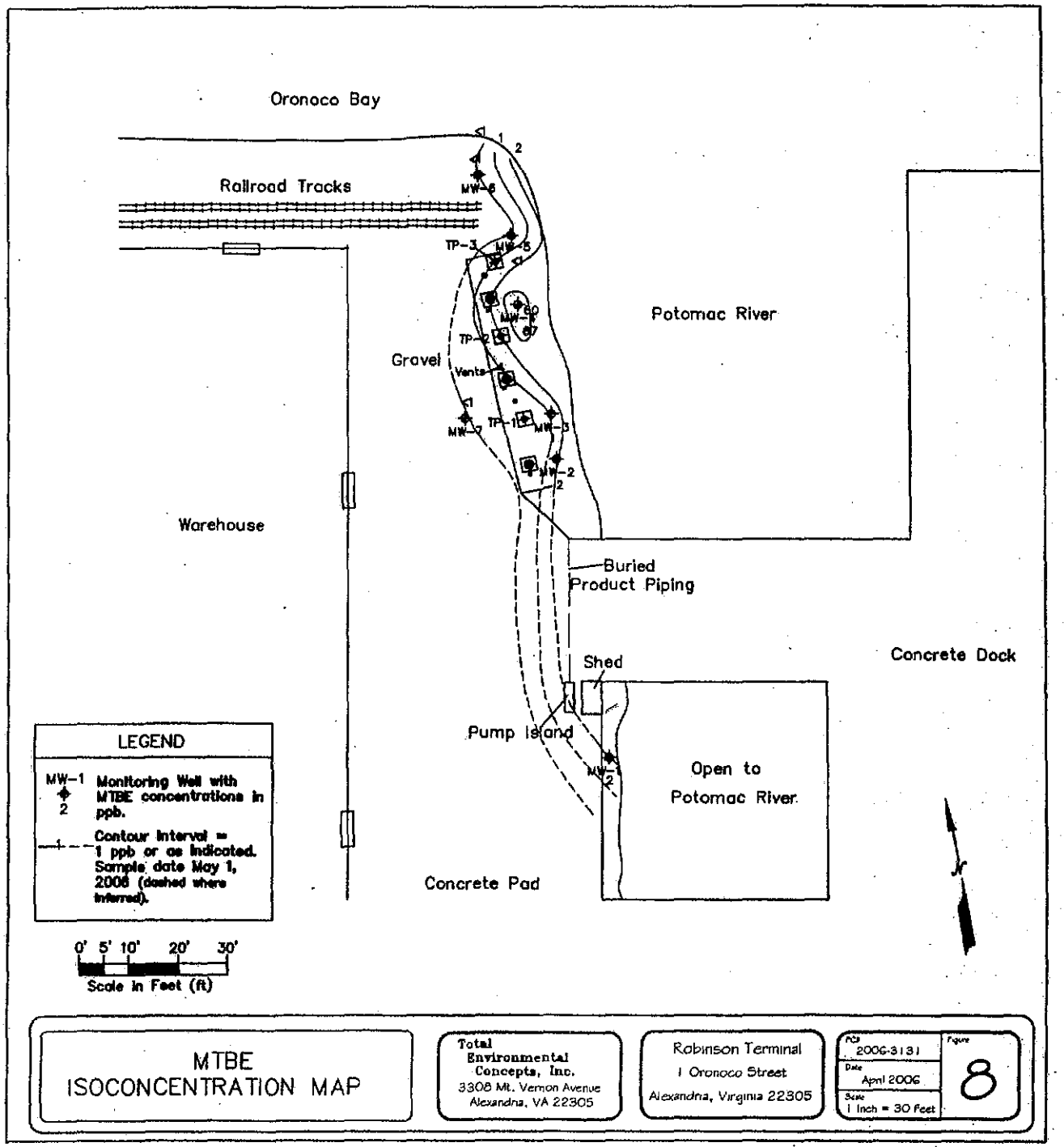
The presence of residual-phase hydrocarbons (RPH) at 12-14 feet in B9, 7-8 feet in B12, and 11-12 feet in B13 are likely derived from the sandy lenses within the lean clay strata of each boring. Concentrations of TPH-GRO ranged from 620 µg/kg in B9 to 950 µg/kg in B12. TPH-DRO concentrations were only found in B9 with a concentration of 17 mg/kg, however lighter and/or heavier fuel/oil patterns were observed (LF/HF) in B12 and B13.

When PSS analyzes a sample for TPH-GRO or TPH-DRO, they looked at a certain Carbon range, C^6-C^{10} for Gasoline or C^{10} to C^{40} for Diesel/heating oil fuel. When the lab runs pure diesel fuel or gasoline through the gas chromatograph (GC), the resulting graph shows a distinct pattern or shape for diesel fuel and a distinct pattern or shape for gasoline (called the "standard"). The lab then sends the test specimen sample through the GC and compares the new pattern with the "standard". If the resulting pattern is different than the "standard", the lab provides a result with the designation of LF or HF. These alternate patterns can correspond to kerosene for the LF and either motor oil, hydraulic oil, creosote, etc. for the HF, all of which can show up in the TPH-DRO range. According to PSS for samples B12 and B13, the pattern read by the GC was not one of diesel, but possibly kerosene for the LF and possibly waste oil, etc. for the HF.

3.4.3 Dissolved-Phase Hydrocarbons

Groundwater samples were collected from the seven monitoring wells installed in April 2006. BTEX, naphthalene, MTBE, and TPH-DRO and TPH-GRO were analyzed to measure concentrations of dissolved phase hydrocarbons (DPH) in the groundwater of the seven monitoring wells. The analytical results are summarized in Table 3.

Concentration ranges of 1 to 67 µg/L MTBE were encountered in MW-1 through MW-4. Dissolved-phase MTBE extends from the suggested source of the tank pit in MW-4, south towards MW-1, west towards MW-7, north towards MW-6 and possibly east towards the river. Figures 6 and 7 depict the groundwater flowing east, which could explain the lack of petroleum related compounds west of the USTs. Figure 8 is an MTBE isoconcentration map depicting the DPH plume for this compound. The VDEQ requests that all groundwater samples be analyzed for MTBE because of the practice by some oil companies to switch products in their delivery trucks from heating oil to gasoline and vice versa. This practice is the likely explanation for the presence of MTBE in the wells, a compound that is found in gasoline and not in #2 heating oil or diesel fuel. MTBE has a


Oronoco Bay
Railroad Tracks
MW-6
TP-3
MW-5
Potomac River
MW-4
TP-2
Gravel
Vents
MW-7
TP-1
MW-3
MW-2
Warehouse
Buried
Product Piping
Shed
Concrete Dock
Pump Island
MW-1
Open to
Potomac River
Concrete Pad
LEGEND
MW-1
2
Monitoring Well with MTBE concentrations in ppb.
Contour Interval = 1 ppb or as indicated. Sample date May 1, 2006 (dashed where inferred).
0' 5' 10' 20' 30'
Scale in Feet (ft)
MTBE
ISOCONCENTRATION MAP
Total Environmental Concepts, Inc.
3308 Mt. Vernon Avenue
Alexandria, VA 22305
Robinson Terminal
1 Oronoco Street
Alexandria, Virginia 22305
PO# 2006-3131
Date April 2006
Scale 1 Inch = 30 Feet
Figure 8

high affinity for water and moves into and out of solution quickly. It usually marks the leading edge of the DPH plume to indicate its migration direction.

3.4.4 Free-Phase Hydrocarbons

Free phase hydrocarbons were originally detected in TPMW-2 during the vacuum truck event. During SCR activities the interface probe detected FPH in TPMW-2 but was unable to read the FPH/water interface and therefore unable to determine the exact thickness of FPH. A bailer was also unable to determine if FPH was in TPMW-2 however a sample was collected and allowed to sit for one day during which the FPH separated in the sample and was visible on top of the water by the next day.

4.0 RISK ASSESSMENT

TEC performed a risk assessment at the site to evaluate the potential risks to human health and the environment. The following sections present the findings of this risk assessment.

4.1 HYDROCARBON CHARACTERIZATION

Based on the information obtained to date, it is apparent that a petroleum release of diesel fuel, heavier and lighter fuel oil, and minor amounts of gasoline has occurred at the site. MTBE, an additive to gasoline to reduce emissions, was detected in four of the monitoring wells onsite.

Diesel fuel mainly consists of compounds with eight or more carbons. About 90 percent is comprised of saturated compounds, such as n- and iso-parrafins. The remaining ten percent are aromatic-ring compounds (e.g., the BTEX compounds, MTBE, and naphthalene). These components have relatively low toxicity. Ingestion can cause gastro-intestinal irritation and depression of the central nervous system. No Threshold Limit Value (TLV) or Permissible Exposure Limit (PEL) has been established for diesel fuel/heating oil.

Gasoline consists of a mixture of C4 to C12 hydrocarbons. It is a highly flammable liquid, is insoluble in water, and dissolves fats, oils, and resins. Gasoline has an upper explosive limit (UEL) of 6.0 percent and lower explosive limit (LEL) of 1.3 percent. Exposure to gasoline can cause dizziness, vomiting, and a burning sensation in the lungs.

The chemicals of primary concern with respect to a gasoline release are the naturally occurring constituents of gasoline, benzene, toluene, ethylbenzene, and xylenes, known collectively by the acronym BTEX. Benzene is the chemical of greatest concern because it is reported to be a human carcinogen and is acutely toxic. Toluene, ethylbenzene, and xylenes are not reported as carcinogenic, and are considerably less toxic than benzene. These chemicals and their relative toxicities are discussed individually below, none of these compounds were detected in the groundwater.

Four of the wells contained some concentration of MTBE. According to John Stephenson (2002, p. 2), "MTBE's health effects have not been conclusively established, but the federal government has determined it to be a potential human carcinogen. Because of the health uncertainties, EPA has not regulated MTBE; instead it has simply advised people not to drink water that contains concentrations in excess of 20 to 40 parts per billion." "Because MTBE has a bad taste and odor at relatively low concentrations, people may not be able to tolerate drinking contaminated water in large enough quantities to pose a health risk." (Ibid, p. 7).

Mr. Stephenson declares that seven states in the U.S. have established their own health-based primary drinking water standards for MTBE. Five of these are northeastern states, with maximum contaminant levels ranging from 13 parts per billion (ppb) in New Hampshire to 70 ppb in New York and New Jersey. The highest concentration of MTBE was detected in MW-4 at 67 µg/L. This value does exceed the EPA's upper guideline of 40 ppb.

4.2 EXPOSURE PATHWAYS/RECEPTOR IDENTIFICATION

Exposure pathways qualitatively connect a hydrocarbon source through one or more natural and man-made media to human and non-human receptor populations. Both on- and off-site exposure pathways can include the following:

1. Direct Human Exposure
   a) Ingestion of soil
   b) Ingestion of groundwater
   c) Inhalation of air:
      1) Particulates
      2) Vapors
   d) Absorption through skin from dermal contact of:
      1) Soil
      2) Groundwater

2. Indirect Human Exposure
   a) Bioaccumulation in fish (aquatic life)
   b) Bioaccumulation in game and livestock

3. Non-Human Exposure
   a) Plants
   b) Fish (aquatic life)
   c) Game and livestock
   d) Real estate

For risk to occur, one or more of these exposure pathways must be complete. For this project, a non-human exposure pathway is complete, if the petroleum related compounds have seeped into the Potomac River and Oronoco Bay.

4.3 EXISTING AND POTENTIAL RECEPTORS

The only identified receptor of contamination from the release on the subject site is the groundwater, Potomac River and Oronoco Bay. From TEC observations, there were no sheens of petroleum product in the river immediately north and east of the USTs and the vegetation therein appeared healthy.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Twelve ounces of diesel fuel was detected in TPMW-2 while the well was being pumped out by a vacuum truck. During the course of this investigation at the Robinson Terminal on Oronoco Street four phases of petroleum hydrocarbons were detected in the subsurface of the site. Vapor phase hydrocarbons were encountered in six of the borings, residual phase hydrocarbons are present in three of the borings, dissolved phase hydrocarbons are present in MW-1 through MW-4, and a trace of free phase hydrocarbons was detected once in TPMW-2. The exact source of the release has not been determined. Therefore, it is suspected to have been a one time release. Based on the absence of FPH in the tank pit monitoring wells since May 2006, further investigation is not warranted at this time. TEC recommends closure of PC#2006-3131.

6.0 REFERENCES

Fleming, Anthony H., Drake, Jr., Avery A., and McCartan, Lucy (1994), Geologic Map of the Washington West Quadrangle, District of Columbia, Montgomery and Prince Georges Counties, Maryland, and Arlington and Fairfax Counties, Virginia: U.S. Geological Survey Geologic Quadrangle Map GQ-1748.

Obermeier, Stephen F. and Langer, William H. (1986), Relationships Between Geology and Engineering Characteristics of Soils and Weathered Rocks of Fairfax County and Vicinity, Virginia: U.S. Geological Survey Professional Paper 1344.

Stephenson, John (2002), Environmental Protection: MTBE Contamination From Underground Storage Tanks. Testimony Before the Subcommittee on Environment and Hazardous Materials, Committee on Energy and Commerce, House of Representatives, Delivered on Tuesday, May 21, 2002. U.S. General Accounting Office, Document GAO-02-753T.

Appendix A

Boring Logs

TOTAL ENVIRONMENTAL CONCEPTS, INC.

DIRECT-PUSH LOG

TEC/PC#: 650.002/06-3131	**Site:** Robinson Terminal	**Boring No.:** B-1
City, State: Alexandria, VA	**Client:** Robinson Terminal Warehouse Corp.	**Date:** 4-27-2006
Site Geologist: A. Weatherly	**Sample Type:** 4-ft poly tube	**Total Depth:** 14'

Depth (feet)	Sample Interval (feet)	USCS	PID (ppm)	Lithologic Description	Comments
--0				Topsoil	
-0.6		FILL		Brown Sandy Gravel FILL, dry	
-2.1	2-4'		0.0	Brown Sandy Clay FILL, with gravel, moist	
-3.1				Tan Rock FILL, dry	
-3.6				Brown Lean Clay FILL, with gravel and some sand,	
--5	5-6'		0.0	moist	
-6.1	6-8'		0.0	Brown Lean Clay FILL, moist	
-					
-					With sand below 8'
-9.6				Light Brown Fat Clay FILL, moist	
--10.6				Brown Lean Clay FILL, with some sand, moist	
-	11-12'		0.0		
-12	12-14'		0.0	Black Gravel FILL, with sand	No petroleum odor
-13				Brown Lean Clay FILL, with sand	
-14				Bottom of Boring at 14'	
--15					
-					
-					
-					
-					
--20					
-					
-					
-					
-					
--25					
-					
-					
-					
-					
--30					
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-					
-					
-					

TOTAL ENVIRONMENTAL CONCEPTS, INC.

DIRECT-PUSH LOG

TEC/PC#: 650.002/06-3131	**Site:** Robinson Terminal	**Boring No.:** B-2/MW-2
City, State: Alexandria, VA	**Client:** Robinson Terminal Warehouse Corp.	**Date:** 4-27-2006
Site Geologist: A. Weatherly	**Sample Type:** 4-ft poly tube	**Total Depth:** 16'

Depth (feet)	Sample Interval (feet)	USCS	PID (ppm)	Lithologic Description	Comments
--0				Topsoil	
-0.6		FILL		Brown Sandy Gravel FILL, dry	
-4	2-4'		0.0	Brown Sandy Clay FILL, with gravel, moist	
-					
-					
--5					
-6	6-8'		0.0	Tan Rock FILL, dry	
-7				Brown Lean Clay FILL, moist	
-7.2				Tan Pea Gravel FILL, moist	
-7.4				Brown Sandy Clay FILL, with gravel, moist	
-8				Brown Lean Clay FILL, moist	
-9.11				Gravel FILL, moist	
--10	10-12'		0.0	Brown Lean Clay FILL, moist	
-					Fat clay below 10.6'
-					Lean clay with sand
-					below 11'
-12				Red Brick FILL, dry	
-12.2				Brown Sand FILL, with clay, moist	
-					With gravel below 14'
--15.6	15-16'	SP	0.0	Grey Poorly Graded SAND, wet	No petroleum odor
-				Bottom of Boring at 16'	
-					
-					
-					
--25					
-					
-					
-					
-					
--30					
-					
-					
-					
-					

TOTAL ENVIRONMENTAL CONCEPTS, INC.

DIRECT-PUSH LOG

TEC/PC#: 650.002/06-3131	**Site:** Robinson Terminal	**Boring No.:** B-3
City, State: Alexandria, VA	**Client:** Robinson Terminal Warehouse Corp.	**Date:** 4-27-2006
Site Geologist: A. Weatherly	**Sample Type:** 4-ft poly tube	**Total Depth:** 12'

Depth (feet)	Sample Interval (feet)	USCS	PID (ppm)	Lithologic Description	Comments
--0				Topsoil	
-0.6	0-4'	FILL	0.0	Brown Sandy Gravel FILL, dry	
-					
-					
-					
--5					
-6				Brown Lean Clay FILL, with sand, moist	
-7.10	7-8'		0.0	Brown Fat Clay FILL, moist	
-					Light brown below 8'
-					
--10				Brown Sand FILL, with quartz fragments, moist	
-10.2				Brown Lean Clay FILL, moist	
-					Fat clay below 10.8'
-11.6	11-12'		0.0	Light Brown Lean Clay FILL, with some sand,	
-				moist	
-				Bottom of Boring at 12'	
--15					
-					
-					
-					
--20					
-					
-					
-					
-					
--25					
-					
-					
-					
-					
--30					
-					
-					
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TOTAL ENVIRONMENTAL CONCEPTS, INC.

DIRECT-PUSH LOG

TEC/PC#: 650.002/06-3131	**Site:** Robinson Terminal	**Boring No.:** B-4/MW-4
City, State: Alexandria, VA	**Client:** Robinson Terminal Warehouse Corp.	**Date:** 4-27-2006
Site Geologist: A. Weatherly	**Sample Type:** 4-ft poly tube	**Total Depth:** 12'

Depth (feet)	Sample Interval (feet)	USCS	PID (ppm)	Lithologic Description	Comments
--0				Topsoil	
-0.6		FILL		Brown Sandy Gravel FILL, dry	
-	2-4'		0.0		
-3.9				Brown Lean Clay FILL, with sand and gravel, moist	
-4				Brown Gravel FILL, moist	
--5.6				Brown Fat Clay FILL, moist	
-6.10				Brown Crushed Rock FILL, moist	
-7	7-8'		0.0	Brown Fat Clay FILL, moist	
-					Lean clay below 8'
-8.6				Brown Sand FILL, with quartz fragments, moist	
-9	9-10'		1.4	Brown Fat Clay FILL, moist	No petroleum odor
--10					
-	11-12'		0.0		
-				Bottom of Boring at 12'	
-					
-					
--15					
-					
-					
-					
-					
--20					
-					
-					
-					
-					
--25					
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-					
-					
--30					
-					
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-					

TOTAL ENVIRONMENTAL CONCEPTS, INC.

DIRECT-PUSH LOG

TEC/PC#: 650.002/06-3131	**Site:** Robinson Terminal	**Boring No.:** B-5
City, State: Alexandria, VA	**Client:** Robinson Terminal Warehouse Corp.	**Date:** 4-27-2006
Site Geologist: A. Weatherly	**Sample Type:** 4-ft poly tube	**Total Depth:** 12'

Depth (feet)	Sample Interval (feet)	USCS	PID (ppm)	Lithologic Description	Comments
--0		FILL		Grey Gravel FILL, dry	
-0.6				Brown Sandy Gravel FILL, dry	
-	2-4'		0.0		
-3.8				Grey Rock FILL, dry	
-					
--5					
-					
-7	7-8'		0.0	Brown Lean Clay FILL, with gravel, moist	
-7.6				Brown Fat Clay FILL, moist	
-7.9				Crushed Rock FILL, moist	
-					Water at 8'
--10				Brown Sand FILL, with gravel, wet	
-	11-12'		0.0		
-				Bottom of Boring at 12'	
-					
-					
--15					
-					
-					
-					
-					
--20					
-					
-					
-					
-					
--25					
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--30					
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TOTAL
ENVIRONMENTAL
CONCEPTS, INC.

DIRECT-PUSH LOG

TEC/PC#: 650.002/06-3131	**Site:** Robinson Terminal	**Boring No.:** B-6/MW-7
City, State: Alexandria, VA	**Client:** Robinson Terminal Warehouse Corp.	**Date:** 4-27-2006
Site Geologist: A. Weatherly	**Sample Type:** 4-ft poly tube	**Total Depth:** 12'

Depth (feet)	Sample Interval (feet)	USCS	PID (ppm)	Lithologic Description	Comments
--0		FILL		Grey Gravel FILL, dry	
-0.6				Brown Sandy Clay FILL, with gravel, dry	
-	2-4'		0.0		
-3				Brown Fat Clay FILL, with sand, moist	
-					
--5					
-	6.6-7.6'		0.0		Slight petroleum odor
-					below 6-6'
-					With sand below 8'
-9				Brown Sandy Clay FILL, moist	
--10					
-	11-12'		0.8		
-				Bottom of Boring at 12'	Water at 12'
-					
-					
--15					
-					
-					
-					
-					
--20					
-					
-					
-					
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--25					
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TOTAL ENVIRONMENTAL CONCEPTS, INC.

DIRECT-PUSH LOG

TEC/PC#: 650.002/06-3131	**Site:** Robinson Terminal	**Boring No.:** B-7
City, State: Alexandria, VA	**Client:** Robinson Terminal Warehouse Corp.	**Date:** 4-27-2006
Site Geologist: A. Weatherly	**Sample Type:** 4-ft poly tube	**Total Depth:** 12'

Depth (feet)	Sample Interval (feet)	USCS	PID (ppm)	Lithologic Description	Comments
--0		FILL		Gravel FILL, dry	
-					
-2	2-4'		0.0	Brown Fat Clay FILL, moist	
-2.6				Brown Well Graded Sand FILL, with gravel, moist	
-2.9				Brown Fat Clay FILL, moist	
--5					
-	6-8'		0.0		
-					
-					
-					Lean clay below 9'
--10	10-12'		0.0		
-					
-				Bottom of Boring at 12'	Water at 12'
-					
-					
--15					
-					
-					
-					
-					
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TOTAL ENVIRONMENTAL CONCEPTS, INC.

DIRECT-PUSH LOG

TEC/PC#: 650.002/06-3131	**Site:** Robinson Terminal	**Boring No.:** B-8
City, State: Alexandria, VA	**Client:** Robinson Terminal Warehouse Corp.	**Date:** 4-27-2006
Site Geologist: A. Weatherly	**Sample Type:** 4-ft poly tube	**Total Depth:** 12'

Depth (feet)	Sample Interval (feet)	USCS	PID (ppm)	Lithologic Description	Comments
--0				Concrete	
-					
-2	2-4'		0.0	Brown Well Graded Sand FILL, moist	
-3				Brown Fat Clay FILL, moist	
-					
--5				Grey Sandy Lean Clay FILL, moist	No petroleum odor
-					
-7	7-8'		1.0	Brown Lean Clay FILL, moist	
-7.8				Red Brick FILL, dry	
-7.10				Brown Fat Clay FILL, moist	
-					Lean clay below 8'
-					
--10	10-12'		0.0		
-					
-				Bottom of Boring at 12'	
-					
-					
--15					
-					
-					
-					
-					
--20					
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TOTAL ENVIRONMENTAL CONCEPTS, INC.

DIRECT-PUSH LOG

TEC/PC#: 650.002/06-3131	**Site:** Robinson Terminal	**Boring No.:** B-9/MW-5
City, State: Alexandria, VA	**Client:** Robinson Terminal Warehouse Corp.	**Date:** 4-27-2006
Site Geologist: A. Weatherly	**Sample Type:** 4-ft poly tube	**Total Depth:** 16'

Depth (feet)	Sample Interval (feet)	USCS	PID (ppm)	Lithologic Description	Comments
--0				Topsoil	
-0.6		FILL		Brown Sandy Clay FILL, with gravel, moist	
-	2-4'		0.0		
-3				Brown Fat Clay FILL, moist	
-					
--5	5-7'		0.0		
-					Lean clay below 6.6'
-					Fat clay below 7'
-					
-					
--10					
-	11-12'		1.3		Lean clay below 11.3'
-12	12-14'		49.2	Grey Lean Clay FILL, with some sand, moist	
-					Moderate petroleum odor
-					at 13'
--15					
-	15-16'		0.0	Bottom of Boring at 16'	
-					
-					
-					
--20					
-					
-					
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--25					
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TOTAL
ENVIRONMENTAL
CONCEPTS, INC.

DIRECT-PUSH LOG

TEC/PC#: 650.002/06-3131	**Site:** Robinson Terminal	**Boring No.:** B-10
City, State: Alexandria, VA	**Client:** Robinson Terminal Warehouse Corp.	**Date:** 4-27-2006
Site Geologist: A. Weatherly	**Sample Type:** 4-ft poly tube	**Total Depth:** 12'

Depth (feet)	Sample Interval (feet)	USCS	PID (ppm)	Lithologic Description	Comments
--0				Topsoil	
-0.6		FILL		Brown Sandy Gravel FILL, dry	
-	2-4'		0.0		
-					
-4				Brown Fat Clay FILL, moist	
--5					
-	6-8'		0.0		
-					
-					
-					
--10					
-11.6	11-12'		0.2	Brown Lean Clay FILL, with sand, moist	
-				Bottom of Boring at 12'	
-					
-					
--15					
-					
-					
-					
-					
--20					
-					
-					
-					
-					
--25					
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-					
-					

TOTAL ENVIRONMENTAL CONCEPTS, INC.

DIRECT-PUSH LOG

TEC/PC#: 650.002/06-3131	**Site:** Robinson Terminal	**Boring No.:** B-11
City, State: Alexandria, VA	**Client:** Robinson Terminal Warehouse Corp.	**Date:** 4-28-2006
Site Geologist: A. Weatherly	**Sample Type:** 4-ft poly tube	**Total Depth:** 12'

Depth (feet)	Sample Interval (feet)	USCS	PID (ppm)	Lithologic Description	Comments
--0		FILL		Concrete	
-					
-2	2-4'		0.0	Brown Fat Clay FILL, with sand and gravel, moist	
-3.2				Grey Gravel FILL, moist	
-3.8				Brown Sandy Clay FILL, with gravel, moist	
-4	4-8'		0.0	Red-Brown Poorly Graded Sand FILL, moist	
-4.6				Brown Lean Clay FILL, moist	
--5					
-6.6				Asphalt	
-7				Brown Lean Clay FILL, moist	
-7.10				Brown Sandy Clay FILL, moist	
-8.6				Brown and Grey Lean Clay FILL, moist	No petroleum odor
-	9-11'		0.0		
--10				Red Brick FILL, dry	
-10.2				Brown Fat Clay FILL, moist	
-				Bottom of Boring at 12'	
-					
-					
--15					
-					
-					
-					
-					
--20					
-					
-					
-					
-					
--25					
-					
-					
-					
-					
--30					
-					
-					

TOTAL ENVIRONMENTAL CONCEPTS, INC.

DIRECT-PUSH LOG

TEC/PC#: 650.002/06-3131	**Site:** Robinson Terminal	**Boring No.:** B-12/MW-1
City, State: Alexandria, VA	**Client:** Robinson Terminal Warehouse Corp.	**Date:** 4-28-2006
Site Geologist: A. Weatherly	**Sample Type:** 4-ft poly tube	**Total Depth:** 10'

Depth (feet)	Sample Interval (feet)	USCS	PID (ppm)	Lithologic Description	Comments
--0	0-4'		0.0	Topsoil	
-0.8		FILL		Brown Sandy Gravel FILL, dry	
-					
-3.10				Brown Sandy Clay FILL, with gravel, moist	
-4	4-6'		0.0	Brown Fat Clay FILL, moist	
--5					
-					
-7	7-8'		0.0	Brown Fat Clay FILL, with some sand, moist	
-					
-8	8-10'		0.0	Dark Grey Gravel FILL, with sand, wet	No petroleum odor
-					Water at 8'
--10				Bottom of Boring at 10'	
-					
-					
-					
--15					
-					
-					
-					
-					
--20					
-					
-					
-					
-					
--25					
-					
-					
-					
-					
--30					
-					
-					
-					
-					

TOTAL ENVIRONMENTAL CONCEPTS, INC.

DIRECT-PUSH LOG

TEC/PC#: 650.002/06-3131	**Site:** Robinson Terminal	**Boring No.:** B-13/MW-6
City, State: Alexandria, VA	**Client:** Robinson Terminal Warehouse Corp.	**Date:** 4-28-2006
Site Geologist: A. Weatherly	**Sample Type:** 4-ft poly tube	**Total Depth:** 16'

Depth (feet)	Sample Interval (feet)	USCS	PID (ppm)	Lithologic Description	Comments
--0				Topsoil	
-0.6		FILL		Brown Sandy Clay FILL, with gravel, moist	
-	2-4'		0.0		
-					
-4				Light Brown Lean Clay FILL, with sand, moist	
--5					
-	6-8'		0.0		
-					
-8				Light Brown Lean Clay FILL, moist	
-					
--10					With some sand and
-	11-12'		1.4		gravel below 10'
-					
-					
-	14-16'		0.0		
--15					
-				Bottom of Boring at 16'	
-					
-					
-					
--20					
-					
-					
-					
-					
--25					
-					
-					
-					
-					
--30					
-					
-					
-					
-					