REMEDIAL INVESTIGATION WORK PLAN

U-Haul Site
555 West 22nd Street
New York, New York 10011
NYSDEC BCP No. C231101

Submitted to:
New York State Department of Environmental Conservation
Division of Environmental Remediation
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FINAL
October 2016

Affiliated with Integral Consulting Inc.

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CERTIFICATION

I, Kevin McCarty, P.G. certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Remedial Investigation Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Signature

10/26/16
Date

1 INTRODUCTION

Integral Engineering, P. C. (Integral) has prepared this Remedial Investigation Work Plan (RIWP) on behalf of 23rd and 11th Associates, L.L.C. for the property located at 555 West 22nd Street (Block 694, Lots 5, 60, 61 and 65), New York, NY (Site). The Site is currently enrolled in the New York State Brownfield Cleanup Program (BCP) and listed as Site No. C231101.

This RIWP includes a summary of Site history, a summary of previous environmental assessments and investigations, a description of the Site geologic and hydrogeologic setting, a summary of subsurface features, and a plan of action for further delineation of areas of concern identified previously by Integral and others. A full characterization of the Site will be performed as part of the Remedial Investigation (RI).

1.1 SITE DESCRIPTION

The Site is located in a mixed use area of the West Chelsea section of the Borough of Manhattan. The Site is comprised of four tax lots (approximately 31,820 SF) identified on New York City tax maps as Block 694 Lots 5, 60, 61, and 65. The Site is bounded to the north by West 23rd Street, to the east by 10th Avenue, to the south by West 22nd Street, and to the west by 11th Avenue. A USGS Topographic Map is included as Figure 1. A map showing the Site property boundaries is included as Figure 2.

The Site is currently zoned C6-3A, C6-3 and M (Commercial, Mixed Buildings and Manufacturing) and is currently owned and operated by U-Haul International Inc. (U-Haul). The Site's entire footprint contains three separate buildings, each designated with the letters; A, B and C that identifies their location on specific tax lots. Building A encompasses Lot 65, located at the corner of West 23rd Street and 11th Avenue, and Lot 5 which adjoins the southeastern corner of Lot 65 and has frontage on West 22nd Street; Building B encompasses Lot 61, which adjoins Lot 65 along its eastern property boundary; Building C encompasses Lot 60, which adjoins Lot 61 to the east. The locations of Buildings A, B, C, and their associated tax lot numbers are outlined on Figure 2.

Building A (Lot 65) is a three story commercial building constructed of brick and concrete with a steel frame structure. Adjoining Building A (Lot 65) to the south is a paved parking area, which is the only exposed area of the Site. The area is currently used by U-Haul for rental vehicle parking. Building A does not currently contain vehicle service operations, and is now used for moving supply retail, mini-storage units, vehicle hand washing and parking. The first floor of Building A contains U-Haul's show room and retail space as well as an interior driveway. The second floor of Building A contains storage units, a single apartment, and rental truck parking. The third floor of Building A contains mini-storage units and an apartment.

Lot 5 contains an extension of Building A consisting of a single-story storage warehouse with portions also used for vehicle parking (Figure 2).

Building-B (Lot 61) and Building-C (Lot 60) are single story garages constructed of brick and concrete with a steel frame structure (Figure 2). Five rows of parking are marked out, where approximately seven vehicles can park in line.

Adjacent properties include mixed use commercial/residential to the north, industrial/manufacturing and commercial/residential to the east, office space and commercial/residential to the south and the West Side Highway to the west.

1.2 SITE HISTORY

Environmental records indicate that historic Site uses included: lumber yard, iron works, garage, automotive repair services, and storage and dispensing of petroleum products. It is unknown whether U-Haul continued to dispense gasoline after taking title to the property in the late 1970's/early 1980's. Currently, no vehicle repair or fueling takes place onsite.

1.3 REGULATORY INTERACTION

23rd and 11th Associates, L.L.C. entered into the BCP as a Volunteer on August 15 2016 via the execution of a Brownfield Cleanup Agreement (BCA) with New York State Department of Environmental Conservation (NYSDEC). Accordingly, the work to be performed under this RIWP, as well as, all future remedial work, will be performed in accordance with the requirements set forth in the BCA.

Numerous environmental actions/investigations associated with the procedural mandates of NYSDEC Spills Program and the removal or abandonment of several underground storage tanks (USTs) and/or above ground storage tanks (ASTs) have been conducted on the Site from 1991 through 2006. A summary of previous site investigations and/or actions is presented in Section 2.2 of this Work Plan. A description of spills associated with the Site is provided below.

Four spills are associated with the Site:

1. NYSDEC Spill No. 9000199 was reported to the Department in April 1990 as an unknown amount of gasoline impacting groundwater due to a tank failure. The spill was closed in June 2000.

2. NYSDEC Spill No. 9305627 was reported to the Department on August 5, 1993 and closed by the Department the next day on August 6, 1993. The spill was reported as waste oil emanating from abandoned drums in the amount of 55 gallons which impacted soil.

3. NYSDEC Spill No. 9700188 was reported to the Department in April 1997 as a 40-gallon gasoline spill impacting soil; cause unknown. The spill was closed in February 2002.

4. NYSDEC Spill No. 0205608 was reported to the Department in August 2002 as an unknown amount of #2 fuel oil impacting soil due to a tank failure. The spill was closed in December 2002.

NYSDEC Spill Nos. 9000199, 9700188, and 0205608 were closed following satisfactory investigation and/or remediation through agreements under the NYSDEC Spills Program. There is no information regarding investigation or remediation activities associated with Spill No. 9305627. The above referenced information for Spill No. 9305627 was obtained via NYSDEC's Spill Database.

1.4 PURPOSE

This RIWP has been developed to achieve the following BCP objectives:

- To define the nature and extent of contamination on and offsite;
- To identify if residual contaminant source areas are present on the Site;
- To determine whether remedial action is needed to protect human health and the environment; and
- To produce data of sufficient quantity and quality to prepare a Remedial Action Work Plan (including alternatives analysis) to support the remediation of the Site, if warranted.

This RIWP was developed in general accordance with the NYSDEC's Division of Environmental Remediation Technical Guidance for Site Investigation and Remediation (DER-10), dated May 2010.

Specifically, this RIWP provides a summary of environmental conditions including the following:

- Relevant information from existing environmental reports;
- Technical overview and findings from previous reports;
- Planned investigation activities as outlined in Section 3 of this RIWP (including soil, soil vapor, air, and groundwater investigations);
- Site base mapping, supporting figures presenting proposed sampling locations of planned investigational activities;
- Quality Assurance Project Plan (QAPP);
- Site Specific Health & Safety Plan (HASP);

- Community Air Monitoring Plan (CAMP); and
- Field Sampling Plan (FSP).

References used in assessment of this Site and for development of this RIWP are identified in the References section at the end of this document.

2 BACKGROUND

2.1 PHYSICAL SETTING

The Site incorporates approximately .73 acres of fairly level land situated in the City of New York, New York County, New York. The Site is mapped on the Jersey City, NY-NJ Quadrant 7.5 Minute Topographic Map, published by the United States Geological Survey (USGS). Review of the topographic map indicates that the Site is located approximately 7 ft above sea level (NAVD 88). The topography of the Site is relatively level with a gentle slope west towards the Hudson River. The entire area surrounding the Site is urban land which has been developed, and manually contoured to be level with street grade.

2.1.1 Site Geology and Hydrogeology

Based on the Limited Phase II Investigation performed in 2016, the Site subsurface consists of an approximate 8-9 foot thick layer of historic fill material, followed by native sand and gravel deposits. Groundwater was encountered at approximately 9 feet below grade (ftbg). Based on the proximity to the Hudson River (approximately 525 ft from the western boundary of the Site) groundwater is expected to flow to the west. The Site is in the 100-yr floodplain; no wetlands or surface water bodies are present at the Site.

2.1.2 Subsurface Features

The Site currently contains two abandoned 1,000-gallon USTs, one abandoned 550-gallon UST, and an abandoned 5,000-gallon AST. The current locations of these abandoned tanks have not been assessed but are known to be within the bounds of Lot 65, 61, and 60. A geophysical survey will be performed prior to the implementation of RI activities in order to confirm the location of the abandoned USTs and clear all proposed boring locations of utilities or subsurface obstruction. Additional details regarding the Site's USTs, ASTs, and other subsurface features are provided in the following sections.

2.1.2.1 Underground Storage Tanks

Integral did not observe the presence of any active USTs or associated infrastructure (vent pipes or fill ports) onsite during the reconnaissance performed as part of the 2015 Phase I ESA. However, environmental records do identify several onsite USTs that were either removed or abandoned in place:

- Lot 65:
    - 1,000-gallon fuel oil UST (closed in place in 1991)

  - o 550-gallon gasoline UST (closed in place in 1994)
  - o Two (2) 1,000-gallon USTs within the former fuel pump island (removed April 11, 1997)
- Lots 60 and 61:
  - o Eight (8) 550-gallon gasoline and diesel USTs (removed in 2002)
  - o One (1) 1,000-gallon No. 2 fuel oil UST (closed in place in 2002)

The approximate locations of the former and closed in-place USTs are shown on Figure 2.

2.1.2.2 Aboveground Storage Tanks

Integral observed the presence of (1) 5,000-gallon abandoned AST and its associated vent pipes, during the 2015 Phase I ESA. According to Site reports, this AST was closed in place in 2006 (foam filled) within the former boiler room. No significant signs of petroleum release were noted during a visual inspection of the AST area. A concrete block wall encompasses the lower half of the AST obstructing any observation of the condition of the underside of the tank.

2.1.2.3 Other Subsurface Features

Two basement areas exist beneath Building A (Lot 65), both of which are accessed through Bilco doors located within the sidewalks on West 23rd Street and 11th Avenue (Figure 2). The West 23rd Street Bilco doors lead to a concrete capped boiler room containing the Site's abandoned 5,000-gallon AST, inactive fuel oil boiler system, and two sump areas with discharge pumps reportedly connected to the combined sewer. The 11th Avenue Bilco doors lead to a concrete capped basement area which contains Building A's sewer line and one sump area with a discharge reportedly connected to a combined sewer. Additionally, Lot 65 contains a zipper drain at the automobile hand wash station near 11th Avenue, which is plumbed to the buildings combined sewer line and discharged into NYC's combined municipal sewer system.

2.2 PREVIOUS INVESTIGATIONS AND ASSESSMENTS

In accordance with the DER-10, this RIWP incorporates a summary of relevant Environmental Site Investigations, which provide the basis for identifying the areas of concern (AOCs) and the principal constituents of concern (COCs) on the Site. Previous investigations include work performed for spill and tank closure reports, a 2015 Phase I Environmental Site Assessment, and a 2016 Limited Phase II Environmental Site Investigation. Findings from these previous investigations are discussed in the following sections, a list of the investigations detailed in this section is included herein:

1. Boring Report, U-Haul Corporation New York City, American Hi-Tech, Inc., 1994.

2. Tank Removal Letter, U-Haul #803-62 562 West 23rd Street, New York, NY, Tyree Brothers Environmental Services, Inc., April 1997.
3. Closure Report for the Excavation of Underground Storage Tanks, U-Haul #803-62 562 West 23rd Street, New York, NY, Tyree Brothers Environmental Services, Inc., July 1997.
4. Site Assessment Report; U-Haul Moving Center #803-62, 562 West 23rd Street, New York, NY, Pinnacle Environmental Technologies, 1997.
5. Groundwater Sampling Report, 562 West 23rd Street, New York, NY, Pinnacle Environmental Technologies, 1998.
6. Quarterly Groundwater Sampling Reports, 562 West 23rd Street, New York, NY, Pinnacle Environmental Technologies, 1999.
7. Site Closure Letter, NYSDEC Spills 9000199 & 9700188, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2000.
8. Site Investigation Report, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2001.
9. Supplement to the Site Investigation Report, Groundwater Modeling, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2001.
10. Underground Storage Tank Closure and Focused Subsurface Investigation, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2002.
11. Report on Drum Removal, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2002.
12. Phase I Environmental Site Assessment, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2002.
13. 5,000-gallon Tank Closure Report, 562 West 23rd Street, New York, NY, Environmental Resources Management, 2006
14. Phase I Environmental Site Assessment, 562 West 23rd Street, New York, NY, Integral Engineering, 2015
15. Limited Phase II Environmental Site Investigation, 555 West 22nd Street, New York, NY, Integral Engineering, 2016

Copies of available environmental records and reports are included in their entirety, as received, in Appendix A. Findings and conclusions from these reports are summarized in the following sections.

2.2.1 Boring Report, U-Haul Corporation New York City, American Hi-Tech, Inc., 1994

American Hi-Tech (AHT) identified the Site as Site #9 (Building A [Lot65]) and noted it to be NYSDEC PBS Facility No. 2-084069 with two active 1,000-gallon USTs which store gasoline and diesel, a closed in place 550-gallon gasoline UST, and a removed 1,000-gallon fuel oil UST. AHT performed a Subsurface Site Investigation in the vicinity of the abandoned 550-gallon and 1,000-gallon USTs. The results of the investigation revealed that VOCs were present in Site soils above NYSDEC applicable soil cleanup objectives in boring B-4. This boring was reportedly located adjacent to the abandoned 1,000-gallon fuel oil UST and was collected at the soil and groundwater interface. Available results from this investigation are shown on Figure 3.

Subsequent to a tank test failure, a spill was reported to the NYSDEC and assigned Spill No. 9000199[1]. After a number of tank removal/closure actions and monitoring of groundwater, this spill was closed in 2000. The spill closure is summarized in Section 2.2.5.

2.2.2 Tank Removal Letter, U-Haul #803-62 562 West 23rd Street, New York, NY, Tyree Brothers Environmental Services, Inc., April 1997

In April 1997, Tyree Brothers Environmental Services, Inc. cut and cleaned two 1,000-gallon USTs located in Building A and removed their associated piping. Excavation of the USTs was anticipated during this time; however, a spill was encountered during tank decommissioning, and therefore the USTs were left in place for excavation at a later date. NYSDEC Spill Number 9700188 was assigned to the property. The spill was closed in February 2002, and is summarized in Section 2.2.8.

2.2.3 Closure Report for the Excavation of Underground Storage Tanks, U-Haul #803-62 562 West 23rd Street, New York, NY, Tyree Brothers Environmental Services, Inc., July 1997

In July 1997, Tyree Brothers Environmental Services, Inc. excavated and removed one 1,000-gallon gasoline UST and one 1,000-gallon diesel UST within the western portion of Building A (Lot 65). These USTs were connected to a previously demolished pump island located near Building A's exit onto 11th Avenue. Post-excavation soil samples revealed that VOCs were present in soil beneath the fill lines (located under the sidewalk adjacent at 11th Avenue) at concentrations exceeding NYSDEC applicable soil cleanup objectives (Figure 4). Approximately 8.5 tons of petroleum-contaminated soil was excavated and removed from the Site in the vicinity of the remote fill lines. The soil was thermally treated and recycled at Posillico Brothers

[1] It appears that the NYSDEC recorded the date of this spill incorrectly, documenting it as having taken place in 1990.

Asphalt Company in July 1997. Available soil analytical results from this investigation are depicted on Figure 4.

2.2.4 Site Assessment Report and Quarterly Groundwater Sampling Reports; U-Haul Moving Center #803-62, 562 West 23rd Street, New York, NY, Pinnacle Environmental Technologies, 1997-1999

In 1997, Pinnacle Environmental Technologies (Pinnacle) installed three groundwater monitoring wells at the Site, two wells were installed within the sidewalk along 11th Avenue and one well was installed within Lot 65. Soil sampling was performed during the installation of the wells and laboratory results indicated that VOCs were detected at concentrations exceeding NYSDEC applicable soil cleanup objectives in two of nine soil samples collected from three soil borings, including the former fill line trench adjacent to 11th Avenue and formerly excavated by Tyree (Figure 5). Laboratory results from groundwater samples collected from the wells indicated that total BTEX concentrations exceeded the NYSDEC Ambient Groundwater Quality Criteria in wells MW-1 and MW-3 (Figure 6). From 1997 to 1999, Pinnacle initiated a groundwater-monitoring program consisting of biannual sampling of the three wells and associated reporting. During this period, dissolved BTEX and MTBE decreased to non-detect in MW-1, non-detect in MW-2 and fluctuated in MW-3. The last sampling event (June 27, 1999) indicated BTEX and MTBE concentrations in MW-3 at 45.8 μg/l and at 53 μg/l, respectively. Available soil results from this investigation are depicted on Figure 5. Available groundwater results from quarterly monitoring are depicted on Figure 6.

2.2.5 Site Closure Letter, NYSDEC Spills 9000199 & 9700188, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2000

In a site closure letter dated May 18, 2000, ATC summarized previous remedial actions and groundwater monitoring and petitioned NYSDEC to close Spills 9000199 and 9700188 and issue a no further action (NFA) letter. On June 21, 2000 NYSDEC closed out Spill 9000199, and left 9700188 open pending additional investigation.

2.2.6 Phase I Environmental Site Assessment, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2001

A Phase I ESA was completed at the Site by ATC in November 2001 for Americo Real Estate Company. The ESA was completed in accordance with the ASTM E1527-00. ATC concluded that there were no recognized environmental conditions (RECs) associated with the property.

2.2.7 Site Investigation Report, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2001

On May 15, 2001, ATC collected additional soil and groundwater samples to delineate the contamination around former boring B-4 to characterize the subsurface conditions along the western boundary of Building A (Lot 65), and to evaluate subsurface conditions down gradient of the abandoned 1,000-gallon fuel oil UST. Laboratory analysis indicated petroleum related VOCs were present in groundwater at concentrations exceeding TOGS AWQS. Available soil and groundwater results from this investigation are shown on Figures 3 and 6, respectively.

2.2.8 Supplement to the Site Investigation Report, Groundwater Modeling, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2001

In December 2001, ATC performed Bioscreen groundwater modeling to evaluate the potential for dissolved phase petroleum impacts to migrate offsite and downgradient of Lot 65. The results of the Bioscreen model suggested that natural attenuation was the appropriate remedial technology for the dissolved hydrocarbons. Based upon the results of the model, ATC requested that the Department issue a NFA letter.

NYSDEC issued a NFA letter for 562 West 23rd Street on February 22, 2002 and NYSDEC Spill Number 9700188 was closed. In May 2002, ATC abandoned the three groundwater monitoring wells in accordance with NYSDEC guidelines.

2.2.9 Underground Storage Tank Closure and Focused Subsurface Investigation, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2002

In July 2002 ATC oversaw the removal of eight 550-gallon petroleum USTs and the in place closure of one 1,000-gallon heating oil UST in in Lots 60, 61 and 58 (abuts Lot 60 to the east). Laboratory analysis of endpoint samples indicated the presence of petroleum related VOCs in soil exceeding applicable regulatory standards. NYSDEC spill number 0205608 was assigned to the Site.

In August 2002, ATC performed a subsurface investigation in the area of the former USTs. Laboratory analysis indicated that low concentrations (exceeding AWQS) of petroleum related VOCs and SVOCs were present in one groundwater sample. ATC concluded that there was minimal risk of exposure and requested that the Department issue a NFA letter. In December 2002, NYSDEC closed spill number 0205608.

Boring and/or sample locations and associated analytical results were not available for review. The above results were summarized from a letter report prepared by ATC and included in Appendix A.

2.2.10 Report on Drum Removal, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2002

In June 2002, seven drums were removed from Lot 65 and sent to Cyclechem in NJ. Laboratory analysis of the contents indicated that 4 plastic drums contained dilute aqueous formic acid and ammonium hydrogen fluoride solution; 1 plastic drum contained a dilute aqueous sodium bicarbonate solution; 1 plastic drum contained an aqueous trifluoroacetic acid and ammonium hydrogen fluoride solution; and a 55-gallon steel drum contained spent granulated activated carbon (GAC). Chemical analysis indicated that the contents of each drum were non-hazardous and non-regulated under RCRA. According to ATC, the aqueous solutions discovered are believed to be spent process liquids typically used in the cleaning and flushing of tap lines in breweries and/or taverns.

2.2.11 Tank Closure Report, 562 West 23rd Street, New York, NY, Environmental Resources Management, 2006

In 2006, ERM abandoned in-place, one 5,000-gallon #2 fuel oil AST located in the basement of Lot 65. The AST was filled with foam and all pipes were plugged. No samples were collected.

2.2.12 Phase I Environmental Site Assessment, Integral 2015

A Phase I Environmental Site Assessment (ESA) was conducted by Integral in December 2015. Five RECs in connection with the Site:

1. Historic Site Usage for Automotive Services and Petroleum Storage
2. NYSDEC Spill Numbers 9000199, 9700188, and 0205608 [all closed]
3. Historic Site Occupancy by Brake Labs Inc.
4. Historic Site Usage for Chemical Storage
5. Presence of a Hazardous Materials E-Designation

Detailed descriptions of the above cited RECs are included in the Phase I ESA Report; Appendix A to this Report.

2.2.13 Limited Phase II Environmental Site Investigation, Integral 2016

A Limited Phase II Environmental Site Investigation (ESI) was performed in February 2016 to evaluate subsurface soil conditions beneath the Site. The ESI consisted of the advancement of 12 soil borings to investigate the potential onsite soil sources, evaluate previously identified RECs, and investigate areas of the Site that had not been previously investigated. A copy of the Limited Phase II Investigation Report is provided in Appendix A.

2.2.13.1 Scope of Limited Phase II Investigation

Two to four borings were advanced within each tax lot to the groundwater/soil interface (~9 ftbg). A total of 12 borings were advanced over the Site (Figure 7). Borings were located with bias toward areas of concern identified in the 2015 Phase I ESA (Figure 2). One soil sample was collected from each boring for chemical analysis at the soil/water interface or area of highest suspected contamination. These samples were analyzed for the following:

- TCL VOCs via EPA Method 8260C
- TCL SVOCs via EPA Method 8270D
- TAL Metals via EPA Method 6010C/7471B

One soil sample was also collected and held from each boring from the 0-2' interval directly below the slab. These samples (secondary samples) were held pending the analytical results of the samples collected from the soil/water interface or highest level of suspected contamination (primary samples). Secondary samples, if run, were analyzed for the following:

- TCL SVOCs via EPA Method 8270D
- Target Analyte List (TAL) Metals via EPA Method 6010C/7471B
- Polychlorinated Biphenyls (PCBs) via EPA Method 8082A
- Pesticides via EPA Method 8081B

Continuous soil sampling was performed with a track mounted Geoprobe® utilizing direct push technology to the groundwater interface depth, approximately 8 to 10 ftbg. Continuous soil samples were collected using five (5) foot macrocore samplers fitted with dedicated acetate liners. The soil/fill retrieved from each sampler was field screened with a photoionization detector (PID) for VOCs and described by Integral field personnel on boring logs. Additionally, evidence of contamination (e.g., Non Aqueous Phase Liquid [NAPL], sheens, odors, staining, elevated PID readings) was documented by Integral field personnel.

2.2.13.2 Results of Limited Phase II Investigation

Minor exceedances of petroleum related VOCs above Unrestricted Use SCOs were detected in soil samples collected from 2 borings: SB-08 [7.5-8.5] and SB-02 [8-9]. Low levels of petroleum related compounds were found in soils below Lot 65 and Lot 60 and are consistent with areas of former onsite petroleum storage (Figure 8).

Elevated concentrations of polycyclic aromatic hydrocarbons (PAHs) and metals (specifically: lead and mercury) above Restricted Residential Soil Cleanup Objectives (RRSCOs) were present in soils/fill material site-wide from approximately 0-10 ftbg (Figures 8 and 9) and are consistent with presence of historic fill material. Metal and PAH concentrations detected in excess of their respective RRSCO are summarized below.

- Concentrations of lead found in Site soils range from 30 ppm in SB-07[6.5-7.5′] to 980 ppm in SB-08[1-2′] exceeding its RRSCO of 400 ppm.
- Concentrations of mercury found in Site soils range from .06 ppm in SB-07[6.5-7.5′] to 0.96 ppm in SB-05[1-2′] exceeding its RRSCO of 0.81 ppm. Concentrations of benzo(a)anthracene found in Site soils range from non-detect (ND) in SB-07[6.5-7.5′] to 11 ppm in SB- 02[2-3′] exceeding its RRSCO of 1 ppm.
- Concentrations of benzo(a)pyrene found in Site soils range from ND in 4 of 18 samples to 20 ppm in SB-10[1-2′] exceeding its RRSCO of 1 ppm.
- Concentrations of benzo(b)fluoranthene found in Site soils range from ND in 3 of 18 samples to 19 ppm in SB-10[1-2′] exceeding its RRSCO of 1 ppm.
- Concentrations of benzo(k)fluoranthene found in Site soils range from ND in 4 of 18 samples to 8.5 ppm in SB-10[1-2′] exceeding its RRSCO of 3.9 ppm.
- Concentrations of chrysene found in Site soils range from ND in 4 of 18 samples to 9.8 ppm in SB-02[2-3′] exceeding its RRSCO of 3.9 ppm.
- Concentrations of dibenzo(a,h)anthracene found in Site soils range from ND in 7 of 18 samples to 5.2 ppm in SB-08[1-2′] exceeding its RRSCO of .33 ppm.
- Concentrations of indeno(1,2,3-cd)pyrene found in Site soils range from ND in 4 of 18 samples to 19 ppm in SB-08[1-2′] exceeding its RRSCO of 0.5 ppm.

Results of the 2016 ESI are provided in Tables 1 – 5 and shown on Figures 8 and 9.

2.2.14 Summary of Previous Investigations

Several Site documents describe numerous environmental imperatives associated with the removal or abandonment of several USTs and/or ASTs on the Site from 1993 through 2002. The majority of these actions took place on Lot 65. Based on the data collected as part of these earlier actions/investigations, prior usage of the Site for petroleum storage and fueling has historically impacted both soil and groundwater (Figures 3 – 6). Historic investigations indicate the presence of petroleum related VOCs in soil and groundwater above applicable regulatory standards in the vicinity of either closed in-place and/or removed USTs beneath Lot 65 (Figures 3-6). Analytical results from the last groundwater sample collected onsite (June 1999) indicated exceedances of benzene, ethylbenzene, isopropylbenzene and MTBE concentrations above NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) (1.1.1) Ambient Water Quality Standards (AWQSs) (Figure 6).

Based upon the results of the February 2016 Limited Phase II Investigation, low levels of petroleum related compounds are present in soils below Lot 65 and Lot 60 and are consistent with areas of former onsite petroleum storage (Figure 8). Elevated concentrations of PAHs and metals (specifically, lead and mercury) are present in soils/fill material site- wide from approximately 0-10 ftbg (Figures 8 and 9) and are consistent with the presence of historic fill material.

2.3 POTENTIAL AREAS OF CONCERN

The following potential areas of concern (AOCs) were identified for the Site:

- Former pump island and UST area on Lot 65;
- Closed in place USTs on Lot 65;
- Former boiler room in Building A (Lot 65); and
- Former UST area located on Lots 61 and 60 that currently contains one closed in place 1,000-gallon UST and previously contained eight 550-gallon USTs.

The locations of identified AOCs are shown on Figure 2.

3 REMEDIAL INVESTIGATION

The work described in this RIWP will be conducted in accordance with 6 NYCRR Part 375 Brownfield Cleanup Regulations, and in general conformance with the NYSDEC DER-10. The Remedial Investigation (RI) work will also comply with the QAPP and FSP appended to this RIWP. The investigation process will consist of sampling of soil/fill, native soil (if encountered), groundwater, soil vapor, and indoor/ambient air. Exploration and testing locations may be modified during the field program based on observations made in the field, access or subsurface obstruction. All horizontal sample locations will be obtained using a handheld GPS for use in completing the EDD submission. Monitoring wells will be surveyed by a NYS licensed surveyor.

3.1 PURPOSE AND OBJECTIVES

The purpose of this RIWP is to define the nature and extent of contamination onsite; to determine whether contamination is present onsite that warrants remedial action; to determine if onsite contamination is migrating offsite; and to provide data of sufficient quantity and quality to support development of a Remedial Action Alternatives Analysis, if remedial action is warranted for the Site. This RIWP was developed to meet the following Site-specific objectives:

- Define the nature and extent of the historic fill material present onsite;
- Delineate the horizontal and vertical extent of contaminants (if present) in soil, groundwater, and soil vapor beneath the Site;
- Evaluate potential sources of contamination, the migration pathways, and actual or potential receptors of contaminants on or through soil, groundwater and soil vapor;
- Evaluate potential offsite impacts to groundwater from contamination, if present;
- Evaluate the potential for soil vapor to migrate offsite via preferred pathways, if present;
- Evaluate the potential presence of unidentified and/or unconfirmed underground storage tanks; and
- Assess potential impacts to human health and the environment as a result of the release of contaminants at the Site, if applicable.

3.2 STANDARDS, CRITERIA AND GUIDANCE

SCGs have been identified for the Site that pertain to meeting applicable regulations and RI objectives.

The SCGs for the Site soils are based upon the selection of applicable values from the New York State Codes, Rules and Regulations Title 6 (6 NYCRR) Part 375-6.8 Remedial Program Soil Cleanup Objectives (SCOs). The applicable SCGs are as follows:

- Protection of public health Restricted Residential Use SCOs; and
- Protection of Groundwater SCOs.

Restricted Residential SCOs are use-based criteria that are compatible with the surrounding area and take into account the current and potential future usage of the Site combined with the potential implementation of engineering controls.

The protection of groundwater SCOs may be used if the following conditions apply: contamination has been identified on a restricted use site in onsite soil during the remedial investigation and groundwater standards are, or are threatened to be, contravened by the presence of soil contamination at concentrations above the protection of groundwater SCOs.

The SCGs for groundwater are based on NYSDEC TOGS AWQSs and Guidance Values and Groundwater Effluent Limitations. TOGS standards and guidance values are ambient water quality values that are set to protect the state's waters.

No SCGs currently exist for soil vapor. However, New York State Department of Health (NYSDOH) has developed soil vapor/indoor air decision matrices which are used for evaluating human health risk and are based on the relationship between sub-slab soil vapor concentrations and corresponding indoor air concentrations. Therefore, soil vapor, in conjunction with indoor air, will be compared to NYSDOH Soil Vapor/Indoor Air Matrix 1 and 2 found in the *Guidance for Evaluating Soil Vapor Intrusion in New York State* (NYSDOH 2006) and the NYSDOH Memorandum dated June 25, 2007, which added three additional VOCs to the soil vapor/indoor air decision matrix. These matrices are risk management tools, developed by the NYSDOH in conjunction with other agencies, to provide guidance on case-by-case basis regarding actions that should be taken to address current and potential exposures related to soil vapor intrusion.

3.3 SCOPE OF REMEDIAL INVESTIGATIONS

The scoping process, for the purpose of identifying and defining the RI tasks described below, included the following:

- Review of current and historic site reports and data;
- Review of results from the 2015 Phase I ESA and 2016 Limited Phase II ESI; and
- Evaluation of DER-10 requirements and relevant State and Federal guidance documents.

The RI will begin after NYSDEC approval of this RIWP and after the 30 day public comment period is satisfied. The RI will include the collection of samples from sixteen (16) soil borings, three (3) permanent monitoring wells, two (2) temporary wells, five (5) soil vapor points, one (1) indoor air location, and one (1) ambient air location within and surrounding the Site. The type, location, and rationale for each exploration are detailed in the sections below. Installation of soil borings, groundwater monitoring wells, and soil vapor and air sampling points will be completed in accordance with the sections below and the standard procedures included in the FSP, included as Appendix B. Following the collection of this data, review and evaluation will be performed in order to determine if additional investigation is needed.

A summary of all proposed sampling locations and QA/QC samples is included as Table 6.

3.4 GROUND PENETRATING RADAR

A ground penetrating radar (GPR) survey is proposed to be conducted over the entire Site (where accessible) prior to the advancement of soil borings (Section 3.5). The GPR survey will evaluate the potential presence of unidentified and/or unconfirmed USTs and will aid in the identification of potential utilities, piping, and other subsurface infrastructure. The GPR survey will involve traversing the Site with a portable digital pulse GPR system in order to obtain detailed horizontal profiles. Spacing of the traverse lines will be dependent upon the interference and resolution. Typical depth range for GPR equipment is primarily governed by site specific lithology. The majority of buried utilities and structures are expected to be positioned above the groundwater table (less than 9 ftbg).

3.5 SOIL SAMPLING

In order to characterize the soil at the Site, the following scope of work will be implemented:

- Advance an estimated eighteen (18) soil borings at and around the Site to evaluate the subsurface soil conditions to the depth of approximately 17 ftbg (one foot below the anticipated excavation depth). The borings are intended to evaluate the horizontal and vertical extent of impacts (if present); assess the condition of soils to be left onsite; assess the soil conditions around and downgradient of the AOCs; evaluate potential sources (on and offsite); evaluate potential offsite migration of onsite impacts (if present); and assist in the presentation of Alternative Analysis and remedy recommendations;
- Evaluate physical characteristics of the entire soil/fill column in each boring and identify appropriate intervals from which samples will be collected;
- Collect soil samples via EPA Method 5035/5035A; and
- Analyze soil samples for::
  - o TCL VOCs via EPA Method 8260C;
  - o TCL SVOCs via EPA Method 8270D;
  - o Target Analyte List (TAL) Metals via EPA Method 6010C/7471B;

- Polychlorinated Biphenyls (PCBs) via EPA Method 8082A; and
- Pesticides via EPA Method 8081B.

3.5.1 Proposed Boring Locations and Rationale for Placement

The following is a description and rationale for the placement of specific borings or groups of borings across the Site. These locations are specifically proposed to investigate the potential of onsite soil sources and assess potential AOCs:

- SB13 – located downgradient of the Site on the corner of 11th Avenue and West 23rd Street. The results will aid in evaluating offsite soil conditions;
- SB14 - located downgradient of the former pump area. The results will aid in evaluating potential impacts to onsite soil and support source area determination/delineation;
- SB15 - located in an area downgradient of the former boiler room and abandoned AST. The results will aid in evaluating potential impacts to onsite soil and support source area determination/delineation;
- SB16 - located in an area downgradient of the former boiler room and abandoned fuel oil UST. The results will aid in evaluating potential impacts to onsite soil and support source area determination/delineation;
- SB17, SB20, SB21, and SB22 – located in the southwestern portion of Lot 65 to provide general site coverage. The results will aid in evaluating potential impacts to onsite soil and support site characterization;
- SB19 – located west of the Site on 11th Avenue. The results will aid in evaluating downgradient offsite soil conditions;
- SB18, SB23, SB24, SB26, and SB28 – located in areas that are downgradient of the Lot 60 and 61 former UST area. The results will aid in evaluating potential impacts to onsite soil and support source area determination/delineation;
- SB25 – located offsite on West 23rd Street to the northeast of Lot 60. The results will aid in evaluating offsite soil conditions and potential offsite source(s) of contamination;
- SB27 – located in the southern portion of Lot 61 to provide general site coverage. The results will aid in evaluating potential impacts to onsite soil and support site characterization;
- SB29 – located on the southern portion of Lot 5 to provide general site coverage. The results will aid in evaluating potential impacts to onsite soil and support site characterization; and
- SB30 – located on the southern portion of Lot 6 to provide general site coverage. The results will aid in evaluating potential impacts to onsite soil and support site characterization.

Proposed soil boring locations are shown on Figure 10.

Based on field measurements and observations boring locations may be moved or added. Prior to modifications being made with regard to the above-described placement, coordination with NYSDEC will take place.

Prior to the advancement of soil borings, all locations will be cleared for utilities and subsurface infrastructure using GPR. Continuous soil sampling will be conducted for all borings. It is anticipated that two (2) soil samples will be analyzed per boring. As a default, one (1) soil sample will be collected from the interval exhibiting the highest PID reading or visual/olfactory impact and one (1) sample will be collected from the interval directly below the anticipated development excavation depth (~17 ftbg). . If no obvious signs of impacts are observed within the soil column, a soil sample will be collected from the interval directly above the groundwater interface (~9 ftbg). If additional impacted or questionable zones are identified, samples will be collected from those areas for analysis. All samples are expected to be collected from two (2) foot intervals, but the intervals may be expanded or contracted based upon material recovery and identification of impacts.

Delineation borings may be advanced in areas where impacts were observed from visual or olfactory cues, or via a photoionization detector (PID). Delineation borings will be advanced radiating out from any proposed onsite soil boring (i.e., within the Site building based on the most reasonable access) that show signs of impact. Delineation borings will be advanced until no obvious signs of impacts are observed or access limitations prevent any further investigation. Samples analyzed from delineation borings showing no impacts will be collected consistent with the previous sample interval selected from the proposed boring that exhibited impacts. Samples collected from delineation borings terminated due to access limitations will be selected from the area of highest suspected impact.

This delineation process focuses the subsurface soil investigation on probable source areas, while obtaining a more complete data set and eliminating multiple mobilizations. The analysis of impacted soil and potential source area delineation will assist in evaluation of the remedy.

Impact will be determined in the field by a Qualified Environmental Professional (QEP) via screening for VOCs using a PID and visual/olfactory indication.

Soil borings will be installed using a track mounted or Bobcat Geoprobe® utilizing direct push technology to the a depth of approximately 17 feet, one foot below anticipated excavation depth. Continuous soil samples will be collected using four (4) or five (5) foot macrocore samplers fitted with dedicated acetate liners. The soil/fill retrieved from each sampler will be field screened with a PID for VOCs and described by Integral field personnel on boring logs. Evidence of contamination (e.g., Non Aqueous Phase Liquid [NAPL], sheens, odors, staining, elevated PID readings) will be documented by Integral field personnel. Product samples, if encountered, will be submitted for gas chromatography-mass spectrometer fingerprint analysis.

Soil samples selected for laboratory analysis will be placed in laboratory supplied containers, sealed and labeled, and placed in a cooler and chilled to 4^{o}C for transport under chain-of-custody procedures. Soil samples will be submitted to a NYSDOH ELAP-certified laboratory via courier service under standard chain-of-custody protocol and analyzed for all of the compounds included in 6 NYCRR Part 375 SCOs and Final CP-51 SCLs. Laboratory analytical parameters and methods are outlined above, in Section 3.4. QA/QC procedures to be followed are described in the QAPP included as Appendix C.

3.6 GROUNDWATER SAMPLING

The following scope of work is proposed to further characterize the groundwater at the Site:

- Collect groundwater samples from five (5) temporary well locations installed concurrent with onsite soil borings;
- Install three (3) permanent groundwater monitoring wells, screened across the groundwater interface;
  - Survey all newly-installed wells;
  - Collect one (1) round of depth-to-groundwater measurements from newly-installed wells;
  - Evaluate groundwater elevations and present groundwater contours;
  - Purge all wells in accordance with DER-10 requirements and collect samples for laboratory analysis. All purging and sampling will be performed in accordance with proper program protocols. Samples will be collected from each of the three (3) proposed wells; and
- Analyze groundwater samples for::
  - TCL VOCs via USEPA Method 8260C.
  - TCL SVOCs via USEPA Method 8270D;
  - TAL Metals via USEPA Method 6010C/7472B (filtered and unfiltered);
  - PCBs via USEPA Method 8082A; and
  - Pesticides via USEPA Method 8081B.

Proposed groundwater monitoring wells and groundwater sample locations are shown on Figure 10.

3.6.1 Proposed Groundwater Sample Locations and Rationale for Placement

The locations of the proposed wells and groundwater samples and rationale for placement are listed below. All well locations will be installed concurrent with a soil boring location. Proposed groundwater sample locations are shown on Figure 10.

- GW13 (MW01) – located downgradient of the Site on the 11th Avenue sidewalk proximal to the northwestern corner of Lot 65. The location of this well will aid in the evaluation of potential offsite migration of containments (if present).
- GW14 – located downgradient of the former pump island and removed USTs on Lot 65. The location of this sample will aid in estimating impacts to onsite groundwater.
- GW18 – located downgradient to a closed in place UST on Lot 65. The location of this sample will aid in estimating impacts to onsite groundwater.
- GW19 (MW02) -- located downgradient of the Site on the 11th Avenue sidewalk proximal to the southwestern corner of Lot 65. The placement of this well will aid in the evaluation of potential offsite migration of containments (if present).
- GW25 (MW03) – located upgradient of the Site on West 23rd Street proximal to the northeast corner of Lot 60. The location of this well will aid in the evaluation of potential onsite migration of containments from an offsite source and support the onsite characterization of groundwater.
- GW26 – located downgradient of potential offsite sources in the northern portion of Lot 5. The location of this sample will aid in estimating impacts to onsite groundwater.
- GW28 - located crossgradient of potential onsite sources in the central portion of Lot 60. The location of this sample will aid in estimating impacts to onsite groundwater.
- GW29 – located downgradient of potential offsite sources in the southeast portion of Lot 5. The location of this well will aid in the evaluation of potential onsite migration of containments from an offsite source and support the onsite characterization of groundwater.

Monitoring well construction will follow the protocol described below. Monitoring wells installed within the sidewalk will be installed using a track mounted Geoprobe outfitted with 4¼" hollow-stem auger attachments. Monitoring wells installed within the Site building will be installed using a track mounted or Bobcat Geoprobe, depending on access limitations. Interior wells installed utilizing a Bobcat Geoprobe will be temporary due to imminent destruction during construction excavation. Temporary wells will be constructed of 1" PVC riser and screen in order to achieve the proper annular space around each well, and will follow the same general construction as the 2" sidewalk wells described below. If any significant impacts are identified, well materials may be altered to prevent detriment to PVC screen material.

Sidewalk wells will be installed approximately 5-6′ below the groundwater table (expected to be at approximately 9 ftbg) in order to collect samples in the shallow saturated zone. The wells will be constructed of 2″ diameter PVC riser with 10′ of .020″ slotted PVC screen. The screen interval will straddle the groundwater interface. The annular space around the well will be filled with No. 2 Morie quartz sand to a depth of 2′ above the top of the well screen, followed by 2′ of bentonite, then backfilled with screened (unimpacted) soil cuttings to 1′ below grade. The wells will be finished with 6″ of bentonite pellets placed below a locking flush-mounted road box, set in a cement apron. Development will be performed by purging the water column in order to remove sediment disturbed by the drilling process. Purge water will be collected and containerized for proper management and disposal.

Sampling of the monitoring wells is anticipated to take place approximately one week following their installation. Following purging, one (1) representative groundwater sample will be collected from each well, using dedicated polyethylene tubing attached to a peristaltic pump capable of low flow control. During purging, water quality indicators (pH, temperature, specific conductivity, and turbidity) will be monitored using a flow through cell while purging. Purging is considered complete when field parameters have stabilized (e.g., turbidity reading of 5 NTU). Groundwater samples will be collected according to EPA's *Low Flow Purging and Sampling Procedures for the Collection of Groundwater Samples from Monitoring Wells* (Low Flow Procedures, January 2010).

The groundwater samples will be pumped directly into laboratory-supplied sample bottles. Samples will be collected, cooled, properly packaged to prevent breakage, and submitted to a NYSDOH ELAP-certified laboratory via courier service under standard chain-of-custody protocol. Laboratory analytical parameters and methods are outlined above, in Section 3.5. QA/QC procedures to be followed are described in the QAPP included as Appendix C.

3.7 SOIL VAPOR AND AIR SAMPLING

The scope of work proposed for the characterization of soil vapor onsite focuses on the potential for offsite migration as well as the potential for onsite migration of contaminants from offsite sources. The results of soil vapor and air sampling will assist in evaluating future onsite engineering controls.

The following scope of work is proposed to characterize the soil vapor at the Site:

- Install six (6) soil vapor points;
- Purge and collect soil vapor samples from six (6) points;
- Collect one (1) indoor air sample from Building A (Lot 65);
- Collect one (1) ambient air sample; and
- Analyze all soil vapor, indoor air and ambient air samples for TO-15 VOCs.

The locations of the proposed samples and rationale for placement are listed below. Proposed soil vapor sampling locations are shown on Figure 10.

3.7.1 Proposed Soil Vapor Locations and Rationale for Placement

The following soil vapor locations are proposed:

- SV01 – located in the basement area in the northwestern corner of Building A on Lot 65. The results will aid in evaluating potential impacts to onsite soil vapor.
- SV02 – located in the former boiler room in Building A on Lot 65. The results will aid in evaluating potential impacts to onsite soil vapor.
- SV03 – located downgradient of the Site on Lot 65's southwestern Site boundary. The results will support the assessment of potential offsite migration of soil vapor west of the Site.
- SV04 - located along an upgradient Site boundary on the eastern perimeter of Lot 5. The results will aid in assessing the potential for offsite soil vapor intrusion from east of the Site.
- SV05 - located along an upgradient Site boundary on the eastern perimeter of Lot 60. The results will aid in assessing the potential for offsite soil vapor intrusion from east of the Site.
- SV06 – located in the eastern portion of Lot 65,downgradient of the former Lot 60 and Lot 61 UST area. The results will aid in evaluating potential impacts to onsite soil vapor and provide site coverage.

Proposed soil vapor locations are shown on Figure 10.

Each soil vapor probe will be installed approximately 2" below the building or parking area slab using dedicated 1/8" Teflon tubing. The tubing will be implanted into the hole and the annular space sealed with bentonite to prevent ambient air from entering the area around the probe. Once the seal is secure, a "T" fitting and valve will be connected on the above-surface end of the tubing. A syringe will be used to purge the vapors in the probe and tubing of three volumes. As required by the NYSDOH, a helium (He) tracer will be used as part of the sampling process and all testing will follow the NYSDOH Soil Vapor Guidance[2]. Prior to sample collection, the He vapor will be screened using a field meter and the measurement recorded at each soil vapor sampling location. Prior to sample collection, a multi-gas meter will be used to measure the concentration of O_2, CO_2, and CH_4 in each probe, to assess the subsurface

[2] *Guidance for Evaluating Soil Vapor Intrusion in the State of New York, Final*. October 2006.

chemistry (e.g. redox state). Following this procedure, the soil vapor samples will be collected in clean, batch certified, two (2) liter Summa™ canisters at flow rates no greater than 200 ml/min.

Soil vapor samples will be collected over a period of two (2) hours. Soil vapor samples will be analyzed for VOCs via USEPA Method TO-15 at a NYSDOH ELAP-certified analytical laboratory.

Indoor and Ambient Air Samples

In accordance with the NYSDOH *Guidance for Evaluating Soil Vapor Intrusion*, one (1) indoor air sample and one (1) ambient air sample (per sampling day) will be collected prior to the collection of sub-slab soil vapor samples[3]. One (1) indoor air sample will be collected from Building A (Lot 65). The indoor air sample will be collected in the breathing zone (approximately four (4) to six (6) feet above the floor). One background ambient air sample will also be collected per day along West 23rd Street. Indoor and background air samples will be collected in six (6) liter, batch-certified clean SUMMA™ canisters attached to 8-hour flow controllers. Samples will be collected at flow rates no greater than 200 ml/min.

For each sub-slab soil vapor, soil vapor, indoor, and background sample, the start time, end time, maximum and minimum temperature, and beginning and final ambient temperature will be recorded. Indoor and ambient air samples will be collected over a period of eight (8) hours and will be analyzed for VOCs via USEPA Method TO-15 at a NYSDOH ELAP-certified analytical laboratory.

3.8 SUMMARY TABLE OF PROPOSED SAMPLING LOCATIONS

As required by Section 3.3(b) 3 of DER-10, a sampling and analysis table with all proposed sampling locations and QA/QC samples is included as Table 6.

3.9 QUALITY ASSURANCE / QUALITY CONTROL (QA/QC)

Samples will be collected in accordance with the FSP and QAPP included as Appendix B and C, respectively.

Sample analysis will be performed by a NYSDOH ELAP certified laboratory. The laboratory will report sample results on a 5-day turnaround time. An independent sub-consultant will validate sample results and a Data Usability Summary Report (DUSR) will be prepared.

[3] This limits interference from the soil vapor matrix.

3.10 HEALTH AND SAFETY PLAN (HASP)

All work at the Site will be completed in accordance with the Health and Safety Plan (HASP) included in Appendix D.

3.11 AIR MONITORING

The NYSDOH Generic Community Air Monitoring Plan (CAMP), included as Appendix 1A of DER-10, will be implemented during all ground-intrusive sampling activities. Details of the CAMP are included in the HASP (Appendix D).

3.12 QUALITATIVE EXPOSURE ASSESSMENT

Following receipt of the sample results, a qualitative exposure assessment (EA) will be completed. The assessment will be performed in accordance with Section 3.3(c) 4 of DER-10 and the NYSDOH guidance for performing a qualitative EA (NYSDEC DER-10; Technical Guidance for Site Investigation and Remediation; Appendix 3 B). The results will be included in the RI report.

3.13 INVESTIGATION DERIVED WASTE

It is anticipated that soil cuttings and purge water will be generated during Site characterization activities. The cutting from drilling operations will be placed on protective sheeting, screened with a PID, and either used to backfill the bore hole (if screening indicates no/minimal VOCs) or placed into 55-gallon drums. Soil (from boreholes not converted to monitoring wells) that is determined to be un-impacted will be returned to their original location within approximately 12 inches of the surface and then backfilled with clean fill. Soil cuttings generated from boreholes expected to be converted to monitoring wells will be drummed. Soil cuttings determined to be inadequate for backfill, along with redevelopment and purge water, will be drummed, characterized and disposed of offsite in accordance with federal, state and local regulations.

Used personal protective equipment (PPE) and other non-hazardous materials that come into contact with petroleum will be drummed and disposed of offsite in accordance with federal, state and local regulations.

3.14 REPORTING

An RI report describing the investigation will be prepared to document Site conditions and will meet the requirements of DER-10. The report will include details of the sampling, tabulated sample results and an assessment of the data and conclusions. If warranted, recommendations for additional actions will be included.

Soil sample results will be compared to the Unrestricted SCOs and Residential Restricted SCOs as included in Part 375-6.8 and CP-51. Groundwater sample results will be compared to TOGS AWQS. Soil vapor sample results will be compared to the NYSDOH matrices.

The RI report will also include the qualitative exposure assessment, CAMP results, laboratory data packages, DUSR, geologic logs, a water table elevation contour map, isopleths maps for groundwater and soil contaminant concentrations (if necessary), well construction diagrams and well purging/sampling logs. All data will also be submitted electronically to NYSDEC via the Environmental Information Management System (EIMS) in EqUIS format.

4 SCHEDULE

Based upon current knowledge of the Site, the following Remedial Investigation schedule, subject to change, is proposed. A minimum of 5-day notice will be provided to NYSDEC in advance of field sampling.

Task	Task Duration	Total Duration
NYSDEC/NYSDOH Review/Comment of RIWP	4 Weeks	4 Weeks
Public Comment Period	4 Weeks	8 Weeks
NYSDEC/NYSDOH Approval of RIWP	1 Week	9 Weeks
Mobilization/Coordination with Owner and Tenant	4 Weeks	13 Weeks
Implement RI	2 Weeks	15 Weeks
Prepare Draft RI Report	6 Weeks	21 Weeks

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FIGURES

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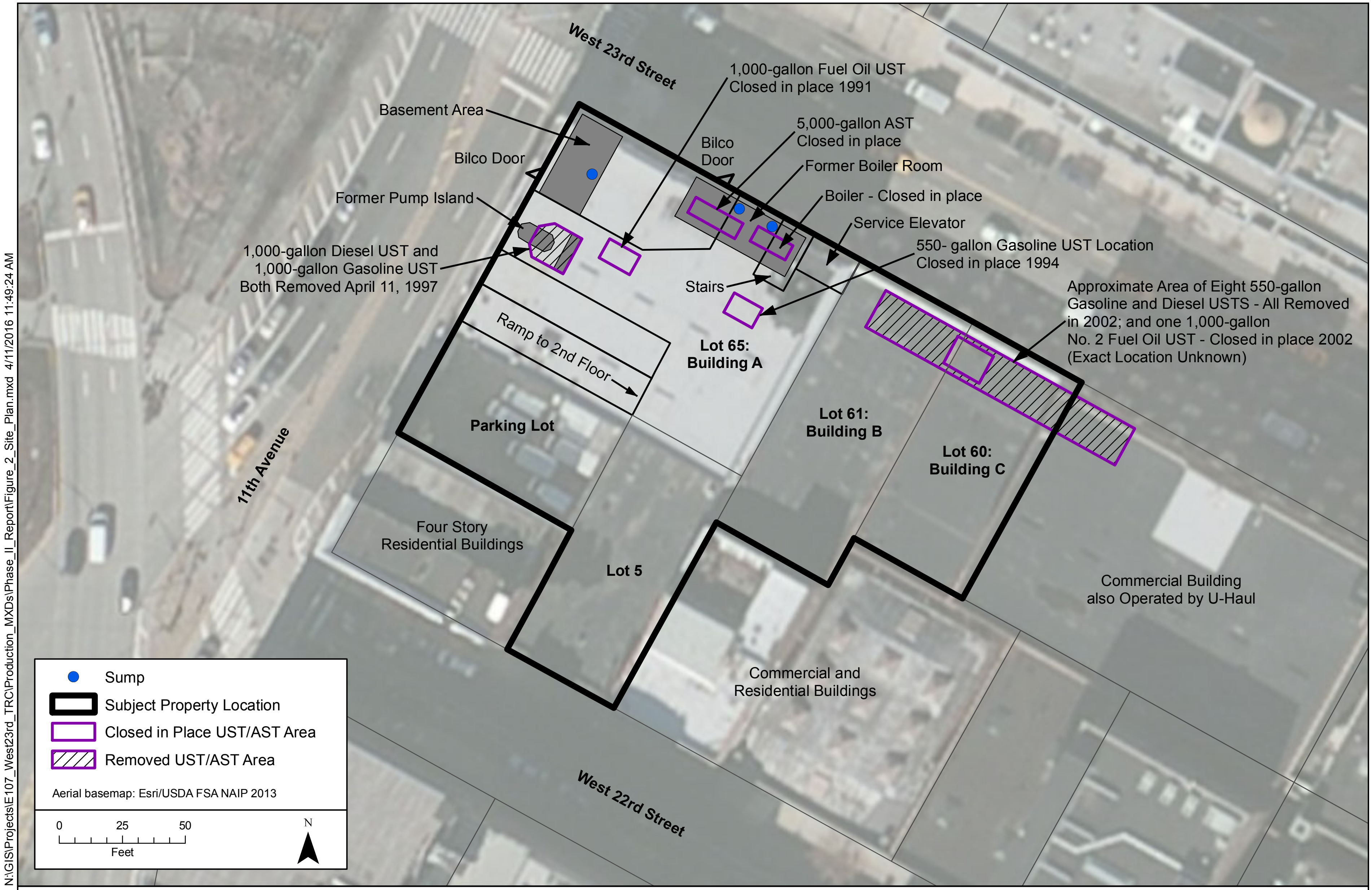
integral
consulting inc.

Figure 1.
Site Location
Remedial Investigation Work Plan
555 West 22nd Street, New York, NY 10011



integral engineering p.c.

Figure 2.
General Site Plan indicating Areas of Concern
Remedial Investigation Work Plan
555 West 22nd Street, New York, NY 10011

GP-1	
5/15/2001	8 ft
Volatile Organics	**mg/kg**
Benzene	ND
Ethylbenzene	ND
n-Propylbenzene	ND
n-Butylbenzene	ND
sec-Butylbenzene	ND
1,2,4-Trimethylbenzene	ND
Toluene	ND
Semivolatile Organics	
Benzo(k)fluoranthene	ND

GP-3	
5/15/2001	8 ft
Volatile Organics	**mg/kg**
Benzene	ND
Ethylbenzene	ND
n-Propylbenzene	ND
n-Butylbenzene	ND
sec-Butylbenzene	ND
1,2,4-Trimethylbenzene	ND
Toluene	ND
Semivolatile Organics	
Benzo(k)fluoranthene	ND

GP-2	
5/15/2001	8 ft
Volatile Organics	**mg/kg**
Benzene	ND
Ethylbenzene	ND
n-Propylbenzene	ND
n-Butylbenzene	ND
sec-Butylbenzene	ND
1,2,4-Trimethylbenzene	ND
Toluene	ND
Semivolatile Organics	
Benzo(k)fluoranthene	ND

GP-4	
5/15/2001	8 ft
Volatile Organics	**mg/kg**
Benzene	ND
Ethylbenzene	ND
n-Propylbenzene	ND
n-Butylbenzene	ND
sec-Butylbenzene	ND
1,2,4-Trimethylbenzene	ND
Toluene	ND
Semivolatile Organics	
Benzo(k)fluoranthene	ND

GP-5	
5/15/2001	8 ft
Volatile Organics	**mg/kg**
Benzene	ND
Ethylbenzene	0.782
n-Propylbenzene	ND
n-Butylbenzene	0.533
sec-Butylbenzene	0.708
1,2,4-Trimethylbenzene	ND
Toluene	***0.947***
Semivolatile Organics	
Benzo(k)fluoranthene	ND

- ● Soil Boring Location
- ◉ Soil Boring Location (see Note 8)
- Closed in Place UST/AST Area
- Removed UST/AST Area
- Subject Property Location

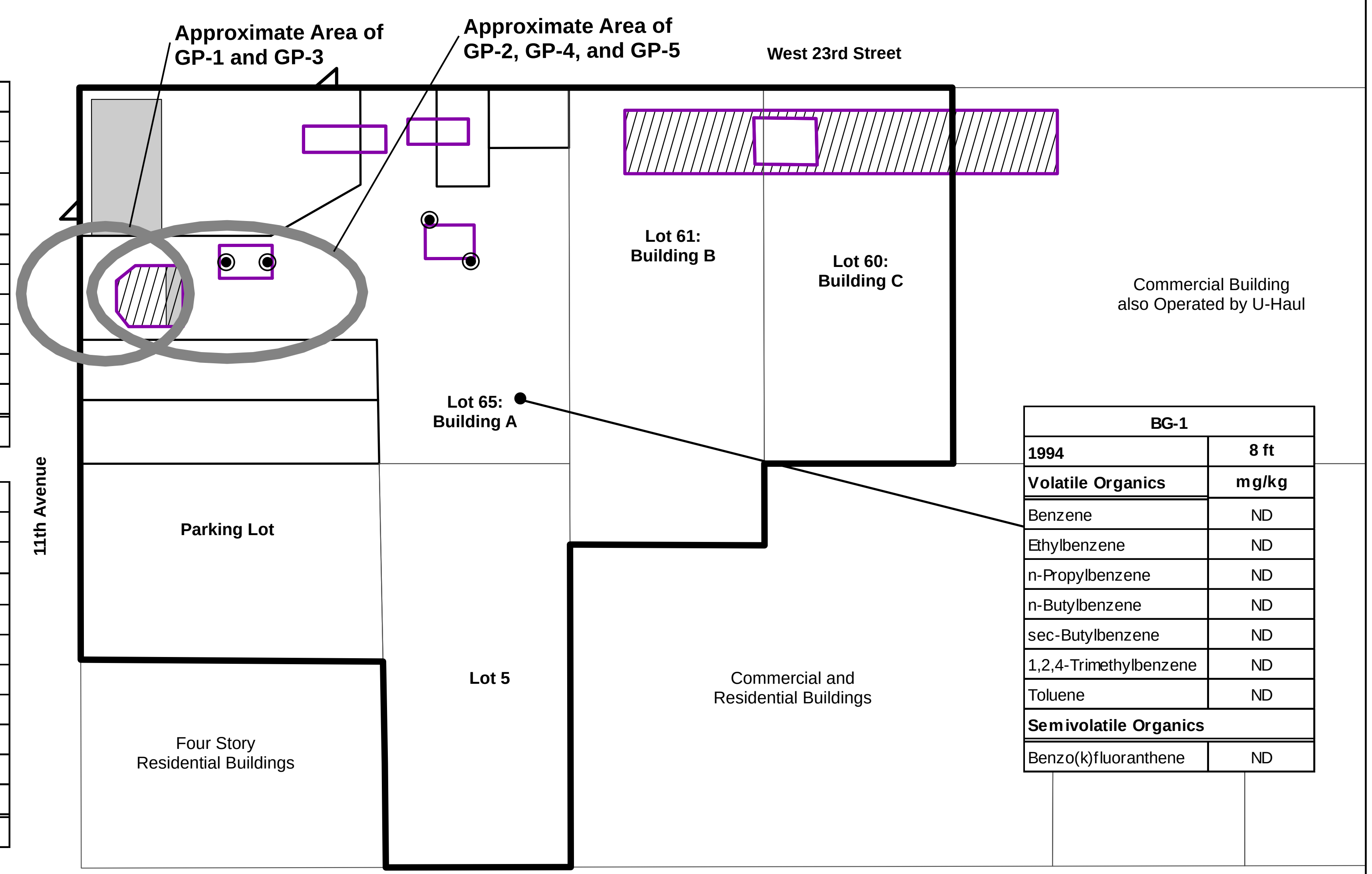
Sample ID		
Date	**NY-RESRR	*NY-UNRES
Depth		
Analyte	mg/kg	mg/kg
Volatile Organics		
Benzene	4.8	0.06
Ethylbenzene	41	1
n-Propylbenzene	100	3.9
n-Butylbenzene	100	12
sec-Butylbenzene	100	11
1,2,4-Trimethylbenzene	52	3.6
Toluene	100	0.7
Semivolatile Organics		
Benzo(k)fluoranthene	3.9	0.8

B-1	
1994	8 ft
Volatile Organics	**mg/kg**
Benzene	ND
Ethylbenzene	ND
n-Propylbenzene	ND
n-Butylbenzene	ND
sec-Butylbenzene	ND
1,2,4-Trimethylbenzene	ND
Toluene	ND
Semivolatile Organics	
Benzo(k)fluoranthene	ND

B-2	
1994	8 ft
Volatile Organics	**mg/kg**
Benzene	0.0011
Ethylbenzene	0.0016
n-Propylbenzene	ND
n-Butylbenzene	ND
sec-Butylbenzene	ND
1,2,4-Trimethylbenzene	0.0009
Toluene	ND
Semivolatile Organics	
Benzo(k)fluoranthene	ND

B-3	
1994	8 ft
Volatile Organics	**mg/kg**
Benzene	ND
Ethylbenzene	ND
n-Propylbenzene	ND
n-Butylbenzene	ND
sec-Butylbenzene	ND
1,2,4-Trimethylbenzene	ND
Toluene	ND
Semivolatile Organics	
Benzo(k)fluoranthene	***1.8***

B-4	
1994	8 ft
Volatile Organics	**mg/kg**
Benzene	***0.2***
Ethylbenzene	***9.9***
n-Propylbenzene	***10***
n-Butylbenzene	***19***
sec-Butylbenzene	***15***
1,2,4-Trimethylbenzene	***16***
Toluene	***1.5***
Semivolatile Organics	
Benzo(k)fluoranthene	ND



BG-1	
1994	8 ft
Volatile Organics	**mg/kg**
Benzene	ND
Ethylbenzene	ND
n-Propylbenzene	ND
n-Butylbenzene	ND
sec-Butylbenzene	ND
1,2,4-Trimethylbenzene	ND
Toluene	ND
Semivolatile Organics	
Benzo(k)fluoranthene	ND

Notes:
1. **Bold** and *Italicized* value indicates concentration exceeds Unrestricted SCOs
2. **Bold** and shaded value indicates concentration exceeds Restricted-Residential SCOs
3. All results in mg/kg
4. ND = Not Detected
5. * = 6 NYCRR Part 375-6.8(a) Unrestricted Use SCOs
6. ** = 6 NYCRR Part 375-6.8(b) Restricted Residential Use SCOs
7. All results are in mg/kg
8. Soil boring locations B-1 through B-4; locations are approximate and individual Sample IDs are unknown
9. Results from Boring Report, American Hi-Tech, Inc., 1994; and Site Investigation Report, ATC Associates Inc., 2001

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Feet

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Figure 3.
Soil Sample Results - VOCs and SVOCs
1994 Boring Report and 2001 Site Investigation Report
Remedial Investigation Work Plan
555 West 22nd Street, New York, NY 10011

Fill Lines	
Apr-97	**mg/kg**
Volatile Organics	
Benzene	***1.01***
Methyl tert butyl ether	***7.56***
Napthalene	***17.8***
Toluene	***5.28***
1,2,4-Trimethylbenzene	**148**
1,3,5-Trimethylbenzene	**69.8**
Total Xylenes	**142.3**
Semivolatile Organics	
Benzo(a)anthracene	0.564
Benzo(a)pyrene	0.844
Benzo(b)fluoranthene	0.88
Indeno(1,2,3-cd)pyrene	**0.578**
Chrysene	0.57

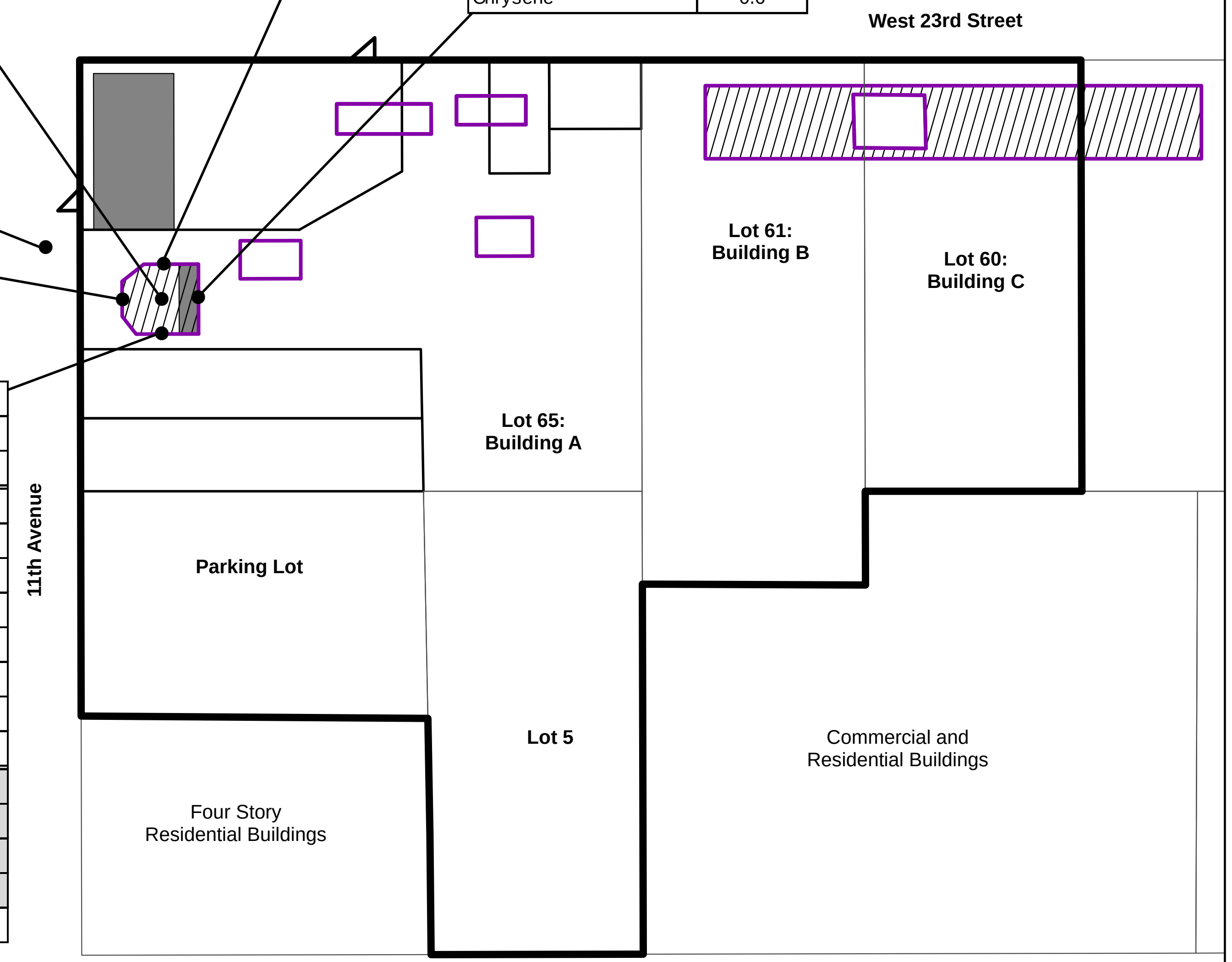
Bottom	
Apr-97	**mg/kg**
Volatile Organics	
Benzene	ND
Methyl tert butyl ether	0.043
Napthalene	0.251
Toluene	ND
1,2,4-Trimethylbenzene	0.0222
1,3,5-Trimethylbenzene	0.0077
Total Xylenes	0.0206
Semivolatile Organics	
Benzo(a)anthracene	0.63
Benzo(a)pyrene	0.898
Benzo(b)fluoranthene	0.955
Indeno(1,2,3-cd)pyrene	0.439
Chrysene	0.603

North	
Apr-97	**mg/kg**
Volatile Organics	
Benzene	ND
Methyl tert butyl ether	0.0057
Napthalene	ND
Toluene	ND
1,2,4-Trimethylbenzene	ND
1,3,5-Trimethylbenzene	ND
Total Xylenes	ND
Semivolatile Organics	
Benzo(a)anthracene	0.499
Benzo(a)pyrene	0.612
Benzo(b)fluoranthene	0.628
Indeno(1,2,3-cd)pyrene	0.332
Chrysene	0.479

East	
Apr-97	**mg/kg**
Volatile Organics	
Benzene	ND
Methyl tert butyl ether	ND
Napthalene	ND
Toluene	ND
1,2,4-Trimethylbenzene	ND
1,3,5-Trimethylbenzene	ND
Total Xylenes	ND
Semivolatile Organics	
Benzo(a)anthracene	0.647
Benzo(a)pyrene	0.822
Benzo(b)fluoranthene	0.925
Indeno(1,2,3-cd)pyrene	0.423
Chrysene	0.6

West	
Apr-97	**mg/kg**
Volatile Organics	
Benzene	ND
Methyl tert butyl ether	0.0073
Napthalene	ND
Toluene	ND
1,2,4-Trimethylbenzene	ND
1,3,5-Trimethylbenzene	ND
Total Xylenes	ND
Semivolatile Organics	
Benzo(a)anthracene	0.726
Benzo(a)pyrene	0.903
Benzo(b)fluoranthene	1
Indeno(1,2,3-cd)pyrene	0.436
Chrysene	0.618

South	
Apr-97	**mg/kg**
Volatile Organics	
Benzene	ND
Methyl tert butyl ether	0.0116
Napthalene	ND
Toluene	ND
1,2,4-Trimethylbenzene	ND
1,3,5-Trimethylbenzene	ND
Total Xylenes	ND
Semivolatile Organics	
Benzo(a)anthracene	**1.15**
Benzo(a)pyrene	**1.32**
Benzo(b)fluoranthene	**1.33**
Indeno(1,2,3-cd)pyrene	**0.653**
Chrysene	***1.01***



- Soil Boring Location
- Closed in Place UST/AST Area
- Removed UST/AST Area
- Subject Property Location

Sample ID		
	****NY-RESRR**	***NY-UNRES**
Date		
Analyte	**mg/kg**	**mg/kg**
Volatile Organics		
Benzene	4.8	0.06
Methyl tert butyl ether	100	0.93
Napthalene	100	12
Toluene	100	0.7
1,2,4-Trimethylbenzene	52	3.6
1,3,5-Trimethylbenzene	52	8.4
Total Xylenes	100	0.93
Semivolatile Organics		
Benzo(a)anthracene	1	1
Benzo(a)pyrene	1	1
Benzo(b)fluoranthene	1	1
Indeno(1,2,3-cd)pyrene	0.5	0.5
Chrysene	3.9	1

Notes:
1. **Bold** and *Italicized* value indicates concentration exceeds Unrestricted SCOs
2. **Bold and shaded** value indicates concentration exceeds Restricted-Residential SCOs
3. J = Estimated value
4. ND = Not Detected
5. * = 6 NYCRR Part 375-6.8(a) Unrestricted Use SCOs
6. ** = 6 NYCRR Part 375-6.8(b) Restricted Residential Use SCOs
7. All results are in mg/kg
8. Results from Closure Report for the Excavation of the Underground Storage Tanks, Tyree Brothers Environmental Services, Inc., 1997

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Figure 4.
Soil Sample Results - VOCs and SVOCs
1997 UST Closure Report
Remedial Investigation Work Plan
555 West 22nd Street, New York, NY 10011

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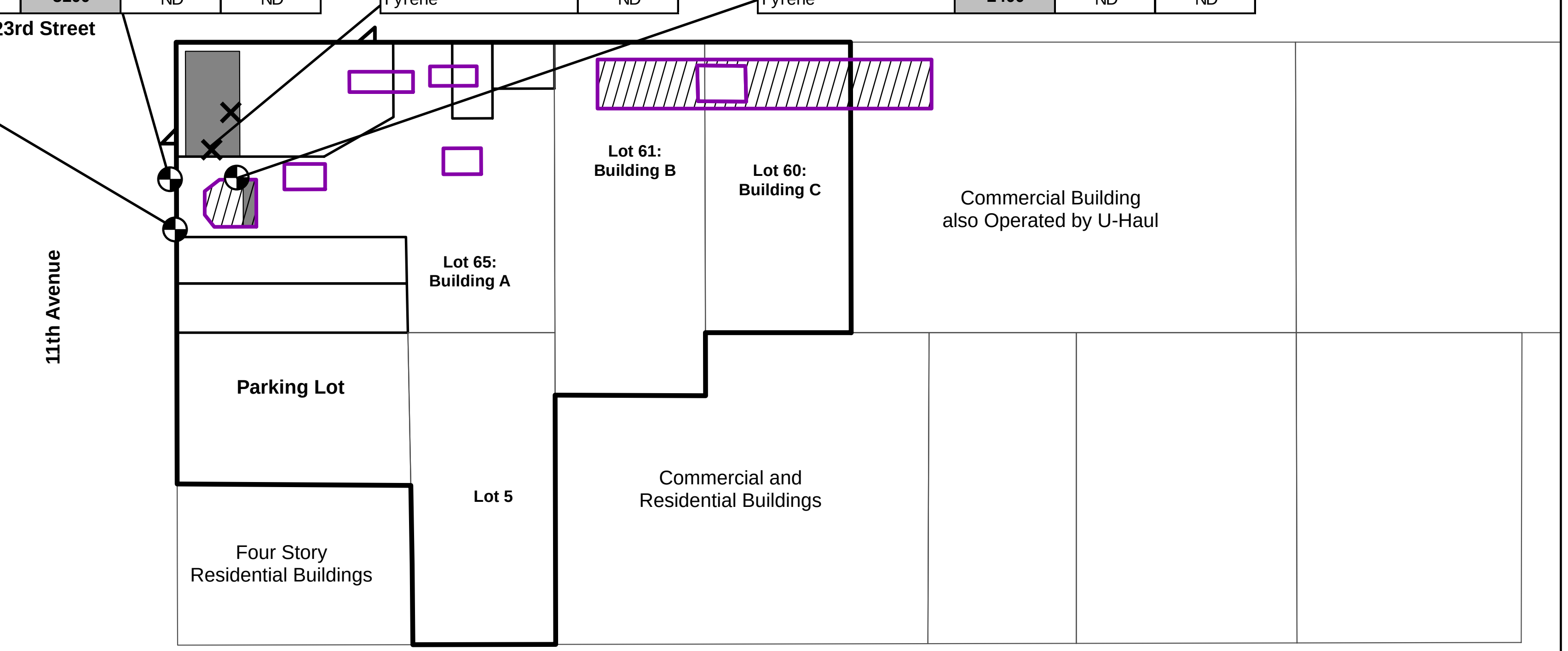
MW-1			
5/31/1997	5 ft	10 ft	15 ft
Volatile Organics			
Benzene	ND	ND	ND
n-Butylbenzene	ND	ND	ND
sec-Butlybenzene	ND	ND	ND
tert-Butlybenzene	ND	ND	ND
Methyl tert butyl ether	***8.2***	***1.7***	***2.9***
Ethylbenzene	ND	ND	ND
Napthalene	ND	ND	***16***
n-Propylbenzene	ND	ND	ND
Toluene	ND	ND	ND
1,3,5-Trimethylbenzene	ND	ND	ND
Total Xylenes	ND	ND	ND
Semivolatile Organics			
Anthracene	ND	ND	**2500**
Benzo(a)anthracene	ND	ND	**1600**
Benzo(a)pyrene	ND	ND	**1300**
Benzo(b)fluoranthene	ND	ND	**900**
Benzo(g,h,i)perylene	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	**1000**
Indeno(1,2,3-cd)pyrene	ND	ND	ND
Chrysene	ND	ND	**1400**
Dibenzo(a,h)anthracene	ND	ND	ND
Fluoranthene	ND	ND	**3600**
Fluorene	ND	ND	**1200**
Napthalene	ND	ND	**940**
Phenanthrene	ND	ND	**3800**
Pyrene	ND	ND	**3200**

MW-2			
5/31/1997	3 ft	10 ft	15 ft
Volatile Organics			
Benzene	**320**	ND	ND
n-Butylbenzene	**1400**	ND	ND
sec-Butlybenzene	**170**	ND	ND
tert-Butlybenzene	ND	ND	ND
Methyl tert butyl ether	**5600**	***37***	***12***
Ethylbenzene	**230**	ND	ND
Napthalene	ND	ND	ND
n-Propylbenzene	ND	ND	ND
Toluene	**1100**	ND	ND
1,3,5-Trimethylbenzene	**690**	ND	ND
Total Xylenes	**2270**	ND	ND
Semivolatile Organics			
Anthracene	**930**	ND	ND
Benzo(a)anthracene	**4100**	ND	ND
Benzo(a)pyrene	**6000**	ND	ND
Benzo(b)fluoranthene	**5000**	ND	ND
Benzo(g,h,i)perylene	**2300**	ND	ND
Benzo(k)fluoranthene	**3600**	ND	ND
Indeno(1,2,3-cd)pyrene	**2600**	ND	ND
Chrysene	**3900**	ND	ND
Dibenzo(a,h)anthracene	**1300**	ND	ND
Fluoranthene	**5200**	ND	ND
Fluorene	ND	ND	ND
Napthalene	ND	ND	ND
Phenanthrene	**2500**	ND	ND
Pyrene	**5100**	ND	ND

Basement	
5/31/1997	
Volatile Organics	
Benzene	ND
n-Butylbenzene	**20000**
sec-Butlybenzene	**4400**
tert-Butlybenzene	ND
Methyl tert butyl ether	ND
Ethylbenzene	ND
Napthalene	**1300**
n-Propylbenzene	ND
Toluene	**4900**
1,3,5-Trimethylbenzene	**5600**
Total Xylenes	ND
Semivolatile Organics	
Anthracene	ND
Benzo(a)anthracene	ND
Benzo(a)pyrene	ND
Benzo(b)fluoranthene	ND
Benzo(g,h,i)perylene	ND
Benzo(k)fluoranthene	ND
Indeno(1,2,3-cd)pyrene	ND
Chrysene	ND
Dibenzo(a,h)anthracene	ND
Fluoranthene	ND
Fluorene	ND
Napthalene	ND
Phenanthrene	ND
Pyrene	ND

MW-3			
5/31/1997	5 ft	10 ft	15 ft
Volatile Organics			
Benzene	ND	ND	ND
n-Butylbenzene	ND	ND	ND
sec-Butlybenzene	***75***	***15***	ND
tert-Butlybenzene	***66***	***11***	ND
Methyl tert butyl ether	ND	***1.8***	***1.4***
Ethylbenzene	ND	ND	ND
Napthalene	ND	ND	ND
n-Propylbenzene	ND	***25***	ND
Toluene	ND	***4.3***	ND
1,3,5-Trimethylbenzene	**140**	1.5	ND
Total Xylenes	***37***	***8.9***	ND
Semivolatile Organics			
Anthracene	**540**	ND	ND
Benzo(a)anthracene	**3200**	ND	ND
Benzo(a)pyrene	**6600**	ND	ND
Benzo(b)fluoranthene	**6100**	ND	ND
Benzo(g,h,i)perylene	**2500**	ND	ND
Benzo(k)fluoranthene	**3900**	ND	ND
Indeno(1,2,3-cd)pyrene	**2900**	ND	ND
Chrysene	**2800**	ND	ND
Dibenzo(a,h)anthracene	**1700**	ND	ND
Fluoranthene	**2200**	ND	ND
Fluorene	ND	ND	ND
Napthalene	ND	ND	ND
Phenanthrene	**1400**	ND	ND
Pyrene	**2400**	ND	ND



Abandoned Monitoring Wells, Installed by Pinnacle

Grab Sample Location

Closed in Place UST/AST Area

Removed UST/AST Area

Subject Property Location

Sample ID		
Date	**NY-RESRR	*NY-UNRES
Depth		
Analyte	mg/kg	mg/kg
Volatile Organics		
Benzene	4.8	0.06
n-Butylbenzene	100	12
sec-Butlybenzene	100	11
tert-Butlybenzene	100	5.9
Methyl tert butyl ether	100	0.93
Ethylbenzene	41	1
Napthalene	100	12
n-Propylbenzene	100	3.9
Toluene	100	0.7
1,3,5-Trimethylbenzene	52	8.4
Total Xylenes	100	0.93
Semivolatile Organics		
Anthracene	100	100
Benzo(a)anthracene	1	1
Benzo(a)pyrene	1	1
Benzo(b)fluoranthene	1	1
Benzo(g,h,i)perylene	100	100
Benzo(k)fluoranthene	3.9	0.8
Indeno(1,2,3-cd)pyrene	0.5	0.5
Chrysene	3.9	1
Dibenzo(a,h)anthracene	0.33	0.33
Fluoranthene	100	100
Fluorene	100	30
Napthalene	100	12
Phenanthrene	100	100
Pyrene	100	100

Notes:
1. **Bold** and *Italicized* value indicates concentration exceeds Unrestricted SCOs
2. **Bold and shaded** value indicates concentration exceeds Restricted-Residential SCOs
3. * = 6 NYCRR Part 375-6.8(a) Unrestricted Use SCOs
4. ** = 6 NYCRR Part 375-6.8(b) Restricted Residential Use SCOs
5. All results are in mg/kg
6. ND = Not detected
7. Results from Site Assessment Report, Pinnacle Environmental Technologies, 1997

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Figure 5.
Soil Sample Results - VOCs and SVOCs
1997 Site Assessment Report
Remedial Investigation Work Plan
555 West 22nd Street, New York, NY 10011

MW-3						
Date	5/31/1997	3/6/1998	6/20/1998	11/22/1998	3/31/1999	6/27/1999
VOCs						
Benzene	ND	ND	ND	ND	ND	**23.5**
n-Butylbenzene	**12**		ND	ND	ND	ND
sec-Butlybenzene	**9.5**		ND	ND	ND	ND
tert-Butlybenzene	**10**		ND	ND	ND	ND
Ethylbenzene	ND	1.2	ND	ND	ND	**19.2**
Isopropylbenzene	**7.7**		ND	ND	3.2	**31**
p-Isopropylbenzene	**60**		-	-	-	-
Napthalene	3.2		ND	ND	ND	ND
n-Propylbenzene	ND		ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	3.1
1,2,4-Trimethylbenzene	**5.3**		ND	ND	ND	ND
1,3,5-Trimethylbenzene	**12**		ND	ND	ND	ND
m+p-Xylene	**5.7**		-	-	-	-
o-Xylene	**7.3**		-	-	-	-
Total Xylenes	**13**	4.5	ND	**21**	ND	ND
Methyl tert butyl ether	**71**	-	ND	**25**	7	**53**

MW-2						
Date	5/31/1997	3/6/1998	6/20/1998	11/22/1998	3/31/1999	6/27/1999
VOCs						
Benzene	ND	**16**	ND	ND	ND	ND
n-Butylbenzene	2.3		ND	ND	ND	ND
sec-Butlybenzene	ND		ND	ND	ND	ND
tert-Butlybenzene	ND		ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ND		ND	ND	ND	ND
p-Isopropylbenzene	ND		-	-	-	-
Napthalene	ND		ND	ND	ND	ND
n-Propylbenzene	ND		ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	2.4		ND	ND	ND	ND
1,3,5-Trimethylbenzene	1.7		ND	ND	ND	ND
m+p-Xylene	ND		-	-	-	-
o-Xylene	ND		-	-	-	-
Total Xylenes	ND	ND	ND	ND	ND	ND
Methyl tert butyl ether	ND	-	ND	**17**	**12**	ND

MW-1						
Date	5/31/1997	3/6/1998	6/20/1998	11/22/1998	3/31/1999	6/27/1999
VOCs						
Benzene	**63**	ND	ND	ND	ND	ND
n-Butylbenzene	ND		ND	ND	ND	ND
sec-Butlybenzene	ND		ND	ND	ND	ND
tert-Butlybenzene	ND		ND	ND	ND	ND
Ethylbenzene	**13**	ND	ND	ND	ND	ND
Isopropylbenzene	1.6		ND	ND	ND	ND
p-Isopropylbenzene	ND		-	-	-	-
Napthalene	ND		ND	ND	ND	ND
n-Propylbenzene	2.2		ND	ND	ND	ND
Toluene	1.8	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	**12**		ND	ND	ND	ND
1,3,5-Trimethylbenzene	ND		ND	ND	ND	ND
m+p-Xylene	4.9		-	-	-	-
o-Xylene	ND		-	-	-	-
Total Xylenes	4.9	ND	ND	ND	ND	ND
Methyl tert butyl ether	ND	-	ND	ND	**25**	ND

BWTR	
Date	5/31/1997
VOCs	
Benzene	ND
n-Butylbenzene	ND
sec-Butlybenzene	ND
tert-Butlybenzene	ND
Ethylbenzene	ND
Isopropylbenzene	ND
p-Isopropylbenzene	ND
Napthalene	ND
n-Propylbenzene	ND
Toluene	ND
1,2,4-Trimethylbenzene	ND
1,3,5-Trimethylbenzene	ND
m+p-Xylene	ND
o-Xylene	ND
Total Xylenes	ND
Methyl tert butyl ether	**20**

	GPW-1	GPW-2	GPW-3	GPW-4	GPW-5	GPW-6
Date	5/15/2001	5/15/2001	5/15/2001	5/15/2001	5/15/2001	5/15/2001
VOCs						
Benzene	**1.2**	ND	**3**	ND	**3.5**	**24.1**
n-Butylbenzene	**5.6**	ND	3.1	ND	2.7	**62.1**
sec-Butylbenzene	4.4	1.9	**6.7**	2.2	**6.6**	**444**
tert-Butylbenzene	**7.2**	1	4.2	ND	2.3	**483**
Ethylbenzene	2.9	2.3	ND	ND	ND	**147**
Isopropylbenzene	ND	2.2	**23.9**	3.4	**11.3**	ND
p-Isopropyltoluene	ND	ND	ND	ND	3.2	ND
Naphthalene	6.9	ND	3.1	ND	4.4	**85**
n-Propylbenzene	**12.8**	2.5	**16.8**	2.9	**10.2**	**43.4**
Toluene	**16.2**	2.7	**8.5**	1.9	**8.9**	ND
1,2,4-Trimethylbenzene	**10**	ND	1	ND	1.3	**363**
1,3,5-Trimethylbenzene	1.6	ND	ND	ND	ND	**98.1**
m+p-Xylene	**7.5**	ND	2.7	ND	1.4	**249**
o-Xylene	4.4	2.5	4.2	1.6	4.4	**165**
Total Xylenes	-	-	-	-	-	-
Methyl tert butyl ether	**18.9**	**37.6**	**58.3**	**182**	**125**	ND
SVOCs						
Naphthalene	ND	ND	ND	ND	ND	**21.2**

Abandoned Monitoring Wells, Installed by Pinnacle

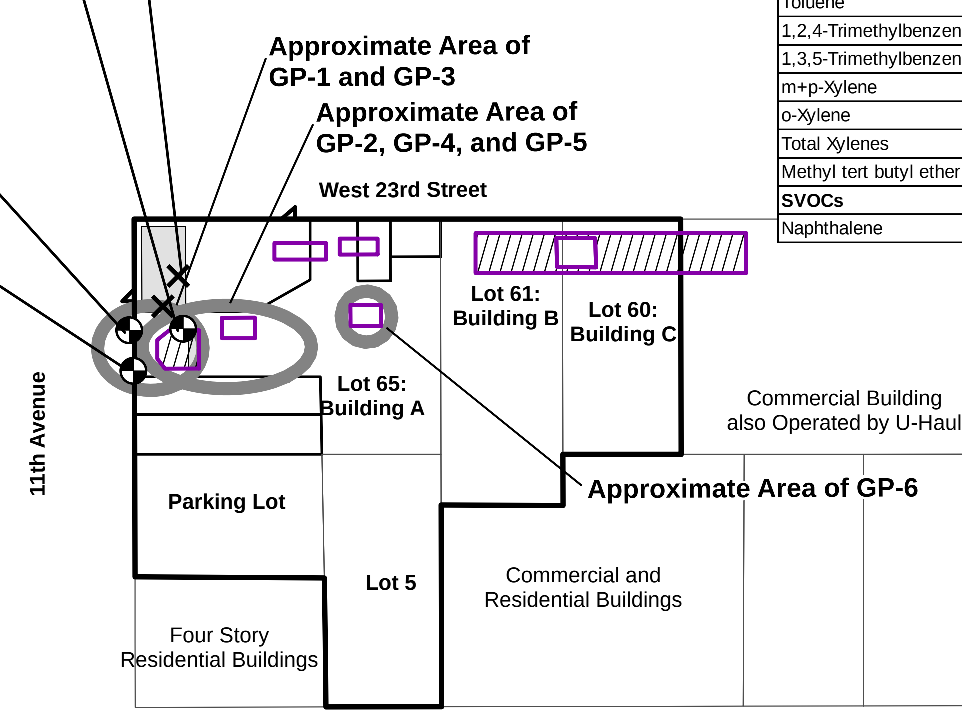
Grab Sample Location

Closed in Place UST/AST Area

Removed UST/AST Area

Subject Property Location

Sample ID	
Analyte	TOGS Class GA Standards*
VOCs	µg/L
Benzene	1
n-Butylbenzene	5
sec-Butlybenzene	5
tert-Butlybenzene	5
Ethylbenzene	5
Isopropylbenzene	5
p-Isopropyltoluene	5
Naphthalene	10
n-Propylbenzene	5
Toluene	5
1,2,4-Trimethylbenzene	5
1,3,5-Trimethylbenzene	5
m+p-Xylene	5
o-Xylene	5
Total Xylenes	5
Methyl tert butyl ether	10
SVOCs	µg/L
Naphthalene	10



Notes:
1. **Bold and shaded** value indicates an exceedance of Class GA Standards
2. * = NYSDEC Division of Water Technical and OperationalGuidance Series (TOGS) 1.1.1, Class GA AmbientWater Quality Standards and Guidance Values
3. All results are in µg/L
4. ND = Not Detected
5. - = Not tested
6. For MW-1, MW-2, and MW-3, only summary results for five analytes could be found for sampling date 3/6/98
7. Results from Site Assessment Reports, Pinnacle Environmental Technologies, 1997-1999; and Site Investigation Report, ATC Associates Inc., 2001

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Assumed Groundwater Flow Direction

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Figure 6.
Groundwater Sample Results
1997-1999 Site Assessment Reports and 2001 Site Investigation Report
Remedial Investigation Work Plan
555 West 22nd Street, New York, NY 10011

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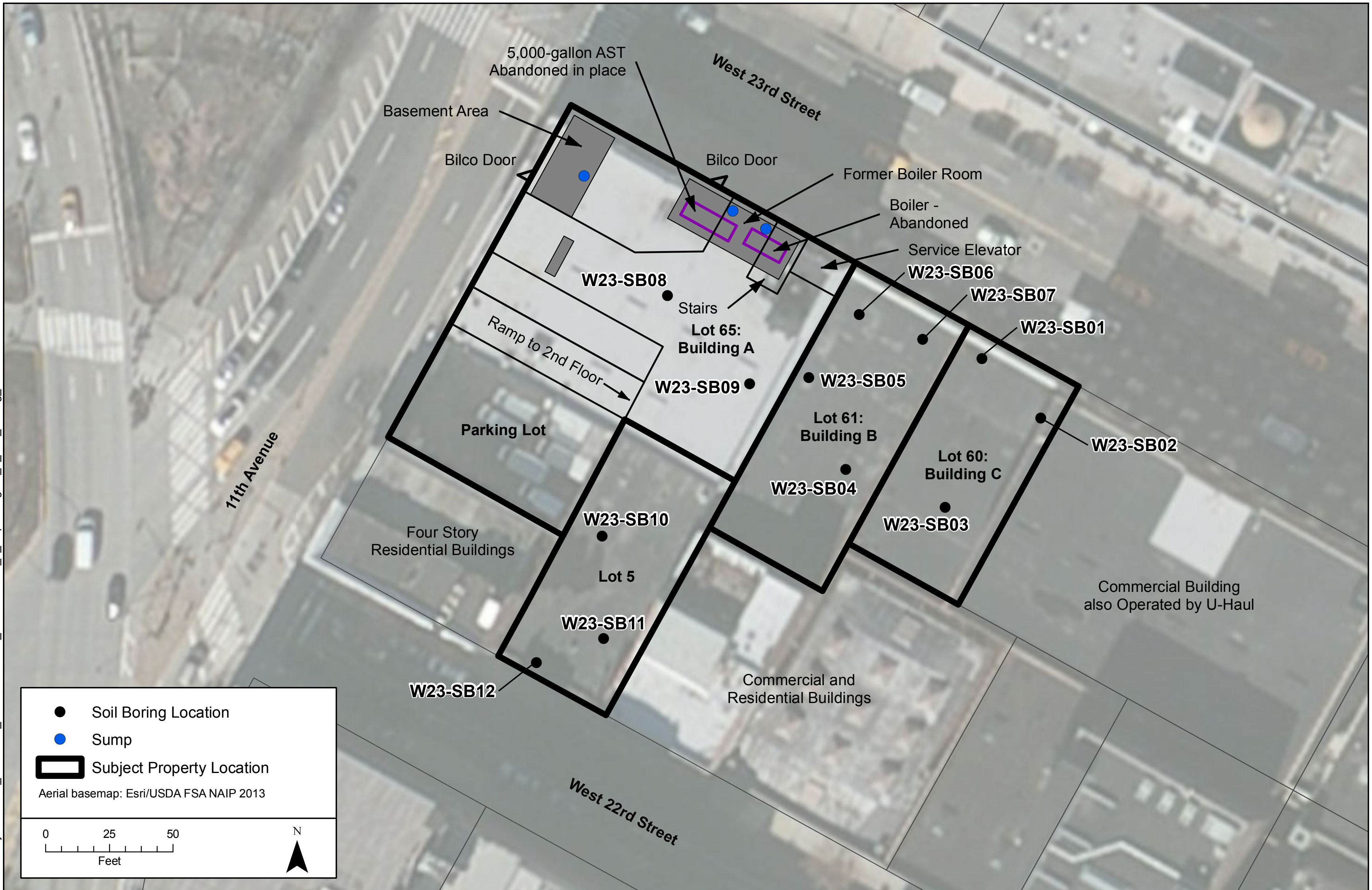

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Figure 7.
Soil Boring Locations
2016 Limited Phase II Investigation
Remedial Investigation Work Plan
555 West 22nd Street, New York, NY 10011

W23-SB08		
2/2/2015	1-2'	7.5-8.5'
Volatile Organics		
Benzene	NT	0.44J
Ethylbenzene	NT	ND
Xylenes, Total	NT	ND
n-Propylbenzene	NT	8
Semivolatile Organics		
Benzo(a)anthracene	8.2	ND
Benzo(a)pyrene	18	ND
Benzo(b)fluoranthene	18	ND
Benzo(k)fluoranthene	5.2	ND
Chrysene	7.8	ND
Dibenzo(a,h)anthracene	5.2	ND
Indeno(1,2,3-cd)Pyrene	19	ND

W23-SB05	
2/1/2016	1-2'
Volatile Organics	
Benzene	ND
Ethylbenzene	ND
Xylenes, Total	ND
n-Propylbenzene	ND
Semivolatile Organics	
Benzo(a)anthracene	8.3
Benzo(a)pyrene	14
Benzo(b)fluoranthene	16
Benzo(k)fluoranthene	5.3
Chrysene	7.6
Dibenzo(a,h)anthracene	3.1
Indeno(1,2,3-cd)Pyrene	9.1

W23-SB06	
2/1/2016	1-2'
Volatile Organics	
Benzene	ND
Ethylbenzene	ND
Xylenes, Total	ND
n-Propylbenzene	ND
Semivolatile Organics	
Benzo(a)anthracene	0.16
Benzo(a)pyrene	0.24
Benzo(b)fluoranthene	0.24
Benzo(k)fluoranthene	0.12
Chrysene	0.14
Dibenzo(a,h)anthracene	0.045J
Indeno(1,2,3-cd)Pyrene	0.16

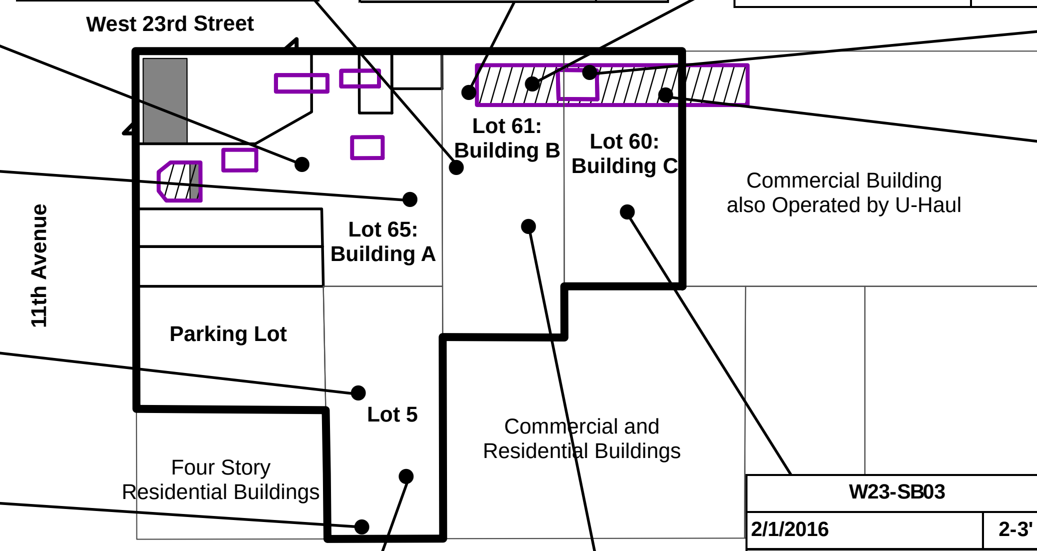
W23-SB07	
2/2/2015	6.5-7.5'
Volatile Organics	
Benzene	ND
Ethylbenzene	ND
Xylenes, Total	ND
n-Propylbenzene	ND
Semivolatile Organics	
Benzo(a)anthracene	ND
Benzo(a)pyrene	ND
Benzo(b)fluoranthene	ND
Benzo(k)fluoranthene	ND
Chrysene	ND
Dibenzo(a,h)anthracene	ND
Indeno(1,2,3-cd)Pyrene	ND

W23-SB01		
2/1/2016	2-3'	9-10'
Volatile Organics		
Benzene	NT	ND
Ethylbenzene	NT	ND
Xylenes, Total	NT	ND
n-Propylbenzene	NT	ND
Semivolatile Organics		
Benzo(a)anthracene	1.2	ND
Benzo(a)pyrene	1.2	ND
Benzo(b)fluoranthene	1.5	ND
Benzo(k)fluoranthene	0.55	ND
Chrysene	1	ND
Dibenzo(a,h)anthracene	0.17	ND
Indeno(1,2,3-cd)Pyrene	0.88	ND

- ● Soil Boring Location
- Closed in Place UST/AST Area
- Removed UST/AST Area
- Subject Property Location

Sample ID		
Date	**NY-RESRR	*NY-UNRES
Depth		
Analyte	mg/kg	mg/kg
Volatile Organics		
Benzene	4.8	0.06
Ethylbenzene	41	1
Xylenes, Total	100	0.26
n-Propylbenzene	100	3.9
Semivolatile Organics		
Benzo(a)anthracene	1	1
Benzo(a)pyrene	1	1
Benzo(b)fluoranthene	1	1
Benzo(k)fluoranthene	3.9	0.8
Chrysene	3.9	1
Dibenzo(a,h)anthracene	0.33	0.33
Indeno(1,2,3-cd)Pyrene	0.5	0.5

W23-SB09		
2/2/2015	1-2'	6-7'
Volatile Organics		
Benzene	ND	NT
Ethylbenzene	ND	NT
Xylenes, Total	0.00077J	NT
n-Propylbenzene	ND	NT
Semivolatile Organics		
Benzo(a)anthracene	0.068J	0.04J
Benzo(a)pyrene	0.082J	ND
Benzo(b)fluoranthene	0.094J	0.053
Benzo(k)fluoranthene	0.036J	0.018J
Chrysene	0.059J	0.035J
Dibenzo(a,h)anthracene	ND	ND
Indeno(1,2,3-cd)Pyrene	0.044J	0.027J



W23-SB02			
2/1/2016	2-3'	8-9'	8-9' DUP
Volatile Organics			
Benzene	NT	ND	ND
Ethylbenzene	NT	1.2J	0.34J
Xylenes, Total	NT	0.59J	0.19J
n-Propylbenzene	NT	15	5.5
Semivolatile Organics			
Benzo(a)anthracene	11	0.028J	0.22
Benzo(a)pyrene	10	ND	0.35
Benzo(b)fluoranthene	13	0.042J	0.35
Benzo(k)fluoranthene	4.6	ND	0.16
Chrysene	9.8	0.026J	0.2
Dibenzo(a,h)anthracene	1.6	ND	0.071J
Indeno(1,2,3-cd)Pyrene	6.9	ND	0.2

W23-SB10	
2/2/2015	1-2'
Volatile Organics	
Benzene	ND
Ethylbenzene	ND
Xylenes, Total	0.0012J
n-Propylbenzene	ND
Semivolatile Organics	
Benzo(a)anthracene	9.4
Benzo(a)pyrene	20
Benzo(b)fluoranthene	19
Benzo(k)fluoranthene	8.5
Chrysene	8.5
Dibenzo(a,h)anthracene	3.7
Indeno(1,2,3-cd)Pyrene	14

W23-SB12	
2/2/2015	1-2'
Volatile Organics	
Benzene	ND
Ethylbenzene	ND
Xylenes, Total	0.0008J
n-Propylbenzene	ND
Semivolatile Organics	
Benzo(a)anthracene	3.3
Benzo(a)pyrene	4.6
Benzo(b)fluoranthene	5.8
Benzo(k)fluoranthene	1.8
Chrysene	3.3
Dibenzo(a,h)anthracene	0.85
Indeno(1,2,3-cd)Pyrene	3.9

W23-SB11		
2/2/2015	1-2'	6.5-7.5'
Volatile Organics		
Benzene	NT	ND
Ethylbenzene	NT	ND
Xylenes, Total	NT	ND
n-Propylbenzene	NT	ND
Semivolatile Organics		
Benzo(a)anthracene	1.8	0.039J
Benzo(a)pyrene	3.6	0.054J
Benzo(b)fluoranthene	3.6	0.052J
Benzo(k)fluoranthene	1.2	ND
Chrysene	1.6	0.033J
Dibenzo(a,h)anthracene	0.65	ND
Indeno(1,2,3-cd)Pyrene	3.5	0.033J

W23-SB04	
2/1/2016	5-7'
Volatile Organics	
Benzene	ND
Ethylbenzene	ND
Xylenes, Total	ND
n-Propylbenzene	ND
Semivolatile Organics	
Benzo(a)anthracene	4.5
Benzo(a)pyrene	4.8
Benzo(b)fluoranthene	5.2
Benzo(k)fluoranthene	3.4
Chrysene	3.6
Dibenzo(a,h)anthracene	1.1
Indeno(1,2,3-cd)Pyrene	2.7

W23-SB03	
2/1/2016	2-3'
Volatile Organics	
Benzene	ND
Ethylbenzene	ND
Xylenes, Total	ND
n-Propylbenzene	ND
Semivolatile Organics	
Benzo(a)anthracene	7
Benzo(a)pyrene	6.3
Benzo(b)fluoranthene	9.8
Benzo(k)fluoranthene	2.6
Chrysene	6
Dibenzo(a,h)anthracene	1.5
Indeno(1,2,3-cd)Pyrene	3.6

Notes:
1. **Bold** and *Italicized* value indicates concentration exceeds Unrestricted SCOs
2. **Bold and shaded** value indicates concentration exceeds Restricted-Residential SCOs
3. J = Estimated value
4. ND = Not Detected
5. NT = Not Tested
6. * = 6 NYCRR Part 375-6.8(a) Unrestricted Use SCOs
7. ** = 6 NYCRR Part 375-6.8(b) Restricted Residential Use SCOs
8. All results are in mg/kg
9. Results from Limited Phase II Investigation, Integral Engineering, 2016

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integral engineering p.c.
61 Broadway, Suite 1601
New York, New York 10006
www.integral-corp.com

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Figure 8.
Soil Sample Results - VOCs and SVOCs
2016 Limited Phase II Investigation
Remedial Investigation Work Plan
555 West 22nd Street, New York, NY 10011

- Soil Boring Location
- Closed in Place UST/AST Area
- Removed UST/AST Area
- Subject Property Location

W23-SB09		
2/2/2015	1-2'	6-7'
Total Metals		
Arsenic	5.4	3.6
Copper	27	16
Lead	***100***	***96***
Mercury	***0.3***	**1.2**
Nickel	11	12
Zinc	47	32

W23-SB08		
2/2/2015	1-2'	7.5-8.5'
Total Metals		
Arsenic	**18**	3
Copper	44	16
Lead	**980**	***120***
Mercury	***0.25***	***0.26***
Nickel	14	14
Zinc	***170***	39

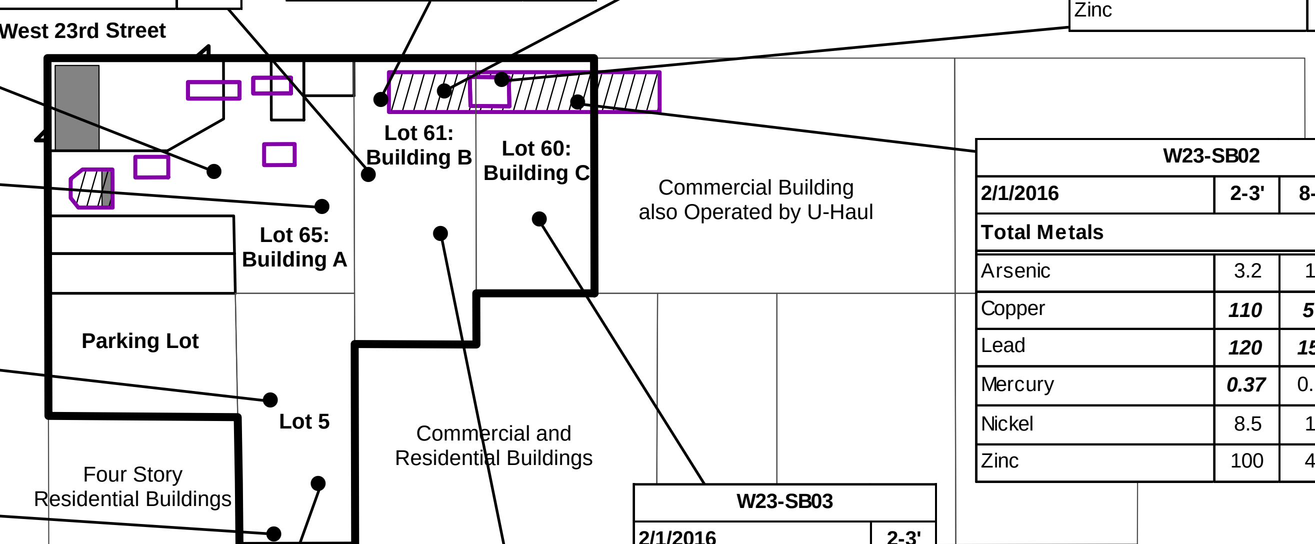
W23-SB05	
2/1/2016	1-2'
Total Metals	
Arsenic	***16***
Copper	***60***
Lead	***350***
Mercury	**0.96**
Nickel	12
Zinc	**170**

W23-SB06	
2/1/2016	1-2'
Total Metals	
Arsenic	**33**
Copper	***73***
Lead	**420**
Mercury	***0.77***
Nickel	11
Zinc	**140**

W23-SB07	
2/2/2015	6.5-7.5'
Total Metals	
Arsenic	3.5
Copper	13
Lead	30
Mercury	0.06J
Nickel	18
Zinc	28

W23-SB01		
2/1/2016	2-3'	9-10'
Total Metals		
Arsenic	2.8	1.6
Copper	***73***	13
Lead	***87***	37
Mercury	***0.68***	***0.22***
Nickel	7.1	9
Zinc	***320***	26

Sample ID		
Date	**NY-RESRR	*NY-UNRES
Depth		
Analyte	mg/kg	mg/kg
Total Metals		
Arsenic	16	13
Copper	270	50
Lead	400	63
Mercury	0.81	0.18
Nickel	310	30
Zinc	10000	109



W23-SB02			
2/1/2016	2-3'	8-9'	8-9' DUP
Total Metals			
Arsenic	3.2	11	***14***
Copper	***110***	***57***	***57***
Lead	***120***	***150***	**580**
Mercury	***0.37***	0.14	***0.38***
Nickel	8.5	16	**110**
Zinc	100	48	**140**

W23-SB10	
2/2/2015	1-2'
Total Metals	
Arsenic	5.5
Copper	30
Lead	***88***
Mercury	0.14
Nickel	15
Zinc	93

W23-SB12	
2/2/2015	1-2'
Total Metals	
Arsenic	3.8
Copper	***90***
Lead	***280***
Mercury	***0.25***
Nickel	9.8
Zinc	***110***

W23-SB11		
2/2/2015	1-2'	6.5-7.5'
Total Metals		
Arsenic	3	3.3
Copper	49	14
Lead	***94***	***120***
Mercury	***0.28***	***0.7***
Nickel	14	9
Zinc	56	33

W23-SB04	
2/1/2016	5-7'
Total Metals	
Arsenic	6.6
Copper	29
Lead	***110***
Mercury	0.1
Nickel	13
Zinc	93

W23-SB03	
2/1/2016	2-3'
Total Metals	
Arsenic	4.2
Copper	***220***
Lead	***210***
Mercury	***0.51***
Nickel	9.2
Zinc	**140**

Notes:
1. **Bold** and *Italicized* value indicates concentration exceeds Unrestricted SCOs
2. **Bold and shaded** value indicates concentration exceeds Restricted-Residential SCOs
3. J = Estimated value
4. * = 6 NYCRR Part 375-6.8(a) Unrestricted Use SCOs
5. ** = 6 NYCRR Part 375-6.8(b) Restricted Residential Use SCOs
6. All results are in mg/kg
7. Results from Limited Phase II Investigation, Integral Engineering, 2016

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New York, New York 10006
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Figure 9.
Soil Sample Results - Metals
2016 Limited Phase II Investigation
Remedial Investigation Work Plan
555 West 22nd Street, New York, NY 10011

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integral consulting inc.

Figure 10.
Proposed RIWP Sample Locations
Remedial Investigation Work Plan
555 West 22nd Street, New York, NY 10011

TABLES

TABLE 1

Soil Analytical Data Summary - VOCs
Phase II Subsurface Investigation
Block 699, Lot 5, 60, 61, and 65
Manhattan, New York

Sample ID Lab Sample ID Sample Date Sample Media Unit of Measure	**NY-RESRR	*NY-UNRES	W23-SB01 (9-10') L1602637-01 2/1/2016 Soil mg/kg	W23-SB02 (8-9') L1602637-02 2/1/2016 Soil mg/kg	W23-SB02 (8-9') DUPLICATE L1602637-07 2/1/2016 Soil mg/kg	W23-SB03 (2-3') L1602637-03 2/1/2016 Soil mg/kg	W23-SB04 (5-7') L1602637-04 2/1/2016 Soil mg/kg	W23-SB05 (1-2') L1602637-05 2/1/2016 Soil mg/kg	W23-SB06 (1-2') L1602637-06 2/1/2016 Soil mg/kg	W23-SB07 (6.5-7.5') L1602736-01 2/2/2016 Soil mg/kg	W23-SB08 (7.5-8.5') L1602736-02 2/2/2016 Soil mg/kg	W23-SB09 (1-2') L1602736-03 2/2/2016 Soil mg/kg	W23-SB10 (1-2') L1602736-04 2/2/2016 Soil mg/kg	W23-SB11 (6.5-7.5') L1602736-05 2/2/2016 Soil mg/kg	W23-SB12 (1-2') L1602736-06 2/2/2016 Soil mg/kg
Volatile Organics															
Methylene chloride	100	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	26	0.27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	49	0.37	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0016J	ND	ND
Carbon tetrachloride	2.4	0.76	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0024	ND	ND
1,2-Dichloropropane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	19	1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.034	0.00059J	0.0083
Chlorobenzene	100	1.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	3.1	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	100	0.68	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0016	ND	0.0031
Bromodichloromethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropene, Total	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	4.8	0.06	ND	ND	ND	ND	ND	ND	ND	ND	***0.44J***	ND	ND	ND	ND
Toluene	100	0.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0016J	0.00064J	ND
Ethylbenzene	41	1	ND	***1.2J***	0.34J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	0.9	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	100	0.33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	100	0.19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	21	0.47	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0011
1,2-Dichlorobenzene	100	1.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	49	2.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	13	1.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl tert butyl ether	100	0.93	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p/m-Xylene	NS	NS	ND	0.59J	0.19J	ND	ND	ND	ND	ND	ND	0.00077J	0.0012J	ND	ND
o-Xylene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0008J
Xylenes, Total	100	0.26	ND	***0.59J***	0.19J	ND	ND	ND	ND	ND	ND	0.00077J	0.0012J	ND	0.0008J
cis-1,2-Dichloroethene	100	0.25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene, Total	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	100	0.05	0.026	ND	ND	0.01J	0.0054J	0.012	0.0049J	0.019	ND	0.028	0.0069J	0.034	0.041
Carbon disulfide	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0012J	ND
2-Butanone	100	0.12	0.0053J	ND	ND	ND	ND	ND	ND	0.0023J	ND	ND	ND	0.0054J	0.0036J
Vinyl acetate	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromobenzene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	100	12	ND	4.2	2	ND	ND	ND	ND	ND	3.6	ND	ND	ND	ND
sec-Butylbenzene	100	11	ND	3.1	1.3	ND	ND	ND	ND	ND	2.8	ND	ND	ND	ND
tert-Butylbenzene	100	5.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Chlorotoluene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Chlorotoluene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	NS	NS	ND	7.8	2.4	ND	ND	ND	ND	ND	4.4	ND	ND	ND	ND
p-Isopropyltoluene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	1.4	ND	ND	ND	0.0016
Naphthalene	100	12	ND	1.6J	0.97J	0.0034J	ND	ND	ND	ND	1.4J	ND	ND	ND	ND
Acrylonitrile	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	100	3.9	ND	***15***	***5.5***	ND	ND	ND	ND	ND	***8***	ND	ND	ND	ND
1,2,3-Trichlorobenzene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	52	8.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0015J	ND	0.0013J
1,2,4-Trimethylbenzene	52	3.6	ND	1J	0.4J	ND	ND	ND	ND	ND	ND	ND	0.0026J	ND	0.0014J
1,4-Dioxane	13	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Diethylbenzene	NS	NS	ND	10	5.1	ND	ND	ND	ND	ND	3.8	ND	0.00057J	ND	0.00046J
p-Ethyltoluene	NS	NS	ND	0.58J	ND	ND	ND	ND	ND	ND	0.45J	ND	0.0012J	ND	0.00057J
1,2,4,5-Tetramethylbenzene	NS	NS	ND	36	22	ND	ND	ND	ND	ND	6.3	ND	ND	ND	ND
Ethyl ether	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,4-Dichloro-2-butene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
Bold and *Italicized* value indicates concentration exceeds Unrestricted SCOs
Bold and shaded value indicates concentration exceeds Restricted-Residential SCOs
J = Estimated value
ND = Not detected
NS = No Standard
* = 6 NYCRR Part 375-6.8(a) Unrestricted Use SCOs
** = 6 NYCRR Part 375-6.8(b) Restricted Residential Use SCOs Restricted-Residential

TABLE 2

Soil Analytical Data Summary - SVOCs
Phase II Subsurface Investigation
Block 699, Lot 5, 60, 61, and 65
Manhattan, New York

Sample ID Lab Sample ID Sample Date Sample Media Unit of Measure	**NY-RESRR	*NY-UNRES	W23-SB01 (2-3') L1602637-08 2/1/2016 Soil mg/kg	W23-SB01 (9-10') L1602637-01 2/1/2016 Soil mg/kg	W23-SB02 (2-3') L1602637-09 2/1/2016 Soil mg/kg	W23-SB02 (8-9') L1602637-02 2/1/2016 Soil mg/kg	W23-SB02 (8-9') DUPLICATE L1602637-07 2/1/2016 Soil mg/kg	W23-SB03 (2-3') L1602637-03 2/1/2016 Soil mg/kg	W23-SB04 (5-7') L1602637-04 2/1/2016 Soil mg/kg	W23-SB05 (1-2') L1602637-05 2/1/2016 Soil mg/kg	W23-SB06 (1-2') L1602637-06 2/1/2016 Soil mg/kg	W23-SB07 (6.5-7.5') L1602736-01 2/2/2016 Soil mg/kg	W23-SB08 (1-2') L1602736-08 2/2/2016 Soil mg/kg	W23-SB08 (7.5-8.5') L1602736-02 2/2/2016 Soil mg/kg	W23-SB09 (1-2') L1602736-03 2/2/2016 Soil mg/kg	W23-SB09 (6-7') L1602736-09 2/2/2016 Soil mg/kg	W23-SB10 (1-2') L1602736-04 2/2/2016 Soil mg/kg	W23-SB11 (1-2') L1602736-11 2/2/2016 Soil mg/kg	W23-SB11 (6.5-7.5') L1602736-05 2/2/2016 Soil mg/kg	W23-SB12 (1-2') L1602736-06 2/2/2016 Soil mg/kg
Semivolatile Organics																				
1,2,4-Trichlorobenzene	NS	NS	-	ND	-	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
1,2-Dichlorobenzene	100	1.1	-	ND	-	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
1,3-Dichlorobenzene	49	2.4	-	ND	-	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
1,4-Dichlorobenzene	13	1.8	-	ND	-	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
Benzoic Acid	NS	NS	-	ND	-	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
Benzyl Alcohol	NS	NS	-	ND	-	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
Acenaphthene	100	20	0.13J	ND	1	ND	ND	0.6	0.26	0.62	ND	ND	0.94	ND	ND	ND	1	0.17	ND	0.16
2-Chloronaphthalene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobenzene	1.2	0.33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-chloroethyl)ether	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3,3'-Dichlorobenzidine	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-Dinitrotoluene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	100	100	2.3	ND	23	0.037J	0.25	15	5.8	8.8	0.18	ND	7.3	ND	0.097J	0.032J	9.2	1.6	0.033J	5.4
4-Chlorophenyl phenyl ether	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-chloroisopropyl)ether	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-chloroethoxy)methane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachloroethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isophorone	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.034J
Naphthalene	100	12	0.062J	ND	0.97	ND	ND	0.28	0.094J	0.34J	ND	ND	1.7	0.86	ND	ND	0.36J	0.17J	ND	0.23
Nitrobenzene	15	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NitrosoDiPhenylAmine(NDPA)/DPA	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Nitrosodi-n-propylamine	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-Ethylhexyl)phthalate	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butyl benzyl phthalate	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butylphthalate	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octylphthalate	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diethyl phthalate	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dimethyl phthalate	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	1	1	***1.2***	ND	***11***	0.028J	0.22	***7***	***4.5***	***8.3***	0.16	ND	***8.2***	ND	0.068J	0.04J	***9.4***	***1.8***	0.039J	***3.3***
Benzo(a)pyrene	1	1	***1.2***	ND	***10***	ND	0.35	***6.3***	***4.8***	***14***	0.24	ND	***18***	ND	0.082J	ND	***20***	***3.6***	0.054J	***4.6***
Benzo(b)fluoranthene	1	1	***1.5***	ND	***13***	0.042J	0.35	***9.8***	***5.2***	***16***	0.24	ND	***18***	ND	0.094J	0.053	***19***	***3.6***	0.052J	***5.8***
Benzo(k)fluoranthene	3.9	0.8	0.55	ND	***4.6***	ND	0.16	***2.6***	***3.4***	***5.3***	0.12	ND	***5.2***	ND	0.036J	0.018J	***8.5***	***1.2***	ND	***1.8***
Chrysene	3.9	1	***1***	ND	***9.8***	0.026J	0.2	***6***	***3.6***	***7.6***	0.14	ND	***7.8***	ND	0.059J	0.035J	***8.5***	***1.6***	0.033J	***3.3***
Acenaphthylene	100	100	0.2	ND	1.9	ND	ND	0.66	0.034J	0.11J	ND	ND	0.16	ND	ND	ND	ND	0.079J	ND	0.47
Anthracene	100	100	0.39	ND	4.2	ND	0.064J	2.2	1.3	1.7	ND	ND	1.4	ND	ND	ND	1.7	0.32	ND	0.62
Benzo(ghi)perylene	100	100	0.78	ND	6.8	0.034J	0.22	4	2.7	9.2	0.17	ND	16	ND	0.054J	0.025J	17	3.1	0.043J	3.6
Fluorene	100	30	0.1J	ND	0.8	ND	ND	0.6	0.14J	0.28J	ND	ND	0.35	ND	ND	ND	0.38J	0.074J	ND	0.12J
Phenanthrene	100	100	1.2	ND	15E	0.05J	0.21	6.9	3.5	4.8	0.083J	ND	4	ND	0.066J	0.024J	5.1	0.91	ND	2.4
Dibenzo(a,h)anthracene	0.33	0.33	0.17	ND	***1.6***	ND	0.071J	***1.5***	***1.1***	***3.1***	0.045J	ND	***5.2***	ND	ND	ND	***3.7***	***0.65***	ND	***0.85***
Indeno(1,2,3-cd)Pyrene	0.5	0.5	***0.88***	ND	***6.9***	ND	0.2	***3.6***	***2.7***	***9.1***	0.16	ND	***19***	ND	0.044J	0.027J	***14***	***3.5***	0.033J	***3.9***
Pyrene	100	100	2	ND	17E	0.035J	0.24	13	4.6	7.8	0.16	ND	7.2	ND	0.09J	0.036J	9.2	1.6	0.033J	5.2
4-Chloroaniline	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitroaniline	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-Nitroaniline	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitroaniline	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	59	7	0.057J	ND	1	ND	ND	0.29	0.14J	0.28J	ND	ND	0.28	ND	ND	ND	0.28J	0.059J	ND	0.13J
2-Methylnaphthalene	NS	NS	0.024J	ND	0.42	0.1J	0.2J	0.1J	0.041J	0.13J	ND	ND	0.94	1.1	ND	ND	0.12J	0.095J	ND	0.1J
2,4,6-Trichlorophenol	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
P-Chloro-M-Cresol	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dichlorophenol	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	NS	NS	ND	ND	0.067J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitrophenol	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrophenol	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,6-Dinitro-o-cresol	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	6.7	0.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenol	100	0.33	ND	ND	0.082J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylphenol	100	0.33	ND	ND	0.042J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-Methylphenol/4-Methylphenol	100	0.33	ND	ND	0.16J	ND	ND	0.045J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.038J	ND
2,4,5-Trichlorophenol	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbazole	NS	NS	0.16J	ND	1.7	ND	ND	0.84	0.45	0.68J	ND	ND	0.7	ND	ND	ND	0.96	0.17J	ND	0.27
4-Nitrophenol	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Bromophenyl phenyl ether	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzaldehyde	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Caprolactam	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Acetophenone	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Biphenyl	NS	NS	ND	ND	0.16J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4,5-Tetrachlorobenzene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Atrazine	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
2,3,4,6-Tetrachlorophenol	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-

Notes:
Bold and *Italicized* value indicates concentration exceeds Unrestricted SCOs
Bold and shaded value indicates
J = Estimated value
ND = Not detected
NS = No Standard
\- = Not Analyzed
* = 6 NYCRR Part 375-6.8(a) Unrestricted Use SCOs
** = 6 NYCRR Part 375-6.8(b)

TABLE 3

Soil Analytical Data Summary - Total Metals
Phase II Subsurface Investigation
Block 699, Lot 5, 60, 61, and 65
Manhattan, New York

Sample ID Lab Sample ID Sample Date Sample Media Unit of Measure	*NY-RESRR	**NY-UNRES	W23-SB01 (2-3') L1602637-08 2/1/2016 Soil mg/kg	W23-SB01 (9-10') L1602637-01 2/1/2016 Soil mg/kg	W23-SB02 (2-3') L1602637-09 2/1/2016 Soil mg/kg	W23-SB02 (8-9') L1602637-02 2/1/2016 Soil mg/kg	W23-SB02 (8-9') DUPLICATE L1602637-07 2/1/2016 Soil mg/kg	W23-SB03 (2-3') L1602637-03 2/1/2016 Soil mg/kg	W23-SB04 (5-7') L1602637-04 2/1/2016 Soil mg/kg	W23-SB05 (1-2') L1602637-05 2/1/2016 Soil mg/kg
Total Metals										
Aluminum, Total	NS	NS	1900	7300	3700	6300	7600	3500	7000	4200
Antimony, Total	NS	NS	18	ND	1.8J	1.4J	ND	3.8J	1.4J	3.1J
Arsenic, Total	16	13	2.8	1.6	3.2	11	***14***	4.2	6.6	***16***
Barium, Total	400	350	110	68	89	60	85	100	120	180
Beryllium, Total	72	7.2	0.1J	0.27J	0.13J	0.3J	0.29J	0.14J	0.32J	0.26J
Cadmium, Total	4.3	2.5	0.22J	ND	0.13J	ND	ND	ND	ND	0.1J
Calcium, Total	NS	NS	12000	2900	22000	8100	30000	36000	5700	8100
Chromium, Total	NS	NS	10	14	9.5	18	18	8	13	26
Cobalt, Total	NS	NS	6.7	4.9	3.7	5.2	11	2.9	5.3	4.8
Copper, Total	270	50	***73***	13	***110***	***57***	***57***	***220***	29	***60***
Iron, Total	NS	NS	6400	10000	8200	13000	20000	8700	14000	20000
Lead, Total	400	63	***87***	37	***120***	***150***	***580***	***210***	***110***	***350***
Magnesium, Total	NS	NS	1400	2200	3600	2600	9900	2800	2200	1800
Manganese, Total	2000	1600	87	130	160	170	540	170	130	210
Mercury, Total	0.81	0.18	***0.68***	***0.22***	***0.37***	0.14	***0.38***	***0.51***	0.1	***0.96***
Nickel, Total	310	30	7.1	9	8.5	16	**110**	9.2	13	12
Potassium, Total	NS	NS	420	980	1200	640	1200	820	820	1000
Selenium, Total	180	3.9	ND	0.43J	ND	1.8J	1.6J	0.42J	0.44J	1.4J
Silver, Total	180	2	0.2J	ND	0.26J	ND	0.42J	0.45J	ND	0.27J
Sodium, Total	NS	NS	580	190	790	540	700	390	320	950
Thallium, Total	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium, Total	NS	NS	7.4	19	12	18	41	13	16	16
Zinc, Total	10000	109	***320***	26	100	48	**140**	**140**	93	**170**

Sample ID Lab Sample ID Sample Date Sample Media Unit of Measure	*NY-RESRR	**NY-UNRES	W23-SB06 (1-2') L1602637-06 2/1/2016 Soil mg/kg	W23-SB07 (6.5-7.5') L1602736-01 2/2/2016 Soil mg/kg	W23-SB08 (1-2') L1602736-08 2/2/2016 Soil mg/kg	W23-SB08 (7.5-8.5') L1602736-02 2/2/2016 Soil mg/kg	W23-SB09 (1-2') L1602736-03 2/2/2016 Soil mg/kg	W23-SB09 (6-7') L1602736-09 2/2/2016 Soil mg/kg	W23-SB10 (1-2') L1602736-04 2/2/2016 Soil mg/kg	W23-SB11 (1-2') L1602736-11 2/2/2016 Soil mg/kg	W23-SB11 (6.5-7.5') L1602736-05 2/2/2016 Soil mg/kg	W23-SB12 (1-2') L1602736-06 2/2/2016 Soil mg/kg
Total Metals												
Aluminum, Total	NS	NS	5200	6800	5000	6600	7100	6600	6300	4700	5800	4700
Antimony, Total	NS	NS	ND	ND	6.4	ND	1J	1J	0.79J	1.5J	ND	1.4J
Arsenic, Total	16	13	***33***	3.5	***18***	3	5.4	3.6	5.5	3	3.3	3.8
Barium, Total	400	350	180	54	86	61	110	65	74	93	83	63
Beryllium, Total	72	7.2	0.38J	0.3J	0.37J	0.29J	0.32J	0.3J	0.55	0.29J	0.28J	0.24J
Cadmium, Total	4.3	2.5	ND	ND	ND	ND	ND	ND	ND	0.09J	ND	ND
Calcium, Total	NS	NS	5900	22000	9100	9500	6200	4000	3700	23000	9000	16000
Chromium, Total	NS	NS	12	10	16	11	11	11	12	11	11	8.7
Cobalt, Total	NS	NS	4.8	5	5.6	4.9	4.6	5.5	5.4	4.2	3.5	3.5
Copper, Total	270	50	***73***	13	44	16	27	16	30	49	14	***90***
Iron, Total	NS	NS	11000	12000	17000	13000	12000	12000	13000	8700	9300	12000
Lead, Total	400	63	***420***	30	***980***	***120***	***100***	***96***	***88***	***94***	***120***	***280***
Magnesium, Total	NS	NS	1400	3600	1400	2500	2300	2500	2000	2600	2100	2200
Manganese, Total	2000	1600	140	350	140	180	210	170	260	260	190	200
Mercury, Total	0.81	0.18	***0.77***	0.06J	***0.25***	***0.26***	***0.3***	***1.2***	0.14	***0.28***	***0.7***	***0.25***
Nickel, Total	310	30	11	18	14	14	11	12	15	14	9	9.8
Potassium, Total	NS	NS	1000	630	680	750	1500	1200	710	970	1000	740
Selenium, Total	180	3.9	0.83J	0.52J	0.6J	0.55J	0.48J	ND	0.34J	ND	0.35J	0.52J
Silver, Total	180	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium, Total	NS	NS	580	250	1400	640	230	280	320	650	240	280
Thallium, Total	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium, Total	NS	NS	15	15	12	13	16	14	15	15	14	12
Zinc, Total	10000	109	**140**	28	***170***	39	47	32	93	56	33	***110***

Notes:
Bold and *Italicized* value indicates concentration exceeds Unrestricted SCOs
Bold and shaded value
J = Estimated value
ND = Not detected
NS = No Standard
- = Not Analyzed
* = 6 NYCRR Part 375-6.8(a) Unrestricted Use SCOs
** = 6 NYCRR Part 375-6.8(b)

TABLE 4

Soil Analytical Data Summary - Pesticides
Phase II Subsurface Investigation
Block 699, Lot 5, 60, 61, and 65
Manhattan, New York

Sample ID Lab Sample ID Sample Date Sample Media Unit of Measure	*NY-RESRR	**NY-UNRES	W23-SB01 (2-3') L1602637-08 2/1/2016 Soil mg/kg	W23-SB01 (9-10') L1602637-01 2/1/2016 Soil mg/kg	W23-SB02 (2-3') L1602637-09 2/1/2016 Soil mg/kg	W23-SB02 (8-9') L1602637-02 2/1/2016 Soil mg/kg	W23-SB02 (8-9') DUPLICATE L1602637-07 2/1/2016 Soil mg/kg	W23-SB03 (2-3') L1602637-03 2/1/2016 Soil mg/kg	W23-SB04 (5-7') L1602637-04 2/1/2016 Soil mg/kg	W23-SB05 (1-2') L1602637-05 2/1/2016 Soil mg/kg	W23-SB06 (1-2') L1602637-06 2/1/2016 Soil mg/kg	W23-SB07 (6.5-7.5') L1602736-01 2/2/2016 Soil mg/kg	W23-SB08 (1-2') L1602736-08 2/2/2016 Soil mg/kg	W23-SB08 (7.5-8.5') L1602736-02 2/2/2016 Soil mg/kg	W23-SB09 (1-2') L1602736-03 2/2/2016 Soil mg/kg	W23-SB09 (6-7') L1602736-09 2/2/2016 Soil mg/kg	W23-SB10 (1-2') L1602736-04 2/2/2016 Soil mg/kg	W23-SB11 (1-2') L1602736-11 2/2/2016 Soil mg/kg	W23-SB11 (6.5-7.5') L1602736-05 2/2/2016 Soil mg/kg	W23-SB12 (1-2') L1602736-06 2/2/2016 Soil mg/kg
Pesticides																				
Delta-BHC	100	0.04	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Lindane	1.3	0.1	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Alpha-BHC	0.48	0.02	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Beta-BHC	0.36	0.036	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Heptachlor	2.1	0.042	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Aldrin	0.097	0.005	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Heptachlor epoxide	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Endrin	11	0.014	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Endrin aldehyde	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Endrin ketone	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Dieldrin	0.2	0.005	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
4,4'-DDE	8.9	0.0033	ND	-	***0.0296***	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
4,4'-DDD	13	0.0033	ND	-	0.00189	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
4,4'-DDT	7.9	0.0033	ND	-	***0.0195***	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Endosulfan I	24	2.4	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Endosulfan II	24	2.4	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Endosulfan sulfate	24	2.4	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Methoxychlor	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Toxaphene	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Chlordane	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
cis-Chlordane	4.2	0.094	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
trans-Chlordane	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-

Notes:
Bold and *Italicized* value indicates concentration exceeds Unrestricted SCOs
Bold and shaded value
J = Estimated value
ND = Not detected
NS = No Standard
- = Not Analyzed
* = 6 NYCRR Part 375-6.8(a) Unrestricted Use SCOs
** = 6 NYCRR Part 375-

TABLE 5

Soil Analytical Data Summary - PCBs
Phase II Subsurface Investigation
Block 699, Lot 5, 60, 61, and 65
Manhattan, New York

Sample ID Lab Sample ID Sample Date Sample Media Unit of Measure	*NY-RESRR	**NY-UNRES	W23-SB01 (2-3') L1602637-08 2/1/2016 Soil mg/kg	W23-SB01 (9-10') L1602637-01 2/1/2016 Soil mg/kg	W23-SB02 (2-3') L1602637-09 2/1/2016 Soil mg/kg	W23-SB02 (8-9') L1602637-02 2/1/2016 Soil mg/kg	W23-SB02 (8-9') DUPLICATE L1602637-07 2/1/2016 Soil mg/kg	W23-SB03 (2-3') L1602637-03 2/1/2016 Soil mg/kg	W23-SB04 (5-7') L1602637-04 2/1/2016 Soil mg/kg	W23-SB05 (1-2') L1602637-05 2/1/2016 Soil mg/kg	W23-SB06 (1-2') L1602637-06 2/1/2016 Soil mg/kg	W23-SB07 (6.5-7.5') L1602736-01 2/2/2016 Soil mg/kg	W23-SB08 (1-2') L1602736-08 2/2/2016 Soil mg/kg	W23-SB08 (7.5-8.5') L1602736-02 2/2/2016 Soil mg/kg	W23-SB09 (1-2') L1602736-03 2/2/2016 Soil mg/kg	W23-SB09 (6-7') L1602736-09 2/2/2016 Soil mg/kg	W23-SB10 (1-2') L1602736-04 2/2/2016 Soil mg/kg	W23-SB11 (1-2') L1602736-11 2/2/2016 Soil mg/kg	W23-SB11 (6.5-7.5') L1602736-05 2/2/2016 Soil mg/kg	W23-SB12 (1-2') L1602736-06 2/2/2016 Soil mg/kg
Polychlorinated Biphenyls (PCBs)																				
Aroclor 1016	1	0.1	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Aroclor 1221	1	0.1	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Aroclor 1232	1	0.1	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Aroclor 1242	1	0.1	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Aroclor 1248	1	0.1	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Aroclor 1254	1	0.1	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Aroclor 1260	1	0.1	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	0.0156J	-	-
Aroclor 1262	1	0.1	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Aroclor 1268	1	0.1	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
PCBs, Total	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	0.0156J	-	-

Notes:
Bold and *Italicized* value indicates concentration exceeds Unrestricted SCOs
Bold and shaded
J = Estimated value
ND = Not detected
NS = No Standard
- = Not Analyzed
* = 6 NYCRR Part 375-6.8(a) Unrestricted Use SCOs
** = 6 NYCRR Part

Table 6.
Proposed RIWP Sample Rationale and Analysis
Remedial Investigation Work Plan
555 West 22nd Steet

Matrix	Sample ID	Rationale	Sample Depth	Drilling Method	Sampling Method	Analytical Method
Soil	SB13	Evaluate offsite soil conditions	One sample will be collected at the bottom of the sample location (approximately 16-17 feet bgs) and one sample TBD per field screening	Geoprobe with a Hollow Stem Auger	PID Screening/ Grab	VOCs by EPA 8260C, SVOCs by EPA 8270D, TAL Metals by 6010C/7471B, PCBs by EPA 8082, and pesticides by 8081B
	SB14	Evaluate potential soil impacts from former onsite pump island		Geoprobe		
	SB15	Evaluate potential soil impacts from former boiler room source(s)				
	SB16	Evaluate potential soil impacts from former onsite UST and boiler room source(s)				
	SB17	General site coverage and site characterization				
	SB18	Evaluate potential soil impacts from former onsite USTs				
	SB19	Evaluate downgradient soil conditions				
	SB20	General site coverage and site characterization				
	SB21					
	SB22					
	SB23	Evaluate potential soil impacts from former onsite USTs				
	SB24					
	SB25	Evaluate potential offsite soil conditions		Geoprobe with a Hollow Stem Auger		
	SB26	Evaluate potential soil impacts from former onsite USTs				
	SB27	General site coverage and site characterization		Geoprobe		
	SB28	Evaluate potential soil impacts from former onsite USTs		Geoprobe with a Hollow Stem Auger		
	SB29	General site coverage and site characterization		Geoprobe		
	SB30	General site coverage and site characterization				
Groundwater	GW13 (MW01)	Evaluate groundwater flow direction and potential for offsite migration	~ 9 ft	Geoprobe with a Hollow Stem Auger	Low Flow Peristaltic Pump	VOCs by EPA 8260C; SVOCs by EPA 8270D, TAL Metals by 6010C/7472B (filtered and unfiltered), PCBs by EPA 8082, and pesticides by EPA 8081B
	GW14	Evaluate groundwater flow direction and estimate impacts to onsite groundwater downgradient of abandoned in place USTs and/or former pump island				
	GW18					
	GW19 (MW02)	Evaluate groundwater flow direction and potential for offsite migration				
	GW25 (MW03)	Evaluate groundwater flow direction and potential impacts from upgradient offsite source(s)				
	GW26	Evaluate groundwater flow direction and estimate impacts to onsite groundwater				
	GW28					
	GW29	Evaluate groundwater flow direction and potential impacts from upgradient offsite source(s)				
Soil Vapor	SV01	Evaluate potential onsite soil vapor impacts in basement area	2 inches below the building slab	Soil Vapor Probe (Geoprobe or Hammer Drill)	2-Hour Summa Canister	VOCs by EPA TO-15
	SV02	Evaluate potential onsite soil vapor impacts in former boiler room				
	SV03	Perimeter sample to evaluate potential for offsite migration	2 inches below the parking lot / storage area slab			
	SV04	Perimeter sample to evaluate potential for offsite vapor intrusion				
	SV05					
	SV06	Located in the center of the Site to provide site coverage	2 inches below the building slab			
Air	IA01	Indoor air sample to evaluate potential air impacts to Building A	4 - 6 ft above building slab	Not Applicable	8-Hour Summa Canister	VOCs by EPA TO-15
	AA01	Ambient air sample for background comparison purposes	4 - 6 ft above ground surface			

Notes:
MS/MSD = matrix spike / matrix spike duplicate
TBD = to be determined

The following QA/QC samples are proposed for collection:
Soil: One (1) field duplicate and one (1) MS/MSD with the full suite of analyses per 20 samples.
Groundwater: One (1) field duplicate and one (1) MS/MSD with the full suite of analyses per 20 samples.

APPENDIX A

PREVIOUS ENVIRONMENTAL REPORTS:

1. Boring Report, U-Haul Corporation New York City, American Hi-Tech, Inc., 1994.
2. Tank Removal Letter, U-Haul #803-62 562 West 23rd Street, New York, NY, Tyree Brothers Environmental Services, Inc., April 1997.
3. Closure Report for the Excavation of Underground Storage Tanks, U-Haul #803-62 562 West 23rd Street, New York, NY, Tyree Brothers Environmental Services, Inc., July 1997.
4. Site Assessment Report; U-Haul Moving Center #803-62, 562 West 23rd Street, New York, NY, Pinnacle Environmental Technologies, 1997.
5. Groundwater Sampling Report, 562 West 23rd Street, New York, NY, Pinnacle Environmental Technologies, 1998.
6. Quarterly Groundwater Sampling Reports, 562 West 23rd Street, New York, NY, Pinnacle Environmental Technologies, 1999.
7. Site Closure Letter, NYSDEC Spills 9000199 & 9700188, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2000.
8. Site Investigation Report, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2001.
9. Supplement to the Site Investigation Report, Groundwater Modeling, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2001.
10. Underground Storage Tank Closure and Focused Subsurface Investigation, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2002.
11. Report on Drum Removal, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2002.
12. Phase I Environmental Site Assessment, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2002.
13. 5,000-gallon Tank Closure Report, 562 West 23rd Street, New York, NY, Environmental Resources Management, 2006
14. Phase I Environmental Site Assessment, 562 West 23rd Street, New York, NY, Integral Engineering, 2015
15. Limited Phase II Environmental Site Investigation, 555 West 22nd Street, New York, NY, Integral Engineering, 2016

AMERICAN HI-TECH, INC.
ENVIRONMENTAL ENGINEERING AND CONTRACTING

39 Avenue at the Commons
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Shrewsbury, NJ 07702
(908) 389-8181
(908) 542-7776 Fax

4616 Abbington Drive
P.O. Box 6702
Harrisburg, PA 17112
(717) 657-3325
(800) 283-3349

U-HAUL CORPORATION

NEW YORK CITY

BORING REPORT

1994

in which the facility is located is heavily industrialized. The background sample indicates the elevated VOA and B/N levels are an ambient condition of the site.

2.3.6 SITE #6

U-Haul, Park Slope, 259 6th St. Brooklyn, NY

As discussed in the July 8th Dames and Moore Work Plan, no site assessment is required for this site.

2.3.7 SITE #7

U-Haul, 622 Atlantic Ave. Brooklyn, NY

A site investigation report for site #7 and #8 has been presented to the NYSDEC for review by American Hi-Tech, Inc. as part of a separate document Dated Dec.12,1994.

2.3.8. SITE #8

U-Haul, 3270 Broadway, Manhattan, NY

A site assessment report for sites #7 and #8 has been presented to the NYSDEC. for review by AHT as part of a separate document dated Dec. 12, 1994.

2.3.9 SITE #9

[redacted]

Background

This site is located in the Chelsea section of Manhattan (figure 9-1). The facility is bounded on the north by west 23rd St. on the west by Eleventh Ave. and on the east and south by commercial properties. The site is currently used as a U-Haul training facility. The general site area may be characterized as a mix of residential and commercial properties.

The NYSDEC PBS Facility Information Report identifies two active 1,000 gallon steel UST's which store gasoline and diesel. AHT is in agreement.

The PBS Facility Information Report also notes a 550 gallon steel gas UST closed-in-place and a 1,000 gallon steel fuel oil UST removed.

In our field observations we noted that the 550 gallon gas tank smelled of gasoline indicating that this tank, if closed, was not properly closed-in-place.

Visual observations of the 1,000 gallon fuel oil tank, which was removed according to the PBS Facility Information Report, indicated that the floor had not been disturbed, fill and vent pipes are still present, and a strong smell of gasoline was present. We feel this tank is most likely a 1,000 gallon gasoline tank, not fuel oil, and may have been closed-in-place, not removed.

The fuel ports for both tanks had a strong gasoline odor when the covers were removed.

The Facility Information Report notes that the two active UST's, which were installed in 1991, were most recently subject to integrity testing in January,1994. AHT personnel observed these tanks in use.

A spill report, No. 9000199, dated March 26, 1994 for this site reports a failed gasoline tank test.

The small stained zone reported by the NYDEC on the concrete sidewalk outside the facility was not observed during AHT's site invesitgation.

All of the tanks at this site are located in a garage at street level.

Site Geology+ Hydrogeology

The site lies on the Manhattan formation. This formation is composed of primarily micaceous schist. Glacial drift deposit overlie the bedrock unit. However, low lying areas are composed of fill material. Ground water was encountered during soil boring at 8 feet. The regional groundwater flow is anticipated to be westerly toward the Hudson River.

SITE ASSESSMENT ACTIVITIES

Utility Markout

A utility markout was performed as discribed for Site #1 in section 2.3.1 of this report.

Overland Geophysical Survey

An overland geophysical survey was performed as described for Site #1 in section 2.3. of this report. A survey located the closed-in-place 550 gallon UST and the 1,000 gallon UST, which was not removed but abandon in place.. Both tanks are thought to have stored gasoline.

Site Investigation

AHT was contracted to drill and collect four soil borings. Two soil borings were collected from the vicinity of the closed-in-place 550 gallon gasoline UST. Additionally, two soil borings were collected adjacent to the closed-in-place 1,000 gallon gasoline UST. (see figure 9-2). All four soil borings were collected at the soil/water interface at 8 ft. These borings were collected as described in section 2.2 of this report. One background sample was collected inside the garage in the northern portion of the building at a depth of approximately 8 feet. No piping runs were observed during the site investigation.

Because the two active UST's reportly passed recent integrity testing, no additional testing was completed.

A summary of the sampling event is as follows: (Table 11)

Table 11 - Site 9

Sample ID	Sample Depth in Feet	Analysis	Location	Remarks
BG-1	8	MTBE 8020,8270	N.E corner of property	no headspace
B-1	8	MTBE 8020,8270	550 gasoline closed UST	no headspace
B-2	8	MTBE 8020,8270	550 gasoline closed UST	no headspace
B-3	8	MTBE 8020,8270	1,000 gasoline closed UST	headspace 0 to 20 PPM
B-4	8	MTBE 8020,8270	1,000 gasoline closed UST	headspace 0 to 20 PPM

The headspace readings were detected at soil/water interface. As a result, one sample was collected and analyzed per boring.

No staining related to site operations were observed on the sidewalk.

Laboratory Analysis

All of the soil samples collected were analyzed by ICM Laboratories, A NYS Dept of Health approved Lab. All of the samples collected were analyzed for methods 8021+ MTBE and 8270. A complete QA/ QC package can be found in appendix D.

A summary of the soil sample results is as follows: (Table 12)

Table 12 - Site 9

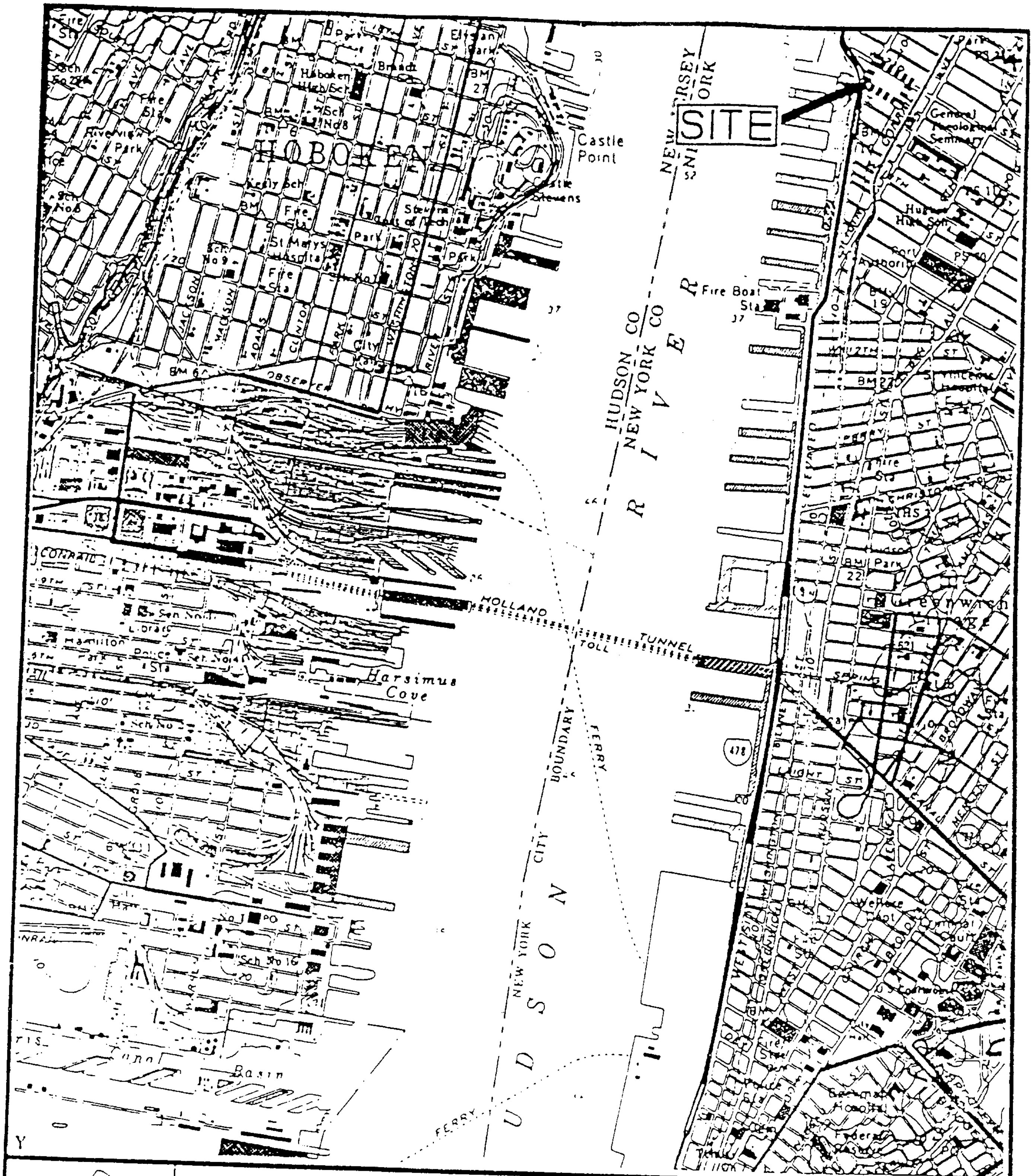
Sample ID	EPA MEthod 8021 ug/kg	EPA Method 8270 ug/kg
SG- 1	UD	UD
SB- 1	UD	UD
SB- 2	Benzene = 1.1 Ethylbenzene = 1.6 M/P-xylene =1.8 1,2,4-Trimethylbenzene=.9 1,3,5-Trimethylbenzene=2.1 MTBE=4.5	*Napthalene=2700
SB- 3	UD	Phenanthrene=410 Fluoranthene=630 Pyrene=830 *Chrysene=630 *Benzo(k)fluoranthene=1800 *Benzo(a)pyrene=960 *Indeno(1,2,3-cd)pyrene=300 *Benzo(g.h.i)perylene=280
SB- 4	*Benzene = 200 *Ethylbenzene = 9900 *Toluene=1500 *o-Xylene=1100 *M/P-xylene = 1700 *Isopropylbenzene=2100 *n-Propylbenzene=10000 *p-Isopropyltoluene=1700 *1,2,4-Trimethylbenzene=16000 *1,3,5-Trimethylbenzene=3700 *n-Butylbenzene=19000 *sec-Butylbenzene=15000 *Napthalene=6400 MTBE=120	UD

* Exceed the clean up levels.

REMEDIAL STRATEGY

Soil

AHT recommends both UST's be removed. All soil shoud be field screened with a PID and all contaminated soil removed. Since each tank is in a seperate area, we recommend a total of four soil samples be collected. One three point composite sample collected along the center line of each tank, and a four point composite sample collected from the four sidewalls of the excavations. All of the samples would be analyzed for methods 8021 + MTBE + 8270. All soils should be remediated to below the clean up levels.



N

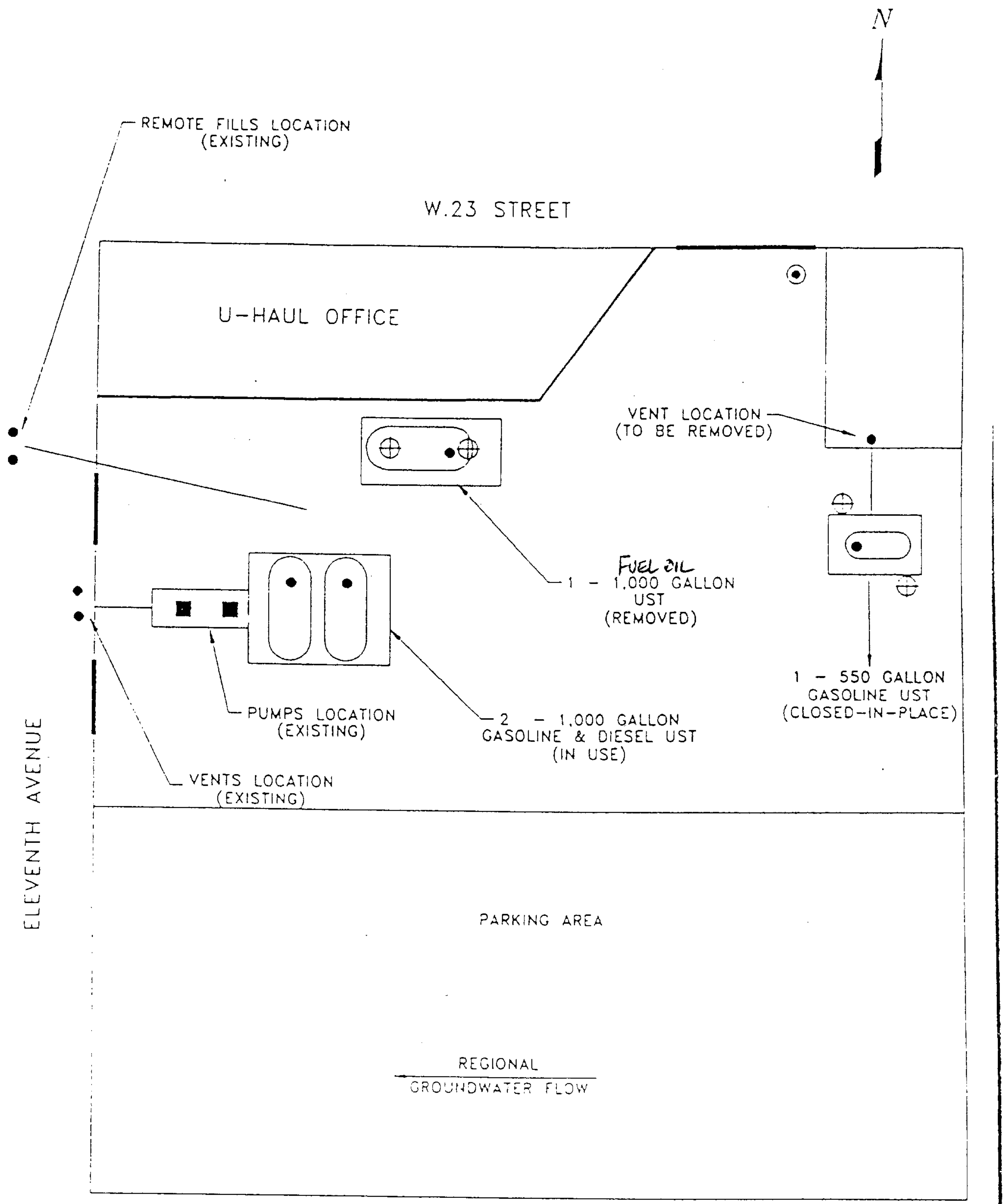
0 2000 4000

SCALE IN FEET

U-HAUL SITE NO. 9
562 W. 23 STREET
MANHATTAN, NEW YORK

SITE LOCATION MAP

REFERENCE:
U.S.G.S. 7.5' QUADRANGLE



NOTE:

⊕ PROPOSED SOIL BORING LOCATION

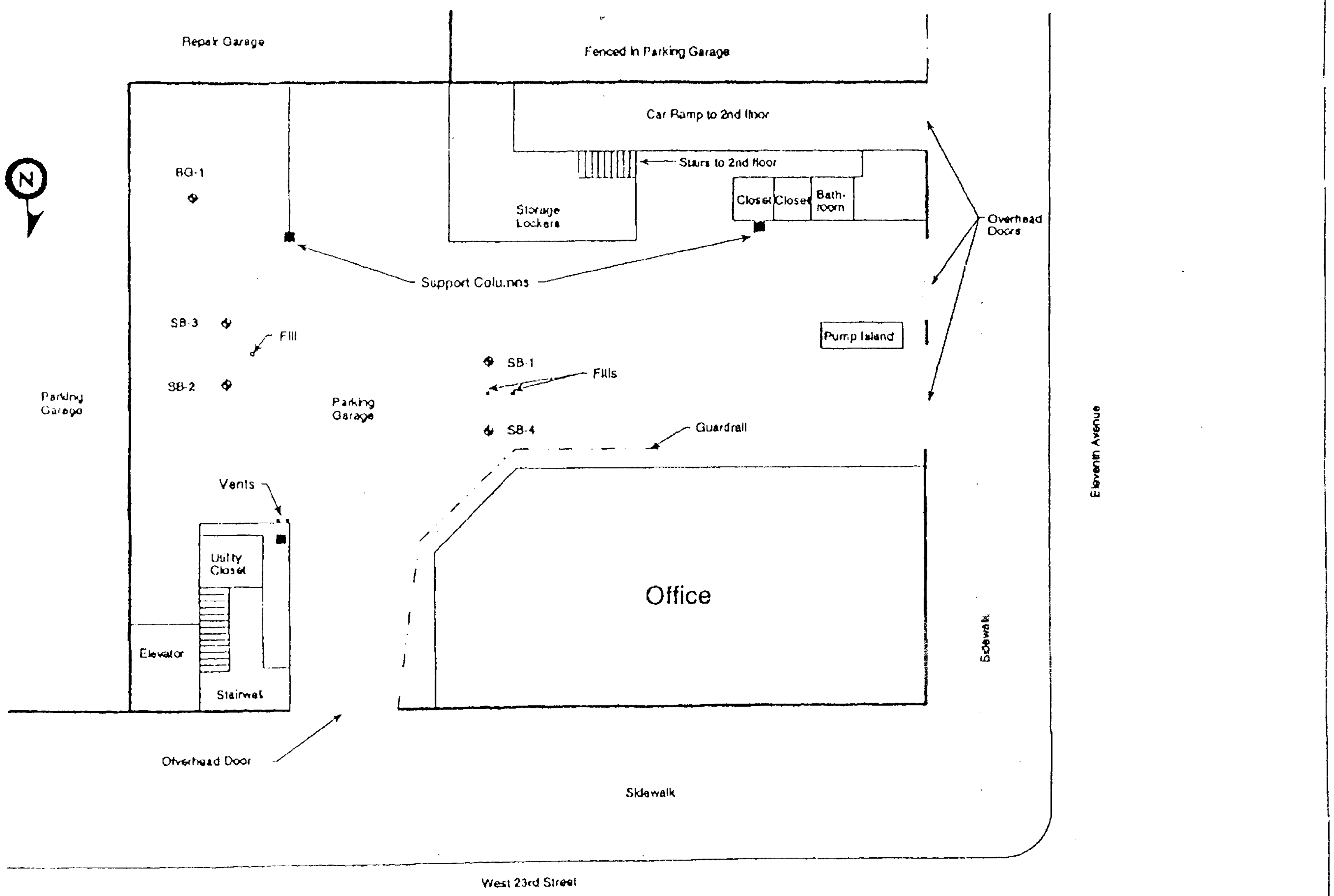
⊙ PROPOSED BACKGROUND SAMPLE LOCATION

NOTE:
THIS GENERALIZED SITE LOCATION PLAN WAS OBTAINED FROM "WORK PLAN FOR THE SITE ASSESSMENT AT THE U-HAUL LOCATIONS" PREPARED BY TONE TANK & PUMP, INC. DATED DECEMBER, 1993

U-HAUL SITE NO. 9 552 W. 23 ST. MANHATTAN, NEW YORK
UST AND PROPOSED BORING LOCATION PLAN

28679\001-8

U-HAUL 562 W. 23rd St.
Soil Boring Location Map



AMERICAN HI-TECH, INC.	174 PATTERSON AVE., SHREWSBURY, N.J. 07701 (908) 747 3349 FAX (908) 747 4164	DATE: 10-17-94	SCALE 1" = 25'	TITLE: U-HAUL 562 W. 23rd St. Soil Boring Location Map	DWG NO: 009-1 MK

Site No. 9 - 562 West 23rd Street, Manhattan
Soil Analytical Results
Volatile Organic Compounds

Reported Compounds	TCLP Alternative Guidance Value - Ca (ug/kg)	Human Health Guidance Value - Ch (ug/kg)	Volatile Organic Compounds - EPA Method 8021 (ug/kg)				
			BG-1-8'	B-1-8'	B-2-8'	B-3-8'	B-4-8'
Benzene	14	24,000	ND < 1	ND < 1	**1.1**	ND < 1	**200**
Toluene	100	20,000,000	ND < 1	ND < 1	ND < 1	ND < 1	**1,500**
Ethylbenzene	100	8,000,000	ND < 1	ND < 1	**1.6**	ND < 1	**9,900**
o-Xylene	100	2,000,000	ND < 1	ND < 1	ND < 1	ND < 1	**1,100**
m/p-Xylene	100	2,000,000	ND < 1	ND < 1	**1.8**	ND < 1	**1,700**
Isopropylbenzene	100	-	ND < 1	ND < 1	ND < 1	ND < 1	**2,100**
n-Propylbenzene	100	-	ND < 1	ND < 1	ND < 1	ND < 1	**10,000**
p-Isopropyltoluene	100	-	ND < 1	ND < 1	ND < 1	ND < 1	**1,700**
1,2,4-Trimethylbenzene	100	-	ND < 1	ND < 1	**0.9**	ND < 1	**16,000**
1,3,5-Trimethylbenzene	100	-	ND < 1	ND < 1	**2.1**	ND < 1	**3,700**
n-Butylbenzene	100	-	ND < 1	ND < 1	ND < 1	ND < 1	**19,000**
sec-Butylbenzene	100	-	ND < 1	ND < 1	ND < 1	ND < 1	**15,000**
Napthalene	200	300,000	ND < 1	ND < 1	ND < 1	ND < 1	**6,400**
MTBE	1,000	-	ND < 1	ND < 1	**4.5**	ND < 1	ND < 120

Shaded cells contain values exceeding either Ca or Ch Guidance Values
ug/kg - micrograms per kilogram
ND - Not detected at a concentration greater than the specified quantitation limit

Site No. 9 - 562 West 23rd Street, Manhattan
Soil Analytical Results
Semi-Volatile (Base-Neutral) Organic Compounds

Reported Compounds	TCLP Alternative Guidance Value - Ca (ug/kg)	Human Health Guidance Value - Ch (ug/kg)	Semi-Volatile (Base-Neutral) Organic Compounds EPA Method 8270 (ug/kg)				
			BG-1-8'	B-1-8'	B-2-8'	B-3-8'	B-4-8'
Acenaphthene	400	5,000,000	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
Acenaphthyene	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
Anthracene	1,000	20,000,000	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
Azobenzene	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
Benzo(a)anthracene	TCLP	220	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
Benzo(b)fluoranthene	TCLP	220	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
Benzo(k)fluoranthene	TCLP	220	ND < 220	ND < 200	ND < 200	**1,800**	ND < 200
Benzo(ghi)perylene	TCLP	-	ND < 220	ND < 200	ND < 200	**280**	ND < 200
Benzo(a)pyrene	TCLP	61	ND < 220	ND < 200	ND < 200	**960**	ND < 200
Benzidine	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
bis(2-Chloroethyoxy)methane	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
bis(2-Chloroethyl)ether	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
bis(2-Chloroisopropyl)ether	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
bis(2-Ethylhexyl)phthalate	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
4-Bromophenylphenylether	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
Butyl benzyl phthalate	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
4-Chlorophenylphenylether	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
2-Chloronaphthalene	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
Chrysene	TCLP	-	ND < 220	ND < 200	ND < 200	**630**	ND < 200
Dibenzo(a,h)anthracene	1,000	14	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
Di-n-butylphthalate	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
1,2-Dichlorobenzene	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
1,3-Dichlorobenzene	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
1,4-Dichlorobenzene	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
3,3'-Dichlorobenzidine	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
Diethylphthalate	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200

Site No. 9 - 562 West 23rd Street, Manhattan
Soil Analytical Results
Semi-Volatile (Base-Neutral) Organic Compounds

Reported Compounds	**TCLP Alternative Guidance Value - Ca (ug/kg)**	**Human Health Guidance Value - Ch (ug/kg)**	**Semi-Volatile (Base-Neutral) Organic Compounds EPA Method 8270 (ug/kg)**				
			BG-1-8'	B-1-8'	B-2-8'	B-3-8'	B-4-8'
Dimethylphthalate	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
2,4-Dinitrotoluene	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
2,6-Dinitrotoluene	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
Di-n-octyphthalate	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
Fluoranthene	1,000	3,000,000	ND < 220	ND < 200	ND < 200	**630**	ND < 200
Fluorene	1,000	3,000,000	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
Hexachlorobenzene	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
Hexachlorobutadiene	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
Hexachlorocyclopentadiene	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
Hexachloroethane	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
Indeno(1,2,3-cd)pyrene	TCLP	-	ND < 220	ND < 200	ND < 200	**300**	ND < 200
Isophorone	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
Napthalene	200	300,000	ND < 220	ND < 200	**2,700**	ND < 190	ND < 200
Nitrobenzene	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
N-Nitrodimethylamine	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
N-Nitrosodi-n-propylamine	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
N-Nitrodiphenylamine	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200
Phenanthrene	1,000	-	ND < 220	ND < 200	ND < 200	**410**	ND < 200
Pyrene	1,000	2,000,000	ND < 220	ND < 200	ND < 200	**830**	ND < 200
1,2,4-Trichlorobenzene	-	-	ND < 220	ND < 200	ND < 200	ND < 190	ND < 200

Shaded cells contain values exceeding either Ca or Ch Guidance Values

ug/kg - micrograms per kilogram

ND - Not detected at concentrations greater than the specified quantitation limit

The Tyree Organization

CLOSURE REPORT
FOR THE EXCAVATION OF
UNDERGROUND STORAGE TANKS
U-HAUL #803-62
562 WEST 23RD STREET
NEW YORK, NEW YORK
SPILL #97-00188

JULY 1997

PREPARED FOR:

U-HAUL CORPORATION
P.O. BOX 21502
2721 NORTH CENTRAL SUITE 700
PHOENIX, AZ 85036

PREPARED BY:

LESLIE KOVALSKY
ENVIRONMENTAL SCIENTIST

REVIEWED BY:

JOSEPH M. PISEL
CONSTRUCTION MANAGER

TYREE BROTHERS ENVIRONMENTAL SERVICES, INC.
208 ROUTE 109
FARMINGDALE, NEW YORK 11735
(516) 249 -3150

The Tyree Organization

TABLE OF CONTENTS

The Tyree Organization

Background

Tyree Brothers Environmental Services (TBES), serving as contractor to U-Haul Corporation, conducted underground storage tank (UST) removal activities at the U-Haul #803-62 facility, located at 562 West 23rd Street, New York, New York. The U-Haul facility is located on the east side of 11th Street, and the tanks removed and discussed within this report were located within the boundaries of the property. The New York State Department of Environmental Conservation (NYSDEC), Region II was informed of the removal of the two (2) underground storage tanks. Spill #97-00188 had already been issued for the location. Figure 1 is a site map indicating the tank layout and soil sample locations.

Field Activities

On April 8th through April 11, 1997 field activities at the above-referenced property included the excavation and removal of two (2) 1,000 gallon, single wall, plasteel, underground gasoline and diesel storage tanks. The installation date (s) of these two (2) underground storage tanks is unknown.

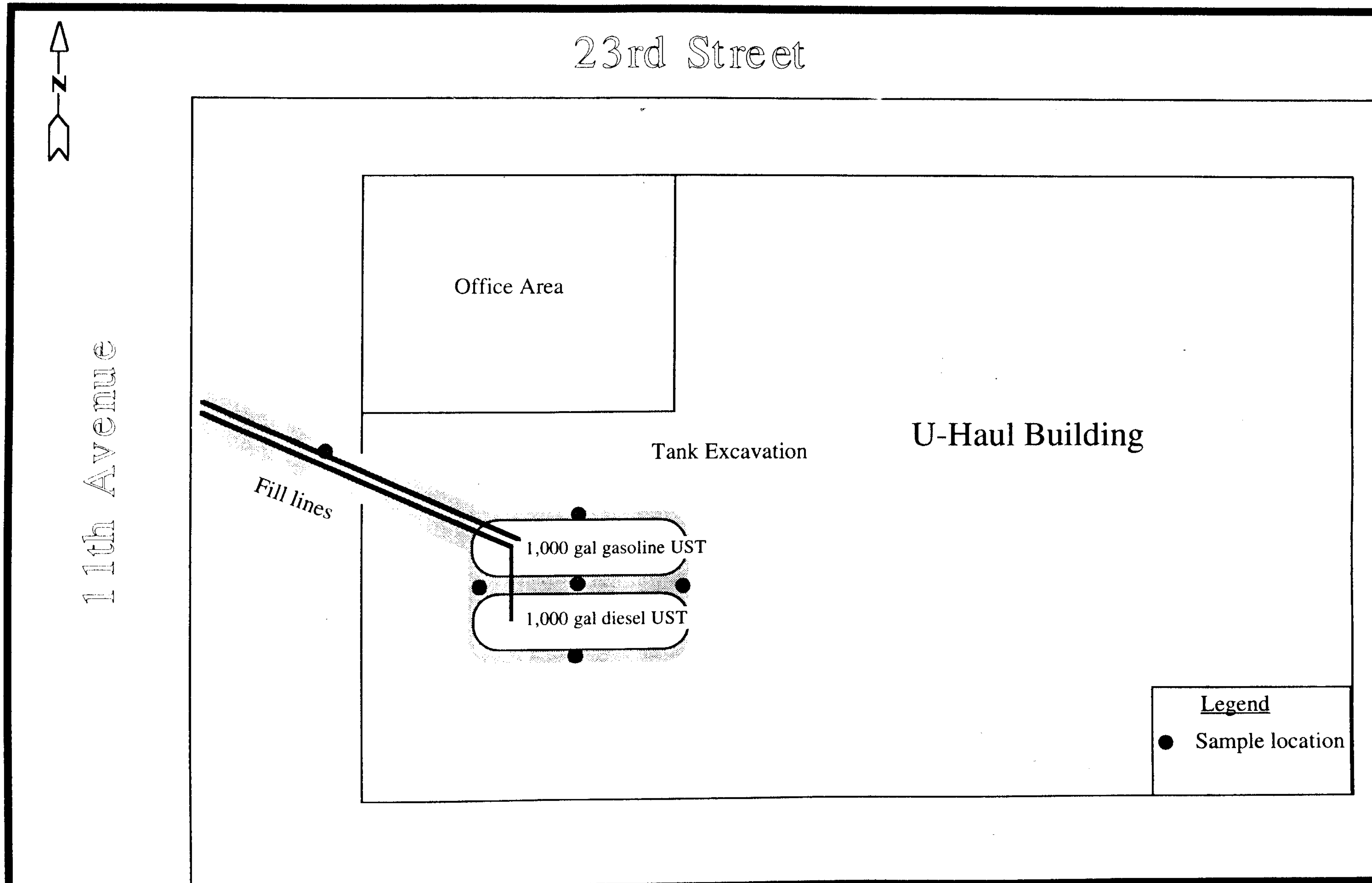
Hydrogeologist, Kevin Hale, from Tyree Brothers Environmental Services, Inc. (TBES) was present on site to document field activities, screen soils, inspect the tanks, and collect endpoint samples as mandated by the NYSDEC.

In order to prepare the tanks for removal, the tanks were deadlined by removing approximately 39 gallons of non-hazardous petroleum contaminated wastewater. This wastewater was removed by TBES and transported to their treatment facility in Farmingdale, New York. The disposal manifest is located in Appendix IV.

Steel Tank Excavation

The tank removal activities were initiated by exposing the gasoline and diesel tanks, which were located approximately two (2) feet below grade.

Prior to cutting the tanks, the interiors and the surrounding areas were tested for explosive gases using a combustible gas and oxygen level detector. Air monitoring was performed on the site and the immediate surrounding areas with a Photovac Microtip HL-2000, photoionization detector (PID) and an explosion meter. The tanks were cut using non-sparking pneumatic tools. A hole was cut into each of the tanks in order to facilitate the cleaning of the tanks. The tanks were properly cleaned and decontaminated of residual



DRAWN BY: L. Kovalsky
SCALE: NTS
DATE: 7-24-97

U-Haul #803-62
562 West 23rd Street
New York, New York

Tyree Brothers
Environmental Services, Inc.
208 Route 109
Farmingdale, New York 11735

sludges. The tanks were then transported to a scrap metal facility for recycling. One (1) 55 gallon DOT drum of sludge was generated by the tank cleaning activities. A disposal manifest for the drum appear in Appendix IV. Four (4) other drums that were previously generated were also disposed of at the same time.

The excavation extended to a depth of approximately ten (10) feet in the tank area. The fill lines excavation through the sidewalk was approximately four (4) feet deep. The gasoline and diesel tanks did not show any signs of corrosion. The tank condition reports and photodocumentation of the tank removal activities appear in Appendices I and II respectively.

Soil Screening

The excavated soils were screened using a Photovac Microtip HL-2000, photoionization detector (PID). The PID meter is used to measure organic vapors as they evolve from the soils. The readings are not exact determinations of true volatile content, but instead provide qualitative indications of the degree of volatile organic contamination. Several different grab samples from various sides of the excavations were obtained. The endpoint samples from the gasoline and diesel excavation contained volatile organic vapors measured in the headspace ranging from one (1) to five (5) parts per million, but no petroleum odors. The soils encountered during the excavation activities were generally fine grain sands and silts with pebbles and cobbles. Table 1 depicts the PID readings obtained from the excavation.

The soil immediately above the fill line exhibited petroleum odors. The impacted soil from the fill line, 8.45 tons, was subsequently stockpiled on the site. A disposal manifest for the stockpile is included in Appendix IV.

TABLE 1

Field Screening of Soils
Gasoline and Diesel UST Excavation

Sample	Depth below grade	PID Reading (ppm)	Location
1	8.0'	5.0	North Wall
2	8.0'	4.0	South Wall
3	8.0'	5.0	East Wall
4	8.0'	1.0	West Wall
5	10.0'	2.0	Bottom

ND Non-detect

Laboratory Analysis

A total of six (6) soil samples were collected from the fill lines, bottom and side walls of the gasoline and diesel tank excavation. All of the soil samples were placed in clean, laboratory supplied containers with zero headspace. The samples were hand delivered under chain of custody to a NYS certified laboratory, to be analyzed for Volatile and Semi-Volatile Organic Compounds, via EPA Methods 8021 and 8270 - Base Neutrals Only.

The results of the analysis were compared to the NYSDEC soil guidelines as published in the Spill Technology And Remediation Series (STARS) Memo #1, August 1992. The alternative guidance value was used for non-TCLP concentrations. A summary of the compounds detected can be found in Tables 2 and 3. Complete laboratory results appear in Appendix III.

Table 2

Summary of Soil Analytical Results
Volatile Organic Compounds via EPA 8021
Concentrations in ppm

Compound	North	South	East	West	Bottom	Fill Lines	Guidance Values
MTBE	.0057	.0116	<MDL	.0073	.0430	**7.56**	1
Benzene	<MDL	<MDL	<MDL	<MDL	<MDL	**1.01**	.1
Toluene	<MDL	<MDL	<MDL	<MDL	<MDL	**5.28**	.1
Ethylbenzene	<MDL	<MDL	<MDL	<MDL	<MDL	**.941**	.1
m,p-xylene	<MDL	<MDL	<MDL	<MDL	.0134	**66.1**	.1
o-xylene	<MDL	<MDL	<MDL	<MDL	.0072	**76.2**	.1
Xylene	<MDL	<MDL	<MDL	<MDL	.0206	**142.3**	.1
Isopropylbenzene	<MDL	<MDL	<MDL	<MDL	.0052	<MDL	.1
n-Propylbenzene	<MDL	<MDL	<MDL	<MDL	.0086	**.765**	.1
1,3,5-Trimethylbenzene	<MDL	<MDL	<MDL	<MDL	.0077	**69.8**	.1
1,2,4-Trimethylbenzene	<MDL	<MDL	<MDL	<MDL	.0222	**148**	.1
sec-Butylbenzene	<MDL	<MDL	<MDL	<MDL	.0133	**1.08**	.1
p-Isopropyltoluene	<MDL	<MDL	<MDL	<MDL	.0097	**10.2**	.1
n-Butylbenzene	<MDL	<MDL	<MDL	<MDL	.0153	<MDL	.1
Naphthalene	<MDL	<MDL	<MDL	<MDL	.0251	**17.8**	.2
tert-Butylbenzene	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	.1

Table 3

Summary of Soil Analytical Results
Semi-Volatile Organic Compounds via EPA 8270 - BN
Concentrations in ppm

Compound	North	South	East	West	Bottom	Fill Lines	Guidance Values
Naphthalene	<MDL	.0665	<MDL	<MDL	<MDL	5.04	.200
Acenaphthalene	.0521	.136	.0602	.0689	.072	<MDL	.400
Fluorene	<MDL	.132	<MDL	.0579	<MDL	.295	1.000
Phenanthrene	.472	**1.35**	.541	.558	.517	.674	1.000
Anthracene	.135	.325	.167	.169	.157	<MDL	1.000
Fluoranthene	.797	**1.74**	.9	.925	.852	.75	1.000
Pyrene	.669	**1.66**	.797	.922	.772	.76	1.000
Benzo(a)anthracene	**.499**	**1.15**	**.647**	**.726**	**.63**	**.564**	.00004*
Chrysene	**.479**	**1.01**	**.6**	**.618**	**.603**	**.57**	.00004*
Benzo(b)flouranthene	**.628**	**1.33**	**.925**	1	**.955**	**.88**	.00004*
Benzo(k)flouranthene	**.245**	**.628**	**.302**	**.338**	**.322**	**.311**	.00004*
Benzo(a)pyrene	**.612**	**1.32**	**.822**	**.903**	**.898**	**.844**	.00004*
Indeno(1,2,3-cd)pyrene	**.332**	**.653**	**.423**	**.436**	**.439**	**.578**	.00004*
Dibenzo(a,h)anthracene	.0943	**.221**	.136	.133	.135	<MDL	1.000
Benzo(g,h,i)perylene	**.342**	**.65**	**.429**	**.424**	**.438**	**.65**	.00004*

Highlighted values denote levels that exceed the NYS regulatory guidance values.

Due to the high detection limit for a solid matrix, the TCLP Method must be used to demonstrate groundwater quality protection for these compounds.

As seen from the previous tables, all volatile organic compounds for the wall and bottom samples were below the guidance values. However, the sample from fill lines contained numerous volatile organic compounds detected above the NYS regulatory guidance values.

Summary

1. On April 8th through April 11, 1997, Tyree Brothers Environmental Services (TBES) removed two (2) 1,000 gasoline and diesel gallon USTs from the U-Haul #803-62, located at 562 West 23rd Street, New York, New York. The location had previously been issued Spill #97-00188 by the NYSDEC.

2. In order to deadline the tanks for removal, approximately 39 gallons of non-hazardous petroleum contaminated wastewater were removed from the site by TBES and transported to their disposal facility in Farmingdale, New York. One (1) drum of sludge was generated due to tank cleaning activities. The disposal manifests appear in this report.

3. The gasoline and diesel tanks showed no signs of deterioration. Soil in the area of the fill lines was noted to have been impacted by hydrocarbons. As a result, 8.45 tons of impacted soil was stockpiled. The disposal manifest for the stockpile appears in this report.

4. A total of six (6) soil samples were procured and submitted for laboratory analysis. The samples were analyzed by a NYS certified laboratory via EPA Methods 8021 and 8270 - BN only, as recommended by the NYSDEC guidance document, STARS Memo #1.

5. All detected volatile organic compounds for the wall and bottom samples were below the guidance values. However, the sample from the fill lines contained numerous volatile organic compounds detected above the NYS regulatory guidance values.

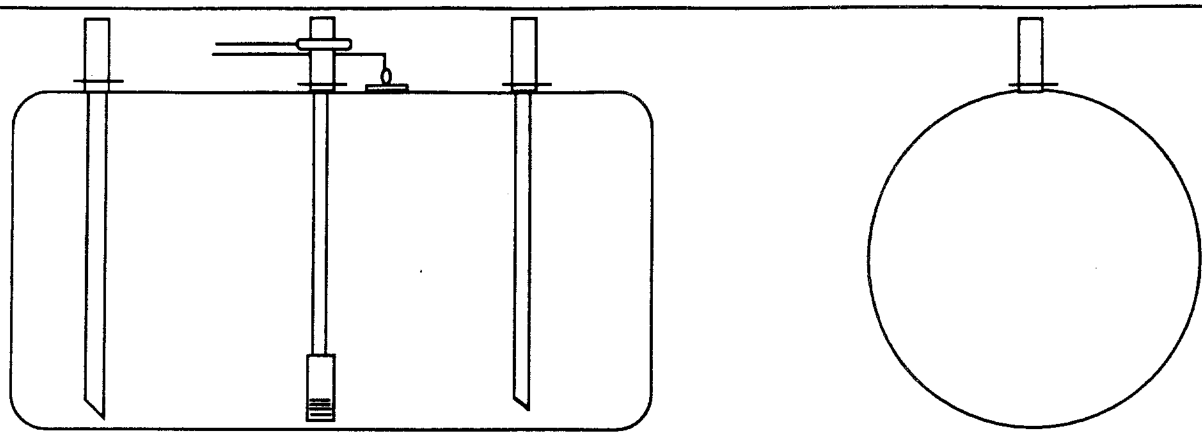
Disclaimer

This UST removal report was prepared for the use of U-Haul Corporation. Reasonable due diligence was exercised by the staff of the Tyree Brothers Environmental Services, Inc. in conducting this tank removal. The conclusions provided by Tyree Brothers Environmental Services (TBES) are based solely on the information reported in this document. The conclusions presented are based upon the current regulatory climate and may require revision if future regulatory changes occur. This investigation and report have been conducted in accordance with generally accepted practices. No other warranty, expressed or implied, is made.

The Tyree Organization

APPEND.X I

Tank Condition Reports



NOTE:
On the above tank diagram, an "X" marks the exact location of leak point(s) or areas of corrosion.

1. Tank Location: U-Haul #803-62, 23rd and 11th Avenue, New York, New York

2. Tank Information: Age ______ Years   Capacity 1,000 Gallons   [ ] Leaker   [x] Non-Leaker

Grade:
- [ ] Leaded Regular
- [ ] Leaded Premium
- [x] Unleaded Regular
- [ ] Unleaded Premium
- [ ] Diesel
- [ ] Waste Oil
- [ ] Other ______

Type:
- [ ] Steel
- [ ] Single Wall Fiberglass
- [ ] Double Wall Fiberglass
- [ ] Steel w/epoxy liner
- [ ] Steel w/sacrifical anodes
- [ ] Steel w/impressed current cathode protection
- [x] Other Plasteel

3. Type of Backfill:
- [x] Sand
- [ ] Soil
- [ ] Pea Gravel
- [ ] Crushed Stone
- [ ] Concrete Encasement
- [ ] Polyvinyl liner
- [ ] Other ______

4. Corrosion Information:
- [ ] External
- [ ] Internal
- [ ] Both
- [ ] Unknown
- [ ] Minimal

Was water table Present? NO
Number of Holes? 0
Average hole diameter? ______

Comments/Description No signs of corrosion.

5. Tank Removal Due To:
- [ ] Leak Detected/Confirmed by Tank Test
- [x] Station Renovation/Construction
- [ ] As part of ______ program.

Reported By: Kevin Hale   Date: 4/11/97

Official on Site: Koon S. Tang   Agency: NYSDEC

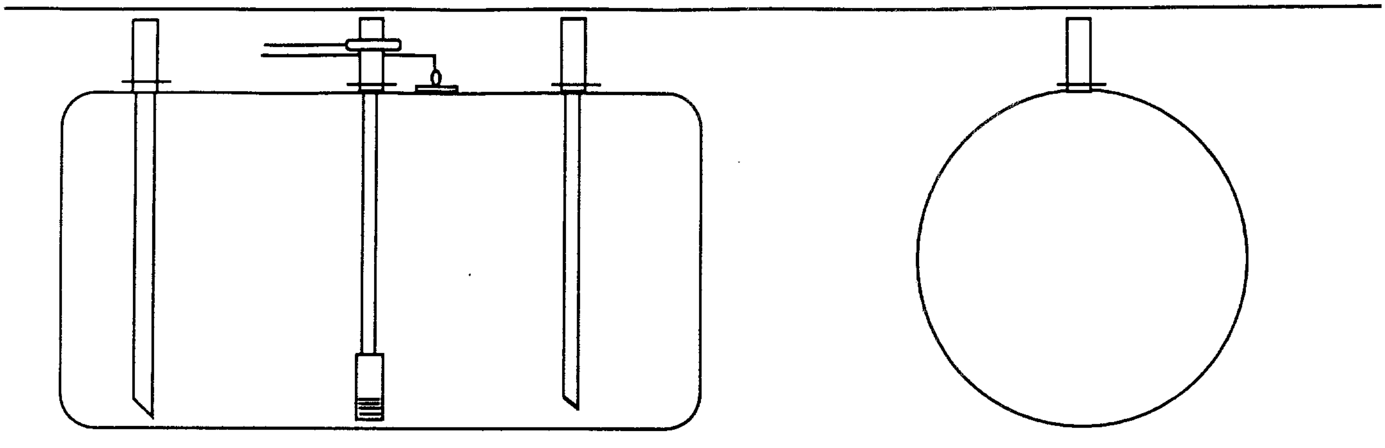
TYREE BROTHERS
ENVIRONMENTAL SERVICES, INC.
208 Route 109
Farmingdale, NY 11735

REMOVED UNDERGROUND STORAGE TANK (UST) CONDITION REPORT

U-HAUL #803-62
23RD AND 11TH AVENUE
NEW YORK, NEW YORK

Drawn By: L. Kovalsky

Date: 5/22/97



NOTE:
On the above tank diagram, an "X" marks the exact location of leak point(s) or areas of corrosion.

1. Tank Location: U-Haul #803-62, 23rd and 11th Avenue, New York, New York

2. Tank Information: Age ____ Years   Capacity 1,000 Gallons   ☐ Leaker ☒ Non-Leaker

Grade:
- ☐ Leaded Regular
- ☐ Leaded Premium
- ☐ Unleaded Regular
- ☐ Unleaded Premium
- ☒ Diesel
- ☐ Waste Oil
- ☐ Other ______

Type:
- ☐ Steel
- ☐ Single Wall Fiberglass
- ☐ Double Wall Fiberglass
- ☐ Steel w/epoxy liner
- ☐ Steel w/sacrifical anodes
- ☐ Steel w/impressed current cathode protection
- ☒ Other Plasteel

3. Type of Backfill:
- ☒ Sand
- ☐ Soil
- ☐ Pea Gravel
- ☐ Crushed Stone
- ☐ Concrete Encasement
- ☐ Polyvinyl liner
- ☐ Other ______

4. Corrosion Information:
- ☐ External
- ☐ Internal
- ☐ Both
- ☐ Unknown
- ☐ Minimal

Was water table Present? NO

Number of Holes? 0

Average hole diameter? ______

Comments/Description: No signs of corrosion.

5. Tank Removal Due To:
- ☐ Leak Detected/Confirmed by Tank Test
- ☒ Station Renovation/Construction
- ☐ As part of ______ program.

Reported By: Kevin Hale   Date: 4/11/97

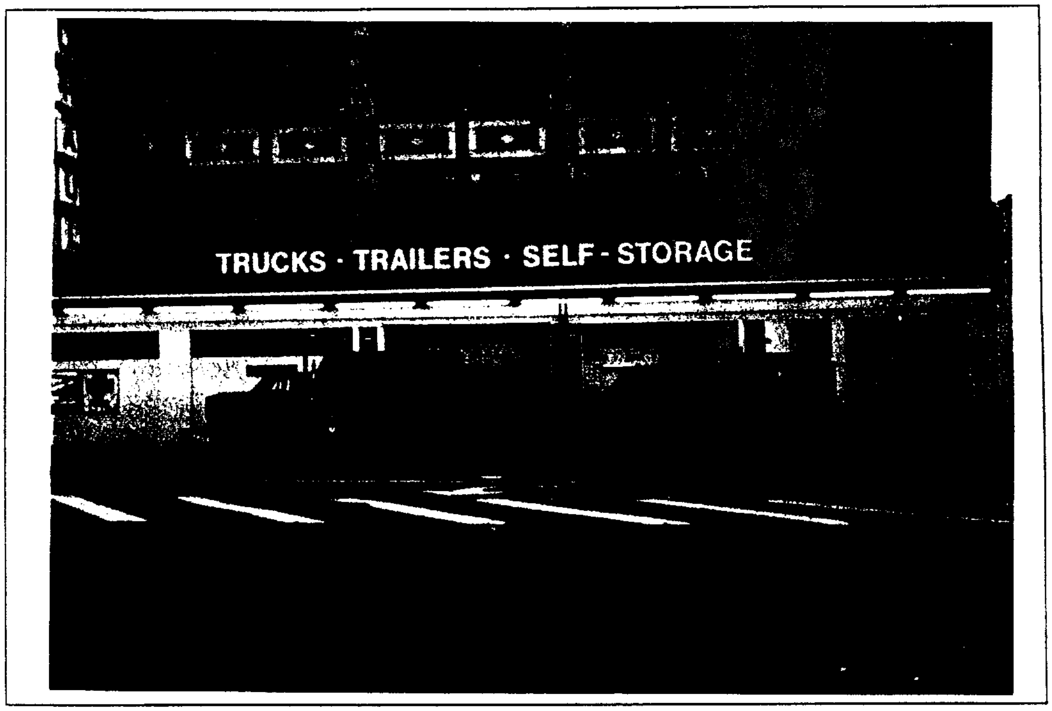
Official on Site: Koon S. Tang   Agency: NYSDEC

TYREE BROTHERS ENVIRONMENTAL SERVICES, INC. 208 Route 109 Farmingdale, NY 11735	**REMOVED UNDERGROUND STORAGE TANK (UST) CONDITION REPORT** U-HAUL #803-62 23RD AND 11TH AVENUE NEW YORK, NEW YORK	Drawn By: L. Kovalsky Date: 5/22/97

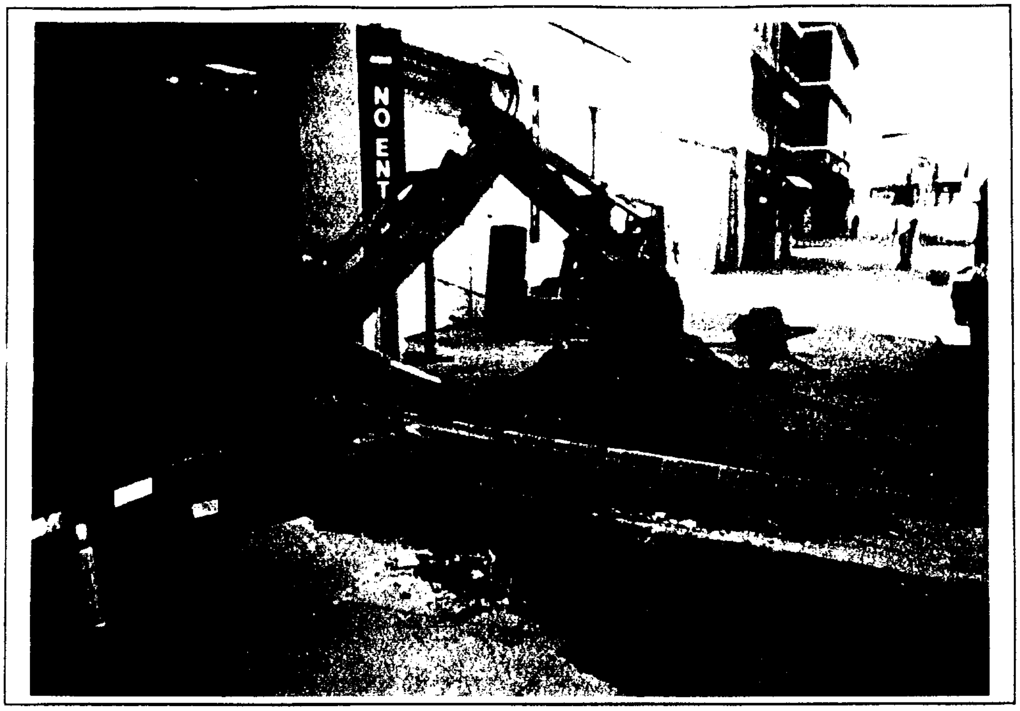
The Tyree Organization

APPENDIX II

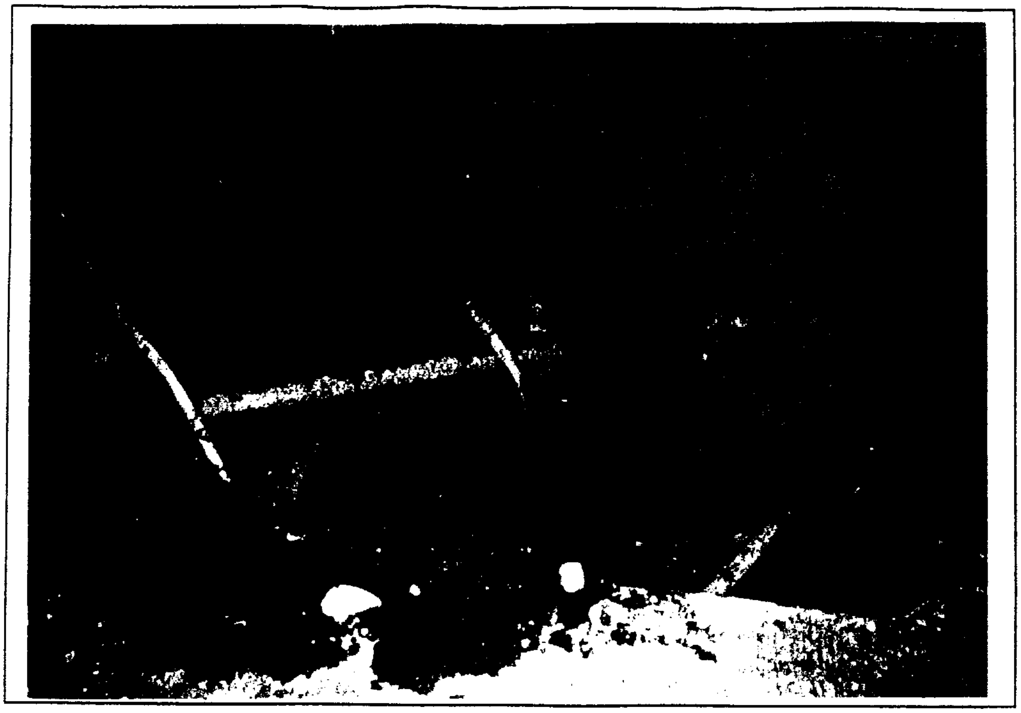
Photodocumentation



PRECONSTRUCTION PHOTO

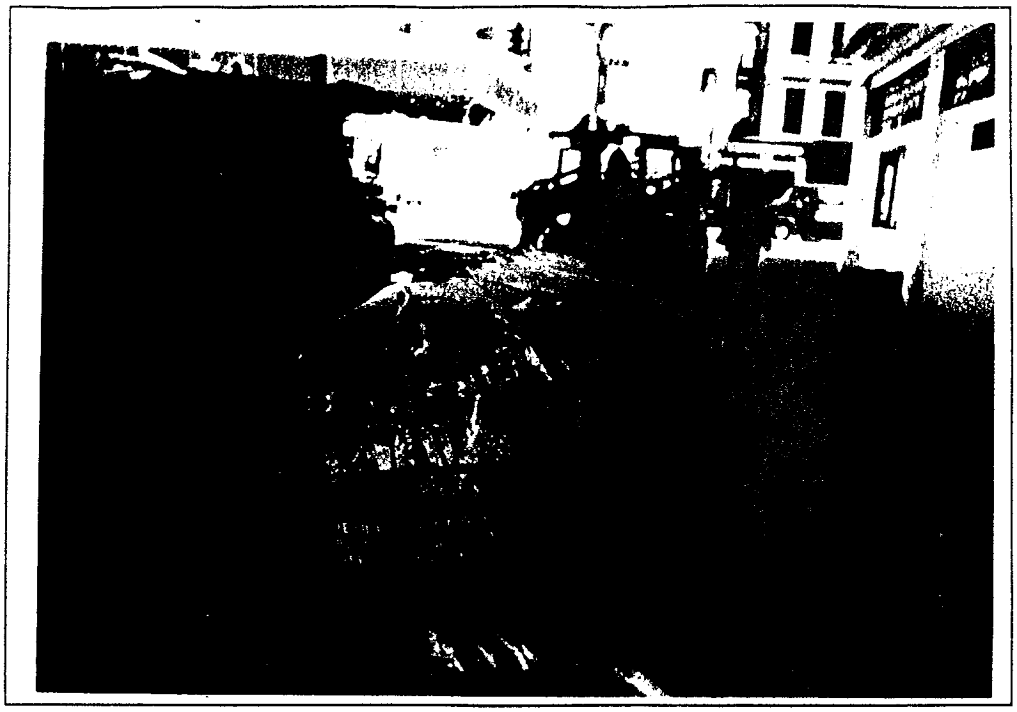


VIEW OF FILL LINE EXCAVATION



VIEW OF GASOLINE / DIESEL EXCAVATION

VIEW OF THE TANKS



VIEW OF THE TANKS

VIEW OF TANK BEING CUT, CLEANED AND READY FOR TRANSPORT

APPENDIX III

Laboratory Analysis

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456

ANALYSIS REPORT - EPA 8021 Stars Memo Cmpds

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 1
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - North
Remarks:

Analysis Information
Analyzed: 04/18/97
Remarks: See Case Narrative

Analyte	Concentration	Units	Dilution	MDL	Units	
MTBE	**5.7**	ppb	1.20	0.66	ppb	B
Benzene	**<0.34**	ppb	1.20	0.34	ppb	
Toluene	**<0.4**	ppb	1.20	0.4	ppb	
Ethylbenzene	**<0.41**	ppb	1.20	0.41	ppb	
m,p-xylene	**<0.76**	ppb	1.20	0.76	ppb	
o-xylene	**<0.34**	ppb	1.20	0.34	ppb	
Xylene	**<1.1**	ppb	1.20	1.1	ppb	
Isopropylbenzene	**<0.31**	ppb	1.20	0.31	ppb	
n-Propylbenzene	**<0.49**	ppb	1.20	0.49	ppb	
1,3,5-Trimethylbenzene	**<0.36**	ppb	1.20	0.36	ppb	
1,2,4-Trimethylbenzene	**<0.4**	ppb	1.20	0.4	ppb	
sec-Butylbenzene	**<0.43**	ppb	1.20	0.43	ppb	
p-Isopropyltoluene	**<0.43**	ppb	1.20	0.43	ppb	
n-Butylbenzene	**<0.47**	ppb	1.20	0.47	ppb	
Naphthalene	**<0.66**	ppb	1.20	0.66	ppb	
tert-Butylbenzene	**<0.62**	ppb	1.20	0.62	ppb	

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456

ANALYSIS REPORT - EPA 8021 Stars Memo Cmpds

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 2
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - South
Remarks:

Analysis Information
Analyzed: 04/18/97
Remarks: See Case Narrative

Analyte	Concentration	Units	Dilution	MDL	Units
MTBE	**11.6**	ppb	1.21	0.67	ppb
Benzene	**<0.34**	ppb	1.21	0.34	ppb
Toluene	**<0.4**	ppb	1.21	0.4	ppb
Ethylbenzene	**<0.41**	ppb	1.21	0.41	ppb
m,p-xylene	**<0.76**	ppb	1.21	0.76	ppb
o-xylene	**<0.34**	ppb	1.21	0.34	ppb
Xylene	**<1.1**	ppb	1.21	1.1	ppb
Isopropylbenzene	**<0.31**	ppb	1.21	0.31	ppb
n-Propylbenzene	**<0.5**	ppb	1.21	0.5	ppb
1,3,5-Trimethylbenzene	**<0.36**	ppb	1.21	0.36	ppb
1,2,4-Trimethylbenzene	**<0.4**	ppb	1.21	0.4	ppb
sec-Butylbenzene	**<0.44**	ppb	1.21	0.44	ppb
p-Isopropyltoluene	**<0.44**	ppb	1.21	0.44	ppb
n-Butylbenzene	**<0.47**	ppb	1.21	0.47	ppb
Naphthalene	**<0.67**	ppb	1.21	0.67	ppb
tert-Butylbenzene	**<0.63**	ppb	1.21	0.63	ppb

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456

ANALYSIS REPORT - EPA 8021 Stars Memo Cmpds

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 3
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - East
Remarks:

Analysis Information
Analyzed: 04/18/97
Remarks: See Case Narrative

Analyte	Concentration	Units	Dilution	MDL	Units
MTBE	**<0.67**	ppb	1.21	0.67	ppb
Benzene	**<0.34**	ppb	1.21	0.34	ppb
Toluene	**<0.4**	ppb	1.21	0.4	ppb
Ethylbenzene	**<0.41**	ppb	1.21	0.41	ppb
m,p-xylene	**<0.76**	ppb	1.21	0.76	ppb
o-xylene	**<0.34**	ppb	1.21	0.34	ppb
Xylene	**<1.1**	ppb	1.21	1.1	ppb
Isopropylbenzene	**<0.31**	ppb	1.21	0.31	ppb
n-Propylbenzene	**<0.5**	ppb	1.21	0.5	ppb
1,3,5-Trimethylbenzene	**<0.36**	ppb	1.21	0.36	ppb
1,2,4-Trimethylbenzene	**<0.4**	ppb	1.21	0.4	ppb
sec-Butylbenzene	**<0.44**	ppb	1.21	0.44	ppb
p-Isopropyltoluene	**<0.44**	ppb	1.21	0.44	ppb
n-Butylbenzene	**<0.47**	ppb	1.21	0.47	ppb
Naphthalene	**<0.67**	ppb	1.21	0.67	ppb
tert-Butylbenzene	**<0.63**	ppb	1.21	0.63	ppb

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456

ANALYSIS REPORT - EPA 8021 Stars Memo Cmpds

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 4
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - West
Remarks:

Analysis Information
Analyzed: 04/18/97
Remarks: See Case Narrative

Analyte	Concentration	Units	Dilution	MDL	Units	
MTBE	**7.3**	ppb	1.22	0.67	ppb	B
Benzene	**<0.34**	ppb	1.22	0.34	ppb	
Toluene	**<0.4**	ppb	1.22	0.4	ppb	
Ethylbenzene	**<0.41**	ppb	1.22	0.41	ppb	
m,p-xylene	**<0.77**	ppb	1.22	0.77	ppb	
o-xylene	**<0.34**	ppb	1.22	0.34	ppb	
Xylene	**<1.1**	ppb	1.22	1.1	ppb	
Isopropylbenzene	**<0.32**	ppb	1.22	0.32	ppb	
n-Propylbenzene	**<0.5**	ppb	1.22	0.5	ppb	
1,3,5-Trimethylbenzene	**<0.37**	ppb	1.22	0.37	ppb	
1,2,4-Trimethylbenzene	**<0.4**	ppb	1.22	0.4	ppb	
sec-Butylbenzene	**<0.44**	ppb	1.22	0.44	ppb	
p-Isopropyltoluene	**<0.44**	ppb	1.22	0.44	ppb	
n-Butylbenzene	**<0.48**	ppb	1.22	0.48	ppb	
Naphthalene	**<0.67**	ppb	1.22	0.67	ppb	
tert-Butylbenzene	**<0.63**	ppb	1.22	0.63	ppb	

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Environmental Testing Laboratories, Inc.
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ANALYSIS REPORT - EPA 8021 Stars Memo Cmpds

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 5
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - Bottom
Remarks:

Analysis Information
Analyzed: 04/18/97
Remarks: See Case Narrative

Analyte	Concentration	Units	Dilution	MDL	Units	
MTBE	**42.0**	ppb	6.48	3.6	ppb	B
Benzene	**<1.8**	ppb	6.48	1.8	ppb	
Toluene	**<2.1**	ppb	6.48	2.1	ppb	
Ethylbenzene	**<2.2**	ppb	6.48	2.2	ppb	
m,p-xylene	**13.4**	ppb	6.48	4.1	ppb	
o-xylene	**7.2**	ppb	6.48	1.8	ppb	
Xylene	**20.6**	ppb	6.48	5.9	ppb	
Isopropylbenzene	**5.2**	ppb	6.48	1.7	ppb	
n-Propylbenzene	**8.6**	ppb	6.48	2.7	ppb	
1,3,5-Trimethylbenzene	**7.7**	ppb	6.48	1.9	ppb	
1,2,4-Trimethylbenzene	**22.2**	ppb	6.48	2.1	ppb	
sec-Butylbenzene	**13.3**	ppb	6.48	2.3	ppb	
p-Isopropyltoluene	**9.7**	ppb	6.48	2.3	ppb	
n-Butylbenzene	**15.3**	ppb	6.48	2.5	ppb	
Naphthalene	**25.1**	ppb	6.48	3.6	ppb	
tert-Butylbenzene	**<3.4**	ppb	6.48	3.4	ppb	

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Environmental Testing Laboratories, Inc.
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ANALYSIS REPORT - Stars Memo Base Neutrals

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 1
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - North
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
Naphthalene	**<45.8**	ppb	39.80	45.8	ppb
Acenaphthylene	**52.1**	ppb	39.80	46.2	ppb
Fluorene	**<50.9**	ppb	39.80	50.9	ppb
Phenanthrene	**472**	ppb	39.80	58.9	ppb
Anthracene	**135**	ppb	39.80	60.9	ppb
Fluoranthene	**797**	ppb	39.80	67.7	ppb
Pyrene	**669**	ppb	39.80	65.7	ppb
Benzo(a)anthracene	**499**	ppb	39.80	54.1	ppb
Chrysene	**479**	ppb	39.80	83.6	ppb
Benzo(b)fluoranthene	**628**	ppb	39.80	65.7	ppb
Benzo(k)fluoranthene	**245**	ppb	39.80	65.7	ppb
Benzo(a)pyrene	**612**	ppb	39.80	66.5	ppb
Indeno(1,2,3-cd)pyrene	**332**	ppb	39.80	84	ppb
Dibenzo(a,h)anthracene	**94.3**	ppb	39.80	83.2	ppb
Benzo(g,h,i)perylene	**342**	ppb	39.80	84	ppb

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

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ANALYSIS REPORT - Stars Memo Base Neutrals

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 2
Custody: F4129
Collected: 04/10/97 2:00 PM
Location: Ex - South
Remarks:

Type: Grab
Matrix: Soil

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
Naphthalene	**66.5**	ppb	39.60	45.5	ppb
Acenaphthylene	**136**	ppb	39.60	45.9	ppb
Fluorene	**132**	ppb	39.60	50.7	ppb
Phenanthrene	**1350**	ppb	39.60	58.6	ppb
Anthracene	**325**	ppb	39.60	60.6	ppb
Fluoranthene	**1740**	ppb	39.60	67.3	ppb
Pyrene	**1660**	ppb	39.60	65.3	ppb
Benzo(a)anthracene	**1150**	ppb	39.60	53.9	ppb
Chrysene	**1010**	ppb	39.60	83.2	ppb
Benzo(b)fluoranthene	**1330**	ppb	39.60	65.3	ppb
Benzo(k)fluoranthene	**628**	ppb	39.60	65.3	ppb
Benzo(a)pyrene	**1320**	ppb	39.60	66.1	ppb
Indeno(1,2,3-cd)pyrene	**653**	ppb	39.60	83.6	ppb
Dibenzo(a,h)anthracene	**221**	ppb	39.60	82.8	ppb
Benzo(g,h,i)perylene	**650**	ppb	39.60	83.6	ppb

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

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ANALYSIS REPORT - Stars Memo Base Neutrals

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 3
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - East
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
Naphthalene	**<46.2**	ppb	40.20	46.2	ppb
Acenaphthylene	**60.0**	ppb	40.20	46.6	ppb
Fluorene	**<51.5**	ppb	40.20	51.5	ppb
Phenanthrene	**541**	ppb	40.20	59.5	ppb
Anthracene	**167**	ppb	40.20	61.5	ppb
Fluoranthene	**900**	ppb	40.20	68.3	ppb
Pyrene	**797**	ppb	40.20	66.3	ppb
Benzo(a)anthracene	**647**	ppb	40.20	54.7	ppb
Chrysene	**600**	ppb	40.20	84.4	ppb
Benzo(b)fluoranthene	**925**	ppb	40.20	66.3	ppb
Benzo(k)fluoranthene	**302**	ppb	40.20	66.3	ppb
Benzo(a)pyrene	**822**	ppb	40.20	67.1	ppb
Indeno(1,2,3-cd)pyrene	**423**	ppb	40.20	84.8	ppb
Dibenzo(a,h)anthracene	**136**	ppb	40.20	84	ppb
Benzo(g,h,i)perylene	**429**	ppb	40.20	84.8	ppb

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Environmental Testing Laboratories, Inc.
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ANALYSIS REPORT - Stars Memo Base Neutrals

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 4
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - West
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
Naphthalene	**<46.6**	ppb	40.50	46.6	ppb
Acenaphthylene	**68.9**	ppb	40.50	47	ppb
Fluorene	**57.9**	ppb	40.50	51.8	ppb
Phenanthrene	**558**	ppb	40.50	59.9	ppb
Anthracene	**169**	ppb	40.50	62	ppb
Fluoranthene	**925**	ppb	40.50	68.9	ppb
Pyrene	**922**	ppb	40.50	66.8	ppb
Benzo(a)anthracene	**726**	ppb	40.50	55.1	ppb
Chrysene	**618**	ppb	40.50	85.1	ppb
Benzo(b)fluoranthene	**1000**	ppb	40.50	66.8	ppb
Benzo(k)fluoranthene	**338**	ppb	40.50	66.8	ppb
Benzo(a)pyrene	**903**	ppb	40.50	67.6	ppb
Indeno(1,2,3-cd)pyrene	**436**	ppb	40.50	85.5	ppb
Dibenzo(a,h)anthracene	**133**	ppb	40.50	84.6	ppb
Benzo(g,h,i)perylene	**424**	ppb	40.50	85.5	ppb

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

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ANALYSIS REPORT - Stars Memo Base Neutrals

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 5
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - Bottom
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
Naphthalene	**<49.6**	ppb	43.10	49.6	ppb
Acenaphthylene	**72.0**	ppb	43.10	50	ppb
Fluorene	**<55.2**	ppb	43.10	55.2	ppb
Phenanthrene	**517**	ppb	43.10	63.8	ppb
Anthracene	**157**	ppb	43.10	65.9	ppb
Fluoranthene	**852**	ppb	43.10	73.3	ppb
Pyrene	**772**	ppb	43.10	71.1	ppb
Benzo(a)anthracene	**630**	ppb	43.10	58.6	ppb
Chrysene	**603**	ppb	43.10	90.5	ppb
Benzo(b)fluoranthene	**955**	ppb	43.10	71.1	ppb
Benzo(k)fluoranthene	**322**	ppb	43.10	71.1	ppb
Benzo(a)pyrene	**898**	ppb	43.10	72	ppb
Indeno(1,2,3-cd)pyrene	**439**	ppb	43.10	90.9	ppb
Dibenzo(a,h)anthracene	**135**	ppb	43.10	90.1	ppb
Benzo(g,h,i)perylene	**438**	ppb	43.10	90.9	ppb

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

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ANALYSIS REPORT - Total Solids

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 1
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - North
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
% Solids	**83.6**	%	1		%

Sample 2
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - South
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
% Solids	**84.1**	%	1		%

Sample 3
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - East
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
% Solids	**82.8**	%	1		%

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Environmental Testing Laboratories, Inc.
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ANALYSIS REPORT - Total Solids

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 4
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - West
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
% Solids	**82.2**	%	1		%

Sample 5
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - Bottom
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
% Solids	**77.2**	%	1		%

Sample 6
Custody: F4129 Type: Grab
Collected: 04/11/97 12:00 PM Matrix: Soil
Location: Fill Line (Stockpile)
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
% Solids	**82.4**	%	1		%

Reviewed by: Peggy Carigo

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Environmental Testing Laboratories, Inc.

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ANALYSIS REPORT - TCLP Lead Method 1311

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 6
Custody: F4129 Type: Grab
Collected: 04/11/97 12:00 PM Matrix: Soil
Location: Fill Line (Stockpile)
Remarks:

Analysis Information
Analyzed: 04/20/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
Lead	**<0.028**	ppm	1.11	0.028	ppm

Reviewed by:

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

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ANALYSIS REPORT - TCLP BTEX

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 6
Custody: F4129 Type: Grab
Collected: 04/11/97 12:00 PM Matrix: Soil
Location: Fill Line (Stockpile)
Remarks:

Analysis Information
Analyzed: 04/23/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
Benzene	**0.076**	ppm	10	0.0005	ppm
Toluene	**NA**	ppm	10	0.0003	ppm
Ethylbenzene	**NA**	ppm	10	0.0008	ppm
Xylene	**NA**	ppm	10	0.0027	ppm

Reviewed by:

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Environmental Testing Laboratories, Inc.
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ANALYSIS REPORT - Stars Memo Base Neutrals

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 6
Custody: F4129 Type: Grab
Collected: 04/11/97 12:00 PM Matrix: Soil
Location: Fill Line (Stockpile)
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
Naphthalene	**5040**	ppb	162	186	ppb
Acenaphthylene	**<188**	ppb	162	188	ppb
Fluorene	**295**	ppb	162	207	ppb
Phenanthrene	**674**	ppb	162	240	ppb
Anthracene	**<248**	ppb	162	248	ppb
Fluoranthene	**750**	ppb	162	275	ppb
Pyrene	**760**	ppb	162	267	ppb
Benzo(a)anthracene	**564**	ppb	162	220	ppb
Chrysene	**570**	ppb	162	340	ppb
Benzo(b)fluoranthene	**880**	ppb	162	267	ppb
Benzo(k)fluoranthene	**311**	ppb	162	267	ppb
Benzo(a)pyrene	**844**	ppb	162	271	ppb
Indeno(1,2,3-cd)pyrene	**578**	ppb	162	342	ppb
Dibenzo(a,h)anthracene	**<339**	ppb	162	339	ppb
Benzo(g,h,i)perylene	**650**	ppb	162	342	ppb

Reviewed by: [signature]

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Environmental Testing Laboratories, Inc.
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ANALYSIS REPORT - EPA 8021 Stars Memo Cmpds

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 6
Custody: F4129 Type: Grab
Collected: 04/11/97 12:00 PM Matrix: Soil
Location: Fill Line (Stockpile)
Remarks:

Analysis Information
Analyzed: 04/18/97 .
Remarks: See Case Narrative

Analyte	Concentration	Units	Dilution	MDL	Units	
MTBE	**7560**	ppb	607	580	ppb	B
Benzene	**1010**	ppb	607	150	ppb	
Toluene	**5280**	ppb	607	150	ppb	
Ethylbenzene	**941**	ppb	607	210	ppb	
m,p-xylene	**66100**	ppb	607	270	ppb	
o-xylene	**76200**	ppb	607	190	ppb	
Xylene	**142300**	ppb	607	460	ppb	
Isopropylbenzene	**<160**	ppb	607	160	ppb	
n-Propylbenzene	**765**	ppb	607	130	ppb	
1,3,5-Trimethylbenzene	**69800**	ppb	607	210	ppb	
1,2,4-Trimethylbenzene	**148000**	ppb	6,068	1300	ppb	
sec-Butylbenzene	**1080**	ppb	607	170	ppb	
p-Isopropyltoluene	**10200**	ppb	607	150	ppb	
n-Butylbenzene	**<73**	ppb	607	73	ppb	
Naphthalene	**17800**	ppb	607	120	ppb	
tert-Butylbenzene	**<220**	ppb	607	220	ppb	

Reviewed by: Peggy Larigo

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456

ANALYSIS REPORT - 602/8020 by GC/MS

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 6
Custody: F4129 Type: Grab
Collected: 04/11/97 12:00 PM Matrix: Soil
Location: Fill Line (Stockpile)
Remarks:

Analysis Information
Analyzed: 04/21/97
Remarks: See Case Narrative

Analyte	Concentration	Units	Dilution	MDL	Units
Benzene	**1030**	ppb	606.80	61	ppb
Toluene	**5280**	ppb	606.80	130	ppb
Chlorobenzene	**<67**	ppb	606.80	67	ppb
Ethylbenzene	**971**	ppb	606.80	120	ppb
m,p-xylene	**66100**	ppb	606.80	170	ppb
o-xylene	**76500**	ppb	606.80	97	ppb
1,3-Dichlorobenzene	**<91**	ppb	606.80	91	ppb
1,4-Dichlorobenzene	**<79**	ppb	606.80	79	ppb
1,2-Dichlorobenzene	**<85**	ppb	606.80	85	ppb
MTBE	**7580**	ppb	606.80	170	ppb

Reviewed by: [signature]

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456

ANALYSIS REPORT - Total Pet. Hydrocarbons 418.1

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 6
Custody: F4129 Type: Grab
Collected: 04/11/97 12:00 PM Matrix: Soil
Location: Fill Line (Stockpile)
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
Total Recoverable Petroleum Hydrocarbon	**2680**	ppm	1	5.0	ppm

Reviewed by: Peggy Perigo

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

The Tyree Organization

APPENDIX IV

Waste Manifests

STRAIGHT BILL OF LADING – SHORT FORM – Original – Not Negotiable

Shipper's No. ______

(Carrier) TYREE ORGANIZATION SCAC. ______ Carrier's No. NYD006801245

Received, subject to the classifications and tariffs in effect on the date of this Bill of Lading:

at ______, date 4/8/97 from ______

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated below, which said company (the word company being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its own road or its own water line, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the conditions not prohibited by law, whether printed or written, herein contained (as specified in Appendix B to Part 1035) which are hereby agreed to by the shipper and accepted for himself and his assigns.

TO: (Mail or street address of consignee for purposes of notification only.)	FROM:
Consignee TYREE BROTHERS ENVIRONMENTAL	Shipper U-Haul
Street 208 ROUTE 109	Street 23rd ST / 11TH AVE
Destination FARMINGDALE, NY Zip 11735	Origin NEW YORK NY Zip
Route:	

Delivering Carrier	Trailer Initial/Number	U.S. DOT Hazmat Reg. Number

No. of packages	HM	Description of articles, special marks, and exceptions	Hazard Class	I.D. Number	Packing Group	*Weight (subject to correction)	Class or rate	Labels required (or exemption)	Check column
	X	Gasoline + Diesel mix	III	UN 1203		39	G		

Remit C.O.D. to:
Address:
City: State: Zip:

COD AMT: $

Charges Advanced $

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement: The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

Philip Mastrogiacomo
(Signature of consignor)

C. O. D. FEE: Prepaid ☐ Collect ☐ $

FREIGHT CHARGES ☐ Prepaid ☐ Collect

If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is "carrier's or shipper's weight". Note. – where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding ______ per ______

This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

PLACARDS REQUIRED

PLACARDS SUPPLIED ☐ YES ☐ NO - FURNISHED BY CARRIER

DRIVER'S SIGNATURE:

SPECIAL INSTRUCTIONS:

SHIPPER: U-Haul

PER: ______ DATE: 4/8/97

CARRIER ______

PER: TYREE ORGANIZATION DATE: 4/8/97

EMERGENCY RESPONSE TELEPHONE NUMBER: (516) 249-3150

Monitored at all times the Hazardous Material is in transportation including storage incidental to transportation (§172.604)

Permanent post office address of shipper

07/24/97 08:25 FAX CPC-21EMI 002

48-14-1 (10/96) 7a

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SOLID & HAZARDOUS MATERIALS

HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, New York 12212

THREE

Please print or type. Do not Staple.

Form Approved. OMB No. 2050-0039.

~~UNIFORM HAZARDOUS~~ WASTE MANIFEST

1. Generator's US EPA No. NYR000040470 — Manifest Document No. 13264

2. Page 1 of 1

Information in the shaded areas is not required by Federal Law.

3. Generator's Name and Mailing Address
U-HAUL
562 WEST 23RD AVENUE, NEW YORK, NY

4. Generator's Phone ( )

A. State Manifest Document No. NYG 021326 4

B. Generator's ID SAME

5. Transporter 1 (Company Name) Chemical Pollution Control Inc

6. US EPA ID Number NYD032785429

C. State Transporter's ID PX3646

D. Transporter's Phone (516) 586-0333

7. Transporter 2 (Company Name)

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone ( )

9. Designated Facility Name and Site Address
Chemical Pollution Control Inc
120 South Fourth Street
Bay Shore, NY 11706

10. US EPA ID Number NYD082785429

G. State Facility's ID Same

H. Facility's Phone (516) 586-0333

GENERATOR

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. WASTE FLAMMABLE LIQUID, NOS (D001) 3 UN1993 PGII ERG#128 B605	005	DM	00275	G	EPA D001 STATE
b.					EPA STATE
c.					EPA STATE
d.					EPA STATE

J. Additional Descriptions for Materials listed Above
a 7217
c
b
d

K. Handling Codes for Wastes Listed Above
a B
c
b
d

15. Special Handling Instructions and Additional Information
A) D001, D018
TANK Bottoms

Emergency Response #516-586-0333

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and state laws and regulations.
If I am a large quantity generator, I certify that I have program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR if I am a small generator, I have made a good faith effort to minimize my waste and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name GODFREY GARRETT — Signature [signature] — Mo. Day Year 06 11 97

TRANSPORTER

17. Transporter 1 (Acknowledgement of Receipt of Materials)
Printed/Typed Name ERIC Hofmann — Signature Eric Hofmann — Mo. Day Year 06 11 97

18. Transporter 2 (Acknowledgement of Receipt of Materials)
Printed/Typed Name — Signature — Mo. Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name FRANK FALCO — Signature [signature] — Mo. Day Year 06 11 97

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete.

COPY 2–Generator State–mailed by TSD facility

NYG 021326 4

In case of emergency or spill immediately call the National Response Center (800) 424-8802 and the N.Y. Dept. of Environmental Conservation (518) 457-7362.

Posillico Bros. Asphalt Co.

1610 New Highway, Farmingdale, NY 11735-1534

Plant Tel.: (516) 293-2620, 2621

Office Tel.: (516) 249-1872

HOT STORAGE

July 24, 1997

TYREE BROS ENVIRONMENTAL, INC.
P.O. Box 9131
Farmingdale, NY 11735

Attention: Jim Allen

RE: DISPOSAL OF:	**Gasoline Contaminated Soil**
LOCATION:	**U-HAUL** **562 West 23rd Street** **Manhattan, NY**
SPILL NO:	**97-00188**
PROJECT NO:	**97086**
DATE OF DISPOSAL:	**May 30, 1997**
QUANTITY REMOVED:	**8.45 Tons**

Dear Mr. Allen:

Attached please find the copies of the corresponding manifests, tickets and load amounts, in reference to the captioned project. All contaminants have been **thermally destroyed** and **residual soils** have been **recycled** into hot mix asphalt.

If you require any additional information, please feel free to contact me.

Sincerely, yours,
POSILLICO BROS. ASPHALT, CO.

Michael J. Posillico
Vice President

MJP/kp

enclosure

Posillico Bros. Asphalt Co.

1610 New Highway, Farmingdale, N.Y. 11735
Plant Tele: 293-2620, 2621

HOT STORAGE

05/30/97

14:28

Ticket
60581

Customer: 35
TYREE BROTHERS

Job: 97086

Truck #
F209

P.O. #:

PICKUP

Products		Amount
67	CONTAMINATED SOIL	8.45

Plant Name: PBA

Received By: M. Reynolds

Driver Name:

G= 15.47
T= 7.02

N= 8.45

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. N/A

Manifest Document No.

2. Page 1 of

3. Generator's Name and Mailing Address U-Haul

4. Generator's Phone ( )

5. Transporter 1 Company Name

6. US EPA ID Number

7. Transporter 2 Company Name

8. US EPA ID Number

9. Designated Facility Name and Site Address

10. US EPA ID Number

A. Transporter's Phone

B. Transporter's Phone

C. Facility's Phone

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. Non-Hazardous Petroleum Contaminated Soil				
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above

E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name Jose Marvin — Signature — Month Day Year 1 5 6 0 87

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name Richard Wright — Signature Richard Wright — Month Day Year 1 5 6 0 87

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name Jos — Signature — Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name — Signature — Month Day Year

GENERATOR — TRANSPORTER — FACILITY

T/S/D/F COPY

Larry E. Tyree Company Inc.
208 Route 109, Farmingdale, NY 11735 · Fax. 516-249-3281 · Phone: 516-249-3150

April 15, 1997

New York City Fire Department
250 Livingston Street
Room 412/413
Brooklyn, New York 11201

Attn: Inspector, Michael Reardon
Motor Fuel Safety Unit

Re: Tank Removal @
U-Haul 803-62
562 West 23rd Street
New York, New York

Dear Mr. Reardon:

This letter is to confirm that on April 9, 1997, the Larry E. Tyree Co. Inc. (License #62071006) pumped all volatile liquids from two (2) 1,000-gallon gasoline and diesel underground storage tanks. The tanks and lines were purged of explosive vapors. All piping was removed off the tanks and openings were sealed. All vent lines were removed. Residual contents were cleaned and drummed for proper disposal. The cleaned tanks was then transported for disposal at a recycling center. Furthermore, a spill was encountered at the subject property (NYSDEC spill #9700188). This spill is currently being monitored under the guidance of NYSDEC representative Koon S. Tang, P.E.

If you have any further questions concerning this matter, feel free to contact this office.

Sincerely,

Thomas Faria
Larry E. Tyree Co. Inc.

Sworn to before me this 15th day of
April, 1997

Barbara Canerossi
County of Suffolk
State of New York

BARBARA CANEROSSI
NOTARY PUBLIC, State of New York
No. 01CA5061595
Qualified in Suffolk County
Commission Expires June 10, 19 98

TF/ekk
Enclosure

cc: Client
G. Graham, Tyree Consulting

Member
Tyree Environmental Technologies

The Tyree Organization

CLOSURE REPORT
FOR THE EXCAVATION OF
UNDERGROUND STORAGE TANKS
U-HAUL #803-62
562 WEST 23RD STREET
NEW YORK, NEW YORK
SPILL #97-00188

JULY 1997

PREPARED FOR:

U-HAUL CORPORATION
P.O. BOX 21502
2721 NORTH CENTRAL SUITE 700
PHOENIX, AZ 85036

PREPARED BY:

LESLIE KOVALSKY
ENVIRONMENTAL SCIENTIST

REVIEWED BY:

JOSEPH M. PISEL
CONSTRUCTION MANAGER

TYREE BROTHERS ENVIRONMENTAL SERVICES, INC.
208 ROUTE 109
FARMINGDALE, NEW YORK 11735
(516) 249 -3150

The Tyree Organization

TABLE OF CONTENTS

Background

Tyree Brothers Environmental Services (TBES), serving as contractor to U-Haul Corporation, conducted underground storage tank (UST) removal activities at the U-Haul #803-62 facility, located at 562 West 23rd Street, New York, New York. The U-Haul facility is located on the east side of 11th Street, and the tanks removed and discussed within this report were located within the boundaries of the property. The New York State Department of Environmental Conservation (NYSDEC), Region II was informed of the removal of the two (2) underground storage tanks. Spill #97-00188 had already been issued for the location. Figure 1 is a site map indicating the tank layout and soil sample locations.

Field Activities

On April 8th through April 11, 1997 field activities at the above-referenced property included the excavation and removal of two (2) 1,000 gallon, single wall, plasteel, underground gasoline and diesel storage tanks. The installation date (s) of these two (2) underground storage tanks is unknown.

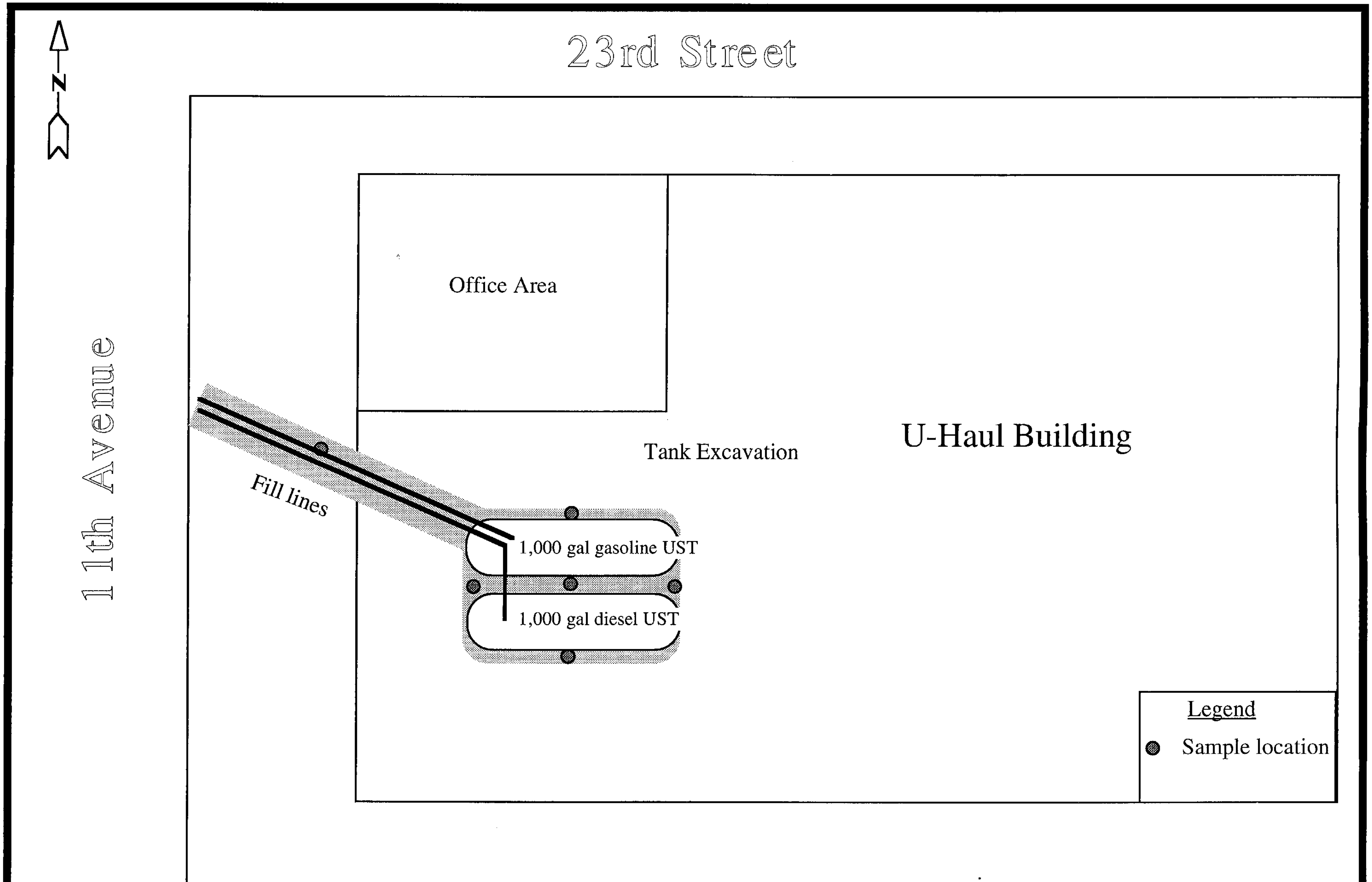
Hydrogeologist, Kevin Hale, from Tyree Brothers Environmental Services, Inc. (TBES) was present on site to document field activities, screen soils, inspect the tanks, and collect endpoint samples as mandated by the NYSDEC.

In order to prepare the tanks for removal, the tanks were deadlined by removing approximately 39 gallons of non-hazardous petroleum contaminated wastewater. This wastewater was removed by TBES and transported to their treatment facility in Farmingdale, New York. The disposal manifest is located in Appendix IV.

Steel Tank Excavation

The tank removal activities were initiated by exposing the gasoline and diesel tanks, which were located approximately two (2) feet below grade.

Prior to cutting the tanks, the interiors and the surrounding areas were tested for explosive gases using a combustible gas and oxygen level detector. Air monitoring was performed on the site and the immediate surrounding areas with a Photovac Microtip HL-2000, photoionization detector (PID) and an explosion meter. The tanks were cut using non-sparking pneumatic tools. A hole was cut into each of the tanks in order to facilitate the cleaning of the tanks. The tanks were properly cleaned and decontaminated of residual



DRAWN BY: L. Kovalsky ***SCALE:*** NTS ***DATE:*** 7-24-97	U-Haul #803-62 562 West 23rd Street New York, New York	T	**Tyree Brothers** **Environmental Services, Inc.** 208 Route 109 Farmingdale, New York 11735

sludges. The tanks were then transported to a scrap metal facility for recycling. One (1) 55 gallon DOT drum of sludge was generated by the tank cleaning activities. A disposal manifest for the drum appear in Appendix IV. Four (4) other drums that were previously generated were also disposed of at the same time.

The excavation extended to a depth of approximately ten (10) feet in the tank area. The fill lines excavation through the sidewalk was approximately four (4) feet deep. The gasoline and diesel tanks did not show any signs of corrosion. The tank condition reports and photodocumentation of the tank removal activities appear in Appendices I and II respectively.

Soil Screening

The excavated soils were screened using a Photovac Microtip HL-2000, photoionization detector (PID). The PID meter is used to measure organic vapors as they evolve from the soils. The readings are not exact determinations of true volatile content, but instead provide qualitative indications of the degree of volatile organic contamination. Several different grab samples from various sides of the excavations were obtained. The endpoint samples from the gasoline and diesel excavation contained volatile organic vapors measured in the headspace ranging from one (1) to five (5) parts per million, but no petroleum odors. The soils encountered during the excavation activities were generally fine grain sands and silts with pebbles and cobbles. Table 1 depicts the PID readings obtained from the excavation.

The soil immediately above the fill line exhibited petroleum odors. The impacted soil from the fill line, 8.45 tons, was subsequently stockpiled on the site. A disposal manifest for the stockpile is included in Appendix IV.

TABLE 1

Field Screening of Soils
Gasoline and Diesel UST Excavation

Sample	Depth below grade	PID Reading (ppm)	Location
1	8.0’	5.0	North Wall
2	8.0’	4.0	South Wall
3	8.0’	5.0	East Wall
4	8.0’	1.0	West Wall
5	10.0’	2.0	Bottom

ND Non-detect

Laboratory Analysis

A total of six (6) soil samples were collected from the fill lines, bottom and side walls of the gasoline and diesel tank excavation. All of the soil samples were placed in clean, laboratory supplied containers with zero headspace. The samples were hand delivered under chain of custody to a NYS certified laboratory, to be analyzed for Volatile and Semi-Volatile Organic Compounds, via EPA Methods 8021 and 8270 - Base Neutrals Only.

The results of the analysis were compared to the NYSDEC soil guidelines as published in the Spill Technology And Remediation Series (STARS) Memo #1, August 1992. The alternative guidance value was used for non-TCLP concentrations. A summary of the compounds detected can be found in Tables 2 and 3. Complete laboratory results appear in Appendix III.

The Tyree Organization

Table 2

Summary of Soil Analytical Results
Volatile Organic Compounds via EPA 8021
Concentrations in ppm

Compound	North	South	East	West	Bottom	Fill Lines	Guidance Values
MTBE	.0057	.0116	<MDL	.0073	.0430	**7.56**	1
Benzene	<MDL	<MDL	<MDL	<MDL	<MDL	**1.01**	.1
Toluene	<MDL	<MDL	<MDL	<MDL	<MDL	**5.28**	.1
Ethylbenzene	<MDL	<MDL	<MDL	<MDL	<MDL	**.941**	.1
m,p-xylene	<MDL	<MDL	<MDL	<MDL	.0134	**66.1**	.1
o-xylene	<MDL	<MDL	<MDL	<MDL	.0072	**76.2**	.1
Xylene	<MDL	<MDL	<MDL	<MDL	.0206	**142.3**	.1
Isopropylbenzene	<MDL	<MDL	<MDL	<MDL	.0052	<MDL	.1
n-Propylbenzene	<MDL	<MDL	<MDL	<MDL	.0086	**.765**	.1
1,3,5-Trimethylbenzene	<MDL	<MDL	<MDL	<MDL	.0077	**69.8**	.1
1,2,4-Trimethylbenzene	<MDL	<MDL	<MDL	<MDL	.0222	**148**	.1
sec-Butylbenzene	<MDL	<MDL	<MDL	<MDL	.0133	**1.08**	.1
p-Isopropyltoluene	<MDL	<MDL	<MDL	<MDL	.0097	**10.2**	.1
n-Butylbenzene	<MDL	<MDL	<MDL	<MDL	.0153	<MDL	.1
Naphthalene	<MDL	<MDL	<MDL	<MDL	.0251	**17.8**	.2
tert-Butylbenzene	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	.1

Table 3

Summary of Soil Analytical Results
Semi-Volatile Organic Compounds via EPA 8270 - BN
Concentrations in ppm

Compound	North	South	East	West	Bottom	Fill Lines	Guidance Values
Naphthalene	<MDL	.0665	<MDL	<MDL	<MDL	5.04	.200
Acenaphthalene	.0521	.136	.0602	.0689	.072	<MDL	.400
Fluorene	<MDL	.132	<MDL	.0579	<MDL	.295	1.000
Phenanthrene	.472	**1.35**	.541	.558	.517	.674	1.000
Anthracene	.135	.325	.167	.169	.157	<MDL	1.000
Fluoranthene	.797	**1.74**	.9	.925	.852	.75	1.000
Pyrene	.669	**1.66**	.797	.922	.772	.76	1.000
Benzo(a)anthracene	**.499**	**1.15**	**.647**	**.726**	**.63**	**.564**	.00004*
Chrysene	**.479**	**1.01**	**.6**	**.618**	**.603**	**.57**	.00004*
Benzo(b)flouranthene	**.628**	**1.33**	**.925**	**1**	**.955**	**.88**	.00004*
Benzo(k)flouranthene	**.245**	**.628**	**.302**	**.338**	**.322**	**.311**	.00004*
Benzo(a)pyrene	**.612**	**1.32**	**.822**	**.903**	**.898**	**.844**	.00004*
Indeno(1,2,3-cd)pyrene	**.332**	**.653**	**.423**	**.436**	**.439**	**.578**	.00004*
Dibenzo(a,h)anthracene	.0943	**.221**	.136	.133	.135	<MDL	1.000
Benzo(g,h,i)perylene	**.342**	**.65**	**.429**	**.424**	**.438**	**.65**	.00004*

Highlighted values denote levels that exceed the NYS regulatory guidance values.

* Due to the high detection limit for a solid matrix, the TCLP Method must be used to demonstrate groundwater quality protection for these compounds.

As seen from the previous tables, all volatile organic compounds for the wall and bottom samples were below the guidance values. However, the sample from fill lines contained numerous volatile organic compounds detected above the NYS regulatory guidance values.

Summary

1. On April 8th through April 11, 1997, Tyree Brothers Environmental Services (TBES) removed two (2) 1,000 gasoline and diesel gallon USTs from the U-Haul #803-62, located at 562 West 23rd Street, New York, New York. The location had previously been issued Spill #97-00188 by the NYSDEC.

2. In order to deadline the tanks for removal, approximately 39 gallons of non-hazardous petroleum contaminated wastewater were removed from the site by TBES and transported to their disposal facility in Farmingdale, New York. One (1) drum of sludge was generated due to tank cleaning activities. The disposal manifests appear in this report.

3. The gasoline and diesel tanks showed no signs of deterioration. Soil in the area of the fill lines was noted to have been impacted by hydrocarbons. As a result, 8.45 tons of impacted soil was stockpiled. The disposal manifest for the stockpile appears in this report.

4. A total of six (6) soil samples were procured and submitted for laboratory analysis. The samples were analyzed by a NYS certified laboratory via EPA Methods 8021 and 8270 - BN only, as recommended by the NYSDEC guidance document, STARS Memo #1.

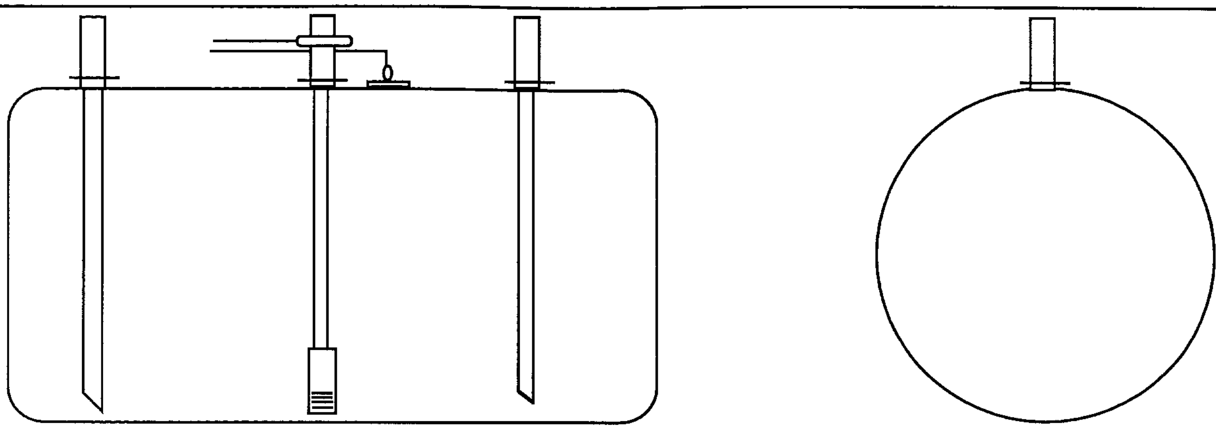
5. All detected volatile organic compounds for the wall and bottom samples were below the guidance values. However, the sample from the fill lines contained numerous volatile organic compounds detected above the NYS regulatory guidance values.

Disclaimer

This UST removal report was prepared for the use of U-Haul Corporation. Reasonable due diligence was exercised by the staff of the Tyree Brothers Environmental Services, Inc. in conducting this tank removal. The conclusions provided by Tyree Brothers Environmental Services (TBES) are based solely on the information reported in this document. The conclusions presented are based upon the current regulatory climate and may require revision if future regulatory changes occur. This investigation and report have been conducted in accordance with generally accepted practices. No other warranty, expressed or implied, is made.

APPENDIX I

Tank Condition Reports



NOTE:
On the above tank diagram, an "X" marks the exact location of leak point(s) or areas of corrosion.

1. Tank Location: U-Haul #803-62, 23rd and 11th Avenue, New York, New York

2. Tank Information: Age ______ Years   Capacity 1,000 Gallons

- [ ] Leaker
- [x] Non-Leaker

Grade:
- [ ] Leaded Regular
- [ ] Leaded Premium
- [x] Unleaded Regular
- [ ] Unleaded Premium
- [ ] Diesel
- [ ] Waste Oil
- [ ] Other ______

Type:
- [ ] Steel
- [ ] Single Wall Fiberglass
- [ ] Double Wall Fiberglass
- [ ] Steel w/epoxy liner
- [ ] Steel w/sacrifical anodes
- [ ] Steel w/impressed current cathode protection
- [x] Other Plasteel

3. Type of Backfill:
- [x] Sand
- [ ] Soil
- [ ] Pea Gravel
- [ ] Crushed Stone
- [ ] Concrete Encasement
- [ ] Polyvinyl liner
- [ ] Other ______

4. Corrosion Information:
- [ ] External
- [ ] Internal
- [ ] Both
- [ ] Unknown
- [ ] Minimal

Was water table Present? NO
Number of Holes? 0
Average hole diameter? ______

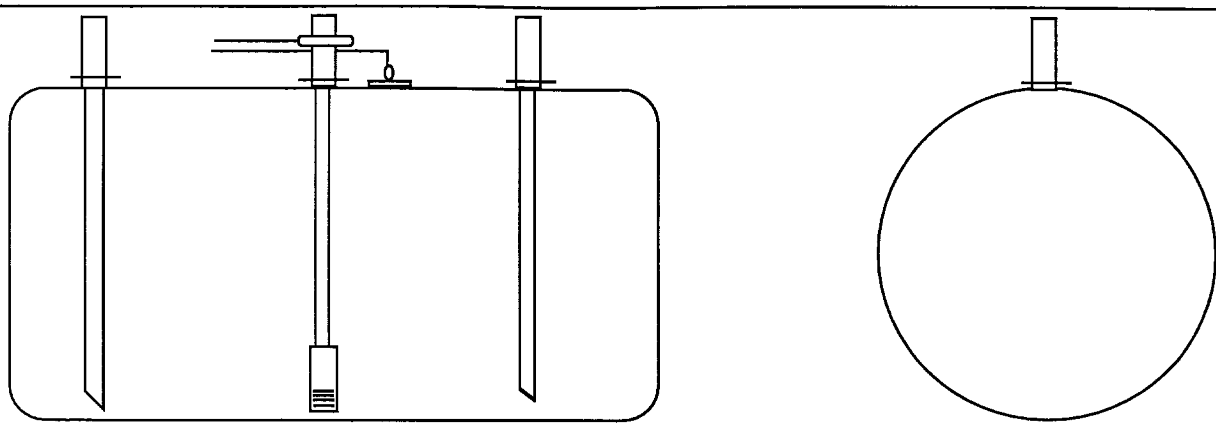
Comments/Description No signs of corrosion.

5. Tank Removal Due To:
- [ ] Leak Detected/Confirmed by Tank Test
- [x] Station Renovation/Construction
- [ ] As part of ______ program.

Reported By: Kevin Hale   Date: 4/11/97

Official on Site: Koon S. Tang   Agency: NYSDEC

TYREE BROTHERS ENVIRONMENTAL SERVICES, INC. 208 Route 109 Farmingdale, NY 11735	**REMOVED UNDERGROUND STORAGE TANK (UST) CONDITION REPORT** U-HAUL #803-62 23RD AND 11TH AVENUE NEW YORK, NEW YORK	Drawn By: L. Kovalsky Date: 5/22/97



NOTE:
On the above tank diagram, an "X" marks the exact location of leak point(s) or areas of corrosion.

1. Tank Location: U-Haul #803-62, 23rd and 11th Avenue, New York, New York

2. Tank Information: Age ____ Years Capacity 1,000 Gallons ☐ Leaker ☒ Non-Leaker

Grade:
- ☐ Leaded Regular
- ☐ Leaded Premium
- ☐ Unleaded Regular
- ☐ Unleaded Premium
- ☒ Diesel
- ☐ Waste Oil
- ☐ Other ____

Type:
- ☐ Steel
- ☐ Single Wall Fiberglass
- ☐ Double Wall Fiberglass
- ☐ Steel w/epoxy liner
- ☐ Steel w/sacrifical anodes
- ☐ Steel w/impressed current cathode protection
- ☒ Other Plasteel

3. Type of Backfill:
- ☒ Sand
- ☐ Soil
- ☐ Pea Gravel
- ☐ Crushed Stone
- ☐ Concrete Encasement
- ☐ Polyvinyl liner
- ☐ Other ____

4. Corrosion Information:
- ☐ External
- ☐ Internal
- ☐ Both
- ☐ Unknown
- ☐ Minimal

Was water table Present? NO
Number of Holes? 0
Average hole diameter? ____

Comments/Description No signs of corrosion.

5. Tank Removal Due To:
- ☐ Leak Detected/Confirmed by Tank Test
- ☒ Station Renovation/Construction
- ☐ As part of ____ program.

Reported By: Kevin Hale Date: 4/11/97

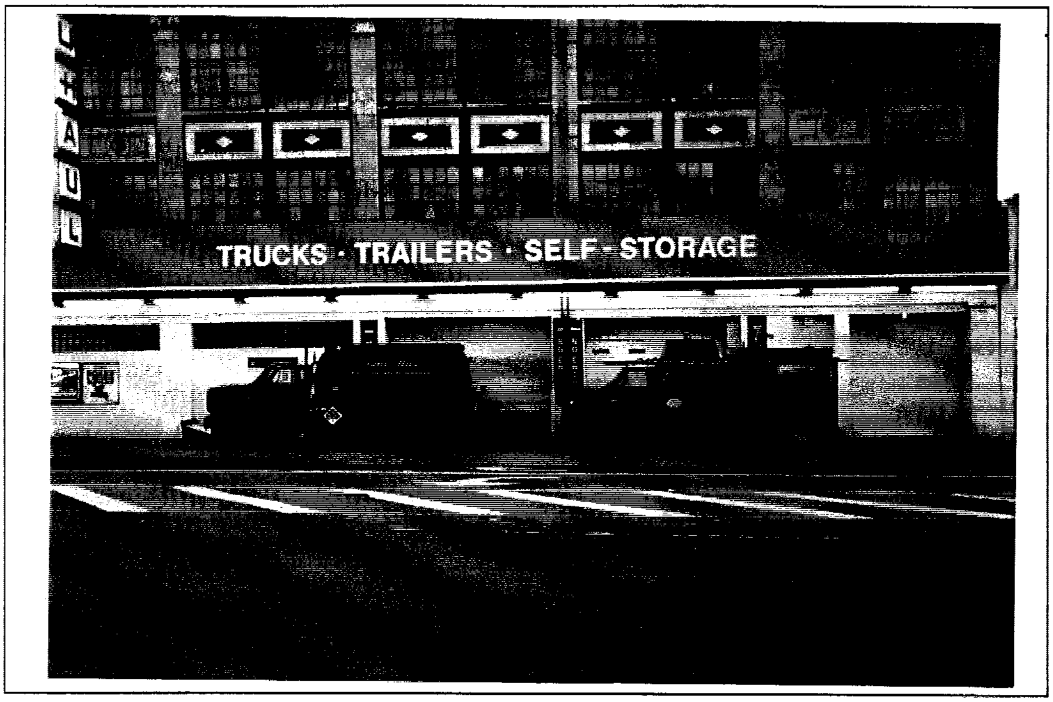
Official on Site: Koon S. Tang Agency: NYSDEC

TYREE BROTHERS ENVIRONMENTAL SERVICES, INC. 208 Route 109 Farmingdale, NY 11735	**REMOVED UNDERGROUND STORAGE TANK (UST) CONDITION REPORT** U-HAUL #803-62 23RD AND 11TH AVENUE NEW YORK, NEW YORK	Drawn By: L. Kovalsky Date: 5/22/97

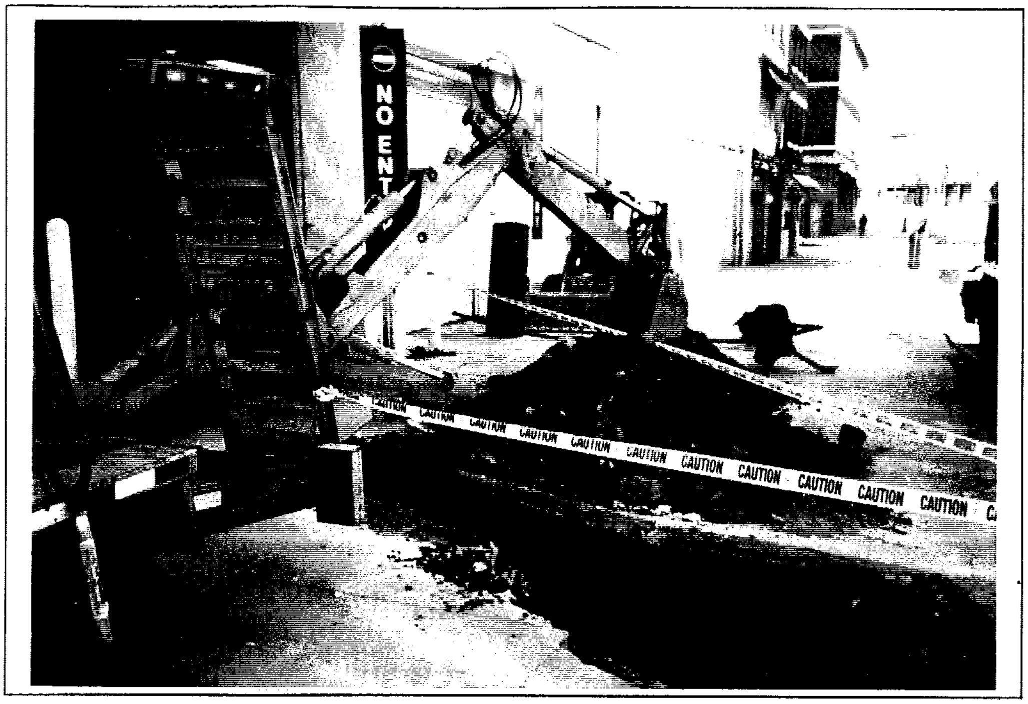
The Tyree Organization

APPENDIX II

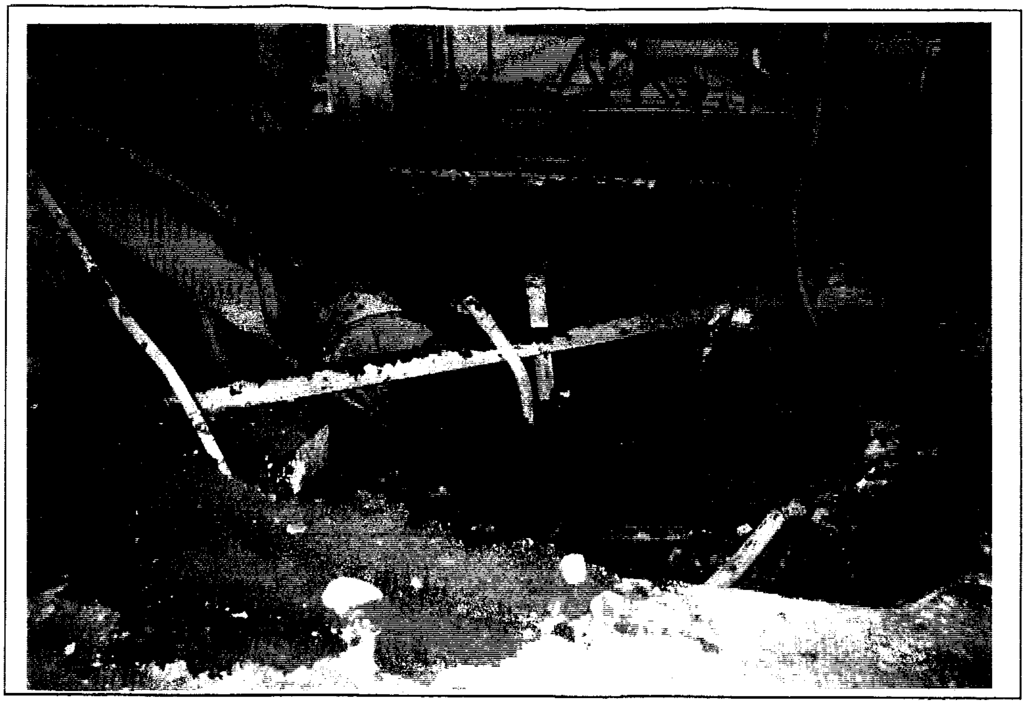
Photodocumentation



PRECONSTRUCTION PHOTO



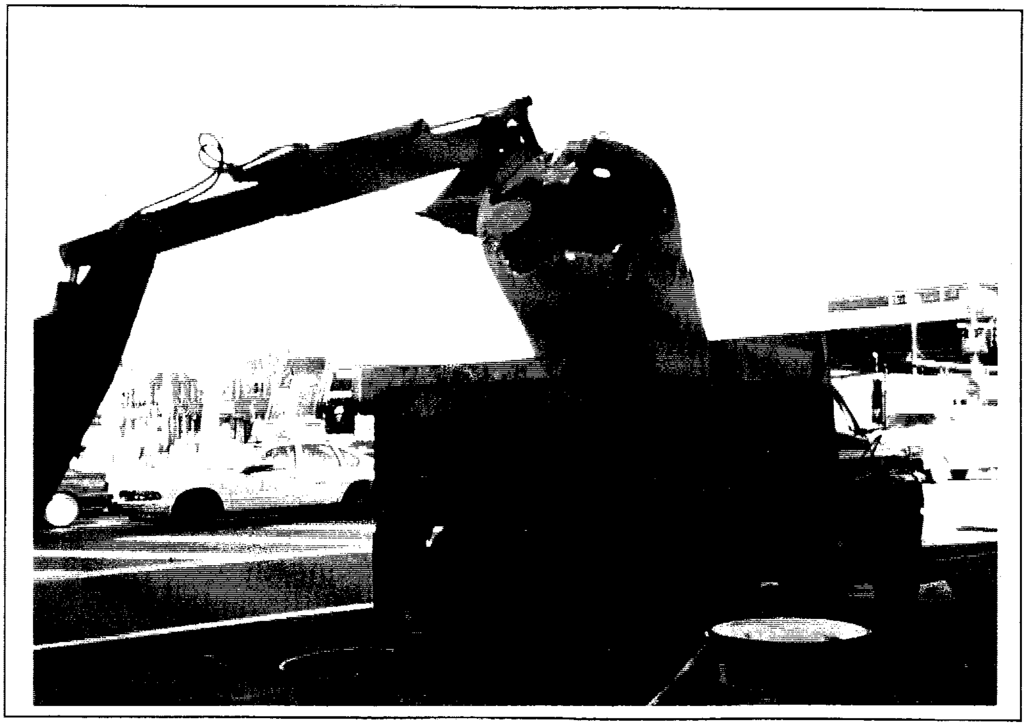
VIEW OF FILL LINE EXCAVATION



VIEW OF GASOLINE / DIESEL EXCAVATION

VIEW OF THE TANKS

VIEW OF THE TANKS



VIEW OF TANK BEING CUT, CLEANED
AND READY FOR TRANSPORT

The Tyree Organization

APPENDIX III

Laboratory Analysis

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456

ANALYSIS REPORT - EPA 8021 Stars Memo Cmpds

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 1
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - North
Remarks:

Analysis Information
Analyzed: 04/18/97
Remarks: See Case Narrative

Analyte	Concentration	Units	Dilution	MDL	Units	
MTBE	**5.7**	ppb	1.20	0.66	ppb	B
Benzene	**<0.34**	ppb	1.20	0.34	ppb	
Toluene	**<0.4**	ppb	1.20	0.4	ppb	
Ethylbenzene	**<0.41**	ppb	1.20	0.41	ppb	
m,p-xylene	**<0.76**	ppb	1.20	0.76	ppb	
o-xylene	**<0.34**	ppb	1.20	0.34	ppb	
Xylene	**<1.1**	ppb	1.20	1.1	ppb	
Isopropylbenzene	**<0.31**	ppb	1.20	0.31	ppb	
n-Propylbenzene	**<0.49**	ppb	1.20	0.49	ppb	
1,3,5-Trimethylbenzene	**<0.36**	ppb	1.20	0.36	ppb	
1,2,4-Trimethylbenzene	**<0.4**	ppb	1.20	0.4	ppb	
sec-Butylbenzene	**<0.43**	ppb	1.20	0.43	ppb	
p-Isopropyltoluene	**<0.43**	ppb	1.20	0.43	ppb	
n-Butylbenzene	**<0.47**	ppb	1.20	0.47	ppb	
Naphthalene	**<0.66**	ppb	1.20	0.66	ppb	
tert-Butylbenzene	**<0.62**	ppb	1.20	0.62	ppb	

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Environmental Testing Laboratories, Inc.
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Project
U-Haul
23rd & 11th Avenue
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Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 2
Custody: F4129
Collected: 04/10/97 2:00 PM
Location: Ex - South
Remarks:

Type: Grab
Matrix: Soil

Analysis Information
Analyzed: 04/18/97
Remarks: See Case Narrative

Analyte	Concentration	Units	Dilution	MDL	Units
MTBE	**11.6**	ppb	1.21	0.67	ppb
Benzene	**<0.34**	ppb	1.21	0.34	ppb
Toluene	**<0.4**	ppb	1.21	0.4	ppb
Ethylbenzene	**<0.41**	ppb	1.21	0.41	ppb
m,p-xylene	**<0.76**	ppb	1.21	0.76	ppb
o-xylene	**<0.34**	ppb	1.21	0.34	ppb
Xylene	**<1.1**	ppb	1.21	1.1	ppb
Isopropylbenzene	**<0.31**	ppb	1.21	0.31	ppb
n-Propylbenzene	**<0.5**	ppb	1.21	0.5	ppb
1,3,5-Trimethylbenzene	**<0.36**	ppb	1.21	0.36	ppb
1,2,4-Trimethylbenzene	**<0.4**	ppb	1.21	0.4	ppb
sec-Butylbenzene	**<0.44**	ppb	1.21	0.44	ppb
p-Isopropyltoluene	**<0.44**	ppb	1.21	0.44	ppb
n-Butylbenzene	**<0.47**	ppb	1.21	0.47	ppb
Naphthalene	**<0.67**	ppb	1.21	0.67	ppb
tert-Butylbenzene	**<0.63**	ppb	1.21	0.63	ppb

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

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New York, NY
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Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 3
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - East
Remarks:

Analysis Information
Analyzed: 04/18/97
Remarks: See Case Narrative

Analyte	Concentration	Units	Dilution	MDL	Units
MTBE	**<0.67**	ppb	1.21	0.67	ppb
Benzene	**<0.34**	ppb	1.21	0.34	ppb
Toluene	**<0.4**	ppb	1.21	0.4	ppb
Ethylbenzene	**<0.41**	ppb	1.21	0.41	ppb
m,p-xylene	**<0.76**	ppb	1.21	0.76	ppb
o-xylene	**<0.34**	ppb	1.21	0.34	ppb
Xylene	**<1.1**	ppb	1.21	1.1	ppb
Isopropylbenzene	**<0.31**	ppb	1.21	0.31	ppb
n-Propylbenzene	**<0.5**	ppb	1.21	0.5	ppb
1,3,5-Trimethylbenzene	**<0.36**	ppb	1.21	0.36	ppb
1,2,4-Trimethylbenzene	**<0.4**	ppb	1.21	0.4	ppb
sec-Butylbenzene	**<0.44**	ppb	1.21	0.44	ppb
p-Isopropyltoluene	**<0.44**	ppb	1.21	0.44	ppb
n-Butylbenzene	**<0.47**	ppb	1.21	0.47	ppb
Naphthalene	**<0.67**	ppb	1.21	0.67	ppb
tert-Butylbenzene	**<0.63**	ppb	1.21	0.63	ppb

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

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Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 4
Custody: F4129
Collected: 04/10/97 2:00 PM
Location: Ex - West
Remarks:

Type: Grab
Matrix: Soil

Analysis Information
Analyzed: 04/18/97
Remarks: See Case Narrative

Analyte	Concentration	Units	Dilution	MDL	Units	
MTBE	**7.3**	ppb	1.22	0.67	ppb	B
Benzene	**<0.34**	ppb	1.22	0.34	ppb	
Toluene	**<0.4**	ppb	1.22	0.4	ppb	
Ethylbenzene	**<0.41**	ppb	1.22	0.41	ppb	
m,p-xylene	**<0.77**	ppb	1.22	0.77	ppb	
o-xylene	**<0.34**	ppb	1.22	0.34	ppb	
Xylene	**<1.1**	ppb	1.22	1.1	ppb	
Isopropylbenzene	**<0.32**	ppb	1.22	0.32	ppb	
n-Propylbenzene	**<0.5**	ppb	1.22	0.5	ppb	
1,3,5-Trimethylbenzene	**<0.37**	ppb	1.22	0.37	ppb	
1,2,4-Trimethylbenzene	**<0.4**	ppb	1.22	0.4	ppb	
sec-Butylbenzene	**<0.44**	ppb	1.22	0.44	ppb	
p-Isopropyltoluene	**<0.44**	ppb	1.22	0.44	ppb	
n-Butylbenzene	**<0.48**	ppb	1.22	0.48	ppb	
Naphthalene	**<0.67**	ppb	1.22	0.67	ppb	
tert-Butylbenzene	**<0.63**	ppb	1.22	0.63	ppb	

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

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ANALYSIS REPORT - EPA 8021 Stars Memo Cmpds

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 5
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - Bottom
Remarks:

Analysis Information
Analyzed: 04/18/97
Remarks: See Case Narrative

Analyte	Concentration	Units	Dilution	MDL	Units	
MTBE	**42.0**	ppb	6.48	3.6	ppb	B
Benzene	**<1.8**	ppb	6.48	1.8	ppb	
Toluene	**<2.1**	ppb	6.48	2.1	ppb	
Ethylbenzene	**<2.2**	ppb	6.48	2.2	ppb	
m,p-xylene	**13.4**	ppb	6.48	4.1	ppb	
o-xylene	**7.2**	ppb	6.48	1.8	ppb	
Xylene	**20.6**	ppb	6.48	5.9	ppb	
Isopropylbenzene	**5.2**	ppb	6.48	1.7	ppb	
n-Propylbenzene	**8.6**	ppb	6.48	2.7	ppb	
1,3,5-Trimethylbenzene	**7.7**	ppb	6.48	1.9	ppb	
1,2,4-Trimethylbenzene	**22.2**	ppb	6.48	2.1	ppb	
sec-Butylbenzene	**13.3**	ppb	6.48	2.3	ppb	
p-Isopropyltoluene	**9.7**	ppb	6.48	2.3	ppb	
n-Butylbenzene	**15.3**	ppb	6.48	2.5	ppb	
Naphthalene	**25.1**	ppb	6.48	3.6	ppb	
tert-Butylbenzene	**<3.4**	ppb	6.48	3.4	ppb	

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Environmental Testing Laboratories, Inc.
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ANALYSIS REPORT - Stars Memo Base Neutrals

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 1
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - North
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
Naphthalene	**<45.8**	ppb	39.80	45.8	ppb
Acenaphthylene	**52.1**	ppb	39.80	46.2	ppb
Fluorene	**<50.9**	ppb	39.80	50.9	ppb
Phenanthrene	**472**	ppb	39.80	58.9	ppb
Anthracene	**135**	ppb	39.80	60.9	ppb
Fluoranthene	**797**	ppb	39.80	67.7	ppb
Pyrene	**669**	ppb	39.80	65.7	ppb
Benzo(a)anthracene	**499**	ppb	39.80	54.1	ppb
Chrysene	**479**	ppb	39.80	83.6	ppb
Benzo(b)fluoranthene	**628**	ppb	39.80	65.7	ppb
Benzo(k)fluoranthene	**245**	ppb	39.80	65.7	ppb
Benzo(a)pyrene	**612**	ppb	39.80	66.5	ppb
Indeno(1,2,3-cd)pyrene	**332**	ppb	39.80	84	ppb
Dibenzo(a,h)anthracene	**94.3**	ppb	39.80	83.2	ppb
Benzo(g,h,i)perylene	**342**	ppb	39.80	84	ppb

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Mem

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456

ANALYSIS REPORT - Stars Memo Base Neutrals

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 2
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - South
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
Naphthalene	**66.5**	ppb	39.60	45.5	ppb
Acenaphthylene	**136**	ppb	39.60	45.9	ppb
Fluorene	**132**	ppb	39.60	50.7	ppb
Phenanthrene	**1350**	ppb	39.60	58.6	ppb
Anthracene	**325**	ppb	39.60	60.6	ppb
Fluoranthene	**1740**	ppb	39.60	67.3	ppb
Pyrene	**1660**	ppb	39.60	65.3	ppb
Benzo(a)anthracene	**1150**	ppb	39.60	53.9	ppb
Chrysene	**1010**	ppb	39.60	83.2	ppb
Benzo(b)fluoranthene	**1330**	ppb	39.60	65.3	ppb
Benzo(k)fluoranthene	**628**	ppb	39.60	65.3	ppb
Benzo(a)pyrene	**1320**	ppb	39.60	66.1	ppb
Indeno(1,2,3-cd)pyrene	**653**	ppb	39.60	83.6	ppb
Dibenzo(a,h)anthracene	**221**	ppb	39.60	82.8	ppb
Benzo(g,h,i)perylene	**650**	ppb	39.60	83.6	ppb

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Mem

The Tyree Organization

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ANALYSIS REPORT - Stars Memo Base Neutrals

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 3
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - East
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
Naphthalene	**<46.2**	ppb	40.20	46.2	ppb
Acenaphthylene	**60.0**	ppb	40.20	46.6	ppb
Fluorene	**<51.5**	ppb	40.20	51.5	ppb
Phenanthrene	**541**	ppb	40.20	59.5	ppb
Anthracene	**167**	ppb	40.20	61.5	ppb
Fluoranthene	**900**	ppb	40.20	68.3	ppb
Pyrene	**797**	ppb	40.20	66.3	ppb
Benzo(a)anthracene	**647**	ppb	40.20	54.7	ppb
Chrysene	**600**	ppb	40.20	84.4	ppb
Benzo(b)fluoranthene	**925**	ppb	40.20	66.3	ppb
Benzo(k)fluoranthene	**302**	ppb	40.20	66.3	ppb
Benzo(a)pyrene	**822**	ppb	40.20	67.1	ppb
Indeno(1,2,3-cd)pyrene	**423**	ppb	40.20	84.8	ppb
Dibenzo(a,h)anthracene	**136**	ppb	40.20	84	ppb
Benzo(g,h,i)perylene	**429**	ppb	40.20	84.8	ppb

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

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ANALYSIS REPORT - Stars Memo Base Neutrals

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 4
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - West
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
Naphthalene	**<46.6**	ppb	40.50	46.6	ppb
Acenaphthylene	**68.9**	ppb	40.50	47	ppb
Fluorene	**57.9**	ppb	40.50	51.8	ppb
Phenanthrene	**558**	ppb	40.50	59.9	ppb
Anthracene	**169**	ppb	40.50	62	ppb
Fluoranthene	**925**	ppb	40.50	68.9	ppb
Pyrene	**922**	ppb	40.50	66.8	ppb
Benzo(a)anthracene	**726**	ppb	40.50	55.1	ppb
Chrysene	**618**	ppb	40.50	85.1	ppb
Benzo(b)fluoranthene	**1000**	ppb	40.50	66.8	ppb
Benzo(k)fluoranthene	**338**	ppb	40.50	66.8	ppb
Benzo(a)pyrene	**903**	ppb	40.50	67.6	ppb
Indeno(1,2,3-cd)pyrene	**436**	ppb	40.50	85.5	ppb
Dibenzo(a,h)anthracene	**133**	ppb	40.50	84.6	ppb
Benzo(g,h,i)perylene	**424**	ppb	40.50	85.5	ppb

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

ANALYSIS REPORT - Stars Memo Base Neutrals

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 5
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - Bottom
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
Naphthalene	**<49.6**	ppb	43.10	49.6	ppb
Acenaphthylene	**72.0**	ppb	43.10	50	ppb
Fluorene	**<55.2**	ppb	43.10	55.2	ppb
Phenanthrene	**517**	ppb	43.10	63.8	ppb
Anthracene	**157**	ppb	43.10	65.9	ppb
Fluoranthene	**852**	ppb	43.10	73.3	ppb
Pyrene	**772**	ppb	43.10	71.1	ppb
Benzo(a)anthracene	**630**	ppb	43.10	58.6	ppb
Chrysene	**603**	ppb	43.10	90.5	ppb
Benzo(b)fluoranthene	**955**	ppb	43.10	71.1	ppb
Benzo(k)fluoranthene	**322**	ppb	43.10	71.1	ppb
Benzo(a)pyrene	**898**	ppb	43.10	72	ppb
Indeno(1,2,3-cd)pyrene	**439**	ppb	43.10	90.9	ppb
Dibenzo(a,h)anthracene	**135**	ppb	43.10	90.1	ppb
Benzo(g,h,i)perylene	**438**	ppb	43.10	90.9	ppb

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456

ANALYSIS REPORT - Total Solids

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 1
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - North
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
% Solids	**83.6**	%	1		%

Sample 2
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - South
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
% Solids	**84.1**	%	1		%

Sample 3
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - East
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
% Solids	**82.8**	%	1		%

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456

ANALYSIS REPORT - Total Solids

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 4
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - West
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
% Solids	**82.2**	%	1		%

Sample 5
Custody: F4129 Type: Grab
Collected: 04/10/97 2:00 PM Matrix: Soil
Location: Ex - Bottom
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
% Solids	**77.2**	%	1		%

Sample 6
Custody: F4129 Type: Grab
Collected: 04/11/97 12:00 PM Matrix: Soil
Location: Fill Line (Stockpile)
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
% Solids	**82.4**	%	1		%

Reviewed by: [signature]

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Member The Tyree Organization

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456

ANALYSIS REPORT - TCLP Lead Method 1311

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 6
Custody: F4129 Type: Grab
Collected: 04/11/97 12:00 PM Matrix: Soil
Location: Fill Line (Stockpile)
Remarks:

Analysis Information
Analyzed: 04/20/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
Lead	**<0.028**	ppm	1.11	0.028	ppm

Reviewed by:

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456

ANALYSIS REPORT - TCLP BTEX

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 6
Custody: F4129 Type: Grab
Collected: 04/11/97 12:00 PM Matrix: Soil
Location: Fill Line (Stockpile)
Remarks:

Analysis Information
Analyzed: 04/23/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
Benzene	**0.076**	ppm	10	0.0005	ppm
Toluene	**NA**	ppm	10	0.0003	ppm
Ethylbenzene	**NA**	ppm	10	0.0008	ppm
Xylene	**NA**	ppm	10	0.0027	ppm

Reviewed by: Peggy Crigo

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456

ANALYSIS REPORT - Stars Memo Base Neutrals

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 6
Custody: F4129 Type: Grab
Collected: 04/11/97 12:00 PM Matrix: Soil
Location: Fill Line (Stockpile)
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
Naphthalene	**5040**	ppb	162	186	ppb
Acenaphthylene	**<188**	ppb	162	188	ppb
Fluorene	**295**	ppb	162	207	ppb
Phenanthrene	**674**	ppb	162	240	ppb
Anthracene	**<248**	ppb	162	248	ppb
Fluoranthene	**750**	ppb	162	275	ppb
Pyrene	**760**	ppb	162	267	ppb
Benzo(a)anthracene	**564**	ppb	162	220	ppb
Chrysene	**570**	ppb	162	340	ppb
Benzo(b)fluoranthene	**880**	ppb	162	267	ppb
Benzo(k)fluoranthene	**311**	ppb	162	267	ppb
Benzo(a)pyrene	**844**	ppb	162	271	ppb
Indeno(1,2,3-cd)pyrene	**578**	ppb	162	342	ppb
Dibenzo(a,h)anthracene	**<339**	ppb	162	339	ppb
Benzo(g,h,i)perylene	**650**	ppb	162	342	ppb

Reviewed by: [signature]

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456

ANALYSIS REPORT - EPA 8021 Stars Memo Cmpds

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 6
Custody: F4129 Type: Grab
Collected: 04/11/97 12:00 PM Matrix: Soil
Location: Fill Line (Stockpile)
Remarks:

Analysis Information
Analyzed: 04/18/97
Remarks: See Case Narrative

Analyte	Concentration	Units	Dilution	MDL	Units	
MTBE	**7560**	ppb	607	580	ppb	B
Benzene	**1010**	ppb	607	150	ppb	
Toluene	**5280**	ppb	607	150	ppb	
Ethylbenzene	**941**	ppb	607	210	ppb	
m,p-xylene	**66100**	ppb	607	270	ppb	
o-xylene	**76200**	ppb	607	190	ppb	
Xylene	**142300**	ppb	607	460	ppb	
Isopropylbenzene	**<160**	ppb	607	160	ppb	
n-Propylbenzene	**765**	ppb	607	130	ppb	
1,3,5-Trimethylbenzene	**69800**	ppb	607	210	ppb	
1,2,4-Trimethylbenzene	**148000**	ppb	6,068	1300	ppb	
sec-Butylbenzene	**1080**	ppb	607	170	ppb	
p-Isopropyltoluene	**10200**	ppb	607	150	ppb	
n-Butylbenzene	**<73**	ppb	607	73	ppb	
Naphthalene	**17800**	ppb	607	120	ppb	
tert-Butylbenzene	**<220**	ppb	607	220	ppb	

Reviewed by: Peggy Carrigo

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456

ANALYSIS REPORT - Total Pet. Hydrocarbons 418.1

05/21/97

Project
U-Haul
23rd & 11th Avenue
New York, NY
Manager: Jim Allen

Custody Document F4129
Received: 04/15/97 8:30 AM
Sampled by: Kevin Hale
Job Number: 977583

Sample 6
Custody: F4129 Type: Grab
Collected: 04/11/97 12:00 PM Matrix: Soil
Location: Fill Line (Stockpile)
Remarks:

Analysis Information
Analyzed: 04/17/97
Remarks:

Analyte	Concentration	Units	Dilution	MDL	Units
Total Recoverable Petroleum Hydrocarbon	**2680**	ppm	1	5.0	ppm

Reviewed by: Peggy Persigo

ppb=ug/L, ug/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed; MDL=Method Detection Limit; nd=Not Determined; E=Quantitated Above Calibration; IDL=Instrument Detection Limit. Soil sample based on dry weight basis; Air MDLs based on 1 L of sample. ELAP Cert #10969.

Member
The Tyree Organization

The Tyree Organization

APPENDIX IV

Waste Manifests

CONTAINS HAZARDOUS MATERIALS

STRAIGHT BILL OF LADING – SHORT FORM – Original – Not Negotiable

Shipper's No. ____________

(Carrier) TYREE ORGANIZATION SCAC. ____________ Carrier's No. NYD006801245

Received, subject to the classifications and tariffs in effect on the date of this Bill of Lading:

at ____________, date 4/8/97 from ____________

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated below, which said company (the word company being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its own road or its own water line, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the conditions not prohibited by law, whether printed or written, herein contained (as specified in Appendix B to Part 1035) which are hereby agreed to by the shipper and accepted for himself and his assigns.

TO: (Mail or street address of consignee for purposes of notification only.)	FROM:
Consignee TYREE BROTHERS ENVIRONMENTAL	Shipper U-Haul
Street 208 ROUTE 109	Street 23rd ST / 11th AVE
Destination FARMINGDALE, NY Zip 11735	Origin NEW YORK NY Zip
Route:	

Delivering Carrier	Trailer Initial/Number	U.S. DOT Hazmat Reg. Number

No. of packages	HM	Description of articles, special marks, and exceptions	Hazard Class	I.D. Number	Packing Group	*Weight (subject to correction)	Class or rate	Labels required (or exemption)	Check column
	X	Gasoline + Diesel mix	III	UN 1203		39	G		

Remit C.O.D. to:
Address:
City: State: Zip:

COD AMT: $

Charges Advanced $

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement: The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

Philip Mastrogiacomo
(Signature of consignor)

C. O. D. FEE: Prepaid ☐ Collect ☐ $

FREIGHT CHARGES ☐ Prepaid ☐ Collect

the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is "carrier's or shipper's weight". ote. – where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. ..e agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding ____________ per ____________

This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

PLACARDS REQUIRED

PLACARDS SUPPLIED ☐ YES ☐ NO - FURNISHED BY CARRIER

DRIVER'S SIGNATURE:

SPECIAL INSTRUCTIONS:

SHIPPER: U-Haul CARRIER

PER: X DATE: 4/8/97 PER: TYREE ORGANIZATION DATE: 4/8/97

EMERGENCY RESPONSE TELEPHONE NUMBER: (516) 249-3150

Monitored at all times the Hazardous Material is in transportation including storage incidental to transportation (§172.604).

Permanent post office address of shipper

CONTAINS HAZARDOUS MATERIALS

48-14-1 (10/96) 7a

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SOLID & HAZARDOUS MATERIALS

HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, New York 12212

THREE

Please print or type. Do not Staple.

Form Approved. OMB No. 2050-0039.

In case of emergency or spill immediately call the National Response Center (800) 424-8802 and the N.Y. Dept. of Environmental Conservation (518) 457-7362.

~~UNIFORM~~ HAZARDOUS WASTE MANIFEST

1. Generator's US EPA No.: NYR000040470 — Manifest Document No.: 13264
2. Page 1 of 1

Information in the shaded areas is not required by Federal Law.

A. State Manifest Document No.: NYG 021326 4

3. Generator's Name and Mailing Address
U-HAUL
562 WEST 23RD ~~AVENUE~~, NEW YORK, NY

B. Generator's ID: SAME

4. Generator's Phone ( )

5. Transporter 1 (Company Name): Chemical Pollution Control Inc
6. US EPA ID Number: NYD082785429

C. State Transporter's ID: PX3646
D. Transporter's Phone (516) 586-0333

7. Transporter 2 (Company Name):
8. US EPA ID Number:

E. State Transporter's ID
F. Transporter's Phone ( )

9. Designated Facility Name and Site Address
Chemical Pollution Control Inc
120 South Fourth Street
Bay Shore, NY 11706

10. US EPA ID Number: NYD082785429

G. State Facility's ID: Same
H. Facility's Phone: (516) 586-0333

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. WASTE FLAMMABLE LIQUID, NOS (D001) 3 UN1993 PG II ERG#128 B 603	005	DM	00275	G	EPA D001 STATE
b.					EPA STATE
c.					EPA STATE
d.					EPA STATE

J. Additional Descriptions for Materials listed Above
a 2217 c
b d

K. Handling Codes for Wastes Listed Above
a B c
b d

15. Special Handling Instructions and Additional Information
A) D001, D018 TANK Bottoms
Emergency Response #516-586-0333

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and state laws and regulations.
If I am a large quantity generator, I certify that I have program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR if I am a small generator, I have made a good faith effort to minimize my waste and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: GODFREY GARRETT — Signature: — Mo. Day Year: 06 11 97

17. Transporter 1 (Acknowledgement of Receipt of Materials)
Printed/Typed Name: ERIC Hofmann — Signature: Eric Hofmann — Mo. Day Year: 06 11 97

18. Transporter 2 (Acknowledgement or Receipt of Materials)
Printed/Typed Name: — Signature: — Mo. Day Year:

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed ~~Name~~: FRANK FAZIO — Signature: — Mo. Day Year: 06 11 97

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete.

COPY 2–Generator State–mailed by TSD facility

NYG 021326 4

Posillico Bros. Asphalt Co.

1610 New Highway, Farmingdale, NY 11735-1534

Plant Tel.: (516) 293-2620, 2621

Office Tel.: (516) 249-1872

HOT STORAGE

July 24, 1997

TYREE BROS ENVIRONMENTAL, INC.
P.O. Box 9131
Farmingdale, NY 11735

Attention: Jim Allen

RE: DISPOSAL OF:	**Gasoline Contaminated Soil**
LOCATION:	**U-HAUL** **562 West 23rd Street** **Manhattan, NY**
SPILL NO:	**97-00188**
PROJECT NO:	**97086**
DATE OF DISPOSAL:	**May 30, 1997**
QUANTITY REMOVED:	**8.45 Tons**

Dear Mr. Allen:

Attached please find the copies of the corresponding manifests, tickets and load amounts, in reference to the captioned project. All contaminants have been **thermally destroyed** and **residual soils** have been **recycled** into hot mix asphalt.

If you require any additional information, please feel free to contact me.

Sincerely, yours,
POSILLICO BROS. ASPHALT, CO.

Michael J. Posillico
Vice President

MJP/kp

enclosure

Posillico Bros. Asphalt Co.

1610 New Highway, Farmingdale, N.Y. 11735
Plant Tele: 293-2620, 2621

HOT STORAGE

05/30/97

14:28

Ticket
60581

Customer: 35
TYREE BROTHERS

Job: 97086

Truck #
F209

P.O. #:

PICKUP

Products		Amount
67	CONTAMINATED SOIL	8.45

Plant Name: PBA

Received By: M. Rupold

Driver Name:

G= 15.47
T= 7.02

N= 8.45

SITE ASSESSMENT REPORT

U-Haul Moving Center #803-62
562 West 23rd Street
New York City, New York

July 31, 1997

Prepared For:

AMERCO
Real Estate Company
2721 North Central Avenue, Suite 700
Phoenix, Arizona 85004

Prepared By:

PINNACLE
ENVIRONMENTAL TECHNOLOGIES

2 Santa Maria
Foothill Ranch, California 92610

(714) 470-3691

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Pinnacle Environmental Technologies (Pinnacle) completed the installation of three groundwater monitoring wells on the behalf of AMERCO Real Estate Company (AMERCO) at U-Haul Moving Center #803-62, located at 562 West 23rd Street in Manhattan, New York City, New York. This investigation was completed in compliance with a request from the New York State Department of Environmental Conservation (NYSDEC) for AMERCO to complete a site assessment at the subject site.

The following summary and conclusions are based on the results of the investigation completed by Pinnacle on May 31, 1997 :

- Three groundwater monitoring wells were installed in the vicinity of the former USTs. Each boring was drilled and sampled to a depth of 15 feet below ground surface (bgs). Each of the three borings were converted to groundwater monitoring wells using 2-inch diameter ID Schedule 40 PVC well casing.

- Nine soil samples, three from each boring, were collected and analyzed for volatile organic compounds (VOC's), including benzene, toluene, ethylbenzene, and xylenes [BTEX]), and semi-volatile organic compounds using EPA Methods 8021 and 8270, respectively.

- Three groundwater samples were collected, one from each well, and analyzed for BTEX and VOC's using EPA Method 8021.

- Two grab samples were collected from the basement area. One sample was collected from absorbent material placed near cracks in the South wall and one water grab sample was collected from the shallow standing water located in the pump sump along the east wall of the basement. Both of these samples were submitted for analysis in accordance with the methods above.

- The soil at the site was observed to be a fine-grained sand with a trace of silt. Obvious field indicators of a significant release were not observed or measured on the photo-ionization detector (PID) used for field screening of soil samples.

- Groundwater was found to be present at approximately 6 feet bgs and was interpreted to flow at a very shallow gradient to the northeast. Gradient was calculated to be 0.005 ft/ft. It is likely that the direction of groundwater flow changes due to a tidal influence from the nearby Hudson River. The gradient is essentially flat beneath the site, which is consistent with the flat topography around the site.

- VOC concentrations above NYSDEC STARS Memo guidelines were detected in three of the nine analyzed soil samples. These samples were collected from borings MW-2 and MW-3. The soil samples collected from MW-1 were either below detection limits for all EPA Method 8021 analytes or were below the NYSDEC STARS Memo Guidelines.

- The area of greatest concern to the NYSDEC was the former remote fill line trench. Detectable concentration of all BTEX components were detected in the soil sample collected a 3 feet bgs, near the estimated base of the trench. However, BTEX was not detected in the soil samples collected below that depth in this boring.

- The lateral and vertical extent of the hydrocarbon-impacted soil appears to be adequately defined.

- Dissolved-phase benzene was detected in only one of the three groundwater samples collected from the wells installed during this investigation. A dissolved-phase benzene concentration of 63 ppb was detected in the sample collected from well MW-1.

- Dissolved-phase MTBE was in only one of the three groundwater samples. A concentration of 71 ppb of dissolved-phase MTBE was found in the sample collected from well MW-3.

- The lateral extent of the dissolved-phase benzene plume appears to be adequately defined based on the low potential for migration and the relatively low concentration detected in the one well. It will be very difficult to find a potential location where a delineation well could be safely installed to the southwest of well MW-1.

- Free product was not observed on the small accumulation of water along the east wall of the basement. Detectable concentrations of volatile organic vapors were not detected by either the onsite Pinnacle personnel or by using a PID. A concentration of 20 ppb of MTBE was detected in a grab sample collected of this water. The source of this MTBE is unknown, however, the very low concentration is not generally considered to pose a threat the environment or to human health.

- A concentration of 4,900 ppb of toluene was detected in a grab sample of some absorbent material placed along the south wall of the basement. No other BTEX or MTBE was found in this sample. The detected concentrations of toluene are inconsistent with the toluene concentrations found in the two soil samples with detectable toluene concentrations. It is unclear what the source of the toluene detected in the grab is, however, it is possible that the material was contaminated prior to be placed in the basement.

CONCLUSIONS AND RECOMMENDATIONS

- No further assessment appears to be necessary at this time.

- It is recommended that quarterly monitoring and sampling of the three wells be initiated and the data used to evaluate the groundwater conditions at the site.

- It is recommended that a determination of the daily groundwater tidal influence be completed to assess what effect the tides in the nearby Hudson River have on the gradient and direction of groundwater flow beneath the site.

- No engineered remedial action appears to be required at this time. The impacted soil volume is adequately defined. Mitigation of the known concentrations in the soil would be costly and have limited impact on the groundwater conditions at the site. The recommended approach to mitigate the dissolved-phase hydrocarbon concentrations detected at the site are monitoring and natural attenuation.

INTRODUCTION

This report presents the field procedures, observations, laboratory methods and results, data evaluation, and conclusions for site assessment activities completed at U-Haul Center #803-62, located at 562 West 23rd Street, New York, New York (Figures 1 & 2). This investigation was completed by Pinnacle Environmental Technologies (Pinnacle) on behalf of AMERCO Real Estate Company (AMERCO). AMERCO was responding to a request from the New York State Department of Environmental Conservation (NYSDEC) to complete assessment activities in the vicinity of the former underground storage tanks (USTs). This work was completed in accordance with the workplan prepared by Pinnacle, dated May 20, 1997.

OBJECTIVE

The objective of this investigation was to install three groundwater monitoring wells in the vicinity of the former USTs to assess the potential impact to soil and groundwater of a petroleum hydrocarbon release detected during the UST removal activities.

BACKGROUND

The site is located on the southeast corner of the intersection of 11th Avenue and West 23rd Street in Manhattan, New York City (Figures 1 & 2). The site is currently operated as a truck rental and mini-storage facility by U-Haul International. The site is completely occupied by a multi-floor building and the interior drive areas are covered with concrete.

The site lies at an approximate elevation of 7 feet above mean sea level (MSL) and is approximately 600 feet (0.1 miles) east of the Hudson River. Local topography is essentially flat and the area is heavily developed by a combination of commercial and industrial properties. Surface drainage appears to be towards the west-southwest at an approximate gradient of 0.01 ft/ft.

Two 1,000-gallon underground storage tanks (USTs) were formerly operated at the site for the storage of motor fuels for the rental vehicles operated from the site. Both USTs were removed on April 11, 1997 by The Tyree Organization (Tyree). The associated dispenser and remote fill lines were also removed at this time.

Tyree collected six soil samples, five from the UST excavation and one from below the former remote fill lines. No information regarding the sample collection depths was reported in the Tyree UST Removal Report (draft), dated May 1997. In addition, the Tyree report did not contain a sample location map so the actual sample locations are also unclear.

Each of the six soil samples was analyzed for volatile organic compounds (VOCs) in accordance with EPA Method 8021 and for Semi-Volatile Organic Compounds - Base Neutral (BN) using EPA Method 8270.

The soil samples collected from the UST excavation sidewalls and analyzed using EPA Method 8021 were below detection limits for benzene, toluene, ethylbenzene, and xylenes (BTEX). Methyl-tertiary-butyl-ether (MTBE) was detected in three of the four sidewall samples at concentrations ranging from 5.7 parts per billion (ppb) to 11.6 ppb.

MTBE was detected in the soil sample collected from the base of the excavation at a concentration of 43.0 ppb. Concentrations of BTEX were below detection limits, with the exception of xylenes, which were detected at a total concentration of 41.2 ppb. The remaining EPA Method 8021 analytes were detected in this sample at concentrations ranging from 5.2 to 25.1 ppb.

VOCs were detected in the soil sample collected from below the former remote fill line. Benzene was detected in the fill line soil sample at a concentration of 1,010 ppb.

Semi-volatile organic compounds were detected in all six soil samples at concentrations ranging from 52.1 ppb to 5,040 ppb. Concentrations in this range may be indicative of the general background levels in the area.

SITE ASSESSMENT ACTIVITIES

Pinnacle completed the following scope of work on May 31, 1997:

- Three soil borings were drilled and sampled to a depth of 15 feet below ground surface (bgs) using a limited access hollow-stem auger drill rig (Figure 2).

- A total of nine soil samples (three from each boring) were collected using a hammer-driven split-spoon at 5-foot intervals commencing at 5 feet bgs.

- Each of the three borings were converted to groundwater monitoring wells which were completed to depths between twelve and fifteen feet bgs. Each well was constructed using 2-inch ID Schedule-40 PVC well casing. The top-of-casing elevation was surveyed relative to an onsite benchmark and measured to the nearest 0.01 foot. Appendix C contains the boring logs and well construction details.

- The basement beneath the site building (Figure 2) was inspected due to reports by Tyree of the presence of free-phase petroleum product in the basement area. Two grab samples were collected from the basement, one of ponded groundwater near the sump pump and one of some absorbent material observed near the south wall of the basement.

- Each of the three newly-installed wells were developed by purging a minimum of ten well casing volumes using a submersible pump. Each well was developed until the temperature, pH, and conductivity had stabilized and a significant decrease in turbidity was observed.

- A groundwater sample was collected from each of the three wells after the static groundwater elevation had stabilized to within 80% of the pre-development elevation.

- A total of fourteen samples were submitted to a NYSDEC-certified laboratory for analysis. Each of the nine soil samples and the basement grab sample were analyzed for VOC's using EPA Method 8021 and for BN using EPA Method 8270. The three ground water samples and the basement sump grab sample were analyzed for VOC's using EPA Method 8021.

RESULTS

The following results were obtained based on the field observations and laboratory data:

- The soil beneath the site was observed to be predominantly a fine-grained sand with trace amounts of silt (Appendix C).

- Groundwater was measured to be present at approximately six feet bgs. Groundwater flow was directed to the northeast at a gradient of 0.006 ft/ft at the time of this investigation.

- Inspection of the basement showed that there was approximately 2 to 4 inches of water ponded in the area of the floor sump pump on the East side of the basement. No sheen or hydrocarbon odors were observed and VOC vapors were not detected by the PID. Several cracks in the south wall, nearest the former UST area, were observed. An absorbent material had been placed near the base of the cracks, possibly to inhibit the flow of water from the cracks towards the sump. No water was observed within 10 feet of the south wall. The floor of the basement is approximately at the static groundwater elevation measured on May 31, 1997. It is possible that seasonal fluctuations in groundwater elevation may cause ponding of water in the basement. This is supported by the presence of the floor sump and pump system. The discharge point of this system is unknown.

- Faint hydrocarbon odors were noted in the 5-foot soil sample collected from well MW-2 and in the 5 and 10-foot soil samples from well MW-3. Field screening of soil samples using a photo-ionization detector (PID) indicated VOC vapor concentrations of between 3 and 15 ppm. Obvious discoloration or other gross indications of significant contamination were noted in the field.

- Laboratory results for VOCs (EPA Method 8021) indicated the presence of petroleum hydrocarbon-impacted soil at the locations of wells MW-2 and MW-3. Benzene was detected in the soil sample collected at 5 feet bgs in well MW-2 at a concentration of 320 ppb. Toluene, ethylbenzene, and xylenes in excess of NYSDEC STARS Memo soil guidelines were also detected in this soil sample. MTBE was detected in all three soil samples collected from well MW-2 at concentrations between 12 ppb and 5,600 ppb.

- Benzene was not detected in any of the three analyzed soil samples from well MW-3. MTBE was detected in two of the three analyzed soil samples from well MW-3 at concentrations of 1.4 and 1.8 ppb.

- All three soil samples collected from well MW-1 were below detection limits for all analytes except MTBE, which was detected in all three soil samples at concentrations ranging from 1.7 to 8.2 ppb.

- The grab sample of absorbent material collected from the base of the south wall of the basement was below detection limits for BTEX with the exception of toluene, which was detected at a concentration of 4,900 ppb.

- Dissolved-phase benzene was detected in only one of the three groundwater samples analyzed. A concentration of 63 ppb of dissolved-phase benzene was detected in the groundwater sample collected from well MW-1.

- The water grab sample collected from the pump sump in the basement was below detection limits for BTEX. A concentration of 20 ppb of MTBE was detected in this sample.

DISCUSSION

The direction of groundwater flow interpreted for the May 31, 1997 sampling event is towards the northeast at a very low gradient of 0.006 ft/ft. Due to the proximal location of the Hudson River, less than 600 feet to the southwest, it is very likely that the groundwater gradient at the site is subject to a tidal influence. The gradient is essentially flat with less that 0.15 feet (1.8 inches) of elevation change across the west side of the site. The relatively flat gradient should significantly reduce the potential migration of dissolved-phase hydrocarbons beneath the site.

Petroleum hydrocarbon-impacted soil exceeding NYSDEC STARS Memo Table 1 Guidelines was detected in well MW-2 and MW-3. At Well MW-2, BTEX and MTBE were detected in excess of the STARS Guideline in the sample collected from 3 feet bgs. This is estimated to be at the base of the trench that Tyree excavated at the time of the UST and line removal.

A concentration of 320 ppb (0.32 parts per million [ppm]) of benzene was detected in the three foot sample at MW-2. The STARS Memo Guidelines for benzene in soil range from 0.7 ppb for the TCLP Extraction Value to 2.4×10^4 for the Human Health Guidance Value.

The soil samples collected at 10 feet and 15 feet bgs in well MW-2 were below detection limits for all BTEX analytes. This indicates that the hydrocarbon-impacted soil present at 3 feet bgs at this location has not impacted the deeper soil zones.

At well MW-3 only xylenes in excess of the STARS Memo Guidelines were detected. All other analytes were either below detection limits or well below the STARS Memo guidelines.

All three soil samples collected from well MW-1 were below detection limits for BTEX. MTBE was detected in all three soil samples, but at concentrations only slightly above the method detection limit of 2.0 ppb.

Based on the above results it is interpreted that the lateral and vertical extent of hydrocarbon-impacted soil in the vicinity of the former UST and fill lines has been adequately defined. The major area of concern noted by the NYSDEC was the remote fill line location. Well MW-2 was located within the confines of the trench patch close to the estimated position of the line sample collected by Tyree. Hydrocarbon-impacted soil does not appear to extend below approximately 3 feet bgs and has not likely migrated a significant distance laterally based on the limited vertical extent determined at this location. No indications of significant soil contamination in the area of the fill lines is present as evidenced by the laboratory results and field observations.

Dissolved-phase petroleum hydrocarbons were detected at the time of this investigation in two of the three ground water wells installed on May 31, 1997. The presence of 63 ppb of dissolved-phase benzene in well MW-1, located approximately 13 feet from the former UST pit, may be due to the tidal-influenced groundwater gradient at the site. Gradient is predominantly from the southwest to the northeast due to tidal fluctuation. The tidal fluctuations would not tend to influence the magnitude of the gradient so much as the direction. While the lateral extent of the dissolved-phase benzene plume is not defined to the southwest, it may not be possible to locate another well in that direction to fully define the lateral extent of the dissolved-phase benzene plume. Pinnacle observed the presence of utility markings in 11th Avenue for construction work in the street. Based on those markings it appears that no suitable potential well location within 75 to 100 feet of the former USTs is available.

In addition to the problems with physically locating a delineation well, it is not unreasonable to conclude that the well is unnecessary due to the known concentrations in well MW-1 and the current state of information regarding the distribution and degradation of benzene in groundwater. While dissolved-phase benzene is present, the concentration of 63 ppb is not an alarmingly high level.
Recent studies by the Lawrence Livermore National Laboratories (LLNL) have shown that in the absence of floating product most dissolved-phase benzene plumes do not move a significant distance due to the combination of physical retardation and natural attenuation. The very low hydraulic gradient present at the site will also reduce the potential migration of the dissolved-phase benzene plume.

In addition, dissolved-phase MTBE was not detected in the groundwater sample collected from well MW-1. MTBE is approximately 26 times more soluble in groundwater than benzene and is therefore many times more mobile in groundwater than benzene. The absence of MTBE in well MW-1 reinforces the interpretation that migration towards the southwest is very limited.

Tyree reported the presence of free product in the basement of the site building. This area is North of the former UST area. The wall nearest the former UST area is in poor repair and apparently allows groundwater to enter the basement during times of higher static water levels. Toluene was detected in the sample of the absorbent material placed at the base of the South wall, nearest the former UST area. No other BTEX analytes or MTBE were detected in that sample.

Since a virgin sample of this material was not available for analysis, it is difficult to state with any certainty what the source of the toluene is. While it is easy to assume that it is from the groundwater at the site as a result of leaching from the soil, the concentrations detected are not consistent with those detected in the groundwater itself or in any of the other soil samples collected during this investigation. For instance, toluene was detected in only two of the nine soil samples collected and analyzed from the soil borings/wells. A concentration of 1,100 ppb was detected in the sample collected at three feet bgs in the line trench area and a concentration of 4.3 ppb was detected in the soil sample collected at 10 feet bgs in well MW-3. These locations are both over fifteen feet from the location of the basement grab sample and it is difficult to envision how, if these are the likely source areas, that the concentrations are lower than that detected in the basement sample. This coupled with the fact that toluene was not detected in the deeper soil sample collected from MW-2 make it even more unlikely that these two areas are significant sources.

The sample from well MW-1, located over 33 feet from the location of the basement grab sample, was the only sample with a detectable dissolved-phase toluene concentration. A concentration of 1.8 ppb of dissolved-phase toluene was detected in the groundwater sample collected from MW-1. Again, it is difficult to substantiate a concentration of 4,900 ppb toluene in the basement absorbent material sample with a groundwater sample dissolved-phase concentration of only 1.8 ppb over 30 feet away. It is not likely that the material could concentrate toluene to that degree and not have any other detectable VOCs in it. It is entirely possible that this material contained a detectable concentration of toluene at the time it was placed in the basement.

BTEX was not detected in the water grab sample collected from the basement pump sump. A low concentration of 20 ppb of MTBE was detected in this sample, but it is impossible to be certain of the source.

Regardless of the analytical results obtained on the two basement grabs samples, it is clear that there was no observable free product in the basement at the time of this investigation and that previous statements to that effect may be in error or were a miscommunication. The lack of measurable VOC vapors in the basement also indicates that it is very likely that free product was never actually present in the basement. No significant threat to the environment or human health appears to be present as a result of petroleum hydrocarbons in the basement area.

SUMMARY AND CONCLUSIONS

The following summary and conclusions are based on the results of this investigation:

- Three groundwater monitoring wells were installed in the vicinity of the former USTs.
- Nine soil samples, three from each boring, were collected and analyzed for BTEX (VOC's), and semi-volatile organic compounds using EPA Methods 8021 and 8270, respectively.
- Three groundwater samples were collected and analyzed for BTEX and VOC's using EPA Method 8021.
- Two grab samples were collected from the basement area. One sample was collected from absorbent material placed near cracks in the south wall and one water grab sample was collected from the shallow standing water located in the pump sump along the east wall of the basement. Both these samples were submitted for analysis in accordance with the methods above.
- The soil at the site was observed to be a fine-grained sand with a trace of silt. Obvious field indicators of a significant petroleum release were not observed in the soil samples or measured on the PID used for field screening of soil samples.

- Groundwater was found to be present at approximately 6 feet bgs and was interpreted to flow under tidal influence at a very shallow gradient to the northeast. Gradient was calculated to be 0.005 ft/ft. It is likely that the direction of groundwater flow changes with the tides. The gradient is essentially flat beneath the site and which is consistent with the flat topography around the site.

- Volatile organic compounds (VOCs) were detected above NYSDEC STARS Memo guidelines in three of the nine soil samples collected and analyzed. These samples were collected from borings MW-2 and MW-3. The soil samples collected from MW-1 were either below detection limits for all EPA Method 8021 analytes or were below the NYSDEC STARS Memo Guidelines.

- The area of greatest concern to the NYSDEC was the former remote fill line trench. Detectable concentration of all BTEX components were present in the soil sample collected a 3 feet bgs, near the estimated base of the trench. However, BTEX was not detected in the soil samples collected below that depth in this boring.

- The lateral and vertical extent of the hydrocarbon-impacted soil appears to be adequately defined.

- Dissolved-phase benzene was detected in only one of the three groundwater samples collected from the wells installed during this investigation. A dissolved-phase benzene concentration of 63 ppb was detected in the sample collected from well MW-1.

- Dissolved-phase MTBE was in only one of the three groundwater samples. A concentration of 71 ppb of dissolved-phase MTBE was found in the sample collected from well MW-3.

- The lateral extent of the dissolved-phase benzene plume appears to be adequately defined based on the low potential for migration and the relatively low concentration detected in the one well. It will be very difficult to find a potential location where a delineation well could be safely installed to the southwest of well MW-1.

- Free product was not observed to be present in the small accumulation of water along the east wall of the basement. Detectable concentrations of volatile organic vapors were not detected by either the onsite Pinnacle personnel or by using a PID. A concentration of 20 ppb of MTBE was detected in a grab sample collected of this water. The source of this MTBE is unknown, however, the very low concentration is not generally considered to pose a threat the environment or to human health.

- A concentration of 4,900 ppb of toluene was detected in a grab sample of some absorbent material placed along the south wall of the basement. No other BTEX or MTBE was found in this sample. The detected concentrations of toluene are inconsistent with the toluene concentrations found in the two soil samples with detectable toluene concentrations. It is unclear what the source of the toluene detected in the grab is, however, it is possible that the material was contaminated prior to be placed in the basement.

- No further assessment appears to be necessary at this time.

- It is recommended that quarterly monitoring and sampling of the three wells be initiated and the data used to evaluate the groundwater conditions at the site.

- It is recommended that a determination of the daily groundwater tidal influence be completed to assess what effect the tides in the nearby Hudson River have on the gradient and direction of groundwater flow beneath the site.

- No engineered remedial action appears to be required at this time. The impacted soil volume is adequately defined. Mitigation of the known concentrations in the soil would be costly and have a limited effect on the groundwater conditions at the site. The recommended approach to mitigate the dissolved-phase hydrocarbon concentrations detected at the site are monitoring and natural attenuation.

William E. Malvey
Principal

Keith G. Thompson
Principal

TABLE 1
SUMMARY OF SOIL ANALYTICAL RESULTS

U-HAUL MOVING CENTER #803-62
562 West 23rd Street
New York, New York

SAMPLE	DATE	BENZENE (ppb)	TOLUENE (ppb)	ETHYLBENZENE (ppb)	XYLENES (ppb)	MTBE (ppb)
		EPA Method 8021				
MW-1-5	5/31/97	<1.2	<1.2	<1.2	<2.4	**8.2**
MW-1-10	5/31/97	<1.2	<1.2	<1.2	<2.4	**1.7**
MW-1-15	5/31/97	<1.2	<1.2	<1.2	<2.4	**2.9**
MW-2-3	5/31/97	**320.0**	**1,100.0**	**230.0**	**2,270.0**	**5,600.0**
MW-2-10	5/31/97	<1.1	<1.1	<1.1	<2.3	**37.0**
MW-2-15	5/31/97	<1.2	<1.2	<1.2	<2.4	**12.0**
MW-3-5	5/31/97	<2.4	<2.4	<2.4	**37.0**	<2.4
MW-3-10	5/31/97	<1.3	**4.3**	<1.3	**8.9**	**1.8**
MW-3-15	5/31/97	<1.3	<1.3	<1.3	<2.5	**1.4**
Basement	5/31/97	<420	**4,900.0**	<420	<840	<420
TCLP Extraction Value:		0.7	5.0	5.0	5.0	50.0
TCLP Alternative Value:		14.0	100.0	100.0	100.0	1,000.0
Human Health Value:		2.4 x 10E04	2.0 x 10E07	8.0 x 10E06	2.0 x 10E08	***
PQL:		1.0	1.0	1.0	1.0	2.0

Guidance Values are from Table 1 of the NYSDEC STARS Memo.
Shaded areas are concentrations exceeding STARS Guidance Values.

MTBE = methyl-tertiary-butyl-ether
ppb = parts per billion

TABLE 3
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

U-HAUL MOVING CENTER #803-62
562 West 23rd Street
New York, New York

SAMPLE	DATE	BENZENE (ppb)	TOLUENE (ppb)	ETHYLBENZENE (ppb)	XYLENES (ppb)	MTBE (ppb)
		EPA Method 8021				
MW-1	5/31/97	**63.0**	**1.8**	**13.0**	**4.9**	<1.0
MW-2	5/31/97	<0.70	<1.0	<1.0	<2.0	<1.0
MW-3	5/31/97	<1.4	<2.0	<2.0	**13.0**	**71.0**
BWTR	5/31/97	<1.0	<1.0	<1.0	<1.0	**20.0**
Stars Guidance Value (1):		0.7	5.0	5.0	5.0	50.0
PQL:		1.0	1.0	1.0	1.0	1.0

BWTR = Sample of water ponded near basement sump pump.
(1) TCLP Guidance Value for Gasoline Contaminated Soil.
This value is equal to the NYSDEC Groundwater Quality Standards.
Shaded areas exceed Guidance Values.

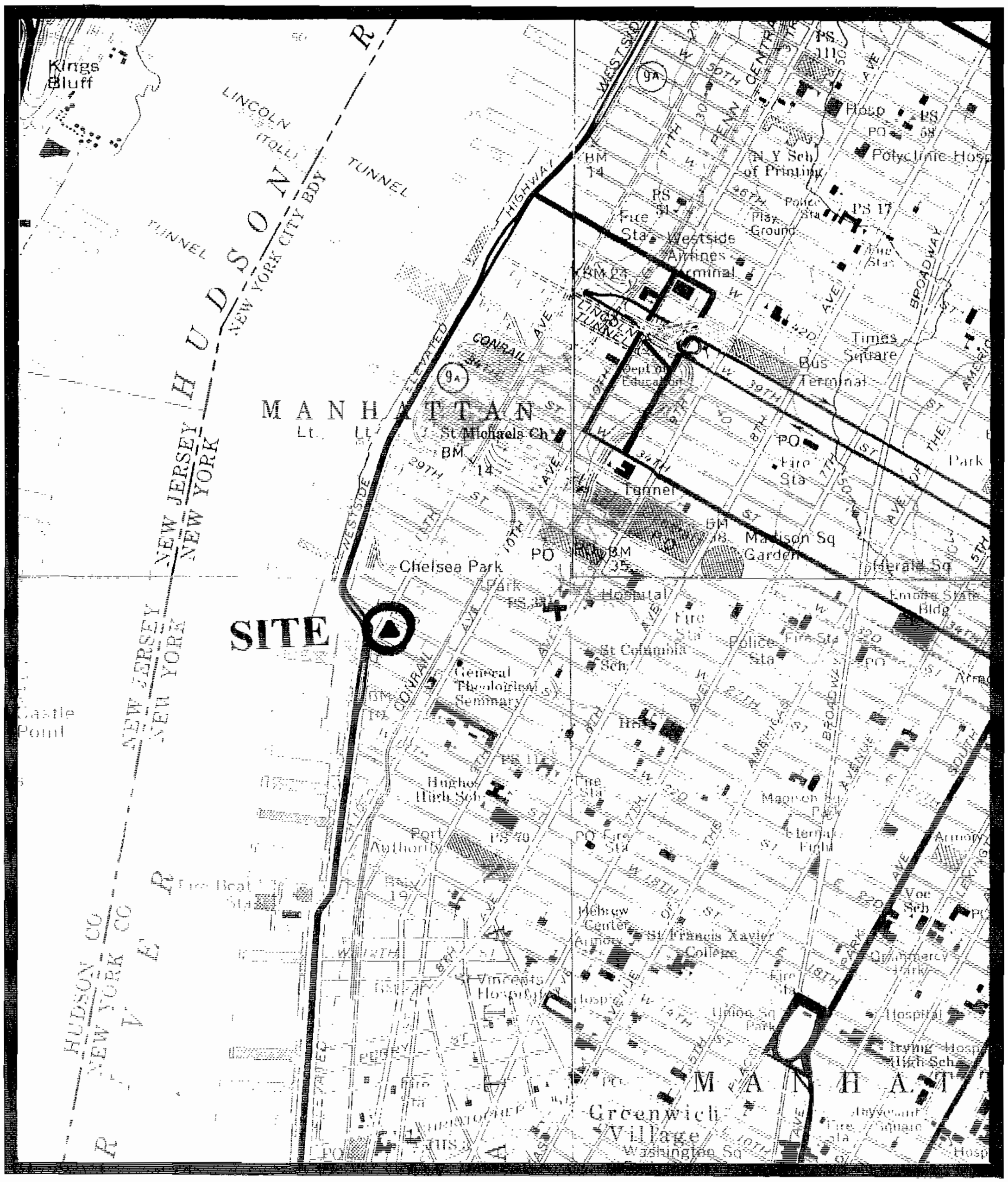
MTBE = methyl-tertiary-butyl-ether
ppb = parts per billion

TABLE 2
SUMMARY OF GROUNDWATER ELEVATION DATA

U-Haul Moving Center #803-62
562 West 23rd Street
New York, New York

WELL	CASING ELEVATION	DATE	DEPTH TO GROUNDWATER	GROUNDWATER ELEVATION	FREE PRODUCT THICKNESS
MW-1	6.61	5/31/97	5.87	0.74	0.00
MW-2	7.22	5/31/97	6.62	0.60	0.00
MW-3	6.51	5/31/97	5.92	0.59	0.00

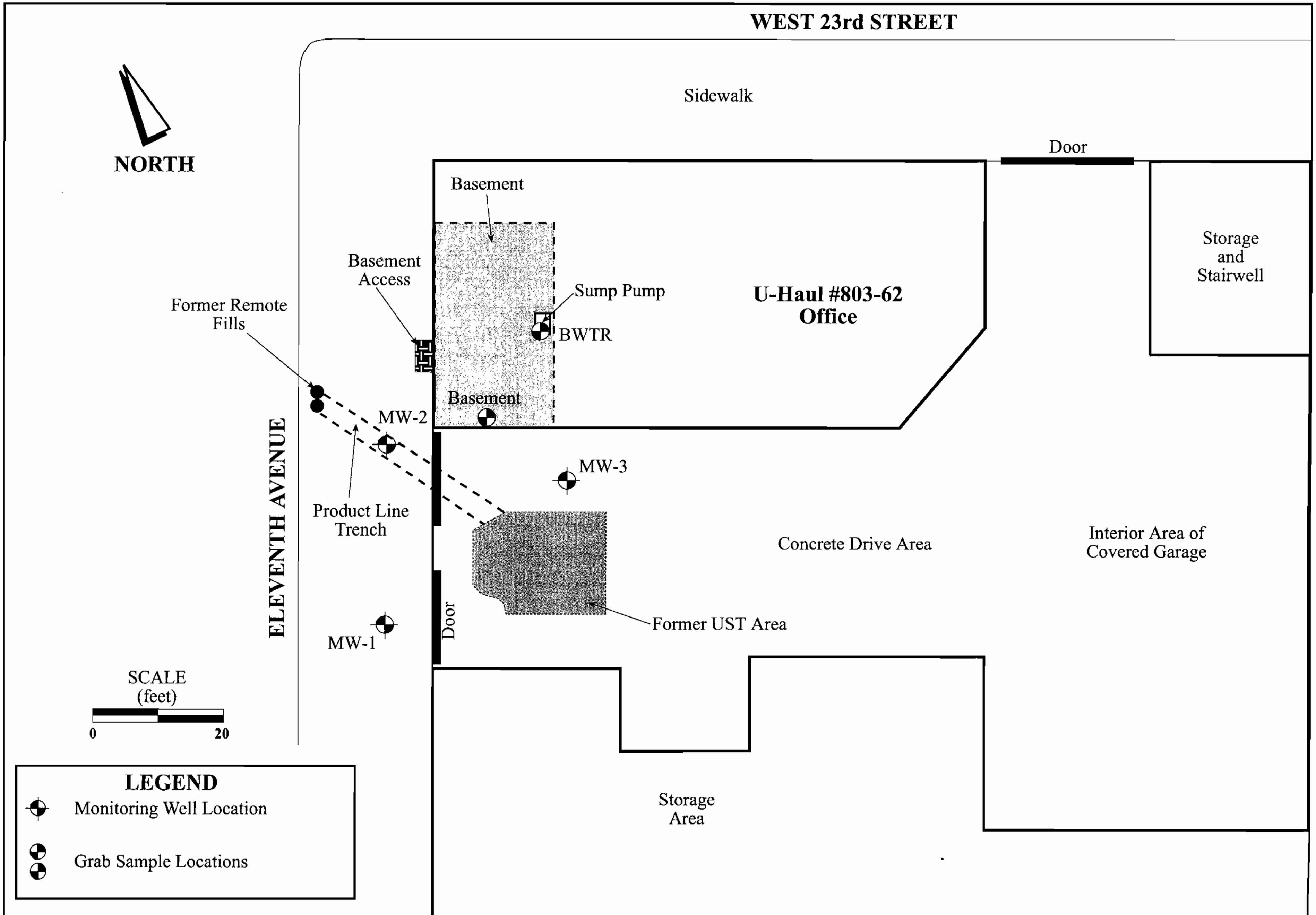
All elevations in feet relative to mean sea level.
All measurements in feet



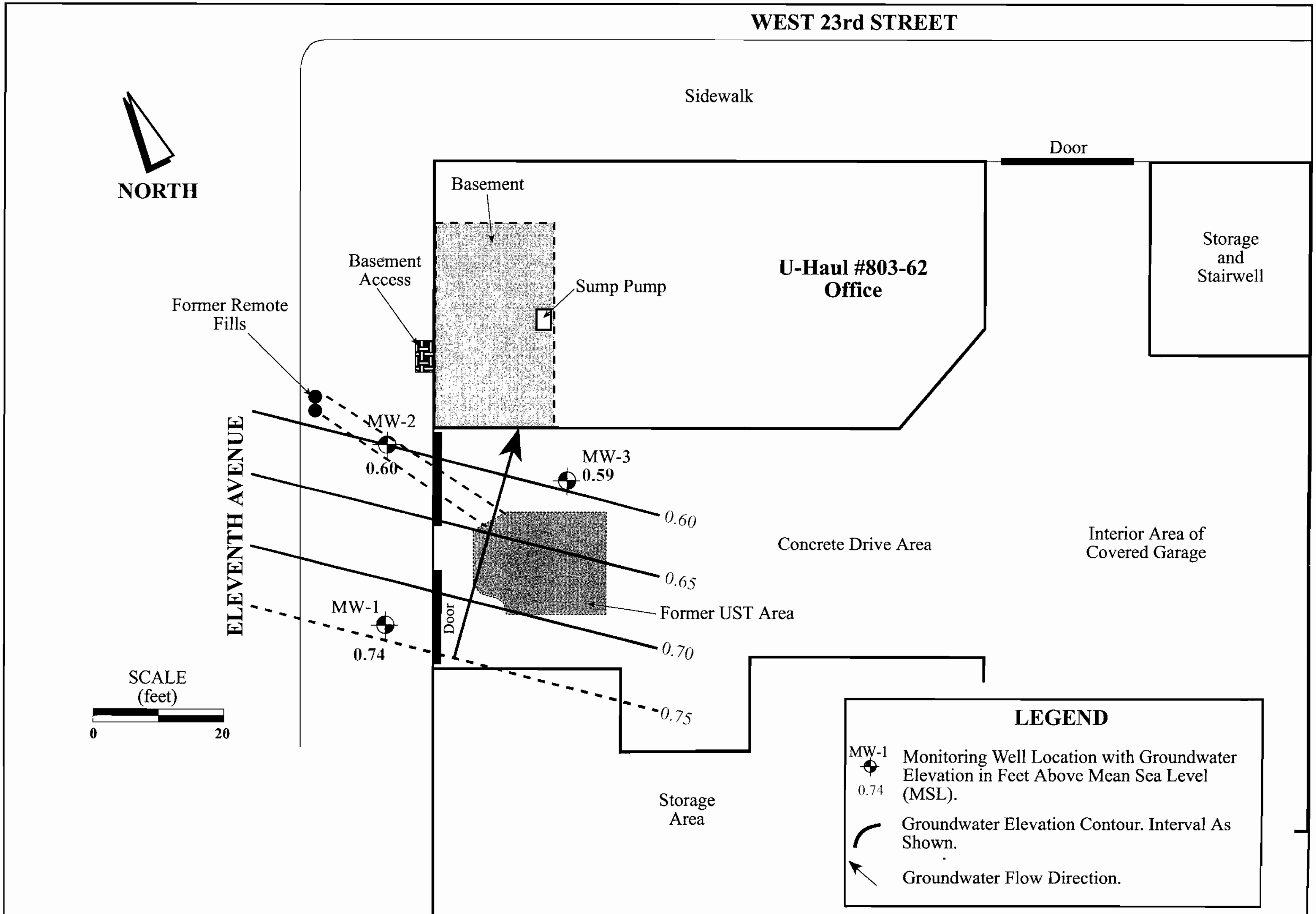
SCALE
(feet)
0 2,000

U.S.G.S. 7.5 Minute Series
Jersey City Quadrangle
1967
Photorevised 1981

PINNACLE ENVIRONMENTAL TECHNOLOGIES #2 Santa Maria, Foothill Ranch, CA 92610 Tel (714) 470-3691 • Fax (714) 595-0459	**U-Haul Center #803-62 562 West 23rd Street New York City, New York**	**LOCATION MAP**	**FIGURE 1**



PINNACLE ENVIRONMENTAL TECHNOLOGIES #2 Santa Maria, Foothill Ranch, CA 92610 Tel: (714) 470-3691 • Fax: (714) 595-0459	**U-Haul Facility #803-62** **562 West 23rd Street** **Manhattan, New York**	**SITE PLAN** **With** **Well Locations**	**FIGURE** **2**

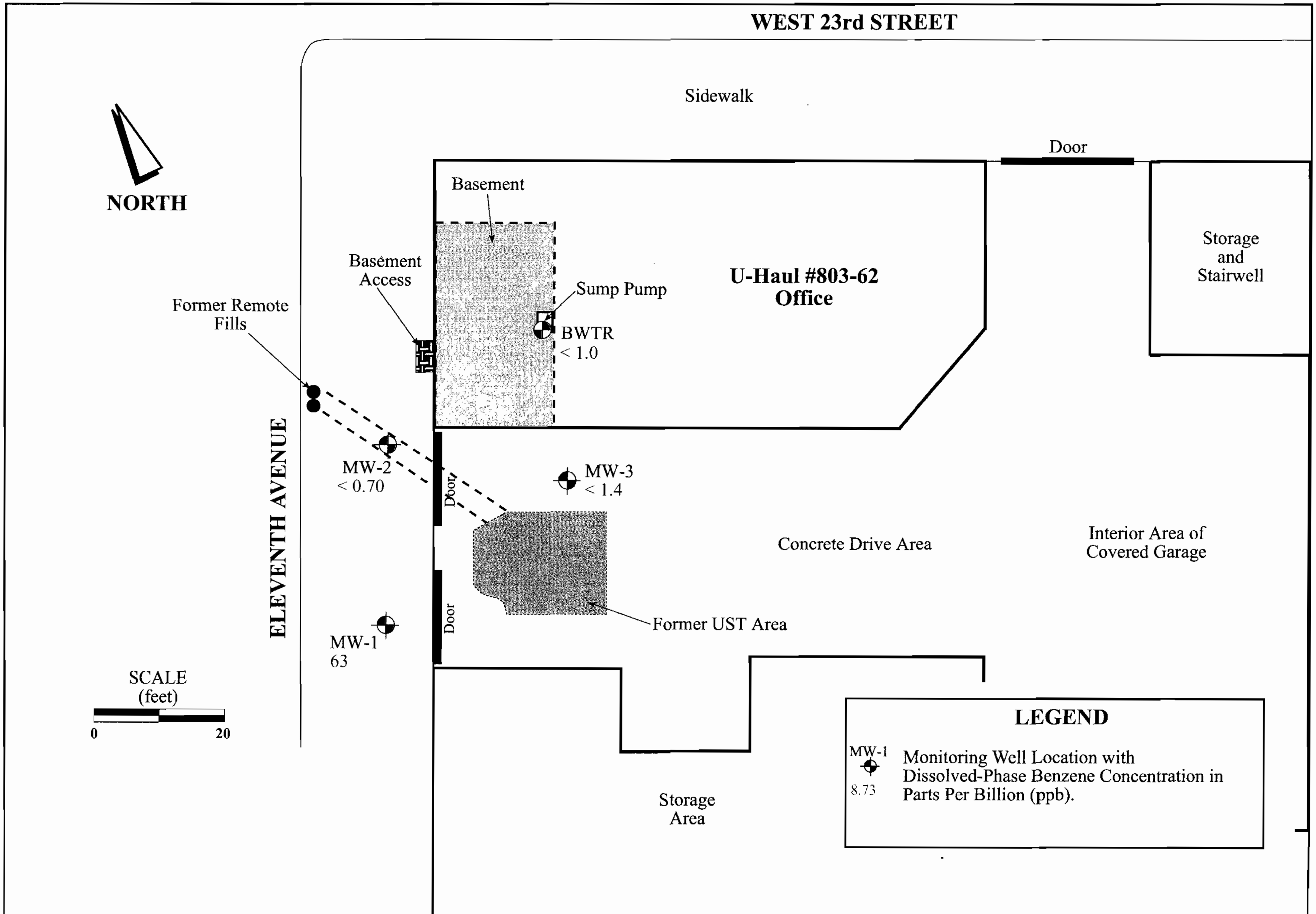


PINNACLE
ENVIRONMENTAL TECHNOLOGIES
#2 Santa Maria, Foothill Ranch, CA 92610
Tel: (714) 470-3691• Fax: (714) 595-0459

U-Haul Facility #803-62
562 West 23rd Street
Manhattan, New York

GROUNDWATER ELEVATION MAP
May 31, 1997

FIGURE 3



PINNACLE ENVIRONMENTAL TECHNOLOGIES #2 Santa Maria, Foothill Ranch, CA 92610 Tel: (714) 470-3691 • Fax: (714) 595-0459	**U-Haul Facility #803-62 562 West 23rd Street Manhattan, New York**	**DISSOLVED-PHASE BENZENE MAP** May 31, 1997	**FIGURE 4**

Direct-Push Drilling Rigs

Direct-push drilling rigs hydraulically advance a 1.5-inch or 2.5-inch drilling point into the subsurface. Samples are collected by releasing the point lock and hydraulically pushing and/or pounding the 2-foot long sampler into the undisturbed soil ahead of the drill point. Samples are collected in either brass sleeves or acetate sleeves. Blow counts cannot be recorded. After retrieving the tubes from the sampling device, the sample tube is sealed using Teflon® tape and plastic end caps. Each tube is labeled with the sample identification, date and time of sampling, and sample site identification. The sample is then placed in a cooler chilled with either Blue Ice® or normal "wet" ice for transport to the laboratory.

Soil Classification and Logging

Soils are classified in the field in conformance with the Unified Soil Classification System (USCS) - (ASTM D 2487).

A boring log is maintained for soil borings and wells installations. Each log records the sample identification; collection location, depth, and interval; number of blows required for sample collection (drop hammer samplers only); USCS soil type; color; field density estimation; field estimated moisture content; physical characteristics (grain size, sorting, roundness, odors, and other distinguishing characteristics); and, time of sample collection.

A well construction log is included on the soil boring log for each boring that is converted to groundwater or vadose zone monitoring well, groundwater recovery well, or soil vapor extraction well. The well construction log details the casing size, casing material, screen size, screened interval, filter pack type and interval, annular seal depth and type, and surface completion.

If a boring is not converted to a well, it is backfilled with either hydrated bentonite chips, Volclay grout, bentonite cement, Portland cement, or a combination of the above. Borings are backfilled in accordance with any prevailing local standards and regulations.

Excavated soils are described in accordance with the USCS and are recorded on the field logs maintained during excavation. Soils are classified in order to provide a general description of the soil present in the vicinity of the excavation.

Groundwater Monitoring Well Installation

Groundwater monitoring wells are installed by lowering the casing string (blank and screened portions) into the borehole. Casing is typically installed inside the flights of hollow-stem augers and the filter pack is emplaced as the flights are withdrawn from the borehole. This minimizes contact with the formation and aids in placing a complete filter pack around the annular region of the screened portion of the well.

The filter pack is installed to a depth approximately 2 feet above the top of the screened portion of the well. A minimum 3-foot thick bentonite chip annular seal is then placed above the filter pack and the remaining annular region to the surface is filled with cement. Well casing materials are 4-inch diameter Schedule 40 PVC unless otherwise noted on the well construction logs. The actual well construction is depicted on the boring logs for each well installed.

After installing the filter pack, the well is surged prior to placing the bentonite seal. Surging is the first stage of well development and is designed to removed fines from the filter pack and repair formation damage due to drilling. Wells are typically surged until the filter pack no longer settles due to the surging. The bentonite annular seal is then placed and hydrated using clean potable water.

Surface completions of wells are either flush-mounted waterproof traffic-rated vaults, installed at active sites, or are vertical "monument" type well head protection (typically installed at inactive sites). Each well box is labeled with the well number or identification, depth of the well, and date of installation. A locking well cap is placed on each well inside the well vault or monument casing.

Temporary wells may be installed at selected sites. This is typically done when using a direct-push drill rig. This allows for the collection of groundwater "screening" samples. The data collected from this type of well is used to determine the optimal location for the installation of traditional monitoring wells.

Temporary, small-diameter wells (0.75-inch to 1.5-inch) are installed using the direct push drill rig to advance a stainless steel well screen into the desired interval. A protective sleeve around the sleeve prevents plugging the screen as it is pushed to the desired depth. The protective sleeve is withdrawn and the screen is exposed to the formation waters. Samples are collected once sufficient water has collected in the well bore.

Groundwater Sample Collection

Groundwater samples are collected from monitoring wells and temporary, small-diameter wells. Sampling of groundwater monitoring wells is conducted in accordance with the EPA Technical Enforcement Guidance Document or with any other local protocols and procedures.

Monitoring Wells

The depth to groundwater is measured to the nearest 0.01 foot and recorded for use in determining the groundwater gradient and flow direction. Water level measurements are completed on all wells prior to purging any well at the site. Depth to groundwater is measured using either an electronic well sounding device (i.e. Solinst) or using an interface probe (i.e. MMC).

If a sounding device is used the well is first checked for the presence of non-aqueous phase petroleum liquids (NAPL's) using hydrocarbon sensitive paste. The interface probe is capable of direct detection of trace thickness of NAPL's.

All wells are purged prior to the collection of groundwater samples in order to ensure that a representative groundwater sample is collected. Wells are typically purged using either a portable submersible pump or by using a vacuum truck and dedicated well stinger. Water temperature, pH, and conductivity are monitored during purging. Purging is considered complete once a minimum of 3 well casing volumes have been purged and the physical parameters have stabilized to within 10% for successive readings.

Many low yield aquifers are not capable of producing 3 well casing volumes of water. In these cases the well may be pumped dry. If this occurs, the well is only pumped dry once and samples are collected once the conditions specified below are achieved.

Care is taken not to overpump a well to dryness and to avoid the possibility of cascading water into the well. All wells are purged at the minimum rate necessary to adequately ensure that a representative groundwater sample will be collected.

In certain cases, regulatory agencies will request the collection of groundwater samples from wells without first purging them. "Pre-Purge" samples are identified as such on the Chain-Of-Custody and in the sample identification section of the report.

Each well is allowed to recharge to 80% of its pre-purge volume prior to sampling, or for 2 hours, whichever occurs first. If a well does not recharge to 80% of its pre-purge volume within 2 hours then a sample is collected as soon as sufficient water has collected in the well to fill the required sample containers.

Samples are collected by slowly lowering either a disposable Teflon® or decontaminated stainless steel bailer into the water column. Care is taken to minimize agitating the water as the bailer enters. The bailer is removed from the well after filling, and a bottom emptying device attached. The water is decanted into the sample containers (40-milliliter VOA's or glass amber bottles as required) in a manner which minimizes bubbling and possible loss of volatiles. Each container is filled so that when the cover is tightened that a zero headspace sample has been collected with no trapped air bubbles visible in the container.

Each container is then labeled with the sample identification, sample date and time, and site name. The sample containers are then placed in a cooled ice chest for transport to the laboratory.

<u>Small Diameter Wells</u>

Small diameter wells are typically installed using direct-push type drilling equipment. Temporary and permanent wells may be installed. Groundwater samples are collected form temporary wells using a polyethylene tube equipped with a check valve end which is pumped until groundwater rises to the surface.

The groundwater sample flows directly into the sample container. Flow rates are very low and agitation of the sample is minimized. Each container is filled so that when the cover is tightened that a zero headspace sample has been collected with no trapped air bubbles visible in the container.

Each container is then labeled with the sample identification, sample date and time, and site name. The sample containers are then placed in a cooled ice chest for transport to the laboratory.

Chain-Of-Custody Protocol

All soil and groundwater samples that are collected are documented using Chain-Of-Custody (COC) procedures. Each sample is identified and entered onto the COC record along with the date and time of collection and the type and number of sample containers. COC documents also typically used to document which analyses are completed on each sample. The COC follows the samples from the field to the laboratory and legally documents who had possession of the samples at all times.

APPENDIX A
GENERAL FIELD PROCEDURES

The following sections outline the general field procedures and protocols followed by Pinnacle Environmental Technologies (Pinnacle) in the completion of field tasks. Any deviation from the procedures outlined here due to unique or unforeseen circumstances will be noted in the body of the applicable report. The following tasks are detailed:

- Soil Sample Collection
  - Hollow-Stem Auger & Air Rotary Rigs
  - Direct-Push Drilling Rigs
- Soil Classification and Logging
- Groundwater Monitoring Well Installation
- Groundwater Sample Collection
  - Monitoring Wells
  - Small Diameter Wells
- Chain-Of-Custody Protocol

Soil Sample Collection

Soil samples are collected to allow soil description/classification and for laboratory analysis. Samples may be collected using a variety of different techniques including: hollow-stem auger rigs (drop hammer samplers), direct push rigs, composite "grab" samples, and excavation samples. The sampling technique utilized will be selected based on the particular phase of work and sample requirements. All soil samples collected during drilling operations are also monitored for VOC vapors, or headspace vapors". This is accomplished using a PID to monitor the soil either in the sample tubes (at the break between tubes) or after it has been placed in a sealed ZipLoc® bag. The maximum PID reading is recorded on the boring log. Field headspace readings are also used to determine if a soil sample will be analyzed in the laboratory.

Hollow-Stem Auger Drill Rigs & Air Rotary Rigs

Samples are collected in decontaminated 1.5 to 2.5-inch diameter brass or stainless steel tubes. At the selected sample interval the sampling device (split spoon or solid) is driven into the undisturbed soil ahead of the auger flight using either a downhole or surface mounted 140-pound drop hammer. Typical sampling devices are 18 to 24 inches in length. After retrieving the tubes from the sampling device, the sample tube is sealed using Teflon® tape and plastic end caps. Each tube is labeled with the sample identification, date and time of sampling, and sample site identification. The sample is then placed in a cooler chilled with either Blue Ice® or normal "wet" ice for transport to the laboratory.

WELL DEPTH TO WATER AND VOLUME DATA

SITE: U-Haul #803-62
Chelsea, NYC, NY

DATE: 5/31/97

WELL	TD	DTW	COL	VOLUME	3X VOL
MW-1	15.00	5.87	9.13	1.55	4.66
MW-2	15.00	6.62	8.38	1.42	4.27
MW-3	13.00	5.92	7.08	1.20	3.61

Pinnacle Environmental Technologies
#2 Santa Maria
Foothill Ranch, CA 92610
(714) 470-3691

WELL PURGING PHYSICAL PARAMETERS

SITE: U-Haul #803-62 Chelsea, NYC, NY **DATE:** 5/31/97 **Field Personnel:** Malvey / Thompson

WELL: MW-1	*WELL:* MW-2	*WELL:* MW-3	*WELL:*	*WELL:*	*WELL:*	*WELL:*
Time: 0.00	Time: 0.00	Time: 0.00	Time:	Time:	Time:	Time:
Vol: 0.00	Vol: 0.00	Vol: 0.00	Vol:	Vol:	Vol:	Vol:
pH: 8.26	pH: 7.51	pH: 7.40	pH:	pH:	pH:	pH:
Temp: 67.5	Temp: 70.9	Temp: 71.8	Temp:	Temp:	Temp:	Temp:
Cond: 591	Cond: 785	Cond: 1,720	Cond:	Cond:	Cond:	Cond:
Time: 1.00	Time: 2.00	Time: 1.50	Time:	Time:	Time:	Time:
Vol: 1.25	Vol: 2.00	Vol: 1.50	Vol:	Vol:	Vol:	Vol:
pH: 8.09	pH: 7.57	pH: 7.38	pH:	pH:	pH:	pH:
Temp: 65.6	Temp: 68.9	Temp: 70.0	Temp:	Temp:	Temp:	Temp:
Cond: 463	Cond: 752	Cond: 1,550	Cond:	Cond:	Cond:	Cond:
Time: 2.50	Time: 5.00	Time: 3.00	Time:	Time:	Time:	Time:
Vol: 3.20	Vol: 5.00	Vol: 3.00	Vol:	Vol:	Vol:	Vol:
pH: 7.87	pH: 7.54	pH: 7.43	pH:	pH:	pH:	pH:
Temp: 64.9	Temp: 66.6	Temp: 69.2	Temp:	Temp:	Temp:	Temp:
Cond: 528	Cond: 767	Cond: 1,590	Cond:	Cond:	Cond:	Cond:
Time: 5.00	Time: 10.00	Time: 4.00	Time:	Time:	Time:	Time:
Vol: 5.00	Vol: 10.00	Vol: 4.00	Vol:	Vol:	Vol:	Vol:
pH: 7.62	pH: 7.51	pH: 7.46	pH:	pH:	pH:	pH:
Temp: 64.9	Temp: 67.1	Temp: 68.3	Temp:	Temp:	Temp:	Temp:
Cond: 596	Cond: 775	Cond: 1,650	Cond:	Cond:	Cond:	Cond:
Time: 10.00	Time: 15.00	Time:	Time:	Time:	Time:	Time:
Vol: 10.00	Vol: 15.00	Vol:	Vol:	Vol:	Vol:	Vol:
pH: 7.52	pH: 7.51	pH:	pH:	pH:	pH:	pH:
Temp: 65.3	Temp: 67.8	Temp:	Temp:	Temp:	Temp:	Temp:
Cond: 630	Cond: 784	Cond:	Cond:	Cond:	Cond:	Cond:
Time: 15.00	Time:	Time:	Time:	Time:	Time:	Time:
Vol: 15.00	Vol:	Vol:	Vol:	Vol:	Vol:	Vol:
pH: 7.51	pH:	pH:	pH:	pH:	pH:	pH:
Temp: 66.6	Temp:	Temp:	Temp:	Temp:	Temp:	Temp:
Cond: 654	Cond:	Cond:	Cond:	Cond:	Cond:	Cond:

Pinnacle Environmental Technologies
2 Santa Maria, Foothill Ranch, CA

UNIFIED SOIL CLASSIFICATION SYSTEM

ASTM D 2487

MAJOR DIVISIONS				TYPICAL NAMES
COARSE-GRAINED SOILS MORE THAN HALF IS LARGER THAN #200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN #4 SIEVE SIZE	GRAVELS WITH LITTLE OR NO FINES	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
			GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 12% FINES	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN #4 SIEVE SIZE	SANDS WITH LITTLE OR NO FINES	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			SP	POORLY-GRADED SANDS, GRAVELLY-SAND, LITTLE OR NO FINES
		SANDS WITH OVER 12% FINES	SM	SILTY SANDS, SAND-SILT MIXTURES
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE-GRAINED SOILS MORE THAN HALF IS SMALLER THAN #200 SIEVE	SILTS AND CLAYS (liquid limit is less than 50)		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR VERY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS (liquid limit is greater than 50)		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAY
			OH	ORGANIC CLAYS OF HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			Pt	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

LEGEND

Sample Interval

Soil Sample Collected

Groundwater Encountered

Filter Pack Sand

Bentonite

Concrete

USCS = Unified Soils Classification System

CGI = Combustible Gas Indicator

PID = Photoionization Detector

OVA = Organic Vapor Analyzer

DESCRIPTORS

Trace = 1% - 5%

Some = 6% - 10%

With = 11% - 25%

-ly = 26% - 40%

And = >40%

SANDS

>50 blows = very dense

30 - 50 blows = dense

10 - 30 blows = medium

0 - 10 blows = loose

CLAST SIZE (Field Classification)

Gravel = > 0.25 inches

Sand = 0.003 - 0.25 inches

Silt = < 0.003 & not plastic

Clay = < 0.003 & plastic

SILTS & CLAYS

>30 blows = hard

15 - 30 blows = very stiff

8 - 15 blows = stiff

4 - 8 blows = firm

0 - 4 blows = soft

PINNACLE

BORING LOG

PINNACLE
ENVIRONMENTAL TECHNOLOGIES
#2 Santa Maria, Foothill Ranch, CA
Tel: (714) 470-3691 Fax: (714) 595-0459

SITE: U-Haul #803-62
ADDRESS: 562 West 23rd Street
Mahhattan, New York
DRILLING METHOD: Limited Access HSA
DRILLING COMPANY: Aquifer Drilling & Testing

BORING No.: **MW-3**
DATE: 5/31/97
GEOLOGIST: W. Malvey
REVIEWED: K. Thompson, R.G.
ELEVATION: 6.51 ft (TOC)

Time	Blows	PID	Depth	Sample	DESCRIPTION	Graphic Log	Well Const
					8" Concrete, 6" ABC		
					Artificial Fill (AF), brownish black, charred wood fragments, broken red clay brick.		
1000	4-5-5	15	5		Silty-clay fill (AF), greenish-gray to black, stiff, below plastic limit, no HC odor.		
					Groundwater observed at 7. 5 feet in boring.		
			10				
1010	6-5-4	< 1			Sand (SP), trace clay, greenish-black, loose, saturated, very fine-grained, no odor.		
					Bottom of well set at 13 feet due to caving of hole.		
			15				
1020	7-8-5	< 1			Sand (SP), trace clay, greenish-black, loose, saturated, very fine-grained, no odor.		
					Boring terminated at 15 feet below ground surface.		
			20				
			25				
			30				

BORING LOG

PINNACLE
ENVIRONMENTAL TECHNOLOGIES
#2 Santa Maria, Foothill Ranch, CA
Tel: (714) 470-3691 Fax: (714) 595-0459

SITE: U-Haul #803-62
ADDRESS: 562 West 23rd Street
Mahhattan, New York
DRILLING METHOD: Limited Access HSA
DRILLING COMPANY: Aquifer Drilling & Testing

BORING No.: **MW-1**
DATE: 5/31/97
GEOLOGIST: W. Malvey
REVIEWED: K. Thompson, R.G.
ELEVATION: 6.61 ft (TOC)

Time	Blows	PID	Depth	Sample	DESCRIPTION	Graphic Log	Well Const
					8" Concrete, 6" ABC		
					Artificial Fill (AF), brownish black, charred wood fragments, broken red clay brick.		
0835	3-4-5	< 1	5		Silty-clay fill (AF), greenish-gray to black, stiff, below plastic limit, no HC odor.		
					Groundwater observed at 7. 5 feet in boring.		
0845	3-2-2	< 1	10		Sand (SP), trace clay, greenish-black, loose, saturated, very fine-grained, no odor.		
0855	5-5-6	< 1	15		Sand (SP), trace clay, greenish-black, loose, saturated, very fine-grained, no odor.		
					Boring terminated at 15 feet below ground surface.		
			20				
			25				
			30				

BORING LOG

PINNACLE
ENVIRONMENTAL TECHNOLOGIES
#2 Santa Maria, Foothill Ranch, CA
Tel: (714) 470-3691 Fax: (714) 595-0459

SITE: U-Haul #803-62
ADDRESS: 562 West 23rd Street
Mahhattan, New York
DRILLING METHOD: Limited Access HSA
DRILLING COMPANY: Aquifer Drilling & Testing

BORING No.: **MW-2**
DATE: 5/31/97
GEOLOGIST: W. Malvey
REVIEWED: K. Thompson, R.G.
ELEVATION: 7.22 ft (TOC)

Time	Blows	PID	Depth	Sample	DESCRIPTION	Graphic Log	Well Const
					8" Concrete, 6" ABC		
					Artificial Fill (AF), brownish black, charred wood fragments, broken red clay brick.		
1000	4-5-5	15	5		Silty-clay fill (AF), greenish-gray to black, stiff, below plastic limit, no HC odor.		
					Groundwater observed at 7. 5 feet in boring.		
1010	6-5-4	< 1	10		Sand (SP), trace clay, greenish-black, loose, saturated, very fine-grained, no odor.		
1020	7-8-5	< 1	15		Sand (SP), trace clay, greenish-black, loose, saturated, very fine-grained, no odor.		
					Boring terminated at 15 feet below ground surface.		
			20				
			25				
			30				

Columbia Analytical Services inc.

A FULL SERVICE ENVIRONMENTAL LABORATORY

June 16, 1997

Mr. William Malvey
Pinnacle Environmental Tech.
2 Santa Maria
Foothill Ranch, CA 92610

PROJECT:U-HAUL FACILITY #803-62, PINNACLE ENVIRONMENTAL
Submission #:9706000114

Dear Mr. Malvey:

Enclosed are the analytical results of the analyses requested. The analytical data was provided to you on 06/16/97 per a Facsimile transmittal. All data has been reviewed prior to report submission.

Should you have any questions please contact me at (716) 454-6810.

Thank you for letting us provide this service.

Sincerely,

COLUMBIA ANALYTICAL SERVICES

Janice Jaeger

Janice Jaeger
Project Chemist

Enc.

® REAL ESTATE

This package has been reviewed by Columbia Analytical Services' QA Department/Laboratory Director prior to report submittal.

Effective 04/01/96

CAS LIST OF QUALIFIERS

(The basis of this proposal are the EPA-CLP Qualifiers)

U - Indicates compound was analyzed for but was not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. For further explanation see case narrative / cover letter.

B - This flag is used when the analyte is found in the associated blank as well as in the sample.

E - This flag identifies compounds whose concentrations exceed the calibration range.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

N - Spiked sample recovery not within control limits.
(Flag the entire batch - Inorganic analysis only)

* - Duplicate analysis not within control limits.
(Flag the entire batch - Inorganic analysis only)

- Also used to qualify Organics QC data outside limits.

D - Spike diluted out.

S - Reported value determined by Method of Standard Additions. (MSA)

X - As specified in the case narrative.

CAS Lab ID # for State Certifications

NY ID # in Rochester:	10145	NJ ID # in Rochester:	73004
CT ID # in Rochester:	PH0556	RI ID # in Rochester:	158
MA ID # in Rochester:	M-NY032		

COLUMBIA ANALYTICAL SERVICES

ANALYTICAL REPORT SUMMARY
METHOD 8021 STARS LIST VOAS
DRY WEIGHT REPORTED UNITS: UG/KG

Pinnacle Environmental Tech.
U-HAUL FACILITY #803-62, PINNACLE ENVIRONMENTAL
SUBMISSION #: 9706000114

ORDER NUMBER		151664	151665	151666	151667
SAMPLE ID:		BASEMENT	MW-1-5	MW-1-10	MW-1-15
DATE SAMPLED:		05/31/1997	05/31/1997	05/31/1997	05/31/1997
DATE RECEIVED:	PQL	06/05/1997	06/05/1997	06/05/1997	06/05/1997
DATE ANALYZED:		06/10/97	06/06/97	06/07/97	06/06/97
DILUTION:		250.0	1.0	1.0	1.0
PERCENT SOLID (%):		59.4	81.9	81.0	83.3
BENZENE	1.0	420 U	1.2 U	1.2 U	1.2 U
N-BUTYLBENZENE	1.0	20000	1.2 U	1.2 U	1.2 U
SEC-BUTYLBENZENE	1.0	4400	1.2 U	1.2 U	1.2 U
TERT-BUTYLBENZENE	1.0	420 U	1.2 U	1.2 U	1.2 U
METHYL-TERT-BUTYLETHER	1.0	420 U	8.2	1.7	2.9
ETHYLBENZENE	1.0	420 U	1.2 U	1.2 U	1.2 U
ISOPROPYLBENZENE	1.0	4000	1.2 U	1.2 U	1.2 U
P-ISOPROPYLTOLUENE	1.0	6700	1.2 U	1.2 U	1.2 U
NAPHTHALENE	1.0	1300	1.2 U	1.2 U	16
N-PROPYLBENZENE	1.0	420 U	1.2 U	1.2 U	1.2 U
TOLUENE	1.0	4900	1.2 U	1.2 U	1.2 U
1,2,4-TRIMETHYLBENZENE	1.0	7200	1.2 U	1.2 U	1.2 U
1,3,5-TRIMETHYLBENZENE	1.0	5600	1.2 U	1.2 U	1.2 U
M+P-XYLENE	2.0	840 U	2.4 U	2.5 U	2.4 U
O-XYLENE	2.0	840 U	2.4 U	2.5 U	2.4 U

SURROGATE RECOVERIES	LIMITS				
CHLOROFLUOROBENZENE	60 - 140	133	91	87	81

ANALYTICAL REPORT SUMMARY
METHOD 8021 STARS LIST VOAS
DRY WEIGHT REPORTED UNITS: UG/KG

Pinnacle Environmental Tech.
U-HAUL FACILITY #803-62, PINNACLE ENVIRONMENTAL
SUBMISSION #: 9706000114

ORDER NUMBER		151668	151669	151670	151671
SAMPLE ID:		MW-2-3	MW-2-10	MW-2-15	MW-3-5
DATE SAMPLED:		05/31/1997	05/31/1997	05/31/1997	05/31/1997
DATE RECEIVED:	PQL	06/05/1997	06/05/1997	06/05/1997	06/05/1997
DATE ANALYZED:		06/09/97	06/06/97	06/07/97	06/06/97
DILUTION:		125.0	1.0	1.0	2.0
PERCENT SOLID (%):		83.9	87.4	82.2	84.8
BENZENE	1.0	320	1.1 U	1.2 U	2.4 U
N-BUTYLBENZENE	1.0	1400	1.1 U	1.2 U	2.4 U
SEC-BUTYLBENZENE	1.0	170	1.1 U	1.2 U	75
TERT-BUTYLBENZENE	1.0	150 U	1.1 U	1.2 U	66
METHYL-TERT-BUTYLETHER	1.0	5600	37	12	2.4 U
ETHYLBENZENE	1.0	230	1.1 U	1.2 U	2.4 U
ISOPROPYLBENZENE	1.0	150 U	1.1 U	1.2 U	13
P-ISOPROPYLTOLUENE	1.0	150 U	1.1 U	1.2 U	2.4 U
NAPHTHALENE	1.0	150 U	1.1 U	1.2 U	2.4 U
N-PROPYLBENZENE	1.0	150 U	1.1 U	1.2 U	2.4 U
TOLUENE	1.0	1100	1.1 U	1.2 U	2.4 U
1,2,4-TRIMETHYLBENZENE	1.0	550	1.1 U	1.2 U	60
1,3,5-TRIMETHYLBENZENE	1.0	690	1.1 U	1.2 U	140
M+P-XYLENE	2.0	1300	2.3 U	2.4 U	4.7 U
O-XYLENE	2.0	970	2.3 U	2.4 U	37

SURROGATE RECOVERIES	LIMITS				
CHLOROFLUOROBENZENE	60 - 140	116	63	93	117

COLUMBIA ANALYTICAL SERVICES

ANALYTICAL REPORT SUMMARY
METHOD 8021 STARS LIST VOAS
DRY WEIGHT REPORTED UNITS: UG/KG

Pinnacle Environmental Tech.
U-HAUL FACILITY #803-62, PINNACLE ENVIRONMENTAL
SUBMISSION #: 9706000114

ORDER NUMBER		151672	151673
SAMPLE ID:		MW-3-10	MW-3-15
DATE SAMPLED:		05/31/1997	05/31/1997
DATE RECEIVED:	PQL	06/05/1997	06/05/1997
DATE ANALYZED:		06/10/97	06/07/97
DILUTION:		1.0	1.0
PERCENT SOLID (%):		79.8	78.9
BENZENE	1.0	1.3 U	1.3 U
N-BUTYLBENZENE	1.0	1.3 U	1.3 U
SEC-BUTYLBENZENE	1.0	15	1.3 U
TERT-BUTYLBENZENE	1.0	11	1.3 U
METHYL-TERT-BUTYLETHER	1.0	1.8	1.4
ETHYLBENZENE	1.0	1.3 U	1.3 U
ISOPROPYLBENZENE	1.0	48	1.3 U
P-ISOPROPYLTOLUENE	1.0	1.3 U	1.3 U
NAPHTHALENE	1.0	1.3 U	1.3 U
N-PROPYLBENZENE	1.0	14	1.3 U
TOLUENE	1.0	4.3	1.3 U
1,2,4-TRIMETHYLBENZENE	1.0	1.3 U	1.3 U
1,3,5-TRIMETHYLBENZENE	1.0	1.5	1.3 U
M+P-XYLENE	2.0	4.9	2.5 U
O-XYLENE	2.0	4.0	2.5 U

SURROGATE RECOVERIES	LIMITS		
CHLOROFLUOROBENZENE	60 - 140	101	79

COLUMBIA ANALYTICAL SERVICES

ANALYTICAL REPORT SUMMARY
METHOD 8021 STARS LIST VOAS
REPORTED UNITS: UG/L

Pinnacle Environmental Tech.
U-HAUL FACILITY #803-62, PINNACLE ENVIRONMENTAL
SUBMISSION #: 9706000114

WATER

ORDER NUMBER		151675	151676	151678	151681
SAMPLE ID:		MW-1	MW-2	MW-3	BWTR
DATE SAMPLED:		05/31/1997	05/31/1997	05/31/1997	05/31/1997
DATE RECEIVED:	PQL	06/05/1997	06/05/1997	06/05/1997	06/05/1997
DATE ANALYZED:		06/06/97	06/06/97	06/06/97	06/06/97
DILUTION:		1.0	1.0	2.0	1.0
BENZENE	0.70	63	0.70 U	1.4 U	0.70 U
N-BUTYLBENZENE	1.0	1.0 U	2.3	12	1.0 U
SEC-BUTYLBENZENE	1.0	1.0 U	1.0 U	9.5	1.0 U
TERT-BUTYLBENZENE	1.0	1.0 U	1.0 U	10	1.0 U
METHYL-TERT-BUTYLETHER	1.0	1.0 U	1.0 U	71	20
ETHYLBENZENE	1.0	13	1.0 U	2.0 U	1.0 U
ISOPROPYLBENZENE	1.0	1.6	1.0 U	7.7	1.0 U
P-ISOPROPYLTOLUENE	1.0	1.0 U	1.0 U	6.0	1.0 U
NAPHTHALENE	1.0	1.0 U	1.0 U	3.2	1.0 U
N-PROPYLBENZENE	1.0	2.2	1.0 U	2.0 U	1.0 U
TOLUENE	1.0	1.8	1.0 U	2.0 U	1.0 U
1,2,4-TRIMETHYLBENZENE	1.0	12	2.4	5.3	1.0 U
1,3,5-TRIMETHYLBENZENE	1.0	1.0 U	1.7	12	1.0 U
M+P-XYLENE	2.0	4.9	2.0 U	5.7	2.0 U
O-XYLENE	2.0	2.0 U	2.0 U	7.3	2.0 U

SURROGATE RECOVERIES	LIMITS				
CHLOROFLUOROBENZENE	60 - 140	89	88	124	94

ANALYTICAL REPORT SUMMARY
METHOD 8270 STARS LIST SEMIVOLATILES
DRY WEIGHT REPORTED UNITS: UG/KG

Pinnacle Environmental Tech.
U-HAUL FACILITY #803-62, PINNACLE ENVIRONMENTAL
SUBMISSION #: 9706000114

ORDER NUMBER		151664	151665	151666	151667
SAMPLE ID:		BASEMENT	MW-1-5	MW-1-10	MW-1-15
DATE SAMPLED:		05/31/1997	05/31/1997	05/31/1997	05/31/1997
DATE RECEIVED:	PQL	06/05/1997	06/05/1997	06/05/1997	06/05/1997
DATE EXTRACTED:		06/09/97	06/09/97	06/09/97	06/09/97
DATE ANALYZED:		6/11/97	6/11/97	6/11/97	6/11/97
DILUTION:		1.0	1.0	1.0	1.0
PERCENT SOLID (%):		59.4	81.9	81.0	83.3
ACENAPHTHENE	330	560 U	400 U	410 U	400 U
ANTHRACENE	330	560 U	400 U	410 U	2500
BENZO(A)ANTHRACENE	330	560 U	400 U	410 U	1600
BENZO(A)PYRENE	330	560 U	400 U	410 U	1300
BENZO(B)FLUORANTHENE	330	560 U	400 U	410 U	900
BENZO(G,H,I)PERYLENE	330	560 U	400 U	410 U	400 U
BENZO(K)FLUORANTHENE	330	560 U	400 U	410 U	1000
INDENO(1,2,3-CD)PYRENE	330	560 U	400 U	410 U	400 U
CHRYSENE	330	560 U	400 U	410 U	1400
DIBENZO(A,H)ANTHRACENE	330	560 U	400 U	410 U	400 U
FLUORANTHENE	330	560 U	400 U	410 U	3600
FLUORENE	330	560 U	400 U	410 U	1200
NAPHTHALENE	200	340 U	240 U	250 U	940
PHENANTHRENE	330	560 U	400 U	410 U	3800
PYRENE	330	560 U	400 U	410 U	3200

SURROGATE RECOVERIES	LIMITS				
TERPHENYL-d14	18 - 137	71	73	83	74
NITROBENZENE-d5	23 - 120	64	65	60	64
2-FLUOROBIPHENYL	30 - 115	60	67	63	67

COLUMBIA ANALYTICAL SERVICES

ANALYTICAL REPORT SUMMARY
METHOD 8270 STARS LIST SEMIVOLATILES
DRY WEIGHT REPORTED UNITS: UG/KG

Pinnacle Environmental Tech.
U-HAUL FACILITY #803-62, PINNACLE ENVIRONMENTAL
SUBMISSION #: 9706000114

ORDER NUMBER		151668	151669	151670	151671
SAMPLE ID:		MW-2-3	MW-2-10	MW-2-15	MW-3-5
DATE SAMPLED:		05/31/1997	05/31/1997	05/31/1997	05/31/1997
DATE RECEIVED:	PQL	06/05/1997	06/05/1997	06/05/1997	06/05/1997
DATE EXTRACTED:		06/09/97	06/09/97	06/09/97	06/09/97
DATE ANALYZED:		6/11/97	6/11/97	6/11/97	6/12/97
DILUTION:		1.0	1.0	1.0	1.0
PERCENT SOLID (%):		83.9	87.4	82.2	84.8
ACENAPHTHENE	330	390 U	380 U	400 U	390 U
ANTHRACENE	330	930	380 U	400 U	540
BENZO(A)ANTHRACENE	330	4100	380 U	400 U	3200
BENZO(A)PYRENE	330	6000	380 U	400 U	6600
BENZO(B)FLUORANTHENE	330	5000	380 U	400 U	6100
BENZO(G,H,I)PERYLENE	330	2300	380 U	400 U	2500
BENZO(K)FLUORANTHENE	330	3600	380 U	400 U	3900
INDENO(1,2,3-CD)PYRENE	330	2600	380 U	400 U	2900
CHRYSENE	330	3900	380 U	400 U	2800
DIBENZO(A,H)ANTHRACENE	330	1300	380 U	400 U	1700
FLUORANTHENE	330	5200	380 U	400 U	2200
FLUORENE	330	390 U	380 U	400 U	390 U
NAPHTHALENE	200	240 U	230 U	240 U	240 U
PHENANTHRENE	330	2500	380 U	400 U	1400
PYRENE	330	5100	380 U	400 U	2400

SURROGATE RECOVERIES	LIMITS				
TERPHENYL-d14	18 - 137	79	62	77	74
NITROBENZENE-d5	23 - 120	61	42	56	58
2-FLUOROBIPHENYL	30 - 115	61	48	54	65

COLUMBIA ANALYTICAL SERVICES

ANALYTICAL REPORT SUMMARY
METHOD 8270 STARS LIST SEMIVOLATILES
DRY WEIGHT REPORTED UNITS: UG/KG

Pinnacle Environmental Tech.
U-HAUL FACILITY #803-62, PINNACLE ENVIRONMENTAL
SUBMISSION #: 9706000114

ORDER NUMBER		151672	151673
SAMPLE ID:		MW-3-10	MW-3-15
DATE SAMPLED:		05/31/1997	05/31/1997
DATE RECEIVED:	PQL	06/05/1997	06/05/1997
DATE EXTRACTED:		06/09/97	06/09/97
DATE ANALYZED:		6/11/97	6/11/97
DILUTION:		1.0	1.0
PERCENT SOLID (%):		79.8	78.9
ACENAPHTHENE	330	410 U	420 U
ANTHRACENE	330	410 U	420 U
BENZO(A)ANTHRACENE	330	410 U	420 U
BENZO(A)PYRENE	330	410 U	420 U
BENZO(B)FLUORANTHENE	330	410 U	420 U
BENZO(G,H,I)PERYLENE	330	410 U	420 U
BENZO(K)FLUORANTHENE	330	410 U	420 U
INDENO(1,2,3-CD)PYRENE	330	410 U	420 U
CHRYSENE	330	410 U	420 U
DIBENZO(A,H)ANTHRACENE	330	410 U	420 U
FLUORANTHENE	330	410 U	420 U
FLUORENE	330	410 U	420 U
NAPHTHALENE	200	250 U	250 U
PHENANTHRENE	330	410 U	420 U
PYRENE	330	410 U	420 U

SURROGATE RECOVERIES	LIMITS		
TERPHENYL-d14	18 - 137	69	70
NITROBENZENE-d5	23 - 120	31	53
2-FLUOROBIPHENYL	30 - 115	38	52

COLUMBIA ANALYTICAL SERVICES

VOLATILE ORGANICS
METHOD 8021 STARS LIST VOAS
Reported: 06/16/97

Project Reference:
Client Sample ID : METHOD BLANK

Date Sampled : **Order #:** 152837 **Sample Matrix:** SOIL/SEDIMENT
Date Received: **Submission #:** **Percent Solid:** 100

ANALYTE	PQL	RESULT	UNITS
DATE ANALYZED : 06/06/97			
ANALYTICAL DILUTION: 1.0			Dry Weight
BENZENE	1.0	1.0 U	UG/KG
SEC-BUTYLBENZENE	1.0	1.0 U	UG/KG
TERT-BUTYLBENZENE	1.0	1.0 U	UG/KG
N-BUTYLBENZENE	1.0	1.0 U	UG/KG
METHYL-TERT-BUTYLETHER	1.0	1.0 U	UG/KG
ETHYLBENZENE	1.0	1.0 U	UG/KG
ISOPROPYLBENZENE	1.0	1.0 U	UG/KG
P-ISOPROPYLTOLUENE	1.0	1.0 U	UG/KG
NAPHTHALENE	1.0	1.0 U	UG/KG
N-PROPYLBENZENE	1.0	1.0 U	UG/KG
TOLUENE	1.0	1.0 U	UG/KG
1,2,4-TRIMETHYLBENZENE	1.0	1.0 U	UG/KG
1,3,5-TRIMETHYLBENZENE	1.0	1.0 U	UG/KG
O-XYLENE	2.0	2.0 U	UG/KG
M+P-XYLENE	2.0	2.0 U	UG/KG

SURROGATE RECOVERIES	QC LIMITS		
CHLOROFLUOROBENZENE	(60 - 140 %)	102	%

COLUMBIA ANALYTICAL SERVICES

VOLATILE ORGANICS
METHOD 8021 STARS LIST VOAS
Reported: 06/16/97

Project Reference:
Client Sample ID : METHOD BLANK

Date Sampled : **Order #:** 152841 **Sample Matrix:** SOIL/SEDIMENT
Date Received: **Submission #:** **Percent Solid:** 100

ANALYTE	PQL	RESULT	UNITS
DATE ANALYZED : 06/07/97			
ANALYTICAL DILUTION: 1.0			Dry Weight
BENZENE	1.0	1.0 U	UG/KG
SEC-BUTYLBENZENE	1.0	1.0 U	UG/KG
TERT-BUTYLBENZENE	1.0	1.0 U	UG/KG
N-BUTYLBENZENE	1.0	1.0 U	UG/KG
METHYL-TERT-BUTYLETHER	1.0	1.0 U	UG/KG
ETHYLBENZENE	1.0	1.0 U	UG/KG
ISOPROPYLBENZENE	1.0	1.0 U	UG/KG
P-ISOPROPYLTOLUENE	1.0	1.0 U	UG/KG
NAPHTHALENE	1.0	1.0 U	UG/KG
N-PROPYLBENZENE	1.0	1.0 U	UG/KG
TOLUENE	1.0	1.0 U	UG/KG
1,2,4-TRIMETHYLBENZENE	1.0	1.0 U	UG/KG
1,3,5-TRIMETHYLBENZENE	1.0	1.0 U	UG/KG
O-XYLENE	2.0	2.0 U	UG/KG
M+P-XYLENE	2.0	2.0 U	UG/KG

SURROGATE RECOVERIES	QC LIMITS		
CHLOROFLUOROBENZENE	(60 - 140 %)	97	%

COLUMBIA ANALYTICAL SERVICES

VOLATILE ORGANICS
METHOD 8021 STARS LIST VOAS
Reported: 06/16/97

Project Reference:
Client Sample ID : METHOD BLANK

Date Sampled : **Order #:** 152842 **Sample Matrix:** SOIL/SEDIMENT
Date Received: **Submission #:** **Percent Solid:** 100

ANALYTE	PQL	RESULT	UNITS
DATE ANALYZED : 06/09/97			
ANALYTICAL DILUTION: 125.0			Dry Weight
BENZENE	1.0	130 U	UG/KG
SEC-BUTYLBENZENE	1.0	130 U	UG/KG
TERT-BUTYLBENZENE	1.0	130 U	UG/KG
N-BUTYLBENZENE	1.0	130 U	UG/KG
METHYL-TERT-BUTYLETHER	1.0	130 U	UG/KG
ETHYLBENZENE	1.0	130 U	UG/KG
ISOPROPYLBENZENE	1.0	130 U	UG/KG
P-ISOPROPYLTOLUENE	1.0	130 U	UG/KG
NAPHTHALENE	1.0	130 U	UG/KG
N-PROPYLBENZENE	1.0	130 U	UG/KG
TOLUENE	1.0	130 U	UG/KG
1,2,4-TRIMETHYLBENZENE	1.0	130 U	UG/KG
1,3,5-TRIMETHYLBENZENE	1.0	130 U	UG/KG
O-XYLENE	2.0	250 U	UG/KG
M+P-XYLENE	2.0	250 U	UG/KG

SURROGATE RECOVERIES	QC LIMITS		
CHLOROFLUOROBENZENE	(60 - 140 %)	101	%

COLUMBIA ANALYTICAL SERVICES

VOLATILE ORGANICS
METHOD 8021 STARS LIST VOAS
Reported: 06/16/97

Project Reference:
Client Sample ID : METHOD BLANK

Date Sampled :	**Order #:** 152843	**Sample Matrix:** SOIL/SEDIMENT
Date Received:	**Submission #:**	**Percent Solid:** 100

ANALYTE	PQL	RESULT	UNITS
DATE ANALYZED : 06/10/97			
ANALYTICAL DILUTION: 1.0			Dry Weight
BENZENE	1.0	1.0 U	UG/KG
SEC-BUTYLBENZENE	1.0	1.0 U	UG/KG
TERT-BUTYLBENZENE	1.0	1.0 U	UG/KG
N-BUTYLBENZENE	1.0	1.0 U	UG/KG
METHYL-TERT-BUTYLETHER	1.0	1.0 U	UG/KG
ETHYLBENZENE	1.0	1.0 U	UG/KG
ISOPROPYLBENZENE	1.0	1.0 U	UG/KG
P-ISOPROPYLTOLUENE	1.0	1.0 U	UG/KG
NAPHTHALENE	1.0	1.0 U	UG/KG
N-PROPYLBENZENE	1.0	1.0 U	UG/KG
TOLUENE	1.0	1.0 U	UG/KG
1,2,4-TRIMETHYLBENZENE	1.0	1.0 U	UG/KG
1,3,5-TRIMETHYLBENZENE	1.0	1.0 U	UG/KG
O-XYLENE	2.0	2.0 U	UG/KG
M+P-XYLENE	2.0	2.0 U	UG/KG

SURROGATE RECOVERIES	QC LIMITS		
CHLOROFLUOROBENZENE	(60 - 140 %)	88	%

COLUMBIA ANALYTICAL SERVICES

VOLATILE ORGANICS
METHOD 8021 STARS LIST VOAS
Reported: 06/16/97

Project Reference:
Client Sample ID : METHOD BLANK

Date Sampled : **Order #:** 151954 **Sample Matrix:** WATER
Date Received: **Submission #:** **Analytical Run** 17703

ANALYTE	PQL	RESULT	UNITS
DATE ANALYZED : 06/05/97			
ANALYTICAL DILUTION: 1.0			
BENZENE	0.70	0.70 U	UG/L
SEC-BUTYLBENZENE	1.0	1.0 U	UG/L
TERT-BUTYLBENZENE	1.0	1.0 U	UG/L
N-BUTYLBENZENE	1.0	1.0 U	UG/L
METHYL-TERT-BUTYLETHER	1.0	1.0 U	UG/L
ETHYLBENZENE	1.0	1.0 U	UG/L
ISOPROPYLBENZENE	1.0	1.0 U	UG/L
P-ISOPROPYLTOLUENE	1.0	1.0 U	UG/L
NAPHTHALENE	1.0	1.0 U	UG/L
N-PROPYLBENZENE	1.0	1.0 U	UG/L
TOLUENE	1.0	1.0 U	UG/L
1,2,4-TRIMETHYLBENZENE	1.0	1.0 U	UG/L
1,3,5-TRIMETHYLBENZENE	1.0	1.0 U	UG/L
O-XYLENE	2.0	2.0 U	UG/L
M+P-XYLENE	2.0	2.0 U	UG/L

SURROGATE RECOVERIES	QC LIMITS		
CHLOROFLUOROBENZENE	(60 - 140 %)	98	%

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 8270 STARS LIST SEMIVOLATILI
Reported: 06/16/97

Project Reference:
Client Sample ID : METHOD BLANK

Date Sampled : **Order #:** 152887 **Sample Matrix:** SOIL/SEDIMEN
Date Received: **Submission #:** **Percent Solid:** 100

ANALYTE	PQL	RESULT	UNITS
DATE EXTRACTED : 06/09/97			
DATE ANALYZED : 06/11/97			
ANALYTICAL DILUTION: 1.0			Dry Weight
ACENAPHTHENE	330	330 U	UG/KG
ANTHRACENE	330	330 U	UG/KG
BENZO(A)ANTHRACENE	330	330 U	UG/KG
BENZO(A)PYRENE	330	330 U	UG/KG
BENZO(B)FLUORANTHENE	330	330 U	UG/KG
BENZO(G,H,I)PERYLENE	330	330 U	UG/KG
BENZO(K)FLUORANTHENE	330	330 U	UG/KG
INDENO(1,2,3-CD)PYRENE	330	330 U	UG/KG
CHRYSENE	330	330 U	UG/KG
DIBENZO(A,H)ANTHRACENE	330	330 U	UG/KG
FLUORANTHENE	330	330 U	UG/KG
FLUORENE	330	330 U	UG/KG
NAPHTHALENE	200	200 U	UG/KG
PHENANTHRENE	330	330 U	UG/KG
PYRENE	330	330 U	UG/KG

SURROGATE RECOVERIES	QC LIMITS	RESULT	UNITS
TERPHENYL-d14	(18 - 137 %)	89	%
NITROBENZENE-d5	(23 - 120 %)	72	%
2-FLUOROBIPHENYL	(30 - 115 %)	76	%

CHAIN OF CUSTODY RECORD

6-114

PINNACLE
ENVIRONMENTAL TECHNOLOGIES

Site: U-HAUL 803-62
Address: 562 W. 23rd STREET
MANHATTAN, NY

Project Manager: W. Malvey
Sampled By: W. Malvey
Laboratory: Columbia

Date: 5/31/97
Page 1 of 1

SAMPLE ID	TIME	DATE	TYPE	CONTAINERS (# / type)	TPHG EPA 8015M	TPHD EPA 8015M	TRPH EPA 418.1	BTEX EPA 8021	MTBE EPA 8020	HVOC EPA 8010	8270 B/N		COMMENTS
BASEMENT	0755	5/31/97	DIRT	1 4oz Jar				X			X	151664	
MW-1-5	0835		Soil					X			X	151665	
MW-1-10	0845							X			X	151666	
MW-1-15	0855							X			X	151667	
MW-2-3	1000							X			X	151668	
MW-2-10	1010							X			X	151669	
MW-2-15	1020							X			X	151670	
MW-3-5	1200							X			X	151671	
MW-3-10	1210							X			X	151672	
MW-3-15	1215		Soil	1 JAR				X			X	151673	
MW-1	1605		Water	4 VOA				X			X	151675	rec'd 8270 in VOA
MW-2	1610		Water	4 VOAH				X			X	151676	vials, only analyze for
MW-3	1615		Water	4 VOA				X			X	151678	8021 as per Bill
BWTR	0755		Water					X			X	151681	Malvey JMS 6/5

Relinquished By: W. Malvey	Date: 6/3/97	Time: 1040	Relinquished By: Peter Kuhl	Date: 6/4/97	Time: 1800
Received By: Peter Kuhl	Date: 6/3/97	Time: 1040	Received By: Tom Hastings	Date: 6/5/97	Time: 07:00

Pinnacle Environmental Technologies
2 Santa Maria
Foothill Ranch, CA 92610
TEL: (714) 470-3691
FAX: (714) 595-0459

GROUNDWATER SAMPLING REPORT

U-Haul Moving Center #803-62
562 West 23rd Street
New York City, New York

August 14, 1998

Prepared For:

AMERCO
Real Estate Company
2721 North Central Avenue, Suite 700
Phoenix, Arizona 85004

Prepared By:

PINNACLE
ENVIRONMENTAL TECHNOLOGIES

2 Santa Maria
Foothill Ranch, California 92610

(949) 470-3691

William E. Malvey
Principal

Keith G. Thompson
Principal

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This report presents the field procedures, observations, laboratory methods and results, data evaluation, and conclusions for groundwater monitoring and sampling activities completed at U-Haul Center #803-62, located at 562 West 23rd Street, New York, New York (Figures 1 & 2). This investigation was completed by Pinnacle Environmental Technologies (Pinnacle) on behalf of AMERCO Real Estate Company (AMERCO). This report covers the first two quarterly monitoring and sampling events of 1998.

The following conclusions are based on the two groundwater monitoring and sampling event completed in 1998:

- Groundwater is present beneath the site at approximately 6.06 feet bgs at an average elevation of 0.72 feet above mean sea level. Groundwater elevation has fluctuated between 0.64 feet and 0.72 feet above mean sea level since May 1997.
- Groundwater flow is directed toward the northeast at a calculated gradient of 0.004 ft/ft. The direction and gradient of flow has remained unchanged since the wells were installed in May 1997.
- Dissolved-phase BTEX concentrations have generally decreased during each sampling event. Dissolved-phase BTEX was not detected in the three wells during the second event of 1998.
- Dissolved-phase MTBE is currently present in two of the three wells at concentrations of 36 and 79 ppb. The downgradient extent is undefined, but appears to extend under the site building. The nearest downgradient point to install an additional well is approximately 65 feet away. This is too great a distance to provide useful information regarding the extent of the MTBE plume. The MTBE concentration of 79 ppb is only slightly above the NYSDEC guideline of 50 ppb and is considerably below the concentrations considered to pose a significant threat to human health and the environment.
- Given the lack of detectable concentration of BTEX and the low concentrations of MTBE detected, it is suggested that the NYSDEC consider granting closure on this site.

INTRODUCTION

This report presents the field procedures, observations, laboratory methods and results, data evaluation, and conclusions for groundwater monitoring and sampling activities completed at U-Haul Center #803-62, located at 562 West 23rd Street, New York, New York (Figures 1 & 2). This investigation was completed by Pinnacle Environmental Technologies (Pinnacle) on behalf of the AMERCO Real Estate Company (AMERCO). This report covers the first two quarterly monitoring and sampling events of 1998.

BACKGROUND

The site is located on the southeast corner of the intersection of 11th Avenue and West 23rd Street in Manhattan, New York City (Figures 1 & 2). The site is currently operated as a truck rental and mini-storage facility by U-Haul International. The site is completely occupied by a multi-floor building. The interior drive areas are surfaced with concrete.

The site lies at an approximate elevation of 7 feet above mean sea level (MSL) and is approximately 600 feet (0.1 miles) east of the Hudson River. Local topography is essentially flat and the area is heavily developed by a combination of commercial and industrial properties. Surface drainage appears to be towards the west-southwest at an approximate gradient of 0.01 ft/ft.

Two 1,000-gallon underground storage tanks (USTs) were formerly operated at the site for the storage of motor fuels for the rental vehicles operated from the site. Both USTs were removed on April 11, 1997 by The Tyree Organization (Tyree). The associated dispenser and remote fill lines were also removed at this time.

Tyree collected six soil samples, five from the UST excavation and one from below the former remote fill lines. No information regarding the sample collection depths was reported in the Tyree UST Removal Report (draft), dated May 1997. In addition, the Tyree report did not contain a sample location map, so the actual sample locations are also unclear.

Each of the six soil samples was analyzed for volatile organic compounds (VOCs) in accordance with EPA Method 8021 and for Semi-Volatile Organic Compounds - Base Neutral (BN) using EPA Method 8270.

The soil samples collected from the UST excavation sidewalls and analyzed using EPA Method 8021 were below detection limits for benzene, toluene, ethylbenzene, and xylenes (BTEX). Methyl-tertiary-butyl-ether (MTBE) was detected in three of the four sidewall samples at concentrations ranging from 5.7 parts per billion (ppb) to 11.6 ppb.

MTBE was detected in the soil sample collected from the base of the excavation at a concentration of 43.0 ppb. Concentrations of BTEX were below detection limits, with the exception of xylenes, which were detected at a total concentration of 41.2 ppb.

The remaining EPA Method 8021 analytes were detected in this sample at concentrations ranging from 5.2 to 25.1 ppb.

VOCs were detected in the soil sample collected from below the former remote fill line. Benzene was detected in the fill line soil sample at a concentration of 1,010 ppb.

Semi-volatile organic compounds were detected in all six soil samples at concentrations ranging from 52.1 ppb to 5,040 ppb. Concentrations in this range may be indicative of the background levels in the area.

Pinnacle installed three groundwater monitoring wells in the vicinity of the former USTs in May 1997. Nine soil samples, three from each boring, were collected and analyzed for BTEX (VOC's), and semi-volatile organic compounds using EPA Methods 8021 and 8270, respectively.

Three groundwater samples were collected and analyzed for BTEX and VOC's using EPA Method 8021.

Two grab samples were collected from the basement area. One sample was collected from absorbent material placed near cracks in the south wall and one grab sample was collected from the shallow standing water located in the pump sump along the east wall of the basement. Both of these samples were submitted for analysis in accordance with the methods above.

The soil at the site was observed to be a fine-grained sand with a trace of silt. Obvious field indicators of a significant petroleum release were not observed in the soil samples or measured on the PID used for field screening of soil samples.

Volatile organic compounds (VOCs) were detected above NYSDEC STARS Memo guidelines in three of the nine soil samples collected and analyzed. These samples were collected from borings MW-2 and MW-3. The soil samples collected from MW-1 were either below detection limits for all EPA Method 8021 analytes or were below the NYSDEC STARS Memo Guidelines.

The area of greatest concern to the NYSDEC was the former remote fill line trench. Detectable concentrations of all BTEX components were present in the soil sample collected a 3 feet bgs, near the estimated base of the trench. However, BTEX was not detected in the soil samples collected below that depth in this boring.

The lateral and vertical extent of the hydrocarbon-impacted soil appears to be adequately defined.

Free product was not observed to be present in the small accumulation of water along the east wall of the basement. Detectable concentrations of volatile organic vapors were not detected by a PID or by Pinnacle personnel . A concentration of 20 ppb of MTBE was detected in a grab sample collected of this water.

The source of this MTBE is unknown, however, the very low concentration is not generally considered to pose a threat the environment or to human health.

A concentration of 4,900 ppb of toluene was detected in a grab sample of some absorbent material placed along the south wall of the basement. No other BTEX or MTBE was found in this sample. The detected concentrations of toluene are inconsistent with the toluene concentrations found in the two soil samples with detectable toluene concentrations. It is unclear what the source of the toluene detected in the grab sample is. However, it is possible that the material was contaminated prior to being placed in the basement.

GROUNDWATER MONITORING AND SAMPLING

The first monitoring and sampling event of 1998 was conducted at the site by Pinnacle on March 6, 1998. The second event of 1998 was completed, also by Pinnacle, on June 20, 1998.

Depth to groundwater was measured to the nearest 0.01 foot during each event prior to purging each well. A minimum of 3 well casing volumes of groundwater was purged from each well using a submersible pump during each event. Temperature, pH, and conductivity were monitored during purging. Purging was considered complete when the 3 casing volumes were evacuated because the physical parameters of the purge water had stabilized prior to that point.

Each well was allowed to recover to a minimum of 80% of the pre-purge water elevation prior to sample collection. Samples were collected in disposable Teflon bailers equipped with a low flow bottom emptying device.

Each sample was slowly decanted into 40 milliliter VOAs to minimize potential volatilization of the sample. Each VOA was capped with a Teflon septa equipped cap, labeled, and placed in an ice chest cooled with Blue-Ice for transport to a New York State certified laboratory for analysis.

<u>March 6, 1998 Monitoring Event</u>

Groundwater was observed to be present at approximately 6.08 feet below ground surface (bgs) which calculated to be an average elevation of 0.70 feet above mean sea level. This was an average increase in elevation of 0.06 feet from the previous monitoring event in May 1997.

Groundwater was interpreted to flow toward the northeast at a calculated gradient of 0.004 foot per foot (ft/ft). The direction and gradient of groundwater flow was unchanged from the previous monitoring event.

June 20, 1998 Monitoring Event

Groundwater was observed to be present at approximately 6.06 feet below ground surface (bgs) which calculated to be an average elevation of 0.72 feet above mean sea level. This was an average increase in elevation of 0.02 feet from the previous monitoring event in March 1998.

Groundwater was interpreted to flow toward the northeast at a calculated gradient of 0.004 foot per foot (ft/ft). The direction and gradient of groundwater flow was unchanged from the previous monitoring event in March 1998.

LABORATORY ANALYSIS AND RESULTS

Each of the three collected groundwater samples was analyzed for volatile organic compounds using EPA Method 8021 for each event in 1998.

March 6, 1998 Results

Two of the three groundwater samples analyzed in March 1998 contained detectable concentrations of volatile organic compounds. Dissolved-phase benzene was detected in one sample, collected from well MW-2, at a concentration of 16 ppb. Dissolved-phase ethylbenzene and xylenes were detected in the sample collected from well MW-3 at concentrations of 1.2 ppb and 4.5 ppb, respectively. The sample collected from well MW-1 was below the method detection limits for all EPA Method 8021 analytes. MTBE was a target analyte during this event.

June 20, 1998 Results

All three samples were below the method detection limits for EPA Method 8021 for all volatile organic compounds except MTBE. MTBE was detected in two groundwater samples, MW-2 and MW-3, at concentrations of 79 ppb and 36 ppb, respectively.

CONCLUSIONS

The following conclusions are based on the two groundwater monitoring and sampling event completed in 1998:

- Groundwater is present beneath the site at approximately 6.06 feet bgs at an average elevation of 0.72 feet above mean sea level. Groundwater elevation has fluctuated between 0.64 feet and 0.72 feet above mean sea level since May 1997.

- Groundwater flow is directed toward the northeast at a calculated gradient of 0.004 ft/ft. The direction and gradient of flow has remained unchanged since the wells were installed in May 1997.

- Dissolved-phase BTEX concentrations have generally decreased during each sampling event. Dissolved-phase BTEX was not detected in the three wells during the second event of 1998.

- Dissolved-phase MTBE is currently present in two of the three wells at concentrations of 36 and 79 ppb. The downgradient extent is undefined, but appears to extend under the site building. The nearest downgradient point to install an additional well is approximately 65 feet away. This is too great a distance to provide useful information regarding the extent of the MTBE plume. The MTBE concentration of 79 ppb is only slightly above the NYSDEC guideline of 50 ppb and is considerably below the concentrations considered to pose a significant threat to human health and the environment.

- Given the lack of detectable concentration of BTEX and the low concentrations of MTBE detected, it is suggested that the NYSDEC consider granting closure on this site.

TABLE 1
SUMMARY OF GROUNDWATER ELEVATION DATA

U-Haul Moving Center #803-62
562 West 23rd Street
New York, New York

WELL	CASING ELEVATION	DATE	DEPTH TO GROUNDWATER	GROUNDWATER ELEVATION	FREE PRODUCT THICKNESS
MW-1	6.61	5/31/97	5.87	0.74	0.00
		3/6/98	5.82	0.79	0.00
		6/20/98	**5.79**	**0.82**	**0.00**
MW-2	7.22	5/31/97	6.62	0.60	0.00
		3/6/98	6.56	0.66	0.00
		6/20/98	**6.54**	**0.68**	**0.00**
MW-3	6.51	5/31/97	5.92	0.59	0.00
		3/6/98	5.87	0.64	0.00
		6/20/98	**5.84**	**0.67**	**0.00**

All elevations in feet relative to mean sea level.
All measurements in feet

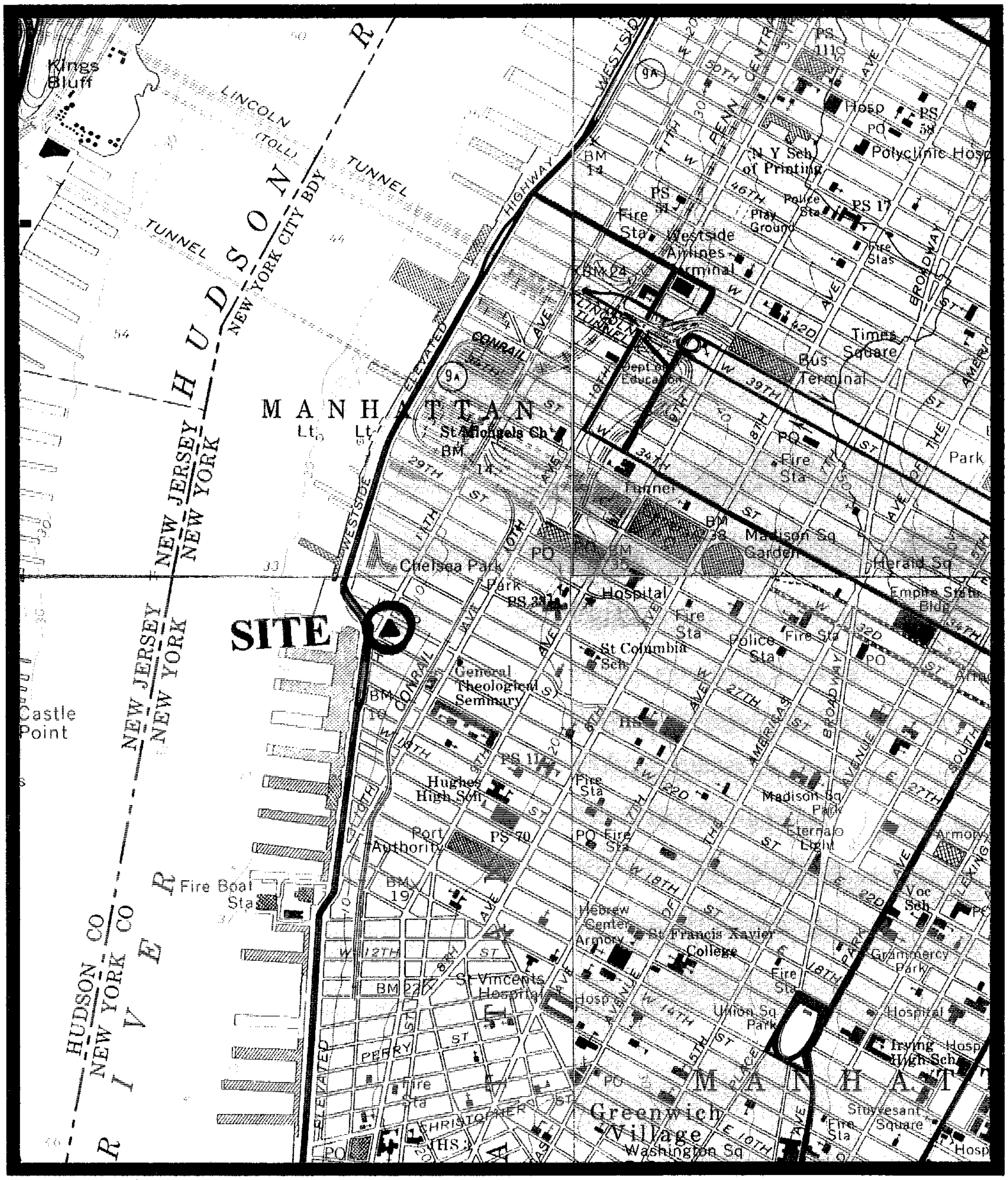
TABLE 2
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

U-HAUL MOVING CENTER #803-62
562 West 23rd Street
New York, New York

SAMPLE	DATE	BENZENE (ppb)	TOLUENE (ppb)	ETHYLBENZENE (ppb)	XYLENES (ppb)	MTBE (ppb)
		EPA Method 8021				
MW-1	5/31/97	63.0	1.8	13.0	4.9	<1.0
	3/6/98	ND	ND	ND	ND	NA
	6/20/98	**ND**	**ND**	**ND**	**ND**	**ND**
MW-2	5/31/97	<0.70	<1.0	<1.0	<2.0	<1.0
	3/6/98	16.0	ND	ND	ND	NA
	6/20/98	**ND**	**ND**	**ND**	**ND**	**79.0**
MW-3	5/31/97	<1.4	<2.0	<2.0	13.0	71.0
	3/6/98	ND	ND	1.2	4.5	NA
	6/20/98	**ND**	**ND**	**ND**	**ND**	**36.0**
BWTR	5/31/97	ND	ND	ND	ND	20.0
Stars Guidance Value (1):		0.7	5.0	5.0	5.0	50.0
PQL:		0.5	0.5	0.5	0.5	5.0

BWTR = Sample of water ponded near basement sump pump.
(1) TCLP Guidance Value for Gasoline Contaminated Soil.
This value is equal to the NYSDEC Groundwater Quality Standards.
Shaded areas exceed Guidance Values.

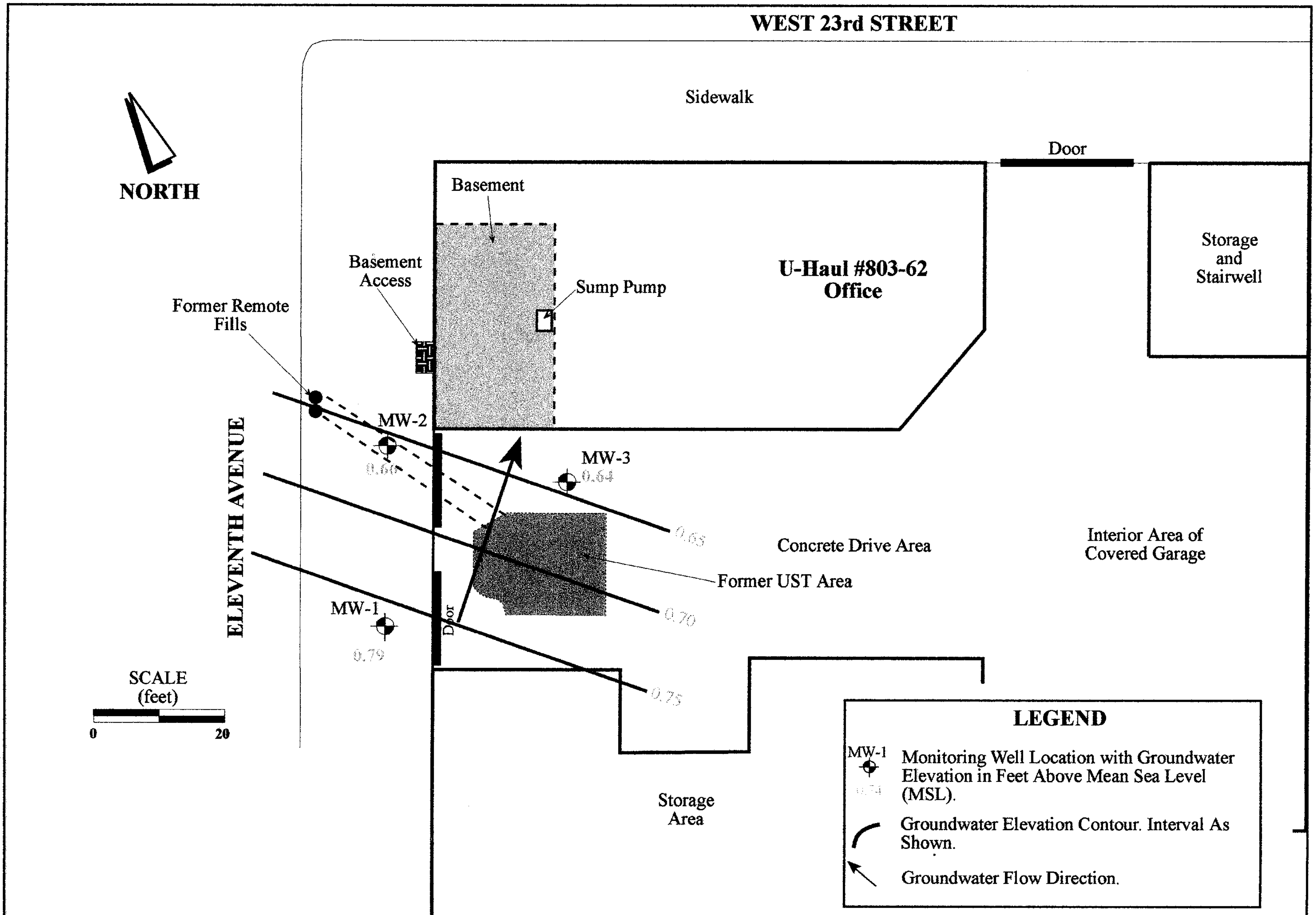
MTBE = methyl-tertiary-butyl-ether
ppb = parts per billion



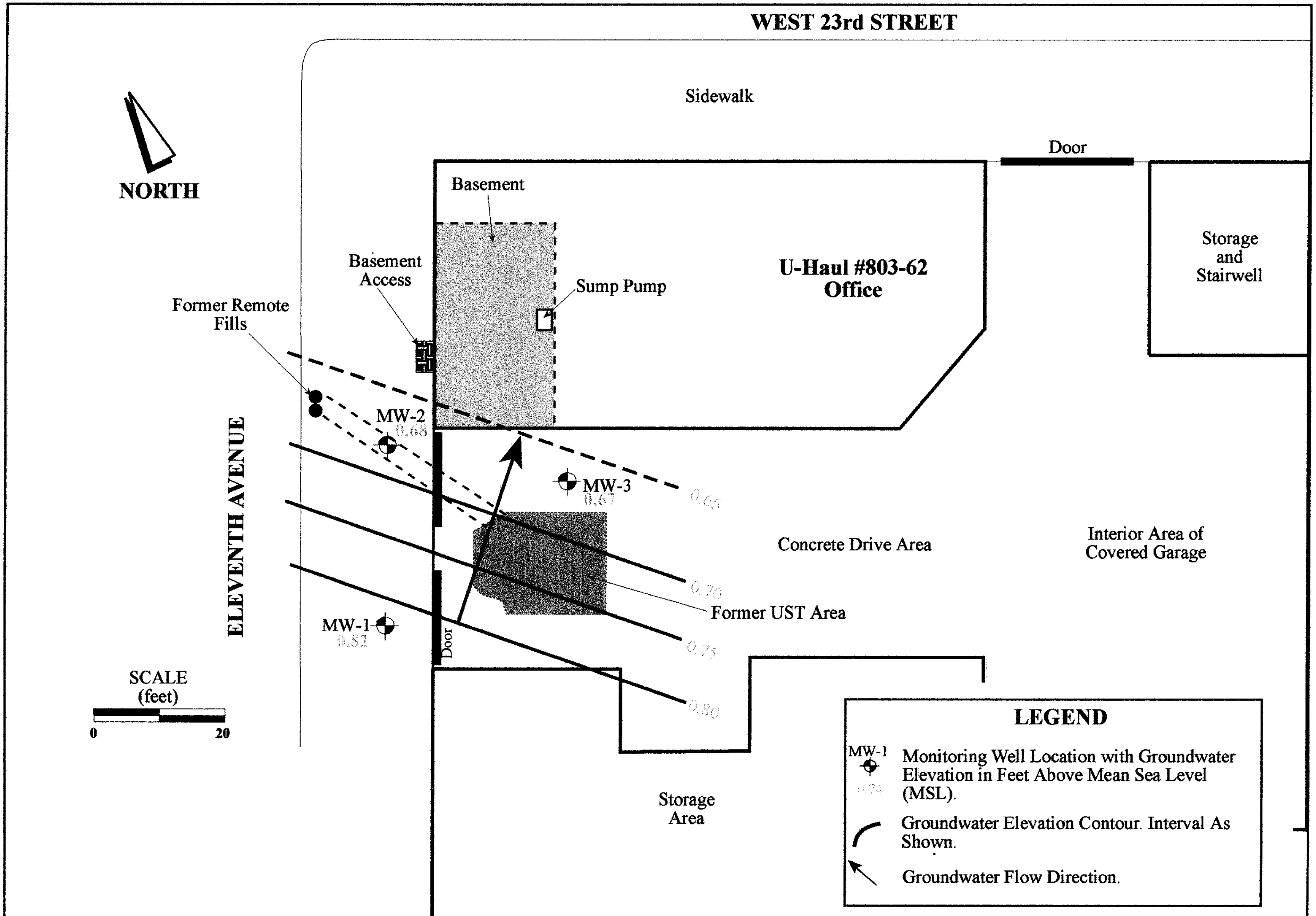
SCALE
(feet)
0 2,000

U.S.G.S. 7.5 Minute Series
Jersey City Quadrangle
1967
Photorevised 1981

PINNACLE ENVIRONMENTAL TECHNOLOGIES #2 Santa Maria, Foothill Ranch, CA 92610 Tel: (714) 470-3691 • Fax: (714) 595-0459	**U-Haul Center #803-62** **562 West 23rd Street** **New York City, New York**	**LOCATION MAP**	**FIGURE 1**



PINNACLE ENVIRONMENTAL TECHNOLOGIES #2 Santa Maria, Foothill Ranch, CA 92610 Tel: (714) 470-3691 • Fax: (714) 595-0459	**U-Haul Facility #803-62** **562 West 23rd Street** **Manhattan, New York**	**GROUNDWATER ELEVATION MAP** March 6, 1998	**FIGURE 2**



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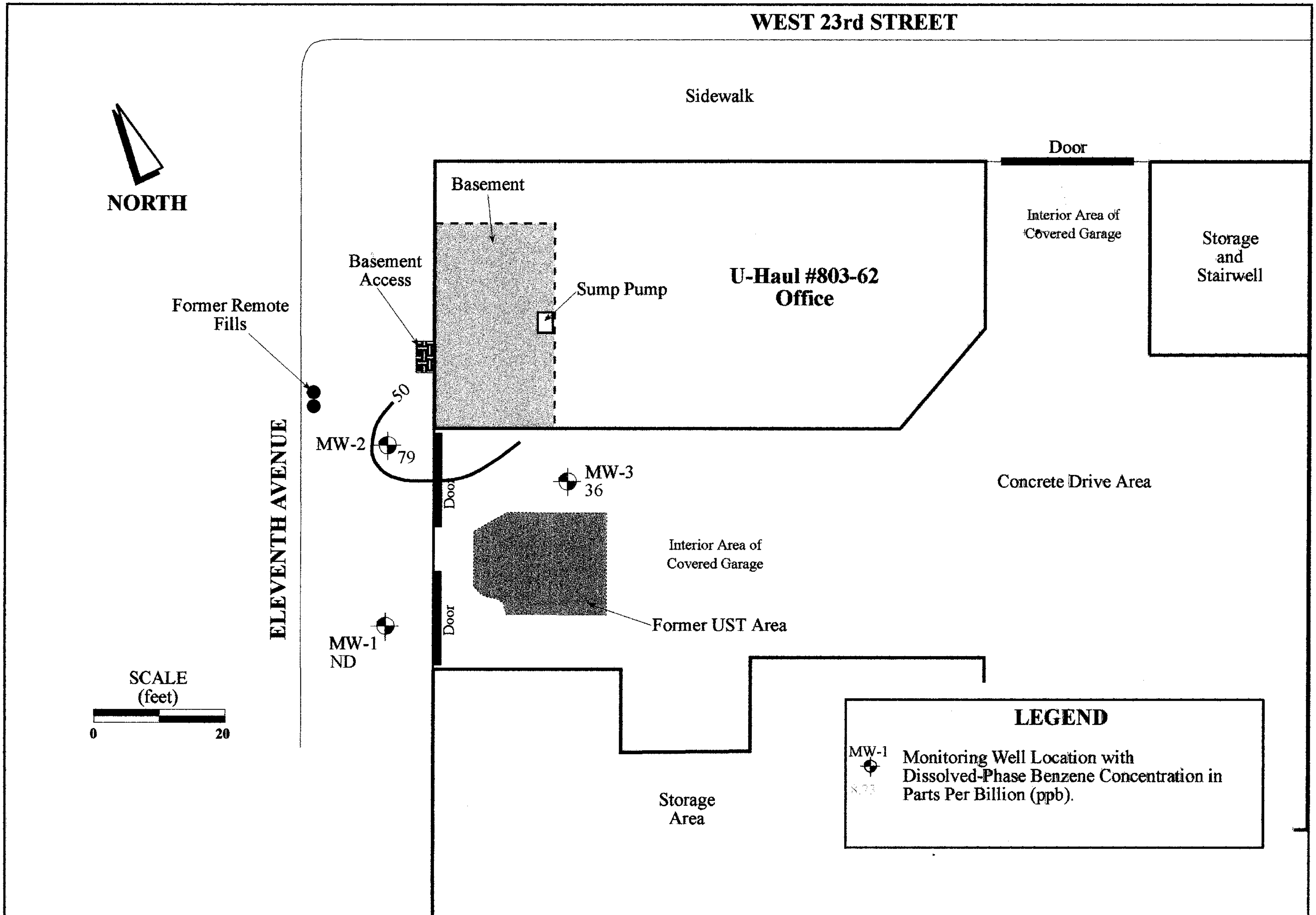
#2 Santa Maria, Foothill Ranch, CA 92610
Tel: (714) 470-3691 • Fax: (714) 595-0459

U-Haul Facility #803-62
562 West 23rd Street
Manhattan, New York

GROUNDWATER ELEVATION MAP
June 20, 1998

FIGURE 3



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ENVIRONMENTAL TECHNOLOGIES
#2 Santa Maria, Foothill Ranch, CA 92610
Tel: (714) 470-3691 • Fax: (714) 595-0459

U-Haul Facility #803-62
562 West 23rd Street
Manhattan, New York

DISSOLVED-PHASE MTBE MAP
June 20, 1998

FIGURE 4

CHEMICAL & ENVIRONMENTAL LABORATORIES, INC.

June 30, 1998 Certificate No.: 11668

Mr. William Malvey
Pinnacle Environmental Technologies
2 Santa Maria
Foothill Ranch, CA 92610

Project: U–Haul 803–62–Chelsea

Dear Mr. Malvey:

Enclosed please find the report for the sample(s) received by Chemical & Environmental Laboratories and analyzed as indicated in the chain–of–custody attached.

We appreciate the opportunity to service the needs of your company. Please call me at (562) 921–8123 if you have any questions.

Sincerely,

Larry Zhang

Larry Zhang, Ph.D.
Laboratory Director

14148 E. Firestone Blvd., Santa Fe Springs, CA 90670 Tel: 562 921-8123, Fax: 562 921-7974

CHEMICAL & ENVIRONMENTAL LABORATORIES, INC.

ANALYTICAL REPORT

---EPA 8021---

Client Name: Pinnacle Env. Technologies
Project Manager: William Malvey
Project Name: U-Haul 803-62-Chelsea

Date Sampled: 06/20/98
Date Analyzed: 06/24/98
Date Reported: 06/27/98

C&E ID		80622D-1	80622D-2	80622D-3		
SAMPLE ID		MW-1	MW-2	MW-3		
COMPOUND	Detection Limit (ug/L)	RESULT (ug/L or ppb)				
Benzene	0.5	ND	ND	ND		
Bromobenzene	0.5	ND	ND	ND		
Bromochloromethane	1	ND	ND	ND		
Bromodichloromethane	1	ND	ND	ND		
Bromoform	1	ND	ND	ND		
Bromomethane	1	ND	ND	ND		
n-Butylbenzene	0.5	ND	ND	ND		
sec-Butylbenzene	0.5	ND	ND	ND		
tert-Butylbenzene	0.5	ND	ND	ND		
Carbon Tetrachloride	0.5	ND	ND	ND		
Chlorobenzene	0.5	ND	ND	ND		
Chloroethane	1	ND	ND	ND		
Chloroform	0.5	ND	ND	ND		
Chloromethane	1	ND	ND	ND		
2-Chlorotoluene	0.5	ND	ND	ND		
4-Chlorotoluene	0.5	ND	ND	ND		
Dibromochloromethane	1	ND	ND	ND		
1,2-Dibromo-3-chloropropane	1	ND	ND	ND		
1,2-Dibromoethane	1	ND	ND	ND		
Dibromomethane	1	ND	ND	ND		
1,2-Dichlorobenzene	0.5	ND	ND	ND		
1,3-Dichlorobenzene	0.5	ND	ND	ND		
1,4-Dichlorobenzene	0.5	ND	ND	ND		
Dichlorodifluoromethane	1	ND	ND	ND		
1,1-Dichloroethane	0.5	ND	ND	ND		
1,2-Dichloroethane	0.5	ND	ND	ND		
1,1-Dichloroethene	0.5	ND	ND	ND		
cis-1,2-Dichloroethene	0.5	ND	ND	ND		
trans-1,2-Dichloroethene	0.5	ND	ND	ND		
1,2-Dichloropropane	0.5	ND	ND	ND		
1,3-Dichloropropane	0.5	ND	ND	ND		

To be continued on page 2

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CHEMICAL & ENVIRONMENTAL LABORATORIES, INC.

ANALYTICAL REPORT

---EPA 8021---

Client Name: Pinnacle Env. Technologies
Project Manager: William Malvey
Project Name: U-Haul 803-62-Chelsea

Date Sampled: 06/20/98
Date Analyzed: 06/24/98
Date Reported: 06/27/98

C&E ID		80622D-1	80622D-2	80622D-3		
SAMPLE ID		MW-1	MW-2	MW-3		
COMPOUND	Detection Limit (ug/L)	RESULT (ug/L or ppb)				
2,2-Dichloropropane	0.5	ND	ND	ND		
1,1-Dichloropropene	0.5	ND	ND	ND		
cis-1,3-Dichloropropene	0.5	ND	ND	ND		
trans-1,3-Dichloropropene	0.5	ND	ND	ND		
Ethylbenzene	0.5	ND	ND	ND		
Hexachlorobutadiene	0.5	ND	ND	ND		
Isopropylbenzene	0.5	ND	ND	ND		
4-Isopropyltoluene	0.5	ND	ND	ND		
Methylene Chloride	1	ND	ND	ND		
Naphthalene	0.5	ND	ND	ND		
n-Propylbenzene	0.5	ND	ND	ND		
Styrene	0.5	ND	ND	ND		
1,1,1,2-Tetrachloroethane	0.5	ND	ND	ND		
1,1,2,2-Tetrachloroethane	0.5	ND	ND	ND		
Tetrachloroethene	0.5	ND	ND	ND		
Toluene	0.5	ND	ND	ND		
1,2,3-Trichlorobenzene	0.5	ND	ND	ND		
1,2,4-Trichlorobenzene	0.5	ND	ND	ND		
1,1,1-Trichloroethane	0.5	ND	ND	ND		
1,1,2-Trichloroethane	0.5	ND	ND	ND		
Trichloroethene	0.5	ND	ND	ND		
Trichlorofluoromethane	1	ND	ND	ND		
1,2,3-Trichloropropane	0.5	ND	ND	ND		
1,2,4-Trimethylbenzene	0.5	ND	ND	ND		
1,2,5-Trimethylbenzene	0.5	ND	ND	ND		
Vinyl Chloride	1	ND	ND	ND		
Total Xylenes	0.5	ND	ND	ND		

ND = Not detected at the indicated detection limit.

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CHEMICAL & ENVIRONMENTAL LABORATORIES, INC.

ANALYTICAL REPORT

--- EPA 8021(MTBE) ---

Client Name: Pinnacle Env. Technologies
Project Manager: William Malvey
Project Name: U-Haul 803-62-Chelsea

Date Sampled: 06/20/98
Date Analyzed: 06/24/98
Date Reported: 06/27/98

SAMPLE IDENTIFICATION		RESULT
C&E ID	Sample ID	(ug/L or ppb)
80622D-1	MW-1	ND
80622D-2	MW-2	79
80622D-3	MW-3	36
Detection Limit:		5

ND = Not Detected at the indicated detection limit.

CHEMICAL & ENVIRONMENTAL LABORATORIES, INC.

QA/QC REPORT

--- EPA 8021 ---

I. Matrix Spike (MS)/Matrix Spike Duplicate(MSD)

Date Performed: 06/24/98
Batch #: 3132
Lab Sample I.D.: 80622D

Unit: ug/L

ANALYTE	SPK CONC	MS (ug/L)	MS %	MSD (ug/L)	MSD %	RPD	ACP %MS	ACP RPD
1,1-Dichloroethene	40.0	34.4	86	35.6	89	3.4	60-140	20
Trichloroethene	40.0	35.8	90	36.3	91	1.4	60-140	20
Benzene	40.0	36.1	90	36.8	92	1.9	60-140	20
Toluene	40.0	35.4	89	37.1	93	4.7	60-140	20
Chlorobenzene	40.0	34.0	85	35.2	88	3.5	60-140	20

II. Laboratory Quality Control Check Sample

ANALYTE	SPK CONC	RESULT	%RECOVERY	ACP %
1,1,1-TCA	40.0	36.4	91	80-120
PCE	40.0	36.1	90	80-120
Benzene	40.0	37.0	93	80-120
Toluene	40.0	37.6	94	80-120
Ethylbenzene	40.0	34.6	87	80-120

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80622D

CHAIN OF CUSTODY RECORD

PINNACLE ENVIRONMENTAL TECHNOLOGIES

Site: U-Haul 803-62
Address: 562 W. 23rd Street
NYC, NY

Project Manager: W. Maluy
Sampled By: W. Maluy
Laboratory: C&E

Agency: NYSDEC
Date: 6/20/98
Page 1 of 1

	SAMPLE ID	TIME	DATE	SAMPLE TYPE	CONTAINERS	TPHG EPA 8015M	TPHD EPA 8015M	TRPH EPA 418.1	BTEX EPA 8020	MTBE EPA 8020	HVOC EPA 8010	B/N EPA 8270	VOC EPA 8021	COMMENTS
1	MW-1	1300	6/20/98	Water	2X VOA								X	
2	MW-2	1305	↓	↓	↓								X	
3	MW-3	1310	↓	↓	↓								X	

Relinquished By: W. Maluy	Date: 6/20/98	Time: 1600	Relinquished By:	Date:	
Received By: [illegible signature]	Date: 6-22-98	Time:	Received By:	Date:	

PINNACLE ENVIRONMENTAL TECHNOLOGIES
2 Santa Maria
Foothill Ranch, CA 92610
TEL: (949) 470-3691
FAX: (949) 595-0459

QUARTERLY GROUNDWATER MONITORING REPORT

U-Haul Moving Center #803-62
562 West 23rd Street
New York, New York

February 21, 1999

Prepared for:

AMERCO

REAL ESTATE COMPANY

2721 North Central Avenue, Suite 700
Phoenix, Arizona 85004

Prepared by:

PINNACLE

ENVIRONMENTAL TECHNOLOGIES

2 Santa Maria
Foothill Ranch, California 92610
(949) 470-3691

William E. Malvey
Principal

Keith G. Thompson
Principal

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This report summarizes the field procedures and observations, laboratory analytical procedures and results, and conclusions of the quarterly groundwater monitoring and sampling event completed on November 22, 1998 by Pinnacle Environmental Technologies (Pinnacle) at U-Haul Moving Center #803-62, located at 562 West 23rd Street in New York, New York.

- On the date of this sampling event, the average depth to groundwater was 6.10 feet below ground surface (bgs) and the average groundwater elevation was 0.68 feet above mean sea level (msl). The calculated groundwater flow was to the north at a gradient of 0.014 feet per foot.

- Three groundwater monitoring wells at the site were purged and sampled. Approximately 24 gallons of purged groundwater was temporarily stored onsite in a 55-gallon drum pending disposal. Three groundwater samples were analyzed for volatile organic compounds EPA Method 8021.

- The average groundwater elevation has decreased 0.04 feet since the last monitoring and sampling event conducted on June 20, 1998. The direction of groundwater flow has changed from the northeast to the north since the previous sampling event. The current gradient is over three times greater than the gradient calculated using the groundwater data collected on June 20, 1998.

- Benzene was not detected at the site for the second consecutive quarter.

- The concentration of total xylenes in well MW-3 exceeded the STARS Memo guidance level of 5 ug/L for the second time in four sampling events performed by Pinnacle.

- MTBE concentrations in wells MW-2 and MW-3 are lower than the last sampling event performed by Pinnacle. MTBE has not been detected in the sample from well MW-1. MTBE concentrations in the three wells did not exceed the STARS guidance level of 50 ug/L.

- Due to the detectable levels of MTBE and xylenes in wells MW-2 and MW-3, the downgradient extent of the dissolved-phase hydrocarbon plume is not defined. However, the concentrations of volatile organic compounds in samples collected during this and previous sampling events are considerably below the concentrations considered to pose a significant threat to human health and the environment.

- Given the lack of consistently detectable concentration of BTEX and the low concentrations of MTBE detected, it is suggested that the NYSDEC consider granting closure on this site.

- If closure is not granted by the NYSDEC, the next groundwater monitoring and sampling event will be conducted in the first quarter of 1999.

INTRODUCTION

This report summarizes the field procedures and observations, laboratory analytical procedures and results, and conclusions of the quarterly groundwater monitoring and sampling event completed on November 22, 1998 by Pinnacle Environmental Technologies (Pinnacle).

U-Haul Moving Center #803-62 is located on the southeast corner of the intersection of 11th Avenue and West 23rd Street in Manhattan, New York City (Figures 1 and 2). The site is currently operated as a truck rental and mini-storage facility by U-Haul International. The site is completely occupied by a multi-floor building. The interior drive areas are surfaced with concrete.

The site lies at an approximate elevation of seven feet above mean sea level (msl) and is approximately 600 feet (0.1 miles) east of the Hudson River. Local topography is essentially flat and the area is heavily developed by a combination of commercial and industrial properties. Surface drainage appears to be towards the west-southwest at an approximate gradient of 0.01 ft/ft.

Two 1,000-gallon underground storage tanks (USTs) and one dispenser were formerly operated to fuel vehicles rented at the site. Both USTs were removed on April 11, 1997 by The Tyree Organization (Tyree). The associated dispenser and remote fill lines were also removed at this time.

Tyree collected six soil samples; five from the UST excavation and one from below the former remote fill lines. No information regarding the sample collection depths was reported in Tyree's UST Removal Report (draft), dated May 1997. In addition, the Tyree report did not contain a sample location map, so the actual sample locations are also unclear.

Each of the six soil samples was analyzed for volatile organic compounds (VOCs) in accordance with EPA Method 8021 and for semi-volatile organic compounds - base neutral (BN) using EPA Method 8270.

The soil samples collected from the UST excavation sidewalls and analyzed using EPA Method 8021 were below detection limits for benzene, toluene, ethylbenzene, and xylenes (BTEX). Methyl tertiary-butyl ether (MTBE) was detected in three of the four sidewall samples at concentrations ranging from 5.7 parts per billion (ppb) to 11.6 ppb.

MTBE was detected in the soil sample collected from the base of the excavation at a concentration of 43.0 ppb. Concentrations of benzene, toluene and ethylbenzene were below detection limits. Xylenes were detected at a total concentration of 41.2 ppb. Some remaining EPA Method 8021 analytes were also detected in this sample, at concentrations ranging from 5.2 to 25.1 ppb.

VOCs were detected in the soil sample collected from below the former remote fill line. Benzene was detected in the fill line soil sample at a concentration of 1,010 ppb.

Semi-volatile organic compounds were detected in all six soil samples at concentrations ranging from 52.1 ppb to 5,040 ppb. Concentrations in this range may be indicative of the background levels in the area.

Pinnacle installed three groundwater monitoring wells in the vicinity of the former USTs in May 1997. Nine soil samples, three from each boring, were collected and analyzed for VOCs and semi-volatile organic compounds using EPA Methods 8021 and 8270, respectively.

Three groundwater samples were collected and analyzed for BTEX and VOCs using EPA Method 8021.

Two grab samples were collected from the basement area. One sample was collected from absorbent material placed near cracks in the south wall and one grab sample was collected from the shallow standing water located in the pump sump along the east wall of the basement. Both of these samples were submitted for analysis in accordance with the methods above.

The soil at the site was observed to be a fine-grained sand with a trace of silt. Obvious field indicators of a significant petroleum release were not observed in the soil samples or measured on the PID used for field screening of soil samples.

Volatile organic compounds (VOCs) were detected above STARS Memo guideline levels in three of the nine soil samples collected and analyzed. These samples were collected from borings MW-2 and MW-3. The soil samples collected from MW-1 were either below detection limits for all EPA Method 8021 analytes or were below the NYSDEC STARS Memo guideline levels.

The area of greatest concern to the NYSDEC was the former remote fill line trench. Detectable concentrations of all BTEX components were present in the soil sample collected a 3 feet bgs, near the estimated base of the trench. However, BTEX was not detected in the soil samples collected below that depth in this boring.

The lateral and vertical extent of the hydrocarbon-impacted soil appears to be adequately defined.

Free product was not observed on the standing water along the east wall of the basement. Detectable concentrations of volatile organic vapors were not detected by a PID or by Pinnacle personnel. A concentration of 20 ppb of MTBE was detected in a grab sample collected of this water.

The source of this MTBE is unknown. However, the very low MTBE concentration is not considered to pose a threat the environment or to human health.

A concentration of 4,900 ppb of toluene was detected in a grab sample of some absorbent material placed along the south wall of the basement. No other BTEX or MTBE was found in this sample. The detected concentration of toluene is inconsistent with the toluene concentrations found in the two soil samples with detectable toluene concentrations. It is unclear what the source of the toluene detected in the grab sample is. However, it is possible that the material was contaminated prior to being placed in the basement.

This is the fourth groundwater sampling event performed at the site by Pinnacle.

GROUNDWATER MONITORING AND SAMPLING

The depth to groundwater in each well was measured to the nearest 0.01 foot. The groundwater elevation in each well was calculated using the top-of-casing elevation data obtained from the top-of-casing survey performed by Pinnacle on May 31, 1997. Table 1 summarizes the historical and latest depth-to-groundwater and groundwater elevation data at the site. Appendix A details the field procedures used during this quarterly sampling event. Appendix B contains the depth to groundwater and well purging field data.

The average depth to groundwater in the three wells was 6.10 feet bgs and the average groundwater elevation was 0.68 feet above msl. The calculated groundwater flow was to the north at a gradient of 0.014 feet per foot (ft/ft) on the date of the sampling event. Figure 3 is the groundwater elevation map for November 22, 1998.

The standing water in each well was purged prior to sampling. Appendix B contains the physical parameter measurements obtained during well purging. A total of 24 gallons of groundwater was purged from the three monitoring wells sampled at the site. Purged groundwater was temporarily stored onsite in a 55-gallon drum pending disposal.

One groundwater sample was collected from each of the three wells using a disposable Teflon bailer equipped with a low-flow bottom emptying device. The bailer was slowly lowered into the water column of the well to be sampled and withdrawn from the well when sufficient water was obtained to fill the sample containers. The sample was slowly decanted into the sample containers to minimize agitation of the sample and release of volatile petroleum hydrocarbons from the sample. The samples were placed in an ice chest cooled with Blue-Ice for transport to the laboratory.

LABORATORY PROCEDURES AND RESULTS

The three groundwater samples were delivered by Pinnacle to a New York State-certified laboratory for analysis. Each sample was analyzed for volatile organic compounds in accordance with EPA Method 8021.

Benzene was not detected in the three samples. Benzene was not detected in the last set of samples collected at the site on June 20, 1998.

The STARS Memo guidance level for MTBE of 50 ug/L was not exceeded in the three samples collected this quarter, though MTBE was detected in two of the three samples (MW-1 and

MW-3). The STARS Memo guidance level for MTBE was exceeded in the one of the three samples collected at the site in June 20, 1998.

Xylenes were detected above the STARS Memo guidance level of 5 micrograms per liter (ug/L) in the samples from well MW-3.

Table 2 summarizes the laboratory analytical results for this event and previous events. Appendix C contains the laboratory reports and chain-of-custody record for this event.

SUMMARY

The following is a summary of the observations and results of this phase of work:

- Quarterly groundwater monitoring and sampling was conducted at the site by Pinnacle on November 22, 1998.
- The average depth to groundwater was 6.10 feet bgs and the average groundwater elevation was 0.68 feet above msl. The calculated groundwater flow was to the north at a gradient of 0.014 ft/ft on the date of this sampling event.
- The average groundwater elevation has decreased 0.04 feet since the last monitoring and sampling event conducted on June 20, 1998. The direction of groundwater flow has changed from the northeast to the north since the previous sampling event.
- Three groundwater monitoring wells were purged and sampled. Approximately 24 gallons of purged groundwater was temporarily stored onsite pending disposal.
- Three groundwater samples were analyzed for volatile organic compounds using EPA Method 8021.
- Benzene was not detected at the site for the second consecutive quarter.
- The concentration of total xylenes in well MW-3 exceeded the STARS Memo guidance levels of 5 ug/L for the second time in four sampling events performed by Pinnacle.
- MTBE concentrations in wells MW-2 and MW-3 are lower than the last sampling event performed by Pinnacle. MTBE has never been detected in the sample from well MW-1. MTBE concentrations in the three wells did not exceed the STARS Memo guidance level of 50 ug/L.

CONCLUSIONS

Based on the results of this sampling event the following conclusions are made:

- Due to the detectable levels of MTBE and xylenes in wells MW-2 and MW-3, the downgradient extent of the dissolved-phase hydrocarbon plume is not defined. However, the concentrations of volatile organic compounds resulting from this and previous sampling events are considerably below the concentrations considered to pose a significant threat to human health and the environment.
- Given the lack of consistently detectable concentrations of BTEX and the low concentrations of MTBE detected, it is suggested that the NYSDEC consider granting closure on this site.
- If closure is not granted by the NYSDEC, the next groundwater monitoring and sampling event will be conducted in the first quarter of 1999.

TABLE 1
SUMMARY OF GROUNDWATER ELEVATION DATA

U-HAUL MOVING CENTER #803-62
562 West 23rd Street
New York, New York

WELL	CASING ELEVATION	DATE	DEPTH TO GROUNDWATER	GROUNDWATER ELEVATION	FREE PRODUCT THICKNESS
MW-1	6.61	5/31/97	5.87	0.74	0.00
		3/6/98	5.82	0.79	0.00
		6/20/98	5.79	0.82	0.00
		11/22/98	5.78	0.83	0.00
MW-2	7.22	5/31/97	6.62	0.60	0.00
		3/6/98	6.56	0.66	0.00
		6/20/98	6.54	0.68	0.00
		11/22/98	6.74	0.48	0.00
MW-3	6.51	5/31/97	5.92	0.59	0.00
		3/6/98	5.87	0.64	0.00
		6/20/98	5.84	0.67	0.00
		11/22/98	5.78	0.73	0.00

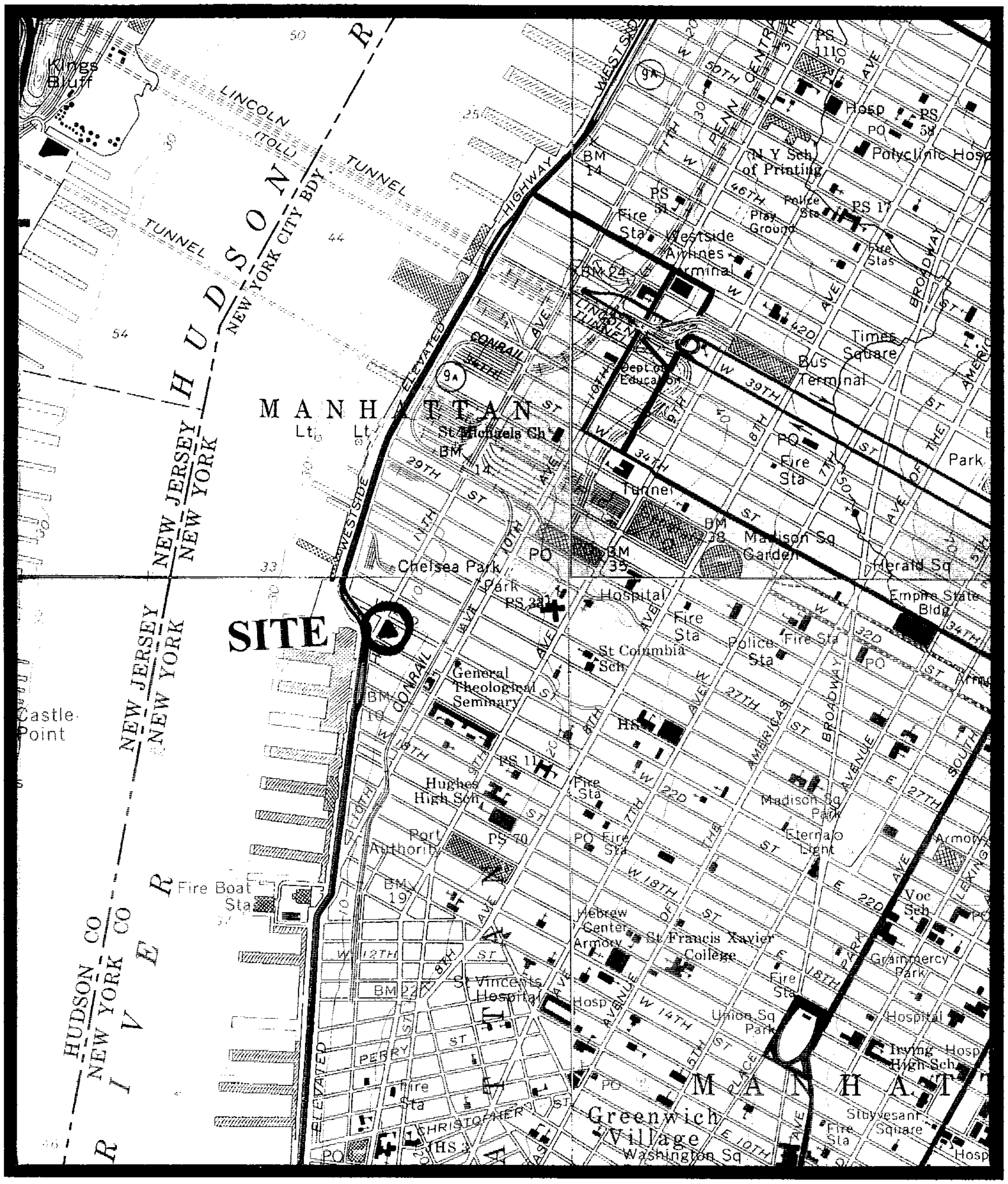
All elevations in feet relative to mean sea level
Depth to groundwater measurements in feet below top of casing

TABLE 2
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

U-HAUL MOVING CENTER #803-62
562 West 62nd Street
New York, New York

WELL NUMBER	DATE	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES	MTBE
		EPA Method 8021				
MW-1	5/31/97	63.0	1.8	13.0	4.9	ND < 1
	3/6/98	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	NA
	6/20/98	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5
	11/22/98	**ND < 0.5**	**ND < 0.5**	**ND < 0.5**	**ND < 0.5**	**ND < 5**
MW-2	5/31/97	ND < 0.7	ND < 1	ND < 1	ND < 2	ND < 1
	3/6/98	16.0	ND < 0.5	ND < 0.5	ND < 0.5	NA
	6/20/98	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	79.0
	11/22/98	**ND < 0.5**	**ND < 0.5**	**ND < 0.5**	**ND < 0.5**	**17**
MW-3	5/31/97	ND < 1.4	ND < 2	ND < 2	13.0	71.0
	3/6/98	ND < 0.5	ND < 0.5	1.2	4.5	NA
	6/20/98	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	36.0
	11/22/98	**ND < 0.5**	**ND < 0.5**	**ND < 0.5**	**21**	**25**
STARS Guidance Value		0.7	5.0	5.0	5.0	50.0

MTBE = methyl tertiary-butyl ether
All values in micrograms per liter (ug/L)



SCALE
(feet)
0 2,000

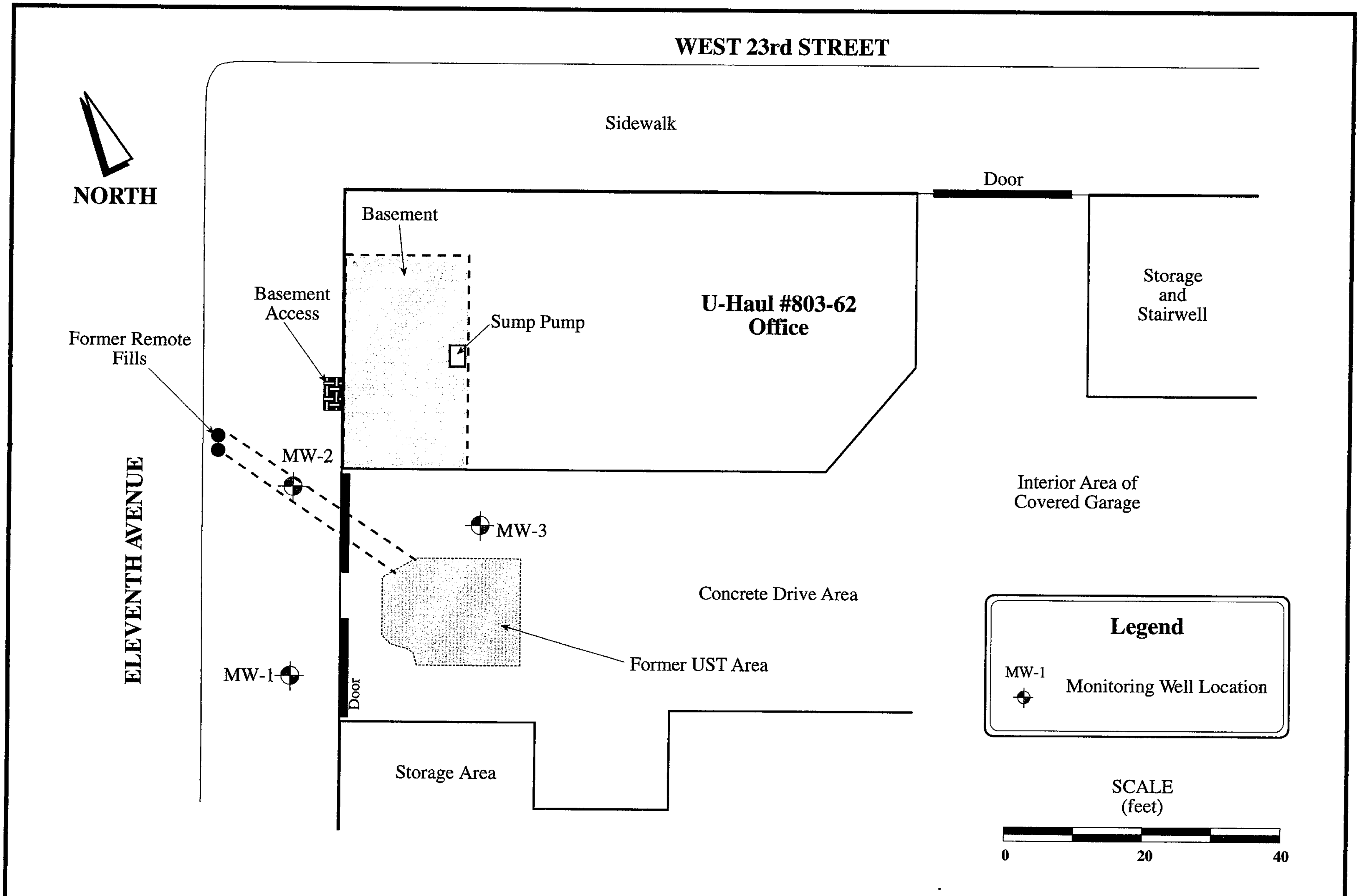
U.S.G.S. 7.5 Minute Series
Jersey City Quadrangle
1967
Photorevised 1981

PINNACLE
ENVIRONMENTAL TECHNOLOGIES
#2 Santa Maria, Foothill Ranch, CA 92610
Tel: (714) 470-3691 • Fax: (714) 595-0459

U-Haul Center #803-62
562 West 23rd Street
New York City, New York

LOCATION MAP

FIGURE 1



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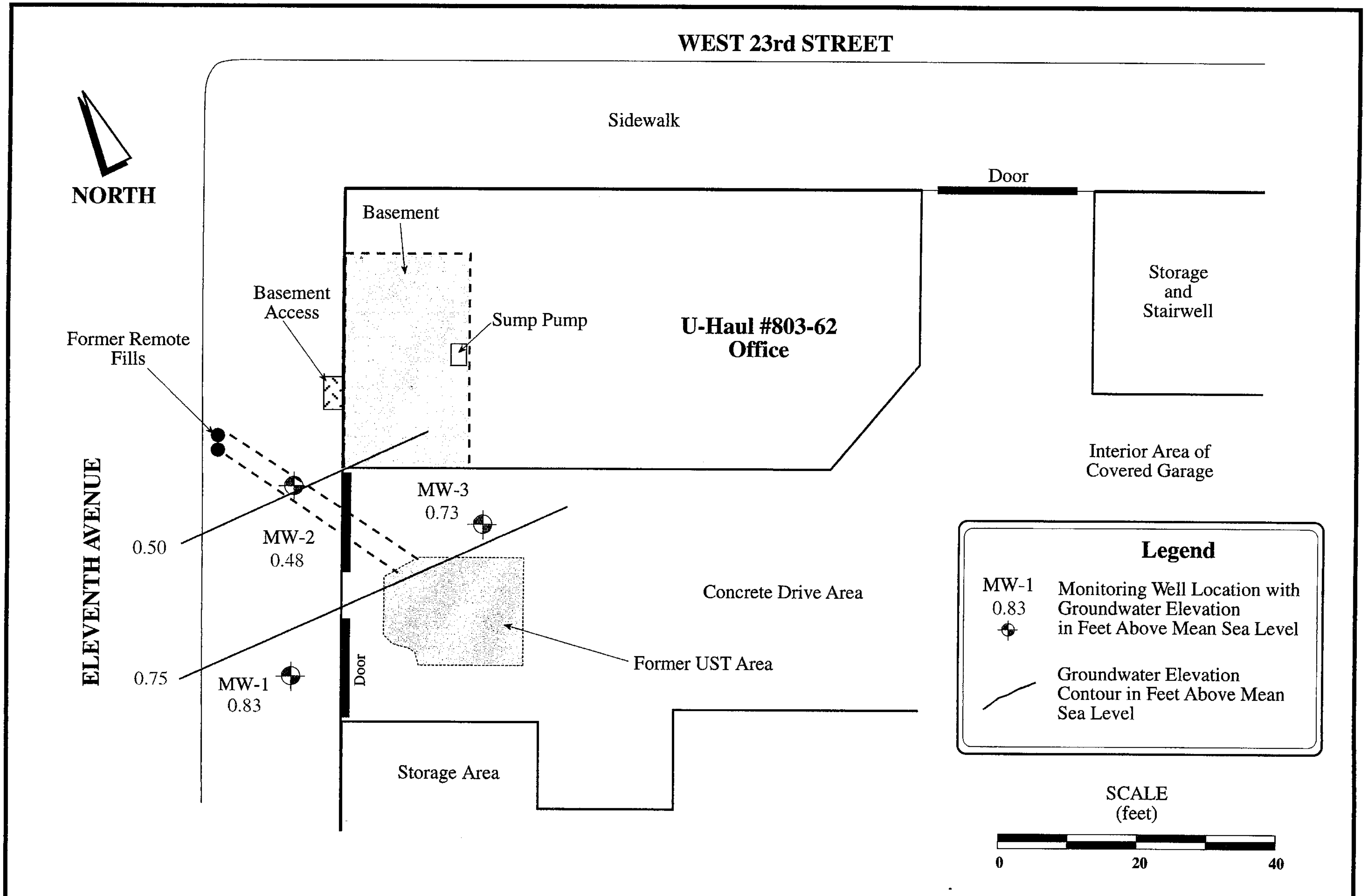
U-Haul Moving Center #803-62
562 West 23rd Street
New York, New York

Site Plan

Figure 2



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U-Haul Moving Center #803-62
562 West 23rd Street
New York, New York

Groundwater Elevation Map
November 22, 1998

Figure

APPENDIX A
GENERAL FIELD PROCEDURES

The following sections outline the general field procedures and protocols followed by Pinnacle Environmental Technologies (Pinnacle) in the completion of field tasks. Any deviation from the procedures outlined here due to unique or unforeseen circumstances will be noted in the body of the applicable report. The following tasks are detailed:

- Groundwater Level Monitoring
- Monitoring Well Purging and Sampling
- Chain-of-Custody Protocol

Groundwater samples are collected from monitoring wells and temporary, small-diameter wells. Sampling of groundwater monitoring wells is conducted in accordance with the EPA Technical Enforcement Guidance Document or with any other local protocols and procedures.

Groundwater Level Monitoring

The depth to groundwater is measured to the nearest 0.01 foot and recorded for use in determining the groundwater gradient and flow direction. Water level measurements are completed on all wells prior to purging any well at the site. Depth to groundwater is measured using either an electronic well sounding device (i.e. Solinst) or using an interface probe (i.e. MMC). If a sounding device is used, the well is first checked for the presence of non-aqueous phase petroleum liquids (NAPLs) using hydrocarbon sensitive paste or an interface probe. The interface probe is capable of direct detection of trace thickness of NAPLs.

Monitoring Well Purging and Sampling

All wells are purged prior to the collection of groundwater samples to ensure that a representative groundwater sample is collected. Wells are typically purged using either a portable submersible pump or by using a vacuum truck and dedicated well stinger. Water temperature, pH, and conductivity are monitored during purging. Purging is considered complete once a minimum of three well casing volumes have been purged and the physical parameters have stabilized for successive readings to within 5 percent of temperature and conductivity and 0.05 pH units.

Many low yield aquifers are not capable of producing three well casing volumes of water. In these cases the well may be pumped dry. If this occurs, the well is only pumped dry once and samples are collected once the conditions specified below are achieved.

Care is taken not to overpump a well to dryness and to avoid the possibility of cascading water into the well. All wells are purged at the minimum rate necessary to adequately ensure that a representative groundwater sample will be collected.

In certain cases, regulatory agencies will request the collection of groundwater samples from wells without first purging them. "Pre-Purge" samples are identified as such on the Chain-of-Custody (COC) and in the sample identification section of the report.

Each well is allowed to recharge to 80% of its pre-purge volume prior to sampling, or for two hours, whichever occurs first. If a well does not recharge to 80% of its pre-purge volume within two hours, then a sample is collected as soon as sufficient water has collected in the well to fill the required sample containers.

Samples are collected by slowly lowering either a disposable Teflon or decontaminated stainless steel bailer into the water column. Care is taken to minimize agitating the water as the bailer enters. The bailer is removed from the well after filling, and a bottom emptying device attached. The water is decanted into the sample containers (40-milliliter VOAs or glass amber bottles, as required) in a manner which minimizes agitation and possible loss of volatiles. Each container is filled so that when the cover is tightened that a zero headspace sample has been collected with no trapped air bubbles visible in the container.

Each container is then labeled with the sample identification, sample date and time, and site name. The sample containers are then placed in a cooled ice chest for transport to the laboratory.

Chain-of-Custody Protocol

All soil and groundwater samples that are collected are documented using COC procedures. Each sample is identified and entered onto the COC record along with the date and time of collection and the type and number of sample containers. COC documents also typically used to document which analyses are completed on each sample. The COC follows the samples from the field to the laboratory and legally documents who had possession of the samples at all times.

WELL DEPTH TO WATER AND VOLUME DATA

SITE: U-Haul #803-62
Chelsea, New York

DATE: 11/22/98

WELL	TD	DTW	COL	VOLUME	3X VOL
MW-1	14.00	6.78	7.22	1.23	3.68
MW-2	15.60	6.74	8.86	1.51	4.52
MW-3	10.70	6.78	3.92	0.67	2.00

Pinnacle Environmental Technologies
#2 Santa Maria
Foothill Ranch, CA 92610
(714) 470-3691

WELL PURGING PHYSICAL PARAMETERS

SITE: U-Haul #803-62
Chelsea, New York

DATE: 11/22/98 **Field Personnel:** Thompson

WELL: MW-1		*WELL:* MW-2		*WELL:* MW-3		*WELL:*	*WELL:*	*WELL:*
Time:	0 #	Time:	0	Time:	0	Time:	Time:	Time:
Vol:	0	Vol:	0	Vol:	0	Vol:	Vol:	Vol:
pH:	7.10	pH:	7.01	pH:	6.85	pH:	pH:	pH:
Temp:	66.0	Temp:	71.3	Temp:	71.8	Temp:	Temp:	Temp:
Cond:	1,690	Cond:	2,340	Cond:	3,200	Cond:	Cond:	Cond:
Time:	1	Time:	1	Time:	1	Time:	Time:	Time:
Vol:	2	Vol:	2	Vol:	2	Vol:	Vol:	Vol:
pH:	6.90	pH:	6.90	pH:	6.81	pH:	pH:	pH:
Temp:	65.6	Temp:	71.0	Temp:	71.0	Temp:	Temp:	Temp:
Cond:	1,710	Cond:	1,970	Cond:	4,510	Cond:	Cond:	Cond:
Time:	2	Time:	2	Time:	2	Time:	Time:	Time:
Vol:	4	Vol:	4	Vol:	4	Vol:	Vol:	Vol:
pH:	6.73	pH:	6.71	pH:	6.72	pH:	pH:	pH:
Temp:	64.3	Temp:	67.8	Temp:	66.8	Temp:	Temp:	Temp:
Cond:	1,570	Cond:	1,940	Cond:	4,790	Cond:	Cond:	Cond:
Time:	3	Time:	3	Time:	3	Time:	Time:	Time:
Vol:	6	Vol:	6	Vol:	6	Vol:	Vol:	Vol:
pH:	6.8	pH:	6.79	pH:	6.75	pH:	pH:	pH:
Temp:	64.5	Temp:	66.2	Temp:	64.9	Temp:	Temp:	Temp:
Cond:	1,530	Cond:	1,940	Cond:	4,710	Cond:	Cond:	Cond:
Time:	4	Time:	4	Time:	4	Time:	Time:	Time:
Vol:	8	Vol:	8	Vol:	8	Vol:	Vol:	Vol:
pH:	6.78	pH:	6.74	pH	6.78	pH:	pH:	pH:
Temp:	64.5	Temp:	65.8	Temp:	64.5	Temp:	Temp:	Temp:
Cond:	1,540	Cond:	1,940	Cond:	4,720	Cond:	Cond:	Cond:
Time:		Time:		Time:		Time:	Time:	Time:
Vol:		Vol:		Vol:		Vol:	Vol:	Vol:
pH:		pH:		pH:		pH:	pH:	pH:
Temp:		Temp:		Temp:		Temp:	Temp:	Temp:
Cond:		Cond:		Cond:		Cond:	Cond:	Cond:

CHEMICAL & ENVIRONMENTAL LABORATORIES, INC.

December 14, 1998 Certificate No.: 11668

Mr. William Malvey
Pinnacle Environmental Technologies
2 Santa Maria
Foothill Ranch, CA 92610

Project: U–Haul Moving Center #803–62

Dear Mr. Malvey:

Enclosed please find the report for the sample(s) received by Chemical & Environmental Laboratories and analyzed as indicated in the chain–of–custody attached.

We appreciate the opportunity to service the needs of your company. Please call me at (562) 921–8123 if you have any questions.

Sincerely,

Larry Zhang

Larry Zhang, Ph.D.
Laboratory Director

CHEMICAL & ENVIRONMENTAL LABORATORIES, INC.

ANALYTICAL REPORT

---EPA 8021---

Client Name: Pinnacle Env. Technologies
Project Manager: William Malvey
Project Name: U-Haul Moving Center #803-62

Date Sampled: 11/22/98
Date Analyzed: 11/27/98
Date Reported: 12/07/98

C&E ID		81124C-1	81124C-2	81124C-3		
SAMPLE ID		MW-1	MW-2	MW-3		
COMPOUND	Detection Limit (ug/L)	RESULT (ug/L or ppb)				
Benzene	0.5	ND	ND	ND		
Bromobenzene	0.5	ND	ND	ND		
Bromochloromethane	1	ND	ND	ND		
Bromodichloromethane	1	ND	ND	ND		
Bromoform	1	ND	ND	ND		
Bromomethane	1	ND	ND	ND		
n-Butylbenzene	0.5	ND	ND	ND		
sec-Butylbenzene	0.5	ND	ND	ND		
tert-Butylbenzene	0.5	ND	ND	ND		
Carbon Tetrachloride	0.5	ND	ND	ND		
Chlorobenzene	0.5	ND	ND	ND		
Chloroethane	1	ND	ND	ND		
Chloroform	0.5	ND	ND	ND		
Chloromethane	1	ND	ND	ND		
2-Chlorotoluene	0.5	ND	ND	ND		
4-Chlorotoluene	0.5	ND	ND	ND		
Dibromochloromethane	1	ND	ND	ND		
1,2-Dibromo-3-chloropropane	1	ND	ND	ND		
1,2-Dibromoethane	1	ND	ND	ND		
Dibromomethane	1	ND	ND	ND		
1,2-Dichlorobenzene	0.5	ND	ND	ND		
1,3-Dichlorobenzene	0.5	ND	ND	ND		
1,4-Dichlorobenzene	0.5	ND	ND	ND		
Dichlorodifluoromethane	1	ND	ND	ND		
1,1-Dichloroethane	0.5	ND	ND	ND		
1,2-Dichloroethane	0.5	ND	ND	ND		
1,1-Dichloroethene	0.5	ND	ND	ND		
cis-1,2-Dichloroethene	0.5	ND	ND	ND		
trans-1,2-Dichloroethene	0.5	ND	ND	ND		
1,2-Dichloropropane	0.5	ND	ND	ND		
1,3-Dichloropropane	0.5	ND	ND	ND		

To be continued on page 2

CHEMICAL & ENVIRONMENTAL LABORATORIES, INC.

ANALYTICAL REPORT

---EPA 8021 ---

Client Name: Pinnacle Env. Technologies
Project Manager: William Malvey
Project Name: U-Haul Moving Center #803-62

Date Sampled: 11/22/98
Date Analyzed: 11/27/98
Date Reported: 12/07/98

C&E ID		81124C-1	81124C-2	81124C-3		
SAMPLE ID		MW-1	MW-2	MW-3		
COMPOUND	Detection Limit (ug/L)	RESULT (ug/L or ppb)				
2,2-Dichloropropane	0.5	ND	ND	ND		
1,1-Dichloropropene	0.5	ND	ND	ND		
cis-1,3-Dichloropropene	0.5	ND	ND	ND		
trans-1,3-Dichloropropene	0.5	ND	ND	ND		
Ethylbenzene	0.5	ND	ND	ND		
Hexachlorobutadiene	0.5	ND	ND	ND		
Isopropylbenzene	0.5	ND	ND	ND		
4-Isopropyltoluene	0.5	ND	ND	ND		
Methylene Chloride	1	ND	ND	ND		
Naphthalene	0.5	ND	ND	ND		
n-Propylbenzene	0.5	ND	ND	ND		
Styrene	0.5	ND	ND	ND		
1,1,1,2-Tetrachloroethane	0.5	ND	ND	ND		
1,1,2,2-Tetrachloroethane	0.5	ND	ND	ND		
Tetrachloroethene	0.5	ND	ND	ND		
Toluene	0.5	ND	ND	ND		
1,2,3-Trichlorobenzene	0.5	ND	ND	ND		
1,2,4-Trichlorobenzene	0.5	ND	ND	ND		
1,1,1-Trichloroethane	0.5	ND	ND	ND		
1,1,2-Trichloroethane	0.5	ND	ND	ND		
Trichloroethene	0.5	ND	ND	ND		
Trichlorofluoromethane	1	ND	ND	ND		
1,2,3-Trichloropropane	0.5	ND	ND	ND		
1,2,4-Trimethylbenzene	0.5	ND	ND	ND		
1,2,5-Trimethylbenzene	0.5	ND	ND	ND		
Vinyl Chloride	1	ND	ND	ND		
Total Xylenes	0.5	ND	ND	21		
MTBE	5	ND	17	25		

ND = Not detected at the indicated detection limit.

CHEMICAL & ENVIRONMENTAL LABORATORIES, INC.

QA/QC REPORT

--- EPA 8021 ---

I. Matrix Spike (MS)/Matrix Spike Duplicate(MSD)

Date Performed: 11/27/98

Lab Sample I.D.: 81124C

Unit: ug/L

ANALYTE	SPK CONC	MS (ug/L)	MS %	MSD (ug/L)	MSD %	RPD	ACP %MS	ACP RPD
1,1-Dichloroethene	40.0	35.7	89	35.0	88	2.0	60-140	20
Trichloroethene	40.0	36.3	91	36.7	92	1.1	60-140	20
Benzene	40.0	36.0	90	35.2	88	2.2	60-140	20
Toluene	40.0	37.1	93	35.8	90	3.6	60-140	20
Chlorobenzene	40.0	36.5	91	35.4	89	3.1	60-140	20

II. Laboratory Quality Control Check Sample

ANALYTE	SPK CONC	RESULT	%RECOVERY	ACP %
1,1,1-TCA	40.0	34.9	87	80-120
PCE	40.0	34.3	86	80-120
Benzene	40.0	36.4	91	80-120
Toluene	40.0	36.8	92	80-120
Ethylbenzene	40.0	36.0	90	80-120

14148 E. Firestone Blvd., Santa Fe Springs, CA 90670 Tel: 562 921-8123, Fax: 562 921-7974

81124C

CHAIN OF CUSTODY RECORD

PINNACLE
ENVIRONMENTAL TECHNOLOGIES

Site: UHAUL MOVING CENTER #803-62
Address: 562 WEST 23rd STREET
NEW YORK, NEW YORK

Project Manager: B. MALVEY
Sampled By: K. THOMPSON
Laboratory: C&E

Agency: NYSDEC
Date: 11/24/98
Page 1 of 1

	SAMPLE ID	TIME	DATE	SAMPLE TYPE	CONTAINERS	TPHG EPA 8015M	TPHD EPA 8015M	TRPH EPA 418.1	BTEX EPA 8020	MTBE EPA 8020	HVOC EPA 8010	B/N EPA 8270	VOC EPA 8021	COMMENTS
1	MW-1	410	11/22/98	GW	40ml VOA								X	
2	MW-2	415	↓	↓	↓								X	
3	MW-3	420											X	

Relinquished By: [signature]	Date: 11-24-98	Time: 15:55	Relinquished By:	Date:	
Received By: [signature]	Date: 11-24-98	Time: 15:55	Received By:	Date:	

PINNACLE ENVIRONMENTAL TECHNOLOGIES
2 Santa Maria
Foothill Ranch, CA 92610
TEL: (949) 470-3691
FAX: (949) 595-0459

QUARTERLY GROUNDWATER MONITORING REPORT

U-Haul Moving Center #803-62
562 West 23rd Street
New York, New York

April 16, 1999

Prepared for:

AMERCO

REAL ESTATE COMPANY

2721 North Central Avenue, Suite 700
Phoenix, Arizona 85004

Prepared by:

PINNACLE

ENVIRONMENTAL TECHNOLOGIES

2 Santa Maria
Foothill Ranch, California 92610
(949) 470-3691

William E. Malvey
Principal

Keith G. Thompson,
Principal

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This report summarizes the field procedures and observations, laboratory analytical procedures and results, and conclusions of the quarterly groundwater monitoring and sampling event completed on March 31, 1999 by Pinnacle Environmental Technologies (Pinnacle) at U-Haul Moving Center #803-62, located at 562 West 23rd Street in New York, New York.

- On the date of this sampling event, the average depth to groundwater was 6.29 feet below ground surface (bgs) and the average groundwater elevation was 0.49 feet above mean sea level (msl). The calculated groundwater flow was to the north at a gradient of 0.006 feet per foot.

- Three groundwater monitoring wells at the site were purged and sampled. Approximately 24 gallons of purged groundwater was temporarily stored onsite in a 55-gallon drum pending disposal. Three groundwater samples were analyzed for volatile organic compounds EPA Method 8021.

- The average groundwater elevation has decreased 0.19 feet since the last monitoring and sampling event conducted on November 22, 1998. The direction of groundwater flow has changed north to the north-northeast since the previous sampling event. The current gradient is less than half the gradient calculated using the groundwater data collected on November 22, 1998.

- Benzene and ethyl benzene were not detected at the site for the third consecutive quarter. Toluene was not detected for the fourth consecutive quarter. Xylenes were not detected for the second time in the last three quarters.

- MTBE concentrations in wells MW-2 and MW-3 are lower than the last sampling event performed by Pinnacle. MTBE has not been detected in the sample from well MW-1 for three consecutive quarters. MTBE concentrations in the three wells did not exceed the STARS guidance level of 50 ug/L for the second consecutive quarter.

- The concentrations of volatile organic compounds in the groundwater samples collected during this and previous sampling events are near or below STARS Guidance concentrations, and are not considered high enough to pose a significant threat to human health and the environment.

- Given the lack of consistently detectable concentrations of BTEX and the low concentrations of MTBE detected, it is suggested again this quarter that the NYSDEC consider granting closure on this site.

INTRODUCTION

This report summarizes the field procedures and observations, laboratory analytical procedures and results, and conclusions of the quarterly groundwater monitoring and sampling event completed on November 22, 1998 by Pinnacle Environmental Technologies (Pinnacle).

U-Haul Moving Center #803-62 is located on the southeast corner of the intersection of 11th Avenue and West 23rd Street in Manhattan, New York City (Figures 1 and 2). The site is currently operated as a truck rental and mini-storage facility by U-Haul International. The site is completely occupied by a multi-floor building. The interior drive areas are surfaced with concrete.

The site lies at an approximate elevation of seven feet above mean sea level (msl) and is approximately 600 feet (0.1 miles) east of the Hudson River. Local topography is essentially flat and the area is heavily developed by a combination of commercial and industrial properties. Surface drainage appears to be towards the west-southwest at an approximate gradient of 0.01 ft/ft.

Two 1,000-gallon underground storage tanks (USTs) and one dispenser were formerly operated to fuel vehicles rented at the site. Both USTs were removed on April 11, 1997 by The Tyree Organization (Tyree). The associated dispenser and remote fill lines were also removed at this time.

Tyree collected six soil samples; five from the UST excavation and one from below the former remote fill lines. No information regarding the sample collection depths was reported in Tyree's UST Removal Report (draft), dated May 1997. In addition, the Tyree report did not contain a sample location map, so the actual sample locations are also unclear.

Each of the six soil samples was analyzed for volatile organic compounds (VOCs) in accordance with EPA Method 8021 and for semi-volatile organic compounds - base neutral (BN) using EPA Method 8270.

The soil samples collected from the UST excavation sidewalls and analyzed using EPA Method 8021 were below detection limits for benzene, toluene, ethylbenzene, and xylenes (BTEX). Methyl tertiary-butyl ether (MTBE) was detected in three of the four sidewall samples at concentrations ranging from 5.7 parts per billion (ppb) to 11.6 ppb.

MTBE was detected in the soil sample collected from the base of the excavation at a concentration of 43.0 ppb. Concentrations of benzene, toluene and ethylbenzene were below detection limits. Xylenes were detected at a total concentration of 41.2 ppb. Some remaining EPA Method 8021 analytes were also detected in this sample, at concentrations ranging from 5.2 to 25.1 ppb.

VOCs were detected in the soil sample collected from below the former remote fill line. Benzene was detected in the fill line soil sample at a concentration of 1,010 ppb.

Semi-volatile organic compounds were detected in all six soil samples at concentrations ranging from 52.1 ppb to 5,040 ppb. Concentrations in this range may be indicative of the background levels in the area.

Pinnacle installed three groundwater monitoring wells in the vicinity of the former USTs in May 1997. Nine soil samples, three from each boring, were collected and analyzed for VOCs and semi-volatile organic compounds using EPA Methods 8021 and 8270, respectively.

Three groundwater samples were collected and analyzed for BTEX and VOCs using EPA Method 8021.

Two grab samples were collected from the basement area. One sample was collected from absorbent material placed near cracks in the south wall and one grab sample was collected from the shallow standing water located in the pump sump along the east wall of the basement. Both of these samples were submitted for analysis in accordance with the methods above.

The soil at the site was observed to be a fine-grained sand with a trace of silt. Obvious field indicators of a significant petroleum release were not observed in the soil samples or measured on the PID used for field screening of soil samples.

Volatile organic compounds (VOCs) were detected above STARS Memo guideline levels in three of the nine soil samples collected and analyzed. These samples were collected from borings MW-2 and MW-3. The soil samples collected from MW-1 were either below detection limits for all EPA Method 8021 analytes or were below the NYSDEC STARS Memo guideline levels.

The area of greatest concern to the NYSDEC was the former remote fill line trench. Detectable concentrations of all BTEX components were present in the soil sample collected a 3 feet bgs, near the estimated base of the trench. However, BTEX was not detected in the soil samples collected below that depth in this boring.

The lateral and vertical extent of the hydrocarbon-impacted soil appears to be adequately defined.

Free product was not observed on the standing water along the east wall of the basement. Detectable concentrations of volatile organic vapors were not detected by a PID or by Pinnacle personnel. A concentration of 20 ppb of MTBE was detected in a grab sample collected of this water.

The source of this MTBE is unknown. However, the very low MTBE concentration were not considered high enough to pose a threat the environment or to human health.

A concentration of 4,900 ppb of toluene was detected in a grab sample of some absorbent material placed along the south wall of the basement. No other BTEX or MTBE was found in this sample. The detected concentration of toluene is inconsistent with the toluene concentrations found in the two soil samples with detectable toluene concentrations. It is possible that the material was contaminated prior to being placed in the basement.

This is the fifth groundwater sampling event performed at the site by Pinnacle.

GROUNDWATER MONITORING AND SAMPLING

The depth to groundwater in each well was measured to the nearest 0.01 foot. The groundwater elevation in each well was calculated using the top-of-casing elevation data obtained from the top-of-casing survey performed by Pinnacle on May 31, 1997. Table 1 summarizes the historical and latest depth-to-groundwater and groundwater elevation data at the site. Appendix A details the field procedures used during this quarterly sampling event. Appendix B contains the depth to groundwater and well purging field data.

The average depth to groundwater in the three wells was 6.29 feet bgs and the average groundwater elevation was 0.49 feet above msl. The calculated groundwater flow was to the north at a gradient of 0.006 feet per foot (ft/ft) on the date of the sampling event. Figure 3 is the groundwater elevation map for March 31, 1999.

The standing water in each well was purged prior to sampling. Appendix B contains the physical parameter measurements obtained during well purging. A total of 24 gallons of groundwater was purged from the three monitoring wells sampled at the site. Purged groundwater was temporarily stored onsite in a 55-gallon drum pending disposal.

One groundwater sample was collected from each of the three wells using a disposable Teflon bailer equipped with a low-flow bottom emptying device. The bailer was slowly lowered into the water column of the well to be sampled and withdrawn from the well when sufficient water was obtained to fill the sample containers. The sample was slowly decanted into the sample containers to minimize agitation of the sample and release of volatile petroleum hydrocarbons from the sample. The samples were placed in an ice chest cooled with Blue-Ice for transport to the laboratory.

LABORATORY PROCEDURES AND RESULTS

The three groundwater samples were delivered by Pinnacle to a New York State-certified laboratory for analysis. Each sample was analyzed for volatile organic compounds in accordance with EPA Method 8021.

Benzene was not detected in the three samples. Benzene was not detected in the last set of samples collected at the site on November 22, 1998.

The STARS Memo guidance level for MTBE of 50 ug/L was not exceeded in the three samples collected this or the last quarter, though MTBE was detected in two of the three groundwater samples (MW-2 and MW-3). The STARS Memo guidance level for MTBE has only been exceeded in the one of the three samples collected at the site in June 20, 1998.

Benzene has not been above the STARS Memo guidance level of 0.7 micrograms per liter (ug/L) in the last three quarters of groundwater sampling.

Table 2 summarizes the laboratory analytical results for this event and previous events. Appendix C contains the laboratory reports and chain-of-custody record for this event.

SUMMARY

The following is a summary of the observations and results of this phase of work:

- Quarterly groundwater monitoring and sampling was conducted at the site by Pinnacle on November 22, 1998.
- The average depth to groundwater was 6.29 feet bgs and the average groundwater elevation was 0.49 feet above msl. The calculated groundwater flow was to the north at a gradient of 0.006 ft/ft on the date of this sampling event.
- The average groundwater elevation has decreased 0.19 feet since the last monitoring and sampling event conducted on June 20, 1998. The direction of groundwater flow has changed from the northeast to the north since the previous sampling event.
- Three groundwater monitoring wells were purged and sampled. Approximately 24 gallons of purged groundwater was temporarily stored onsite pending disposal.
- Three groundwater samples were analyzed for volatile organic compounds using EPA Method 8021.
- Benzene and ethyl benzene were not detected at the site for the third consecutive quarter. Toluene was not detected for the fourth consecutive quarter. Xylenes were not detected for the second time in the last three quarters.
- MTBE concentrations in wells MW-2 and MW-3 are lower than the last sampling event performed by Pinnacle. MTBE has not been detected in the sample from well MW-1 for three consecutive quarters. MTBE concentrations in the three wells did not exceed the STARS guidance level of 50 ug/L for the second consecutive quarter.

CONCLUSIONS

Based on the results of this sampling event the following conclusions are made:

- The concentrations of volatile organic compounds in the groundwater samples collected during this and previous sampling events are near or below STARS Guidance concentrations, and are not considered high enough to pose a significant threat to human health and the environment.

- Given the lack of consistently detectable concentrations of BTEX and the low concentrations of MTBE detected, it is suggested again this quarter that the NYSDEC consider granting closure on this site.

TABLE 1
SUMMARY OF GROUNDWATER ELEVATION DATA

U-HAUL MOVING CENTER #803-62
562 West 23rd Street
New York, New York

WELL	CASING ELEVATION	DATE	DEPTH TO GROUNDWATER	GROUNDWATER ELEVATION	FREE PRODUCT THICKNESS
MW-1	6.61	5/31/97	5.87	0.74	0.00
		3/6/98	5.82	0.79	0.00
		6/20/98	5.79	0.82	0.00
		11/22/98	5.78	0.83	0.00
		3/31/99	6.03	0.58	0.00
MW-2	7.22	5/31/97	6.62	0.60	0.00
		3/6/98	6.56	0.66	0.00
		6/20/98	6.54	0.68	0.00
		11/22/98	6.74	0.48	0.00
		3/31/99	6.79	0.43	0.00
MW-3	6.51	5/31/97	5.92	0.59	0.00
		3/6/98	5.87	0.64	0.00
		6/20/98	5.84	0.67	0.00
		11/22/98	5.78	0.73	0.00
		3/31/99	6.04	0.47	0.00

All elevations in feet relative to mean sea level

Depth to groundwater measurements in feet below top of casing

TABLE 2
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

U-HAUL MOVING CENTER #803-62
562 West 62nd Street
New York, New York

WELL NUMBER	DATE	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES	MTBE
		EPA Method 8021				
MW-1	5/31/97	63	1.8	13	4.9	ND < 1
	3/6/98	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	NA
	6/20/98	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5
	11/22/98	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5
	3/31/99	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5
MW-2	5/31/97	ND < 0.7	ND < 1	ND < 1	ND < 2	ND < 1
	3/6/98	16	ND < 0.5	ND < 0.5	ND < 0.5	NA
	6/20/98	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	79
	11/22/98	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	17
	3/31/99	**ND < 0.5**	**ND < 0.5**	**ND < 0.5**	**ND < 0.5**	**12**
MW-3	5/31/97	ND < 1.4	ND < 2	ND < 2	13	71
	3/6/98	ND < 0.5	ND < 0.5	1.2	4.5	NA
	6/20/98	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	36
	11/22/98	ND < 0.5	ND < 0.5	ND < 0.5	21	25
	3/31/99	**ND < 0.5**	**ND < 0.5**	**ND < 0.5**	**ND < 0.5**	**7**
STARS Guidance Value		0.7	5.0	5.0	5.0	50

MTBE = methyl tertiary-butyl ether
All values in micrograms per liter (ug/L)

SCALE
(feet)

0 2000 4000

Base Map - USGS 7.5 Minute Quadrangle, Jersey City

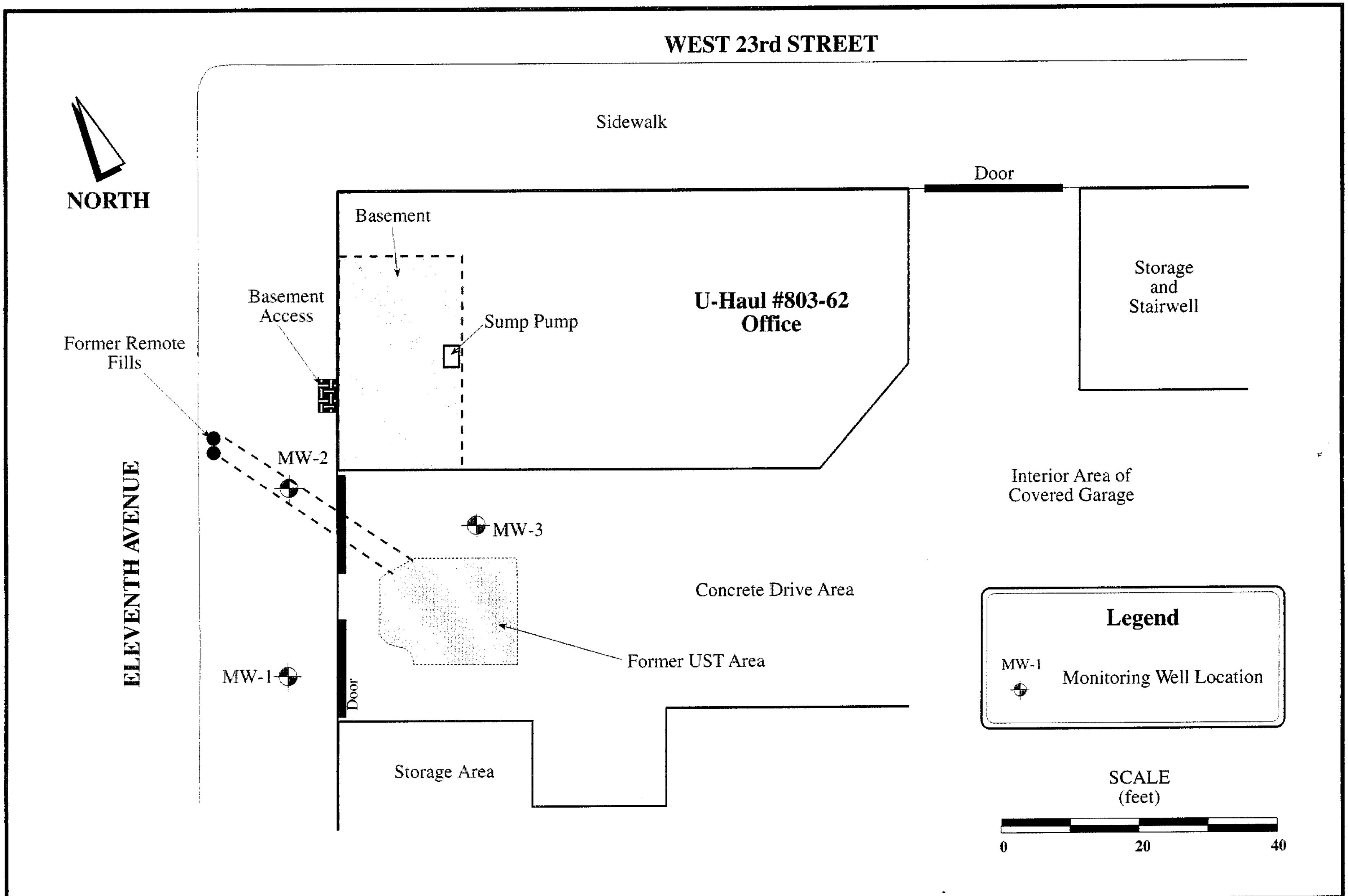
NORTH

PINNACLE
ENVIRONMENTAL TECHNOLOGIES
#2 Santa Maria, Foothill Ranch, CA 92610
Tel: (949) 470-3691 • Fax: (949) 595-0459

U-Haul Moving Center # 803-62
562 West 23rd Street
New York, New York

Site Location Map

Figure 1



PINNACLE
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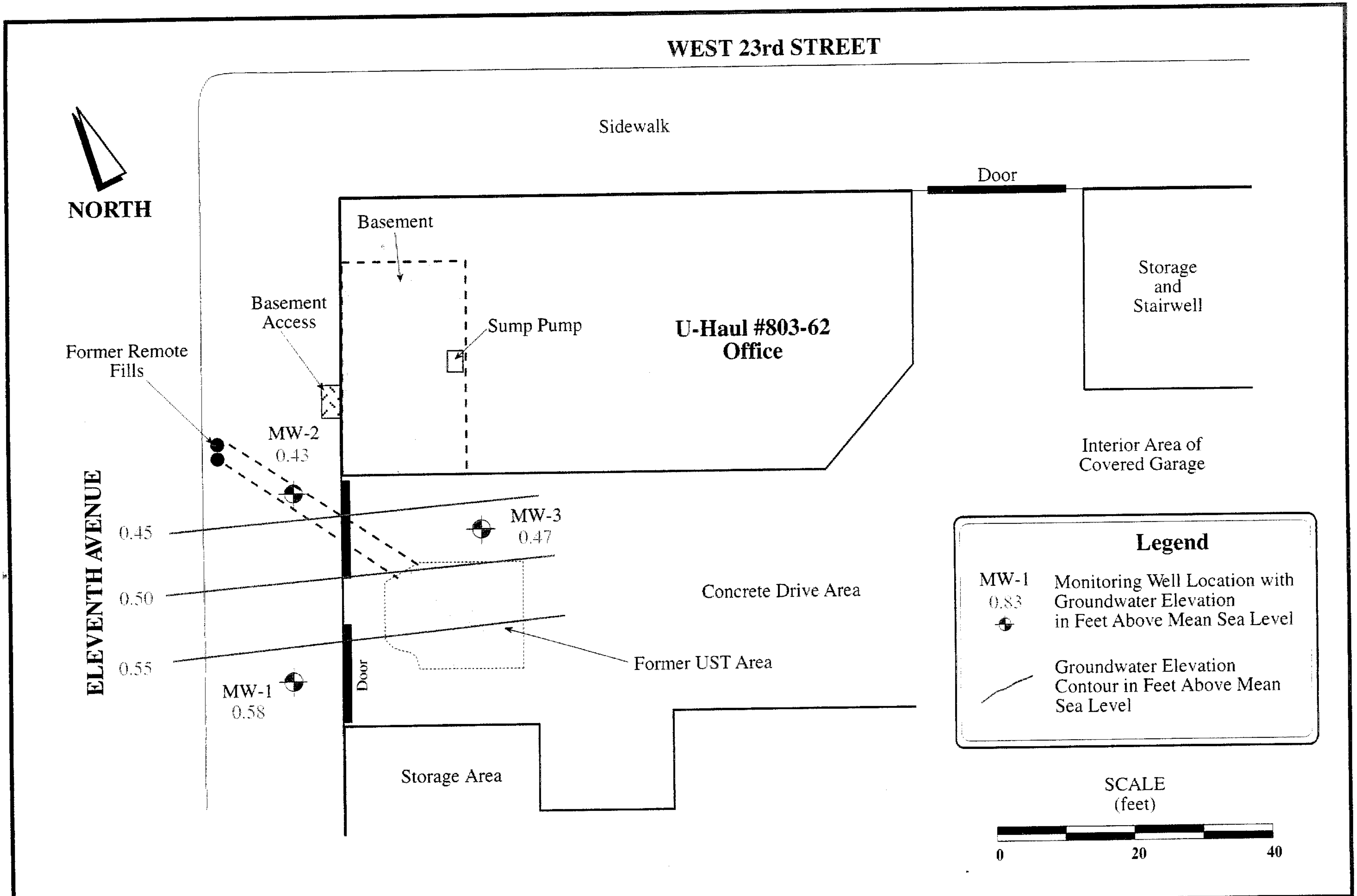
Tel: (949) 470-3691 • Fax: (949) 595-0459

U-Haul Moving Center #803-62
562 West 23rd Street
New York, New York

Site Plan

Figure 2



PINNACLE ENVIRONMENTAL TECHNOLOGIES #2 Santa Maria, Foothill Ranch, CA 92610 Tel: (949) 470-3691 • Fax: (949) 595-0459	**U-Haul Moving Center #803-62** **562 West 23rd Street** **New York, New York**	**Groundwater Elevation Map** March 31, 1999	**Figure 3**

APPENDIX A
GENERAL FIELD PROCEDURES

The following sections outline the general field procedures and protocols followed by Pinnacle Environmental Technologies (Pinnacle) in the completion of field tasks. Any deviation from the procedures outlined here due to unique or unforeseen circumstances will be noted in the body of the applicable report. The following tasks are detailed:

- Groundwater Level Monitoring
- Monitoring Well Purging and Sampling
- Chain-of-Custody Protocol

Groundwater samples are collected from monitoring wells and temporary, small-diameter wells. Sampling of groundwater monitoring wells is conducted in accordance with the EPA Technical Enforcement Guidance Document or with any other local protocols and procedures.

Groundwater Level Monitoring

The depth to groundwater is measured to the nearest 0.01 foot and recorded for use in determining the groundwater gradient and flow direction. Water level measurements are completed on all wells prior to purging any well at the site. Depth to groundwater is measured using either an electronic well sounding device (i.e. Solinst) or using an interface probe (i.e. MMC). If a sounding device is used, the well is first checked for the presence of non-aqueous phase petroleum liquids (NAPLs) using hydrocarbon sensitive paste or an interface probe. The interface probe is capable of direct detection of trace thickness of NAPLs.

Monitoring Well Purging and Sampling

All wells are purged prior to the collection of groundwater samples to ensure that a representative groundwater sample is collected. Wells are typically purged using either a portable submersible pump or by using a vacuum truck and dedicated well stinger. Water temperature, pH, and conductivity are monitored during purging. Purging is considered complete once a minimum of three well casing volumes have been purged and the physical parameters have stabilized for successive readings to within 5 percent of temperature and conductivity and 0.05 pH units.

Many low yield aquifers are not capable of producing three well casing volumes of water. In these cases the well may be pumped dry. If this occurs, the well is only pumped dry once and samples are collected once the conditions specified below are achieved.

Care is taken not to overpump a well to dryness and to avoid the possibility of cascading water into the well. All wells are purged at the minimum rate necessary to adequately ensure that a representative groundwater sample will be collected.

In certain cases, regulatory agencies will request the collection of groundwater samples from wells without first purging them. "Pre-Purge" samples are identified as such on the Chain-of-Custody (COC) and in the sample identification section of the report.

Each well is allowed to recharge to 80% of its pre-purge volume prior to sampling, or for two hours, whichever occurs first. If a well does not recharge to 80% of its pre-purge volume within two hours, then a sample is collected as soon as sufficient water has collected in the well to fill the required sample containers.

Samples are collected by slowly lowering either a disposable Teflon or decontaminated stainless steel bailer into the water column. Care is taken to minimize agitating the water as the bailer enters. The bailer is removed from the well after filling, and a bottom emptying device attached. The water is decanted into the sample containers (40-milliliter VOAs or glass amber bottles, as required) in a manner which minimizes agitation and possible loss of volatiles. Each container is filled so that when the cover is tightened that a zero headspace sample has been collected with no trapped air bubbles visible in the container.

Each container is then labeled with the sample identification, sample date and time, and site name. The sample containers are then placed in a cooled ice chest for transport to the laboratory.

Chain-of-Custody Protocol

All soil and groundwater samples that are collected are documented using COC procedures. Each sample is identified and entered onto the COC record along with the date and time of collection and the type and number of sample containers. COC documents also typically used to document which analyses are completed on each sample. The COC follows the samples from the field to the laboratory and legally documents who had possession of the samples at all times.

WELL DEPTH TO WATER AND VOLUME DATA

SITE: U-Haul #803-62
Chelsea, New York

DATE: 3/31/99

WELL	TD	DTW	COL	VOLUME	3X VOL
MW-1	14.00	6.03	7.97	1.35	4.06
MW-2	15.60	6.79	8.81	1.50	4.49
MW-3	10.70	6.04	4.66	0.79	2.38

Pinnacle Environmental Technologies
#2 Santa Maria
Foothill Ranch, CA 92610
(949) 470-3691

WELL PURGING PHYSICAL PARAMETERS

SITE: U-Haul #803-62 **DATE:** 3/31/99 **Field Personnel:** Malvey
Chelsea, New York

WELL: MW-1		*WELL:* MW-2		*WELL:* MW-3		*WELL:*		*WELL:*		*WELL:*	
Time:	0 #	Time:	0	Time:	0	Time:		Time:		Time:	
Vol:	0	Vol:	0	Vol:	0	Vol:		Vol:		Vol:	
pH:	7.23	pH:	7.14	pH:	7.04	pH:		pH:		pH:	
Temp:	69.2	Temp:	67.8	Temp:	68.8	Temp:		Temp:		Temp:	
Cond:	1,710	Cond:	1,560	Cond:	5,120	Cond:		Cond:		Cond:	
Time:	1	Time:	1	Time:	1	Time:		Time:		Time:	
Vol:	2	Vol:	2	Vol:	2	Vol:		Vol:		Vol:	
pH:	7.05	pH:	6.99	pH:	7.01	pH:		pH:		pH:	
Temp:	67.5	Temp:	67.9	Temp:	67.5	Temp:		Temp:		Temp:	
Cond:	1,620	Cond:	1,770	Cond:	4,190	Cond:		Cond:		Cond:	
Time:	2	Time:	2	Time:	2	Time:		Time:		Time:	
Vol:	4	Vol:	4	Vol:	4	Vol:		Vol:		Vol:	
pH:	6.98	pH:	6.94	pH:	6.91	pH:		pH:		pH:	
Temp:	67.1	Temp:	67.1	Temp:	66.9	Temp:		Temp:		Temp:	
Cond:	1,620	Cond:	1,750	Cond:	4,180	Cond:		Cond:		Cond:	
Time:	3	Time:	3	Time:	3	Time:		Time:		Time:	
Vol:	6	Vol:	6	Vol:	6	Vol:		Vol:		Vol:	
pH:	6.97	pH:	6.99	pH:	6.92	pH:		pH:		pH:	
Temp:	66.7	Temp:	67.4	Temp:	66.6	Temp:		Temp:		Temp:	
Cond:	1,660	Cond:	1,740	Cond:	4,060	Cond:		Cond:		Cond:	
Time:	4	Time:	4	Time:	4	Time:		Time:		Time:	
Vol:	8	Vol:	8	Vol:	8	Vol:		Vol:		Vol:	
pH:	6.95	pH:	6.96	pH	6.95	pH:		pH:		pH:	
Temp:	66.5	Temp:	67.4	Temp:	66.9	Temp:		Temp:		Temp:	
Cond:	1,650	Cond:	1,750	Cond:	4,080	Cond:		Cond:		Cond:	
Time:		Time:		Time:		Time:		Time:		Time:	
Vol:		Vol:		Vol:		Vol:		Vol:		Vol:	
pH:		pH:		pH:		pH:		pH:		pH:	
Temp:		Temp:		Temp:		Temp:		Temp:		Temp:	
Cond:		Cond:		Cond:		Cond:		Cond:		Cond:	

CHEMICAL & ENVIRONMENTAL LABORATORIES, INC.

April 16, 1999

Certificate No.: 11668

Mr. William Malvey
Pinnacle Environmental Technologies
2 Santa Maria
Foothill Ranch, CA 92610

Project: U-Haul 803-62

Dear Mr. Malvey:

Enclosed please find the report for the sample(s) received by Chemical & Environmental Laboratories and analyzed as indicated in the chain-of-custody attached.

We appreciate the opportunity to service the needs of your company. Please call me at (562) 921-8123 if you have any questions.

Sincerely,

Larry Zhang

Larry Zhang, Ph.D.
Laboratory Director

CHEMICAL & ENVIRONMENTAL LABORATORIES, INC.

ANALYTICAL REPORT

---EPA 8021 ---

Client Name: Pinnacle Env. Technologies
Project Manager: William Malvey
Project Name: U-Haul 803-62

Date Sampled: 03/31/99
Date Analyzed: 04/04/99
Date Reported: 04/15/99

C&E ID		90402C-1	90402C-2	90402C-3	90402C-4	
SAMPLE ID		MW-1	MW-2	MW-3	PUMP	
COMPOUND	Detection Limit (ug/L)	RESULT (ug/L or ppb)				
Benzene	0.5	ND	ND	ND	ND	
Bromobenzene	0.5	ND	ND	ND	ND	
Bromochloromethane	1	ND	ND	ND	ND	
Bromodichloromethane	1	ND	ND	ND	ND	
Bromoform	1	ND	ND	ND	ND	
Bromomethane	1	ND	ND	ND	ND	
n-Butylbenzene	0.5	ND	ND	ND	ND	
sec-Butylbenzene	0.5	ND	ND	ND	ND	
tert-Butylbenzene	0.5	ND	ND	ND	ND	
Carbon Tetrachloride	0.5	ND	ND	ND	ND	
Chlorobenzene	0.5	ND	ND	ND	ND	
Chloroethane	1	ND	ND	ND	ND	
Chloroform	0.5	ND	ND	ND	ND	
Chloromethane	1	ND	ND	ND	ND	
2-Chlorotoluene	0.5	ND	ND	ND	ND	
4-Chlorotoluene	0.5	ND	ND	ND	ND	
Dibromochloromethane	1	ND	ND	ND	ND	
1,2-Dibromo-3-chloropropane	1	ND	ND	ND	ND	
1,2-Dibromoethane	1	ND	ND	ND	ND	
Dibromomethane	1	ND	ND	ND	ND	
1,2-Dichlorobenzene	0.5	ND	ND	ND	ND	
1,3-Dichlorobenzene	0.5	ND	ND	ND	ND	
1,4-Dichlorobenzene	0.5	ND	ND	ND	ND	
Dichlorodifluoromethane	1	ND	ND	ND	ND	
1,1-Dichloroethane	0.5	ND	ND	ND	ND	
1,2-Dichloroethane	0.5	ND	ND	ND	ND	
1,1-Dichloroethene	0.5	ND	ND	ND	ND	
cis-1,2-Dichloroethene	0.5	ND	ND	ND	ND	
trans-1,2-Dichloroethene	0.5	ND	ND	ND	ND	
1,2-Dichloropropane	0.5	ND	ND	ND	ND	
1,3-Dichloropropane	0.5	ND	ND	ND	ND	

To be continued on page 2

CHEMICAL & ENVIRONMENTAL LABORATORIES, INC.

ANALYTICAL REPORT

---EPA 8021 ---

Client Name: Pinnacle Env. Technologies
Project Manager: William Malvey
Project Name: U-Haul 803-62

Date Sampled: 03/31/99
Date Analyzed: 04/04/99
Date Reported: 04/15/99

C&E ID		90402C-1	90402C-2	90402C-3	90402C-4	
SAMPLE ID		MW-1	MW-2	MW-3	PUMP	
COMPOUND	Detection Limit (ug/L)	RESULT (ug/L or ppb)				
2,2-Dichloropropane	0.5	ND	ND	ND	ND	
1,1-Dichloropropene	0.5	ND	ND	ND	ND	
cis-1,3-Dichloropropene	0.5	ND	ND	ND	ND	
trans-1,3-Dichloropropene	0.5	ND	ND	ND	ND	
Ethylbenzene	0.5	ND	ND	ND	ND	
Hexachlorobutadiene	0.5	ND	ND	ND	ND	
Isopropylbenzene	0.5	ND	ND	3.2	ND	
4-Isopropyltoluene	0.5	ND	ND	ND	ND	
Methylene Chloride	1	ND	ND	ND	ND	
Naphthalene	0.5	ND	ND	ND	ND	
n-Propylbenzene	0.5	ND	ND	ND	ND	
Styrene	0.5	ND	ND	ND	ND	
1,1,1,2-Tetrachloroethane	0.5	ND	ND	ND	ND	
1,1,2,2-Tetrachloroethane	0.5	ND	ND	ND	ND	
Tetrachloroethene	0.5	ND	ND	ND	ND	
Toluene	0.5	ND	ND	ND	ND	
1,2,3-Trichlorobenzene	0.5	ND	ND	ND	ND	
1,2,4-Trichlorobenzene	0.5	ND	ND	ND	ND	
1,1,1-Trichloroethane	0.5	ND	ND	ND	ND	
1,1,2-Trichloroethane	0.5	ND	ND	ND	ND	
Trichloroethene	0.5	ND	ND	ND	ND	
Trichlorofluoromethane	1	ND	ND	ND	ND	
1,2,3-Trichloropropane	0.5	ND	ND	ND	ND	
1,2,4-Trimethylbenzene	0.5	ND	ND	ND	ND	
1,2,5-Trimethylbenzene	0.5	ND	ND	ND	ND	
Vinyl Chloride	1	ND	ND	ND	ND	
Total Xylenes	0.5	ND	ND	ND	ND	
MTBE	5	ND	12	7	ND	

ND = Not detected at the indicated detection limit.

CHEMICAL & ENVIRONMENTAL LABORATORIES, INC.

QA/QC REPORT

--- EPA 8021 ---

I. Matrix Spike (MS)/Matrix Spike Duplicate(MSD)

Date Performed: 04/04/99

Lab Sample I.D.: 90402C

Unit: ug/L

ANALYTE	SPK CONC	MS (ug/L)	MS %	MSD (ug/L)	MSD %	RPD	ACP %MS	ACP RPD
1,1-Dichloroethene	40.0	33.2	83	34.7	87	4.4	60-140	20
Trichloroethene	40.0	34.5	86	36.1	90	4.5	60-140	20
Benzene	40.0	35.6	89	36.6	92	2.8	60-140	20
Toluene	40.0	34.8	87	35.0	88	0.6	60-140	20
Chlorobenzene	40.0	33.4	84	34.3	86	2.7	60-140	20

II. Laboratory Quality Control Check Sample

ANALYTE	SPK CONC	RESULT	%RECOVERY	ACP %
1,1-Dichloroethene	40.0	36.2	91	80-120
Trichloroethene	40.0	37.0	93	80-120
Benzene	40.0	38.1	95	80-120
Toluene	40.0	37.5	94	80-120
Chlorobenzene	40.0	35.4	89	80-120

90402C

CHAIN OF COUNTODY RECORD

PINNACLE ENVIRONMENTAL TECHNOLOGIES

Site: U-HAUL 803-62
Address: 562 W. 23rd ST NYC, NY
Project Manager: W Malvey
Sampled By: W Malvey
Laboratory: C&E

TURN AROUND TIME
24hr / RUSH / Normal

Page 1 of 1

	SAMPLE ID	TIME	DATE	SAMPLE MATRIX	NUMBER of CONTAINERS	TPHG 8015M	TPHD 8015M	TRPH 418.1	BTEX 8020	MTBE 8020	EPA 8021			COMMENTS
1	MW-1	1730	3/31/99	Water	2 VOAS						X			+ MTBE
2	MW-2	1735	↓	↓	↓						X			↓
3	MW-3	1740	↓	↓	↓						X			↓
4	PUMP	1745	↓	↓	↓						X			↓

Total Number of Samples: 8

FAX Results: YES / NO

Relinquished By: W Malvey	Date/Time: 4/1/99 1230	Relinquished By:	Date/Time:
Received By: FEDEX	Date/Time:	Received By: Jane Doe	Date/Time: 4/2/99

PINNACLE ENVIRONMENTAL TECHNOLOGIES
2 Santa Maria
Foothill Ranch, CA 92610
TEL: (949) 470-3691
FAX: (949) 595-0459

QUARTERLY GROUNDWATER MONITORING REPORT

U-Haul Moving Center #803-62
562 West 23rd Street
New York, New York

July 15, 1999

Prepared for:

AMERCO
REAL ESTATE COMPANY
2721 North Central Avenue, Suite 700
Phoenix, Arizona 85004

Prepared by:

PINNACLE
ENVIRONMENTAL TECHNOLOGIES
2 Santa Maria
Foothill Ranch, California 92610
(949) 470-3691

for William E. Malvey
Principal

Keith G. Thompson,
Principal

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EXECUTIVE SUMMARY

This report summarizes the field procedures and observations, laboratory analytical procedures and results, and conclusions of the quarterly groundwater monitoring and sampling event completed on June 27, 1999 by Pinnacle Environmental Technologies (Pinnacle) at U-Haul Moving Center #803-62, located at 562 West 23rd Street in New York, New York.

- On the date of this sampling event, the average depth to groundwater was 6.32 feet below ground surface (bgs) and the average groundwater elevation was 0.46 feet above mean sea level (msl). The calculated groundwater flow was to the north at a gradient of 0.006 feet per foot.

- Three groundwater monitoring wells at the site were purged and sampled. Approximately 24 gallons of purged groundwater was temporarily stored onsite in a 55-gallon drum pending disposal. Three groundwater samples were analyzed for volatile organic compounds EPA Method 8021.

- The average groundwater elevation is nearly identical to the average elevation calculated for the last monitoring and sampling event conducted on March 31, 1999. The direction and gradient of groundwater flow are also virtually identical to the previous sampling event.

- Benzene and ethyl benzene were detected at the site for the first time in the past four quarters. Toluene was detected for the first time in past five quarters. Xylenes have not been detected for the third time in the last four quarters.

- The MTBE concentration in well MW-2 was lower than the last sampling event performed by Pinnacle. The MTBE concentration in well MW-3 was higher than the last sampling event performed by Pinnacle. MTBE has not been detected in the sample from well MW-1 for four consecutive quarters. The MTBE concentration in well MW-3 exceeded the STARS guidance level of 50 ug/L.

- The next sampling event will be conducted by Pinnacle during the third quarter of 1999.

INTRODUCTION

This report summarizes the field procedures and observations, laboratory analytical procedures and results, and conclusions of the quarterly groundwater monitoring and sampling event completed on June 27, 1999 by Pinnacle Environmental Technologies (Pinnacle).

U-Haul Moving Center #803-62 is located on the southeast corner of the intersection of 11th Avenue and West 23rd Street in Manhattan, New York City (Figures 1 and 2). The site is currently operated as a truck rental and mini-storage facility by U-Haul International. The site is completely occupied by a multi-floor building. The interior drive areas are surfaced with concrete.

The site lies at an approximate elevation of seven feet above mean sea level (msl) and is approximately 600 feet (0.1 miles) east of the Hudson River. Local topography is essentially flat and the area is heavily developed by a combination of commercial and industrial properties. Surface drainage appears to be towards the west-southwest at an approximate gradient of 0.01 ft/ft.

Two 1,000-gallon underground storage tanks (USTs) and one dispenser were formerly operated to fuel vehicles rented at the site. Both USTs were removed on April 11, 1997 by The Tyree Organization (Tyree). The associated dispenser and remote fill lines were also removed at this time.

Tyree collected six soil samples; five from the UST excavation and one from below the former remote fill lines. No information regarding the sample collection depths was reported in Tyree's UST Removal Report (draft), dated May 1997. In addition, the Tyree report did not contain a sample location map, so the actual sample locations are also unclear.

Each of the six soil samples was analyzed for volatile organic compounds (VOCs) in accordance with EPA Method 8021 and for semi-volatile organic compounds - base neutral (BN) using EPA Method 8270.

The soil samples collected from the UST excavation sidewalls and analyzed using EPA Method 8021 were below detection limits for benzene, toluene, ethylbenzene, and xylenes (BTEX). Methyl tertiary-butyl ether (MTBE) was detected in three of the four sidewall samples at concentrations ranging from 5.7 parts per billion (ppb) to 11.6 ppb.

MTBE was detected in the soil sample collected from the base of the excavation at a concentration of 43.0 ppb. Concentrations of benzene, toluene and ethylbenzene were below detection limits. Xylenes were detected at a total concentration of 41.2 ppb. Some remaining EPA Method 8021 analytes were also detected in this sample, at concentrations ranging from 5.2 to 25.1 ppb.

VOCs were detected in the soil sample collected from below the former remote fill line. Benzene was detected in the fill line soil sample at a concentration of 1,010 ppb.

Semi-volatile organic compounds were detected in all six soil samples at concentrations ranging from 52.1 ppb to 5,040 ppb. Concentrations in this range may be indicative of the background levels in the area.

Pinnacle installed three groundwater monitoring wells in the vicinity of the former USTs in May 1997. Nine soil samples, three from each boring, were collected and analyzed for VOCs and semi-volatile organic compounds using EPA Methods 8021 and 8270, respectively.

Three groundwater samples were collected and analyzed for BTEX and VOCs using EPA Method 8021.

Two grab samples were collected from the basement area. One sample was collected from absorbent material placed near cracks in the south wall and one grab sample was collected from the shallow standing water located in the pump sump along the east wall of the basement. Both of these samples were submitted for analysis in accordance with the methods above.

The soil at the site was observed to be a fine-grained sand with a trace of silt. Obvious field indicators of a significant petroleum release were not observed in the soil samples or measured on the PID used for field screening of soil samples.

Volatile organic compounds (VOCs) were detected above STARS Memo guideline levels in three of the nine soil samples collected and analyzed. These samples were collected from borings MW-2 and MW-3. The soil samples collected from MW-1 were either below detection limits for all EPA Method 8021 analytes or were below the NYSDEC STARS Memo guideline levels.

The area of greatest concern to the NYSDEC was the former remote fill line trench. Detectable concentrations of all BTEX components were present in the soil sample collected a 3 feet bgs, near the estimated base of the trench. However, BTEX was not detected in the soil samples collected below that depth in this boring.

The lateral and vertical extent of the hydrocarbon-impacted soil appears to be adequately defined.

Free product was not observed on the standing water along the east wall of the basement. Detectable concentrations of volatile organic vapors were not detected by a PID or by Pinnacle personnel. A concentration of 20 ppb of MTBE was detected in a grab sample collected of this water.

The source of this MTBE is unknown. However, the very low MTBE concentration were not considered high enough to pose a threat the environment or to human health.

A concentration of 4,900 ppb of toluene was detected in a grab sample of some absorbent material placed along the south wall of the basement. No other BTEX or MTBE was found in this sample. The detected concentration of toluene is inconsistent with the toluene concentrations found in the two soil samples with detectable toluene concentrations. It is possible that the material was contaminated prior to being placed in the basement.

This is the sixth groundwater sampling event performed at the site by Pinnacle.

GROUNDWATER MONITORING AND SAMPLING

The depth to groundwater in each well was measured to the nearest 0.01 foot. The groundwater elevation in each well was calculated using the top-of-casing elevation data obtained from the top-of-casing survey performed by Pinnacle on May 31, 1997. Table 1 summarizes the historical and latest depth-to-groundwater and groundwater elevation data at the site. Appendix A details the field procedures used during this quarterly sampling event. Appendix B contains the depth to groundwater and well purging field data.

The average depth to groundwater in the three wells was 6.32 feet bgs and the average groundwater elevation was 0.46 feet above msl. The calculated groundwater flow was to the north at a gradient of 0.006 feet per foot (ft/ft) on the date of the sampling event. Figure 3 is the groundwater elevation map for June 27, 1999.

The standing water in each well was purged prior to sampling. Appendix B contains the physical parameter measurements obtained during well purging. A total of 24 gallons of groundwater was purged from the three monitoring wells sampled at the site. Purged groundwater was temporarily stored onsite in a 55-gallon drum pending disposal.

One groundwater sample was collected from each of the three wells using a disposable Teflon bailer equipped with a low-flow bottom emptying device. The bailer was slowly lowered into the water column of the well to be sampled and withdrawn from the well when sufficient water was obtained to fill the sample containers. The sample was slowly decanted into the sample containers to minimize agitation of the sample and release of volatile petroleum hydrocarbons from the sample. The samples were placed in an ice chest cooled with Blue-Ice for transport to the laboratory.

LABORATORY PROCEDURES AND RESULTS

The three groundwater samples were delivered by Pinnacle to a New York State-certified laboratory for analysis. Each sample was analyzed for volatile organic compounds in accordance with EPA Method 8021.

Benzene was detected in one of the three samples (well MW-3). Benzene was not detected in the last three sets of samples collected at the site. Benzene has not been above the STARS

Memo guidance level of 0.7 micrograms per liter (ug/L) in the previous three quarters of groundwater sampling.

The STARS Memo guidance level for MTBE of 50 ug/L was exceeded in the samples collected from well MW-3. The STARS Memo guidance level for MTBE has been exceeded in the three of the six sampling event conducted at the site by Pinnacle.

Table 2 summarizes the laboratory analytical results for this event and previous events. Appendix C contains the laboratory reports and chain-of-custody record for this event.

SUMMARY AND CONCLUSIONS

The following is a summary of the observations and results of this phase of work:

- Quarterly groundwater monitoring and sampling was conducted at the site by Pinnacle on June 27, 1999.
- The average depth to groundwater was 6.32 feet bgs and the average groundwater elevation was 0.46 feet above msl. The calculated groundwater flow was to the north at a gradient of 0.006 ft/ft on the date of this sampling event.
- The average groundwater elevation is nearly identical to the average elevation calculated for the last monitoring and sampling event conducted on March 31, 1999. The direction and gradient of groundwater flow are also virtually identical to the previous sampling event.
- Three groundwater monitoring wells were purged and sampled. Approximately 24 gallons of purged groundwater was temporarily stored onsite pending disposal.
- Three groundwater samples were analyzed for volatile organic compounds using EPA Method 8021.
- Benzene and ethyl benzene were detected at the site for the first time in the past four quarters. Toluene was detected for the first time in past five quarters. Xylenes have not been detected for the third time in the last four quarters.
- The MTBE concentration in well MW-2 was lower than the last sampling event performed by Pinnacle. The MTBE concentration in well MW-3 was higher than the last sampling event performed by Pinnacle. MTBE has not been detected in the sample from well MW-1 for four consecutive quarters. The MTBE concentration in well MW-3 exceeded the STARS guidance level of 50 ug/L.
- The next sampling event will be conducted by Pinnacle during the third quarter of 1999.

TABLE 2
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

U-HAUL MOVING CENTER #803-62
562 West 62nd Street
New York, New York

WELL NUMBER	SAMPLING DATE	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES	MTBE
		EPA Method 8021				
MW-1	5/31/97	63	1.8	13	4.9	ND < 1
	3/6/98	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	NA
	6/20/98	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5
	11/22/98	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5
	3/31/99	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5
	6/27/99	**ND < 0.5**	**ND < 0.5**	**ND < 0.5**	**ND < 0.5**	**ND < 5**
MW-2	5/31/97	ND < 0.7	ND < 1	ND < 1	ND < 2	ND < 1
	3/6/98	16	ND < 0.5	ND < 0.5	ND < 0.5	NA
	6/20/98	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	79
	11/22/98	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	17
	3/31/99	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	12
	6/27/99	**ND < 0.5**	**ND < 0.5**	**ND < 0.5**	**ND < 0.5**	**ND < 5**
MW-3	5/31/97	ND < 1.4	ND < 2	ND < 2	13	71
	3/6/98	ND < 0.5	ND < 0.5	1.2	4.5	NA
	6/20/98	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	36
	11/22/98	ND < 0.5	ND < 0.5	ND < 0.5	21	25
	3/31/99	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	7
	6/27/99	**23.5**	**3.1**	**19.2**	**ND < 0.5**	**53**
STARS Memo Guidance Value		0.7	5.0	5.0	5.0	50

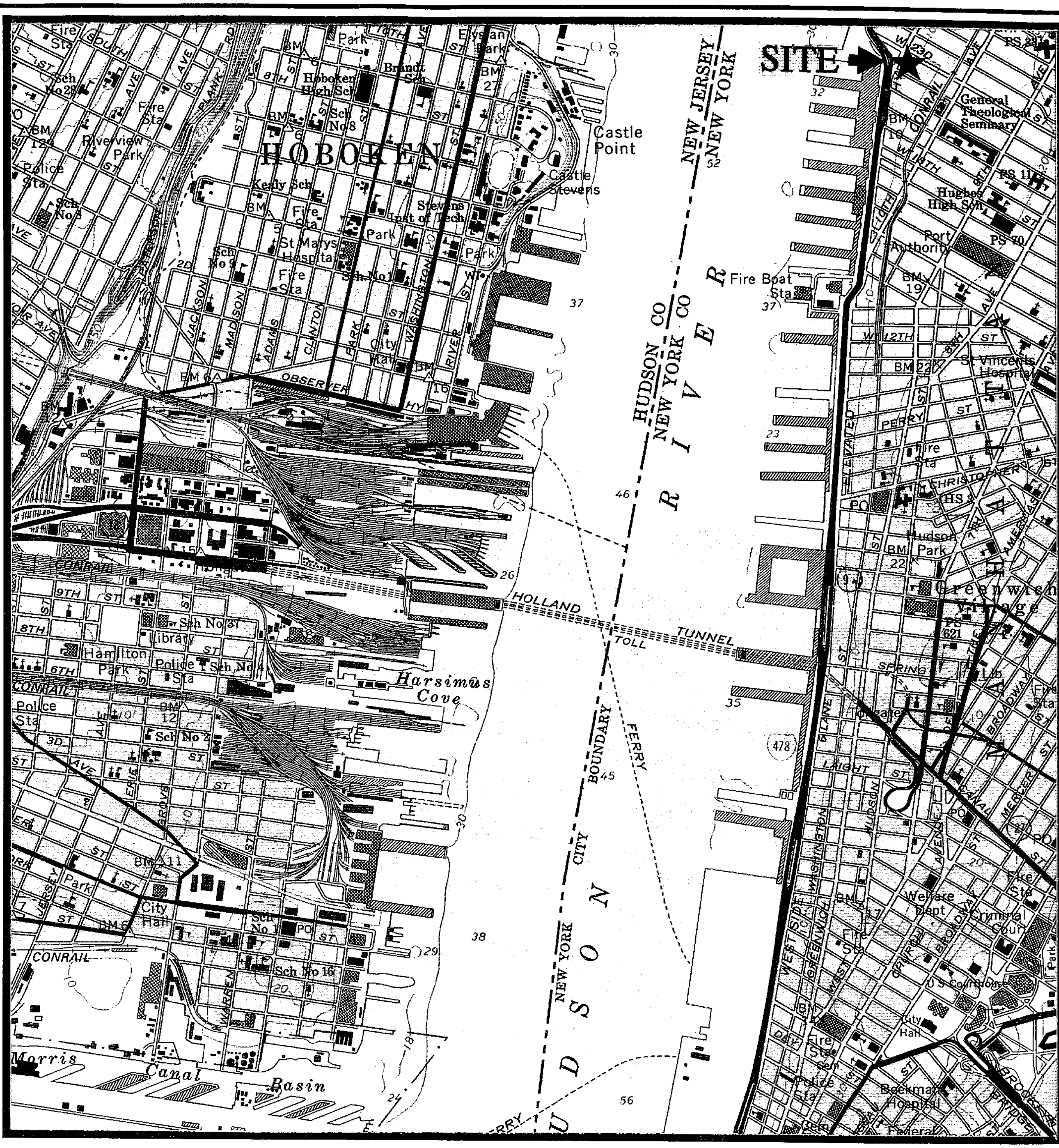
MTBE = methyl tertiary-butyl ether
All values in micrograms per liter (ug/L)

TABLE 1
SUMMARY OF GROUNDWATER ELEVATION DATA

U-HAUL MOVING CENTER #803-62
562 West 23rd Street
New York, New York

WELL	CASING ELEVATION	DATE	DEPTH TO GROUNDWATER	GROUNDWATER ELEVATION	FREE PRODUCT THICKNESS
MW-1	6.61	5/31/97	5.87	0.74	0.00
		3/6/98	5.82	0.79	0.00
		6/20/98	5.79	0.82	0.00
		11/22/98	5.78	0.83	0.00
		3/31/99	6.03	0.58	0.00
		6/27/99	**6.08**	**0.53**	**0.00**
MW-2	7.22	5/31/97	6.62	0.60	0.00
		3/6/98	6.56	0.66	0.00
		6/20/98	6.54	0.68	0.00
		11/22/98	6.74	0.48	0.00
		3/31/99	6.79	0.43	0.00
		6/27/99	**6.81**	**0.41**	**0.00**
MW-3	6.51	5/31/97	5.92	0.59	0.00
		3/6/98	5.87	0.64	0.00
		6/20/98	5.84	0.67	0.00
		11/22/98	5.78	0.73	0.00
		3/31/99	6.04	0.47	0.00
		6/27/99	**6.06**	**0.45**	**0.00**

All elevations in feet relative to mean sea level
Depth to groundwater measurements in feet below top of casing



SCALE
(feet)

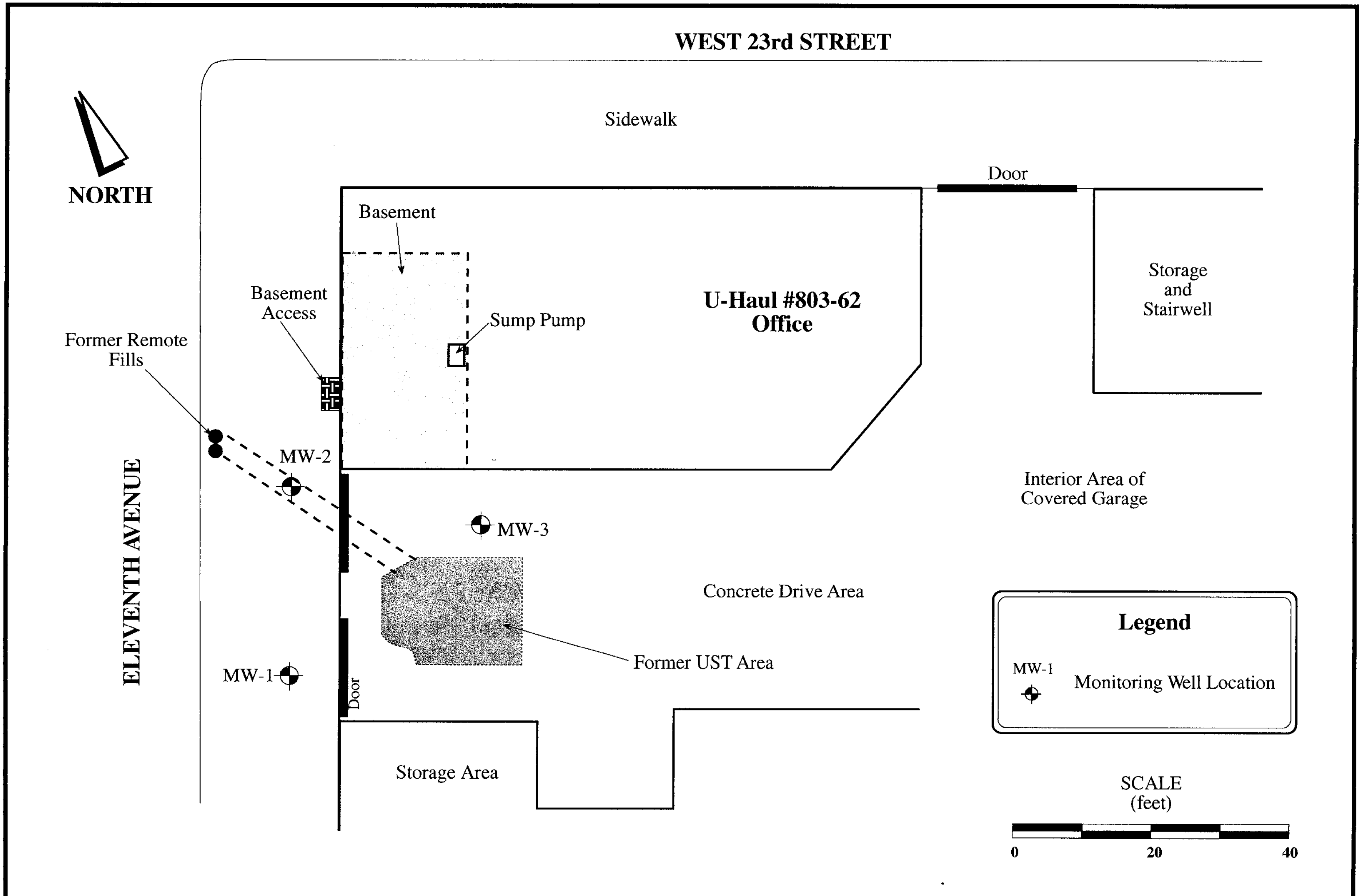
0 2000 4000

Base Map - USGS 7.5 Minute Quadrangle, Jersey City

NORTH

PINNACLE
ENVIRONMENTAL TECHNOLOGIES
#2 Santa Maria, Foothill Ranch, CA 92610
Tel: (949) 470-3691 • Fax: (949) 595-0459

U-Haul Moving Center # 803-62 562 West 23rd Street New York, New York	Site Location Map	Figure 1



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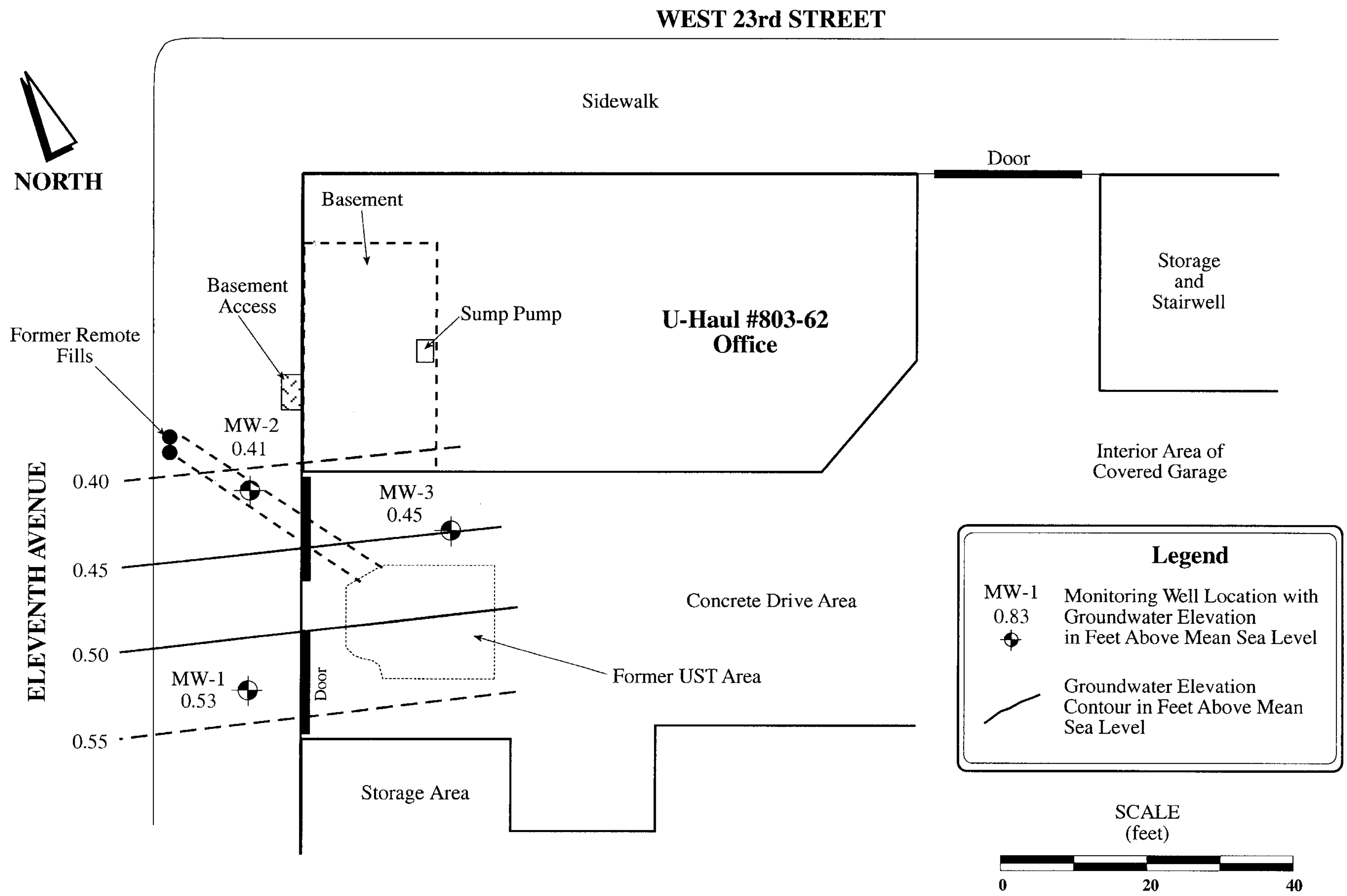
U-Haul Moving Center #803-62
562 West 23rd Street
New York, New York

Site Plan

Figure 2



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U-Haul Moving Center #803-62
562 West 23rd Street
New York, New York

Groundwater Elevation Map
June 27, 1999

Figure 3

APPENDIX A
GENERAL FIELD PROCEDURES

The following sections outline the general field procedures and protocols followed by Pinnacle Environmental Technologies (Pinnacle) in the completion of field tasks. Any deviation from the procedures outlined here due to unique or unforeseen circumstances will be noted in the body of the applicable report. The following tasks are detailed:

- Groundwater Level Monitoring
- Monitoring Well Purging and Sampling
- Chain-of-Custody Protocol

Groundwater samples are collected from monitoring wells and temporary, small-diameter wells. Sampling of groundwater monitoring wells is conducted in accordance with the EPA Technical Enforcement Guidance Document or with any other local protocols and procedures.

Groundwater Level Monitoring

The depth to groundwater is measured to the nearest 0.01 foot and recorded for use in determining the groundwater gradient and flow direction. Water level measurements are completed on all wells prior to purging any well at the site. Depth to groundwater is measured using either an electronic well sounding device (i.e. Solinst) or using an interface probe (i.e. MMC). If a sounding device is used, the well is first checked for the presence of non-aqueous phase petroleum liquids (NAPLs) using hydrocarbon sensitive paste or an interface probe. The interface probe is capable of direct detection of trace thickness of NAPLs.

Monitoring Well Purging and Sampling

All wells are purged prior to the collection of groundwater samples to ensure that a representative groundwater sample is collected. Wells are typically purged using either a portable submersible pump or by using a vacuum truck and dedicated well stinger. Water temperature, pH, and conductivity are monitored during purging. Purging is considered complete once a minimum of three well casing volumes have been purged and the physical parameters have stabilized for successive readings to within 5 percent of temperature and conductivity and 0.05 pH units.

Many low yield aquifers are not capable of producing three well casing volumes of water. In these cases the well may be pumped dry. If this occurs, the well is only pumped dry once and samples are collected once the conditions specified below are achieved.

Care is taken not to overpump a well to dryness and to avoid the possibility of cascading water into the well. All wells are purged at the minimum rate necessary to adequately ensure that a representative groundwater sample will be collected.

In certain cases, regulatory agencies will request the collection of groundwater samples from wells without first purging them. "Pre-Purge" samples are identified as such on the Chain-of-Custody (COC) and in the sample identification section of the report.

Each well is allowed to recharge to 80% of its pre-purge volume prior to sampling, or for two hours, whichever occurs first. If a well does not recharge to 80% of its pre-purge volume within two hours, then a sample is collected as soon as sufficient water has collected in the well to fill the required sample containers.

Samples are collected by slowly lowering either a disposable Teflon or decontaminated stainless steel bailer into the water column. Care is taken to minimize agitating the water as the bailer enters. The bailer is removed from the well after filling, and a bottom emptying device attached. The water is decanted into the sample containers (40-milliliter VOAs or glass amber bottles, as required) in a manner which minimizes agitation and possible loss of volatiles. Each container is filled so that when the cover is tightened that a zero headspace sample has been collected with no trapped air bubbles visible in the container.

Each container is then labeled with the sample identification, sample date and time, and site name. The sample containers are then placed in a cooled ice chest for transport to the laboratory.

Chain-of-Custody Protocol

All soil and groundwater samples that are collected are documented using COC procedures. Each sample is identified and entered onto the COC record along with the date and time of collection and the type and number of sample containers. COC documents also typically used to document which analyses are completed on each sample. The COC follows the samples from the field to the laboratory and legally documents who had possession of the samples at all times.

WELL DEPTH TO WATER AND VOLUME DATA

SITE: U-Haul #803-62
Chelsea, New York

DATE: 6/27/99

WELL	TD	DTW	COL	VOLUME	3X VOL
MW-1	14.00	6.08	7.92	1.35	4.04
MW-2	15.60	6.81	8.79	1.49	4.48
MW-3	10.70	6.06	4.64	0.79	2.37

Pinnacle Environmental Technologies
#2 Santa Maria
Foothill Ranch, CA 92610
(949) 470-3691

WELL PURGING PHYSICAL PARAMETERS

SITE: U-Haul #803-62
Chelsea, New York

DATE: 6/27/99 **Field Personnel:** Malvey

WELL: MW-1		*WELL:* MW-2		*WELL:* MW-3		*WELL:*		*WELL:*		*WELL:*	
Time:	0	Time:	0	Time:	0	Time:		Time:		Time:	
Vol:	0	Vol:	0	Vol:	0	Vol:		Vol:		Vol:	
pH:	7.05	pH:	7.07	pH:	7.08	pH:		pH:		pH:	
Temp:	71.2	Temp:	71.1	Temp:	71.5	Temp:		Temp:		Temp:	
Cond:	1,780	Cond:	1,990	Cond:	3,540	Cond:		Cond:		Cond:	
Time:	1	Time:	1	Time:	1	Time:		Time:		Time:	
Vol:	2	Vol:	2	Vol:	2	Vol:		Vol:		Vol:	
pH:	6.99	pH:	7.05	pH:	7.11	pH:		pH:		pH:	
Temp:	70.5	Temp:	71.0	Temp:	71.0	Temp:		Temp:		Temp:	
Cond:	1,670	Cond:	1,860	Cond:	3,140	Cond:		Cond:		Cond:	
Time:	2	Time:	2	Time:	2	Time:		Time:		Time:	
Vol:	4	Vol:	4	Vol:	4	Vol:		Vol:		Vol:	
pH:	6.95	pH:	7.02	pH:	7.03	pH:		pH:		pH:	
Temp:	70.6	Temp:	70.5	Temp:	70.5	Temp:		Temp:		Temp:	
Cond:	1,550	Cond:	1,710	Cond:	3,190	Cond:		Cond:		Cond:	
Time:	3	Time:	3	Time:	3	Time:		Time:		Time:	
Vol:	6	Vol:	6	Vol:	6	Vol:		Vol:		Vol:	
pH:	6.94	pH:	6.99	pH:	7.02	pH:		pH:		pH:	
Temp:	70.1	Temp:	70.3	Temp:	70.6	Temp:		Temp:		Temp:	
Cond:	1,540	Cond:	1,710	Cond:	3,150	Cond:		Cond:		Cond:	
Time:	4	Time:	4	Time:	4	Time:		Time:		Time:	
Vol:	8	Vol:	8	Vol:	8	Vol:		Vol:		Vol:	
pH:	6.98	pH:	6.99	pH	7.01	pH:		pH:		pH:	
Temp:	70.2	Temp:	70.1	Temp:	70.5	Temp:		Temp:		Temp:	
Cond:	1,540	Cond:	1,710	Cond:	3,110	Cond:		Cond:		Cond:	
Time:		Time:		Time:		Time:		Time:		Time:	
Vol:		Vol:		Vol:		Vol:		Vol:		Vol:	
pH:		pH:		pH:		pH:		pH:		pH:	
Temp:		Temp:		Temp:		Temp:		Temp:		Temp:	
Cond:		Cond:		Cond:		Cond:		Cond:		Cond:	

Pinnacle Environmental Technologies
2 Santa Maria, Foothill Ranch, CA

CHEMICAL & ENVIRONMENTAL LABORATORIES, INC.

July 08, 1999

Certificate No.: 2268

Mr. William Malvey
Pinnacle Environmental Technologies
2 Santa Maria
Foothill Ranch, CA 92610

Project: U-Haul #803-62

Dear Mr. Malvey:

Enclosed please find the report for the sample(s) received by Chemical & Environmental Laboratories and analyzed as indicated in the chain-of-custody attached.

We appreciate the opportunity to service the needs of your company. Please call me at (562) 921-8123 if you have any questions.

Sincerely,

Larry Zhang

Larry Zhang, Ph.D.
Laboratory Director

14148 E. Firestone Blvd., Santa Fe Springs, CA 90670 Tel: 562 921-8123, Fax: 562 921-7974

CHEMICAL & ENVIRONMENTAL LABORATORIES, INC.

ANALYTICAL REPORT

---EPA 8021 ---

Client Name: Pinnacle Env. Technologies
Project Manager: William Malvey
Project Name: U-Haul #803-62

Date Sampled: 06/27/99
Date Analyzed: 06/29/99
Date Reported: 07/07/99

C&E ID		90629H-1	90629H-2	90629H-3		
SAMPLE ID		MW-1	MW-2	MW-3		
COMPOUND	Detection Limit (ug/L)	RESULT (ug/L or ppb)				
Benzene	0.5	ND	ND	23.5		
Bromobenzene	0.5	ND	ND	ND		
Bromochloromethane	1	ND	ND	ND		
Bromodichloromethane	1	ND	ND	ND		
Bromoform	1	ND	ND	ND		
Bromomethane	1	ND	ND	ND		
n-Butylbenzene	0.5	ND	ND	ND		
sec-Butylbenzene	0.5	ND	ND	ND		
tert-Butylbenzene	0.5	ND	ND	ND		
Carbon Tetrachloride	0.5	ND	ND	ND		
Chlorobenzene	0.5	ND	ND	ND		
Chloroethane	1	ND	ND	ND		
Chloroform	0.5	ND	ND	ND		
Chloromethane	1	ND	ND	ND		
2-Chlorotoluene	0.5	ND	ND	ND		
4-Chlorotoluene	0.5	ND	ND	ND		
Dibromochloromethane	1	ND	ND	ND		
1,2-Dibromo-3-chloropropane	1	ND	ND	ND		
1,2-Dibromoethane	1	ND	ND	ND		
Dibromomethane	1	ND	ND	ND		
1,2-Dichlorobenzene	0.5	ND	ND	ND		
1,3-Dichlorobenzene	0.5	ND	ND	ND		
1,4-Dichlorobenzene	0.5	ND	ND	ND		
Dichlorodifluoromethane	1	ND	ND	ND		
1,1-Dichloroethane	0.5	ND	ND	ND		
1,2-Dichloroethane	0.5	ND	ND	ND		
1,1-Dichloroethene	0.5	ND	ND	ND		
cis-1,2-Dichloroethene	0.5	ND	ND	ND		
trans-1,2-Dichloroethene	0.5	ND	ND	ND		
1,2-Dichloropropane	0.5	ND	ND	ND		
1,3-Dichloropropane	0.5	ND	ND	ND		

To be continued on page 2

14148 E. Firestone Blvd., Santa Fe Springs, CA 90670 Tel: 562 921-8123, Fax: 562 921-7974

CHEMICAL & ENVIRONMENTAL LABORATORIES, INC.

ANALYTICAL REPORT

---EPA 8021 ---

Client Name: Pinnacle Env. Technologies
Project Manager: William Malvey
Project Name: U-Haul #803-62

Date Sampled: 06/27/99
Date Analyzed: 06/29/99
Date Reported: 07/07/99

C&E ID		90629H-1	90629H-2	90629H-3		
SAMPLE ID		MW-1	MW-2	MW-3		
COMPOUND	Detection Limit (ug/L)	RESULT (ug/L or ppb)				
2,2-Dichloropropane	0.5	ND	ND	ND		
1,1-Dichloropropene	0.5	ND	ND	ND		
cis-1,3-Dichloropropene	0.5	ND	ND	ND		
trans-1,3-Dichloropropene	0.5	ND	ND	ND		
Ethylbenzene	0.5	ND	ND	19.2		
Hexachlorobutadiene	0.5	ND	ND	ND		
Isopropylbenzene	0.5	ND	ND	31.0		
4-Isopropyltoluene	0.5	ND	ND	ND		
Methylene Chloride	1	ND	ND	ND		
Naphthalene	0.5	ND	ND	ND		
n-Propylbenzene	0.5	ND	ND	ND		
Styrene	0.5	ND	ND	ND		
1,1,1,2-Tetrachloroethane	0.5	ND	ND	ND		
1,1,2,2-Tetrachloroethane	0.5	ND	ND	ND		
Tetrachloroethene	0.5	ND	ND	ND		
Toluene	0.5	ND	ND	3.1		
1,2,3-Trichlorobenzene	0.5	ND	ND	ND		
1,2,4-Trichlorobenzene	0.5	ND	ND	ND		
1,1,1-Trichloroethane	0.5	ND	ND	ND		
1,1,2-Trichloroethane	0.5	ND	ND	ND		
Trichloroethene	0.5	ND	ND	ND		
Trichlorofluoromethane	1	ND	ND	ND		
1,2,3-Trichloropropane	0.5	ND	ND	ND		
1,2,4-Trimethylbenzene	0.5	ND	ND	ND		
1,2,5-Trimethylbenzene	0.5	ND	ND	ND		
Vinyl Chloride	1	ND	ND	ND		
Total Xylenes	0.5	ND	ND	ND		
MTBE	5	ND	ND	53		

ND = Not detected at the indicated detection limit.

14148 E. Firestone Blvd., Santa Fe Springs, CA 90670 Tel: 562 921-8123, Fax: 562 921-7974

CHEMICAL & ENVIRONMENTAL LABORATORIES, INC.

QA/QC REPORT

--- EPA 8021 ---

I. Matrix Spike (MS)/Matrix Spike Duplicate(MSD)

Date Performed: 06/29/99

Lab Sample I.D.: 90629H

Unit: ug/L

ANALYTE	SPK CONC	MS (ug/L)	MS %	MSD (ug/L)	MSD %	RPD	ACP %MS	ACP RPD
1,1-Dichloroethene	40.0	32.6	82	32.5	81	0.3	60-140	20
Trichloroethene	40.0	35.0	88	34.5	86	1.4	60-140	20
Benzene	40.0	34.8	87	33.2	83	4.7	60-140	20
Toluene	40.0	35.3	88	33.7	84	4.6	60-140	20
Chlorobenzene	40.0	35.1	88	32.2	81	8.6	60-140	20

II. Laboratory Quality Control Check Sample

ANALYTE	SPK CONC	RESULT	%RECOVERY	ACP %
1,1-Dichloroethene	40.0	34.5	86	80-120
Trichloroethene	40.0	35.1	88	80-120
Benzene	40.0	34.8	87	80-120
Toluene	40.0	35.5	89	80-120
Chlorobenzene	40.0	34.3	86	80-120

90629H

CHAIN OF COLUSTODY RECORD

PINNACLE ENVIRONMENTAL TECHNOLOGIES

Site: U-HAUL #803-62

Address: West 23rd Street

Chelsea, NYC

Project Manager: W. Malvey

Sampled By: W. Malvey

Laboratory: CIT

TURN AROUND TIME
24hr / RUSH / Normal

Page 1 of 1

	SAMPLE ID	TIME	DATE	SAMPLE MATRIX	NUMBER of CONTAINERS	TPHG 8015M	TPHD 8015M	TRPH 418.1	BTEX 8020	MTBE 8020	EPA 8021			COMMENTS
1	MW-1	1400	6/27/99	Water	2 VOA						X			Report MTBE
2	MW-2	1405	↓	↓	↓						X			on all samples
3	MW-3	1410	↓	↓	↓						X			

Total Number of Samples: 6

FAX Results: YES / NO

Relinquished By: W. Malvey	Date/Time: 6/28/99 1600	Relinquished By:	Date/Time:
Received By: [signature]	Date/Time: 6/29/99	Received By:	Date/Time:

PINNACLE ENVIRONMENTAL TECHNOLOGIES
2 Santa Maria
Foothill Ranch, CA 92610
TEL: (949) 470-3691
FAX: (949) 595-0459

ASSOCIATES INC.

104 East 25th Street
New York, NY 10010
www.atc-enviro.com
212.353.8280
Fax 212.353.8306

May 18, 2000

Mr. Christopher Tomasello
NYSDEC Region II
30-20 Thomson Avenue, 3rd Floor
Long Island City, New York 11101

RE: Site Closure Letter
NYSDEC Spill Nos. 9000199 and 9700188
U-Haul Moving Center 803-62
562 West 23rd Street
New York, New York

Dear Mr. Tomasello:

ATC Associates Inc. (ATC) respectfully submits this request for Site Closure related to the removal of underground storage tanks (USTs) and subsequent groundwater monitoring at the U-haul Moving Center No. 803-62, located at 562 West 23rd Street, New York, New York (the "Site"). Based upon the information disclosed by this review, ATC recommends that a no further action letter be issued for the Site.

The Site is currently operated as a truck rental and mini-storage facility by U-Haul International. The site is completely occupied by a multi-floor building. The interior drive areas are covered in concrete. The Site lies at an elevation of 7 feet above sea level and is 600 feet from the Hudson River. Local topography is essentially flat and the area is developed with industrial and commercial properties. Pinnacle Environmental's Site Plan is presented in Attachment 1. Pinnacle Environmental's groundwater gradient map is presented in Attachment 2.

Two 1,000 gallon underground storage tanks (USTs) and one dispenser were formerly operated to fuel rental trucks at the Site. Both USTs were removed on April 11, 1997. Prior to 1997 a 550-gallon gasoline UST and a 1,000-gallon fuel oil UST had been closed in place.

New York State Department of Environmental Conservation (NYSDEC) Spill Number 9000199 was issued for a tank test failure in 1990. NYSDEC Spill Number 97-00188 was issued due to contamination detected beneath the remote fill lines during tank removal activities in 1997.

Historical and Current Environmental Conditions

Below, ATC has summarized the historic information regarding the petroleum releases at the Site. ATC has further attached copies of all available reports regarding petroleum releases at the Site.

- In 1994 American Hi-Tech, Inc. performed a Subsurface Site Investigation in the vicinity of the abandoned 550-gallon UST and the abandoned 1,000-gallon UST. The results of the investigation revealed that volatile organic compounds (VOCs) were detected above New York State Department of Environmental Conservation Spill Technology and Remediation Series Memo #1-Petroleum-Contaminated Soil Guidance Policy (NYSDEC STARS Memo) Alternative Guidance Values in one soil sample from boring B-4. This boring was located adjacent to a reportedly abandoned 1,000-gallon fuel oil UST. The soil sample was collected at the soil/groundwater interface. Please see Attachment 3 for a summary of all laboratory soil data collected at the Site.

- In 1997, Tyree Brothers Environmental Services, Inc. excavated and removed two 1,000-gallon gasoline USTs. A NYSDEC Spill Number (97-00188) was issued for the Site. Post-excavation soil samples revealed that VOCs well above NYSDEC STARS Memo Alternative Guidance Values were present in soil beneath the fill lines. 8.45 tons of petroleum contaminated soil was excavated and removed from the site from the vicinity of the remote fill lines. The soil was thermally treated and recycled at Posillico Brothers Asphalt Company in July 1997. Please see Attachment 3 for a summary of all laboratory soil data collected at the Site.

- In 1997, the NYSDEC and the New York City Fire Department responded to a report of free-phase petroleum penetrating through the basement walls of the on-site building. It was reported to ATC that free-phase petroleum had been spilled into the basement during a delivery. No free-phase product has since been reported at the Site either infiltrating into the basement or in any of the on-site monitoring wells.

- On July 31, 1997, Pinnacle Environmental Technologies issued a Site Assessment Report. The Assessment Report was issued to address the soil and contamination detected during the previous investigations and UST removal activities. The report indicated that VOCs were detected above NYSDEC STARS Memo Alternative Guidance Values in three of the nine soil samples collected from three soil borings installed as part of the investigation, including the former fill line trench. However, at depths of 10' below ground surface (bgs), benzene, toluene, ethylbenzene and xylenes (BTEX) concentrations decreased to nondetect. BTEX compounds were detected above NYSDEC Ambient Groundwater Quality Criteria in MW-1 and MW-3. BTEX concentrations ranged from 82.7 micrograms per liter (ug/l) to 84 ug/l.

These monitoring wells were the first and only wells installed at the Site.

- Following the installation of the monitoring wells, Pinnacle Environmental Technologies initiated a groundwater-monitoring program involving biannual sampling and reporting on the three existing monitoring wells. One well was installed adjacent to the former fill lines. The monitoring wells were sampled on May 31, 1997, March 6, 1998, June 20, 1998, November 22, 1998, March 31, 1999 and June 27, 1999. During the monitoring periods, dissolved BTEX plus MTBE has decreased to nondetect in MW-1, nondetect in MW-2 and fluctuated in MW-3. As of June 27, 1999, BTEX compounds were detected in groundwater samples from monitoring wells MW-3 at 45.8 ug/l. MTBE was detected in MW-3 at 53 ug/l. The historical groundwater laboratory results are presented in Attachment 4.

Recommendations

Based upon the results of this study it is apparent that any remaining soil contamination does not severely impact the groundwater quality beneath the Site. It appears that the petroleum releases are old and that a steady state equilibrium has been reached between the contamination present in the soil and groundwater resulting in attenuation of the contaminants by the mechanisms of sorption and degradation. VOCs above NYSDEC STARS Alternative Guidance Values have been documented in what appears to be the capillary fringe. However, groundwater VOC concentrations are not severe and no separate-phase product was detected in the on-site monitoring wells. Minimal off-Site migration of VOCs has been observed. The Site is paved and developed with a commercial building, preventing infiltration and migration of absorbed contamination to the water table. Therefore, ATC recommends that the spill numbers associated with this Site be closed and a no further action letter be issued by the NYSDEC.

Please do not hesitate to call the undersigned with questions or comments.

Sincerely,
ATC ASSOCIATES INC.

David M. Winslow, Ph.D.
Senior Geologist, Subsurface Investigation
and Remediation Group Manager

Attachments

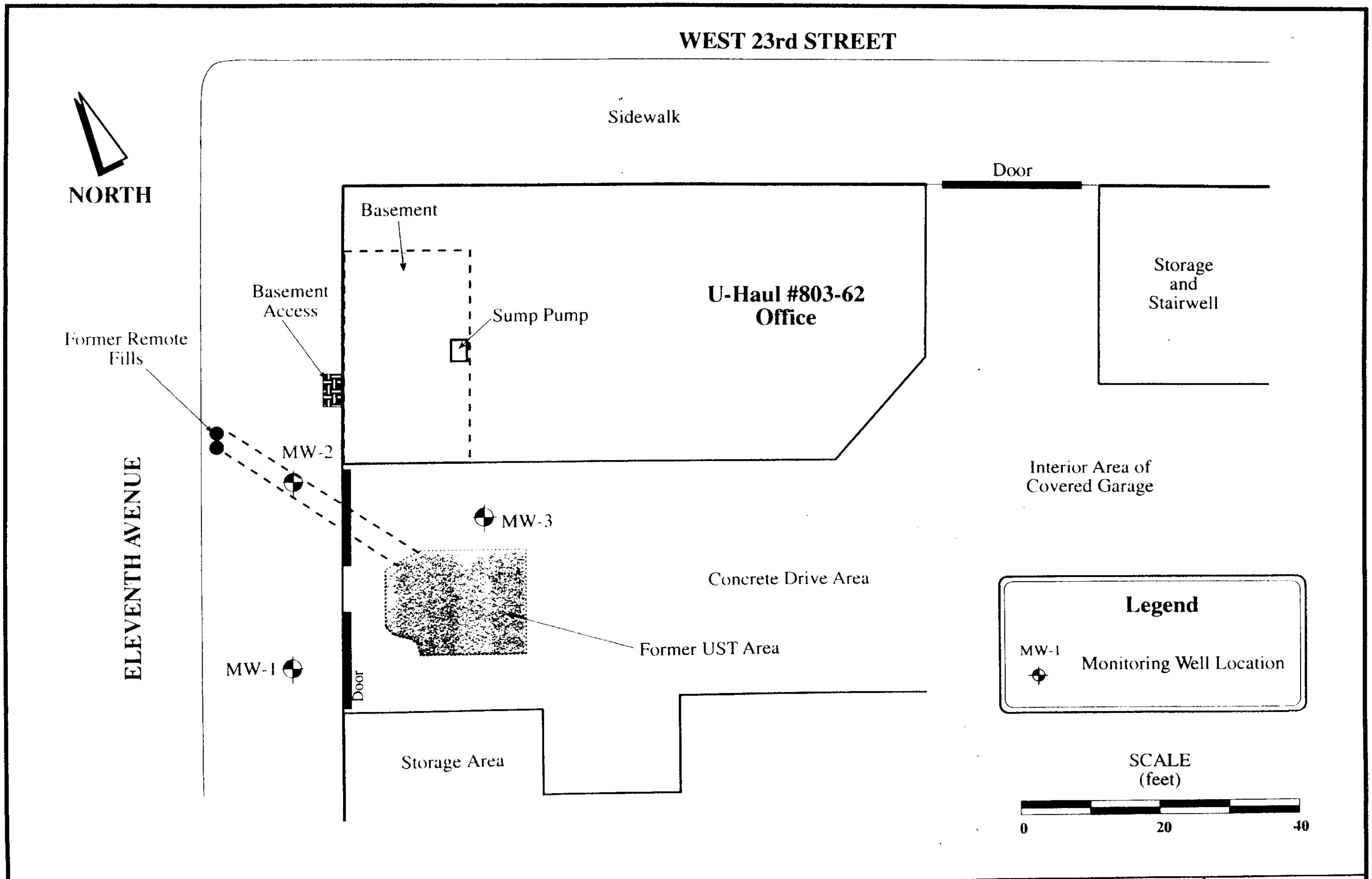
Attachment 1:	Pinnacle Environmental Technologies Inc. Site Plan
Attachment 2:	Pinnacle Environmental Technologies Inc. Groundwater Gradient Map
Attachment 3:	Pinnacle Environmental Technologies Inc. Summary of Dissolved BTEX Concentrations
Attachment 4:	Summary of Soil Sample Laboratory Results
Attachment 5:	Past Investigations

- America High Tech Inc. Report
- Closure Report for the Excavation of Underground Storage Tanks U-Haul 803-62, prepared by Tyree Brothers Environmental Serices In.
- Site Assessment Report, prepared by Pinnacle Environmental
- Groundwater Sampling Report, August 1998, prepared by Pinnacle Environmental
- Quarterly Groundwater Monitoring Report, February 21, 1999, prepared by Pinnacle Environmental
- Quarterly Groundwater Monitoring Report, August 16, 1999, prepared by Pinnacle Environmental
- Quarterly Groundwater Monitoring Report, July 15, 1999, prepared by Pinnacle Environmental
- Various Letters.

cc: Dale Allison, ATC Associates Inc.
Reid Riner, AMERCO Real Estate Company

Attachment 1:

Pinnacle Environmental Technologies Inc. Site Plan



PINNACLE
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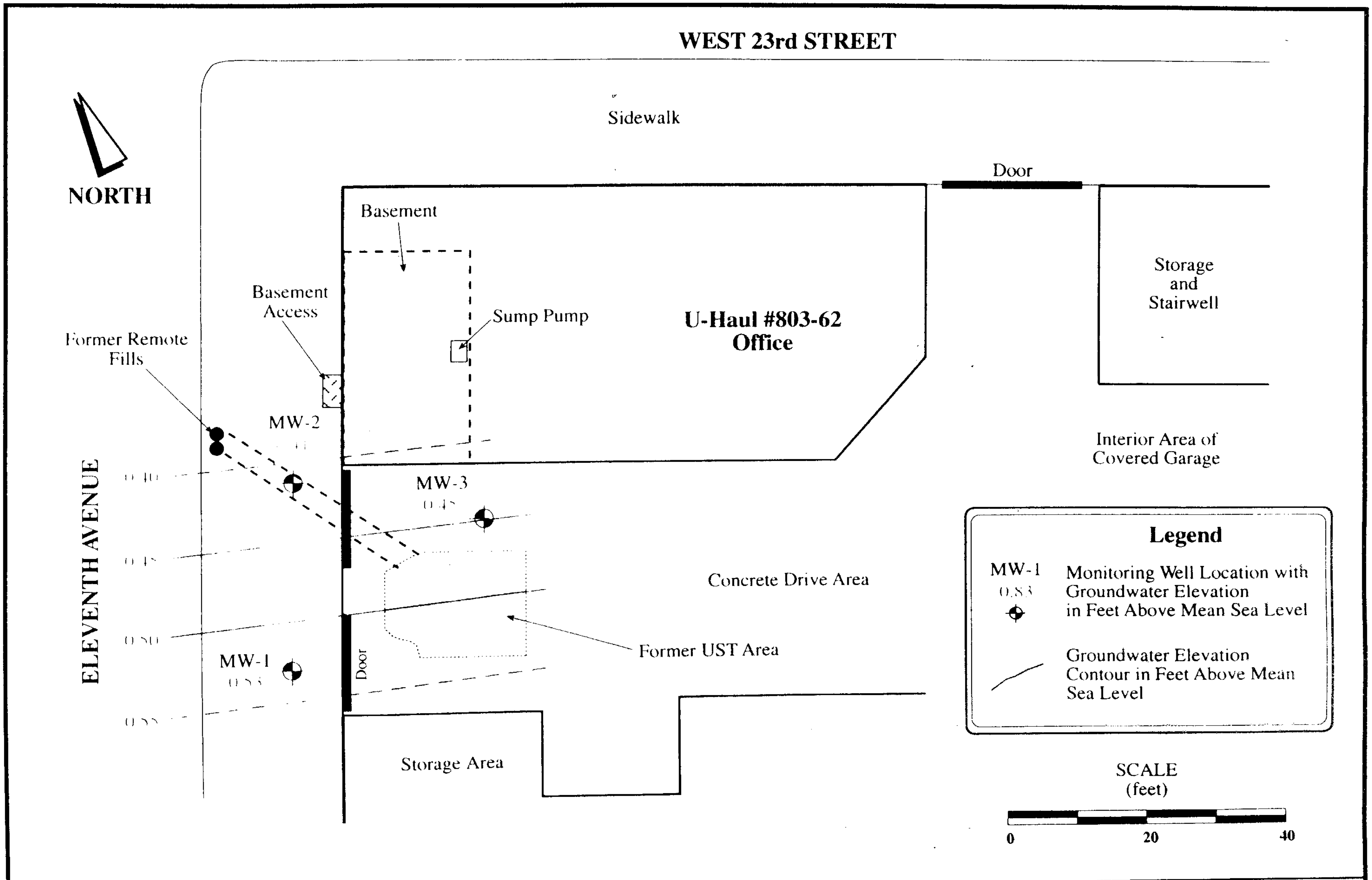
U-Haul Moving Center #803-62
562 West 23rd Street
New York, New York

Site Plan

Figure 2

Attachment 2:

Pinnacle Environmental Technologies Inc.
Groundwater Gradient Map



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U-Haul Moving Center #803-62
562 West 23rd Street
New York, New York

Groundwater Elevation Map
June 27, 1999

Figure 3

Attachment 3:

Pinnacle Environmental Technologies Inc. Summary of Dissolved BTEX Concentrations

TABLE 2
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

U-HAUL MOVING CENTER #803-62
562 West 62nd Street
New York, New York

WELL NUMBER	SAMPLING DATE	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES	MTBE
		EPA Method 8021				
MW-1	5/31/97	63	1.8	13	4.9	ND < 1
	3/6/98	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	NA
	6/20/98	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5
	11/22/98	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5
	3/31/99	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5
	6/27/99	**ND < 0.5**	**ND < 0.5**	**ND < 0.5**	**ND < 0.5**	**ND < 5**
MW-2	5/31/97	ND < 0.7	ND < 1	ND < 1	ND < 2	ND < 1
	3/6/98	16	ND < 0.5	ND < 0.5	ND < 0.5	NA
	6/20/98	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	79
	11/22/98	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	17
	3/31/99	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	12
	6/27/99	**ND < 0.5**	**ND < 0.5**	**ND < 0.5**	**ND < 0.5**	**ND < 5**
MW-3	5/31/97	ND < 1.4	ND < 2	ND < 2	13	71
	3/6/98	ND < 0.5	ND < 0.5	1.2	4.5	NA
	6/20/98	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	36
	11/22/98	ND < 0.5	ND < 0.5	ND < 0.5	21	25
	3/31/99	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	7
	6/27/99	**23.5**	**3.1**	**19.2**	**ND < 0.5**	**53**
STARS Memo Guidance Value		0.7	5.0	5.0	5.0	50

MTBE = methyl tertiary-butyl ether
All values in micrograms per liter (ug/L)

Attachment 4:

Summary of Soil Sample Laboratory Results

Historical Soil Sample Analytical Results

Sample No.:		BG-1-8	B-1-8	B-2-8	B-3-8	B-4-8	North	South	East	West	Bottom	Fill Lines	*NYSDEC*
Date		1994	1994	1994	1994	1994	Apr-97	Apr-97	Apr-97	Apr-97	Apr-97	Apr-97	*STARS*
	Boring #:	BG-1	SB-1	SB-2	SB-3	SB-4							*Guidance Values*
COMPOUNDS:	epth (ft)	8	8	8	8	8	8	8	8	8	10		
VOCs:	UNITS												
Benzene	ppb	ND	ND	1.1	ND	**200**	ND	ND	ND	ND	ND	1,010	14
Toulene	ppb	ND	ND	ND	ND	**1,500**	ND	ND	ND	ND	ND	5,280	100
Ethylbenzene	ppb	ND	ND	1.6	ND	**9,900**	ND	ND	ND	ND	ND	941	100
o-Xylene	ppb	ND	ND	ND	ND	**1,100**	ND	ND	ND	ND	7.2	76,200	100
m/p-Xylene	ppb	ND	ND	1.8	ND	**1,700**	ND	ND	ND	ND	13.4	66,100	100
Isopropylbenzene	ppb	ND	ND	ND	ND	**2,100**	ND	ND	ND	ND	5.2	ND	100
n-Propylbenzene	ppb	ND	ND	ND	ND	**10,000**	ND	ND	ND	ND	8.6	765	100
p-Isopropyltoluene	ppb	ND	ND	ND	ND	**1,700**	ND	ND	ND	ND	9.7	10,200	100
1,2,4-Trimethylbenzene	ppb	ND	ND	0.9	ND	**1,600**	ND	ND	ND	ND	22.2	148,000	100
1,3,5-Trimethylbenzene	ppb	ND	ND	2.1	ND	**3,700**	ND	ND	ND	ND	7.7	69,800	100
n-Butylbenzene	ppb	ND	ND	ND	ND	**19,000**	ND	ND	ND	ND	15.3	ND	100
sec-Butylbenzene	ppb	ND	ND	ND	ND	**15,000**	ND	ND	ND	ND	13.3	1,080	100
Naphthalene	ppb	ND	ND	ND	ND	6400	ND	ND	ND	ND	25.1	17,800	200
MTBE	ppb	ND	ND	4.5	ND	ND	5.7	11.6	ND	7.3	43		1000

NYSDEC STARS=SPILL TECHNOLOGY AND REMEDIATION SERIES MEMO No. 1 ALTERNATIVE GUIDANCE VALUES

ND = NOT DETECTI)

NA = NOT ANALYZED

BOLD TEXT: Concentrations exceed NYSDEC STARS Memo Alternative Guidance Values

Sample No.:		MW-1-5	MW-1-10	MW-1-15	MW-2-3	MW-2-10	MW-2-15	MW-3-5	MW-3-10	MW-3-15	*NYSDEC*
Date		May-97	May-97	May-97	May-97	May-97	May-97	May-97	May-97	May-97	*STARS*
	Boring #:	MW-1	MW-1	MW-1	MW-2	MW-2	MW-2	MW-3	MW-3	MW-3	
COMPOUNDS:	epth (ft)	5	10	15	3	10	15	5	10	15	
VOCs:	UNITS										
Benzene	ppb	ND	ND	ND	**320**	ND	ND	ND	ND	ND	14
Toluene	ppb	ND	ND	ND	**1,100**	ND	ND	ND	ND	ND	100
Ethylbenzene	ppb	ND	ND	ND	**230**	ND	ND	ND	ND	ND	100
Xylenes	ppb	ND	ND	ND	**2,270**	ND	ND	37	8.9	ND	100
MTBE	ppb	8.2	1.7	2.9	**5,600**	37	12	ND	1.8	1.4	1000

NYSDEC STARS=SPILL TECHNOLOGY AND REMEDIATION SERIES MEMO No. 1 ALTERNATIVE GUIDANCE VALUES

ND = NOT DETECTED

NA = NOT ANALYZED

BOLD TEXT: Concentrations exceed NYSDEC STARS Memo Alternative Guidance Values

Attachment 5:

Past Investigations

803062
PARTIAL

July 30, 2001

Mr. Stephen Sangesland
New York State Department of Environmental Conservation
Division of Environmental Remediation
Bureau of Spill Management
47-40 21st Street, Long Island City, NY 11101

RE: **Site Investigation Report**
NYSDEC Spill Nos. 9000199 and 9700188
U-Haul Moving Center 803-62
562 West 23rd Street (Chelsea)
New York, New York

Dear Mr. Sangesland:

ATC Associates Inc. (ATC) is submitting this Site Investigation Report for the U-Haul Moving Center # 803-62, located at 562 West 23rd Street, New York, New York (the "Site"). The data provided in this report was designed to supplement the data presented in a Site Closure Letter, submitted to the New York State Department of Environmental Conservation (NYSDEC) on May 18, 2000. Following submittal of the Site Closure Request, the NYSDEC requested further investigation of the soil and groundwater conditions beneath the site, specifically in the vicinity of an abandoned 1,000 gallon, reportedly fuel oil underground storage tank (UST). The request for additional data was made during a meeting between the NYSDEC and ATC. Based on the results of the supplemental data provided in this report, ATC recommends that a no further action letter be issued for the Site.

Background

The Site currently operates as a truck rental and mini-storage facility by U-Haul International. The Site is completely occupied by a multi-floor building. The interior drive areas are covered in concrete. The Site lies at an elevation of 7 feet above sea level and is 600 feet from the Hudson River. Local topography is essentially flat and the area is developed with industrial and commercial properties. A Site Plan is provided as Attachment 1. A groundwater gradient map, prepared as part of a prior report by Pinnacle Environmental, is provided as Attachment 2. Historic information regarding the petroleum releases at the Site was previously summarized in ATC's May 18, 2001 Site Closure Letter. Copies of all available reports regarding petroleum releases at the Site were also attached with that letter. A brief summary of the historical USTs at the Site is provided below:

- A 1,000-gallon gasoline underground storage tank (UST), a 1,000-gallon diesel UST and one dispenser were formerly operated to fuel rental trucks at the Site. The USTs were removed in April 1997 and were located at the western portion of the Site (refer to Site Plan).

- Prior to 1997, a 550-gallon gasoline UST and a 1,000-gallon fuel oil UST were closed in place. The 550-gallon gasoline UST is located at the eastern portion of the Site and the 1,000-gallon fuel oil UST is at the central portion of the Site (refer to Site Plan).

NYSDEC Spill Number 90-00199 was issued for a tank test failure in 1990. NYSDEC Spill Number 97-00188 was issued when contamination was detected beneath the remote fill lines during the removal of the two 1,000 gallon USTs in 1997.

Subsurface Investigation Objective

In 1994 American Hi-Tech, Inc. performed a Subsurface Site Investigation in the vicinity of the abandoned 550-gallon UST and the abandoned 1,000-gallon UST. The results of the investigation revealed that volatile organic compounds (VOCs) were detected above NYSDEC Technical and Administrative Guidance Memorandum No. 4046 (TAGM Memo) Recommended Soil Cleanup Objectives in one soil sample from boring B-4. This boring was located adjacent to a reportedly abandoned 1,000-gallon fuel oil UST. The NYSDEC indicated during the meeting that the concentrations of VOCs in the soil sample were high enough to warrant additional groundwater samples. Furthermore, the NYSDEC indicated that the reported location of the abandoned 1,000-gallon tank is crossgradient from the existing monitoring wells; therefore, the data from the monitoring wells was insufficient to determine if groundwater had been impacted by potential releases from the UST.

In addition, the NYSDEC and the New York City Fire Department responded to a report of free-phase petroleum penetrating through the basement walls of the on-site building in 1997. It was reported to ATC that free-phase petroleum had been spilled into the basement during a delivery. No free-phase product has since been reported at the Site either infiltrating into the basement or in any of the on-site monitoring wells.

Scope of Work

Ground-Penetrating Radar

ATC performed a Ground Penetrating Radar (GPR) investigation on May 8, 2001 to determine to the best extent possible, the location of the abandoned 1,000-gallon UST. A GPR system consists of a radar control unit, a control cable and a transducer (antenna). The control unit transmits a trigger pulse at a normal repetition rate of 50 KHz/sec. The trigger pulse is sent to the transmitter electronics in the transducer via the control cable. The transmitter electronics amplify the trigger pulses into bipolar pulses that are radiated to the ground surface. The transformed pulses vary in shape and frequency according to the transducer used. In the subsurface, variations of the signal occur at boundaries where there is a dielectric contrast between materials (void, steel, soil type, etc.). Signal reflections travel back to the control unit and are represented as color graphic images for interpolation. This system is capable of transmitting electromagnetic energy in the frequency range of 16 MHz to 200 MHz.

The results of the GPR indicated that the UST was located further south than originally suspected (toward the storage area, refer to the Site Plan, Attachment 1). The location of the tank was marked with spray paint.

Soil and Groundwater Investigation

On May 15, 2001, ATC provided oversight during the advancement of six soil borings near former soil boring B-4 and the abandoned 1,000-gallon UST. Aquifer Drilling and Testing (ADT) of New Hyde Park, New York was contracted to complete the borings. The boring locations are shown on the Site Plan provided as Attachment 1. Soil borings GP-2, GP-4 and GP-5 were completed to delineate contamination around former soil boring B-4 and characterize the condition of soil along the boundary of the building. Soil borings GP-1 and GP-3 were completed hydraulically downgradient from the abandoned 1,000-gallon UST to determine if a release occurred from this tank. Soil boring GP-6 was advanced to delineate any groundwater contamination associated with the 1,000-gallon tank. One additional boring was to be collected in the basement to evaluate conditions beneath the concrete floor, however the basement was flooded and no boring was advanced.

All soil borings were advanced to the water table using a drilling tool identified by the trade name "Geoprobe" to approximately 14 feet below ground surface (bgs). At each boring location, the soil column was screened for the presence of volatile petroleum compounds using a photoionization detector (PID). The interval within the soil column that exhibited the greatest evidence of petroleum contamination, based on visual observation and PID measurements, was retained and sent to a laboratory for analysis. Where no evidence of contamination was found, the interval just above the water table was retained and submitted for laboratory analysis. Samples were collected from borings GP-1 through GP-5. A groundwater sample only was collected from GP-6 since no further soil characterization is warranted in this area (see Figure 1). The soil samples were analyzed for volatile organic compounds (VOCs) and semi-VOCs using EPA Methods 8021 and 8270, respectively. The NYSDEC STARS analyte list was used for both analytical methods.

In addition to collecting soil samples, groundwater samples were retained for laboratory analysis from each boring location. The groundwater samples were analyzed for VOCs and SVOCs using EPA Methods 8021 and 8270, respectively. The NYSDEC STARS analyte list was used for both analytical methods. All soil and groundwater samples were submitted to SciLab of Weymouth, Massachusetts, a New York State Department of Health approved laboratory.

Results

The PID measurements collected during drilling ranged from 0.0 parts per million (ppm, various borings) to 822 ppm (6 feet bgs @ GP-5). The soil boring logs are provided as Attachment 3 and include all PID measurements. Based on the results of laboratory analysis on the soil samples, the samples collected from borings GP-1 through GP-4 exhibited either non-detect ("ND") VOC and SVOC concentrations, or exhibited concentrations below the Recommended Soil Cleanup Objectives as defined in the TAGM Memo. One compound, O-xylene, was detected slightly above the Recommended Soil Cleanup Objectives in the soil sample collected from GP-5. The concentration detected (1,160 parts per billion, ppb) is below the Recommended Soil Cleanup Objective for Mixed Xylenes (i.e. total xylenes, includes O-Xylene and M & P-Xylenes). The concentration is relatively low, and since this was the only VOC detected above the Recommended Soil Cleanup Objective in the sample, it is not considered an area of environmental concern that warrants a recommendation for additional investigation or remediation. A summary table of the soil results is provided as Attachment 4. The complete laboratory analytical data package is provided as Attachment 5.

Based on the laboratory analysis of the groundwater samples, several VOCs and SVOCs were detected above the applicable NYSDEC Ambient Water Quality Standards and Guidance Values, as defined in the NYSDEC Technical and Operational Guidance Series (1.1.1), *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations* (NYSDEC TOGS Memo). SVOCs were only detected in the groundwater sample collected from geoprobe location GP-6, at relatively low concentrations. Several VOCs, however, were detected at slightly elevated concentrations at geoprobe location GP-6, which represents the area downgradient of the abandoned 550-gallon UST at the eastern portion of the Site. Despite GP-6 exhibiting the highest concentrations, the total VOC concentration in this sample was below 3 ppm. The remaining samples exhibited total VOC concentrations below 0.2 ppm. A summary table of the groundwater results is provided as Attachment 4. The complete laboratory analytical data package is provided as Attachment 5.

<u>Basement</u>

The anticipated Scope of Work was to include the collection of one soil and one groundwater sample beneath the basement to address any remaining conditions associated with the report of free-phase petroleum penetrating through the basement walls of the on-site building in 1997. Upon arrival to the basement on May 15, 2001, ATC noted that the basement was flooded with approximately a half-foot of water. A sample of the water from the basement was inspected for visual or olfactory evidence of petroleum contamination. No visual evidence or olfactory evidence of contamination was identified. Furthermore, there have been no complaints about odors or free product in the basement since the initial report in 1997. Based on the previous groundwater analytical results from wells MW-2 and MW-3, and the current soil/groundwater results from the recent geoprobe investigation, free product was not identified and the contaminant concentrations are relatively low.

Conclusions and Recommendations

Based upon the results of this study, minimal to no VOC and SVOC contamination exists in the subsurface soils. One compound, O-xylene, was detected in soil slightly above the TAGM Memo Recommended Soil Cleanup Objective, however the concentration is lower than the Cleanup Objective for Mixed (total) Xylenes. The compound was also detected in only one location (GP-5) and ATC concludes that this condition does not warrant a recommendation for additional investigation or remediation. The VOCs reported in former boring B-4 (collected in 1994) have now been sufficiently delineated and no further action is warranted.

Low levels of petroleum-related VOCs and 2-methyl-naphthalese exist in the groundwater beneath the Site. The total VOC and SVOC concentrations detected in the groundwater from the geopbrobe borings ranged from 0.053 ppm (GP-2) to 2.192 ppm (GP-6). The groundwater samples collected from the previously installed monitoring wells at the Site indicate VOC and SVOC concentrations ranging from ND (MW-1 and MW-2) to 0.130 ppm (MW-3). The levels across the Site are relatively low. Based on these findings, ATC recommends that the NYSDEC issue a No Further Action letter for the Site. The following conclusions support this recommendation.

- ATCs most recent soil investigation indicates that the only area of concern with respect to soil is the limited area around B-4. The results of soil samples collected to delineate the extent of contamination around B-4 exhibited VOC and SVOC concentrations below the TAGM Memo Recommended Soil Cleanup Objectives, with the exception of one compound (O-Xylene), detected just slightly above the appropriate Recommended Soil Cleanup Objective. Furthermore, past soil samples collected near the former UST area, former dispensers and 550-gallon abandoned UST exhibited concentrations below the TAGM Memo Recommended Soil Cleanup Objectives.

- Past and recent groundwater sampling events indicate that low levels of VOCs and SVOCs are present in groundwater. The results from recent geoprobe sampling indicate slightly higher concentrations than those detected in the monitoring wells. The current levels do not, however, suggest that significant releases occurred from the 550-gallon or 1,000-gallon abandoned USTs. Based on the most recent groundwater data from the wells (6/27/99) and the geoprobe groundwater sampling results (5/15/01), the total VOC and SVOC concentrations at the Site range from ND to 2.193 ppm. Separate-phase hydrocarbon has never been detected in any boring or monitoring well. The levels are indicative of small, old petroleum releases that have reached a state equilibrium between the contamination present in the soil and the contamination present in the groundwater.

- The contaminant concentrations in the groundwater samples collected from the monitoring wells are lower than the groundwater samples collected during the May 2001 geoprobe investigation. It should be noted that groundwater samples collected via geoprobe can exhibit higher levels of VOCs since the water is not purged prior to collecting a sample. Contaminants are adsorbed by the soil in higher concentrations, therefore when a sample is collected without purging, the VOCs tend to be found at higher concentrations.

- The risk of exposure to potential sensitive receptors at and around the Site is low. The Site is located in the Chelsea district of Manhattan, New York. Water is supplied to the Site and surrounding properties by a municipal water supply system and there are no potable or public supply wells in the area. The closest surface water body is the Hudson River, which is approximately 1,000 feet from the Site. Subsurface utilities exist along the property boundary, however no separate-phase hydrocarbon is present in groundwater, therefore the risk of hydrocarbon vapors impacting the utilities is low.

- The grab sample collected from the floodwater in the basement was inspected for visual or olfactory evidence of petroleum contamination. No visual evidence or olfactory evidence of contamination was identified. ATC does not believe that the complaint in 1997, of free product in the basement of the on-site building, remains a concern. Based on all soil and groundwater samples collected from the Site to date, the results do not suggest a significant release occurred that had the potential to seep through basement walls. Wells MW-2 and MW-3 (near the basement) have never exhibited free product and have historically exhibited low VOC concentrations. The same is true for the soil samples collected along the boundary of the building (from current borings GP-2, GP-4 and GP-5). Furthermore, there have been no complaints about odors or free product in the basement since the initial report in 1997.

- The source of the minimal soil and groundwater contamination at the Site has been removed. Any existing contamination will naturally attenuate via the processes of migration, degradation and adsorption. Furthermore, the Site is paved and developed with a commercial building, limiting the infiltration of absorbed contamination to the water table.

Please do not hesitate to call the undersigned with questions or comments.

Sincerely,
ATC ASSOCIATES INC.

Kristien T. Vanmarcke
Senior Project Manager

David M. Winslow, Ph.D.
Senior Geologist, Subsurface Investigation and Remediation Group Manager

Attachments:

Attachment 1:	Site Plan with Past and Current Geoprobe Boring and Monitoring Well Locations
Attachment 2:	Pinnacle Environmental Technologies Inc. Groundwater Gradient Map
Attachment 3:	Boring Logs
Attachment 4:	Summary Tables of Soil and Groundwater Data
Attachment 5:	Laboratory Analytical Data Package

cc: Dale Allison, ATC Associates Inc.
Reid Riner, Amerco Real Estate Company
ATC File

Attachment 1:

Site Plan with Geoprobe Locations

Attachment 2:

Pinnacle Environmental Technologies Inc.
Groundwater Gradient Map

Attachment 3:

Boring Logs

Attachment 4:

Summary Tables of Soil and Groundwater Data

Attachment 5:

Laboratory Analytical Data Package

SOIL ANALYTICAL RESULTS

U-Haul Chelsea
562 W. 23th Street
New York, New York

Boring #:	GP-1	GP-2	GP-3	GP-4	GP-5	NYSDEC Soil Cleanup Objectives
Depth	8'	8'	7'	7-8'	6-7'	
VOCs (8021)						
p-Isopropyltoluene	ND	ND	ND	ND	ND	10,000*
n-Butylbenzene	ND	ND	ND	ND	533	10,000*
sec-Butylbenzene	ND	ND	ND	ND	708	10,000*
tert-Butylbenzene	ND	ND	ND	ND	ND	10,000*
Naphthalene	ND	ND	ND	ND	ND	13,000
Benzene	ND	ND	ND	ND	ND	60
Ethylbenzene	ND	ND	ND	ND	782	5,500
Toluene	ND	ND	ND	ND	947	1,500
Isopropylbenzene	ND	ND	ND	ND	ND	2,300
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	10,000*
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	3,300
Methyl t-butyl ether	ND	ND	ND	ND	ND	120
n-Propylbenzene	ND	ND	ND	ND	ND	3,700
O-Xylene	ND	ND	ND	ND	**1,160**	600
M & P Xylenes	ND	ND	ND	ND	ND	800/1,200
SVOCs (8270)						
Acenaphthene	ND	ND	ND	ND	ND	50,000
Acenaphthylene	ND	ND	ND	ND	ND	41,000
Anthracene	ND	ND	ND	ND	ND	50,000
Benzo(a)anthracene	ND	ND	ND	ND	ND	224 or MDL
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	61 or MDL
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	610 or MDL
Benzo(a)pyrene	ND	ND	ND	ND	ND	61 or MDL
Benzo(g,h,I)perylene	ND	ND	ND	ND	ND	50,000
Chrysene	ND	ND	ND	ND	ND	400
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	14.3
Fluoranthene	ND	ND	ND	ND	ND	50,000
Fluorene	ND	ND	ND	ND	ND	50,000
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	3,200
Naphthalene	ND	ND	ND	2,400	500	13,000
2-Methyl-Naphthalene	ND	ND	1,600	1,900	740	500,000
Phenanthrene	ND	ND	ND	ND	ND	50,000
Pyrene	ND	ND	ND	ND	ND	50,000

All results in parts per billion (ppb)
NYSDEC Cleanup Objectives = NYSDEC Recommended Soil Cleanup Objectives (TAGM #4046)
Boldface type indicates concentration is above the above Recommended Soil Cleanup Objectives
** Individual non-carcinogenic semivolatiles < 50 ppm and total semi-volatiles not listed < 500 ppm*
MDL = Laboratory method detection limit

GROUNDWATER ANALYTICAL RESULTS
U-Haul Chelsea
562 W. 23rd Street
New York, New York

Boring #:	GPW-1	GPW-2	GPW-3	GPW-4	GPW-5	GPW-6	NYSDEC Groundwater Standards
Depth from Surface:	14'	14'	12'	14'	14'	12'	
VOCs (8021)							
p-Isopropyltoluene	ND	ND	ND	ND	3.2	ND	5
n-Butylbenzene	5.6	ND	3.1	ND	2.7	**62.1**	5
sec-Butylbenzene	4.4	1.9	**6.7**	2.2	**6.6**	**444**	5
tert-Butylbenzene	**7.2**	1	4.2	ND	2.3	**483**	5
Naphthalene	6.9	ND	3.1	ND	4.4	**85**	10
Benzene	**1.2**	ND	3	ND	**3.5**	**24.1**	1
Ethylbenzene	2.9	2.3	ND	ND	ND	**147**	5
Toluene	**16.2**	2.7	**8.5**	1.9	**8.9**	ND	5
Isopropylbenzene	ND	2.2	**23.9**	3.4	**11.3**	ND	5
1,2,4-Trimethylbenzene	**10**	ND	1	ND	1.3	**363**	5
1,3,5-Trimethylbenzene	1.6	ND	ND	ND	ND	**98.1**	5
Methyl t-butyl ether	18.9	37.6	**58.3**	**182**	**125**	ND	10
n-Propylbenzene	**12.8**	2.5	**16.8**	2.9	**10.2**	**43.4**	5
O-Xylene	4.4	2.5	4.2	1.6	4.4	**165**	5
M & P-Xylenes	**7.5**	ND	2.7	ND	1.4	**249**	5
BTEX	**29.3**	**7.5**	**18.4**	**3.5**	**18.2**	**585.1**	
SVOCs (8270)							
Acenaphthene	ND	ND	ND	ND	ND	ND	20
Acenaphthylene	ND	ND	ND	ND	ND	ND	NL
Anthracene	ND	ND	ND	ND	ND	ND	50
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	0.002
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	0.002
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	0.002
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	0.002
Benzo(g,h,I)perylene	ND	ND	ND	ND	ND	ND	NL
Chrysene	ND	ND	ND	ND	ND	ND	0.002
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND	5
Fluoranthene	ND	ND	ND	ND	ND	ND	50
Fluorene	ND	ND	ND	ND	ND	ND	50
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	0.002
Naphthalene	ND	ND	ND	ND	ND	**21.2**	10
2-Methyl-Naphthalene	ND	ND	2.14	ND	ND	**7.36**	4.7
Phenanthrene	ND	ND	ND	ND	ND	ND	50
Pyrene	ND	ND	ND	ND	ND	ND	50

All results in parts per billion (ppb)
NL = Not listed
NYSDEC Groundwater Standards = NYSDEC Ambient Water Quality Standards and Guidance Values
Boldface type indicates concentration is above the Groundwater Standard

GROUNDWATER ANALYTICAL RESULTS

U-Haul Chelsea
562 W. 23rd Street
New York, New York

803062
PARTIAL

December 27, 2001

Mr. Steven Sangesland
Environmental Engineer I
New York State Department of Environmental Conservation
47-40 21st Street
Long Island City, New York 11101

RE: **Groundwater Modeling**
NYSDEC Spill Nos. 9000199 and 9700188
U-Haul Moving Center #803-62
562 West 23rd Street (Chelsea)
New York, New York

Dear Mr. Sangesland,

As agreed upon during our discussions regarding the U-Haul property located at 562 West 23rd Street, New York, New York (the Site), ATC has conducted contaminant fate transport modeling to supplement the results of the Site Investigation Report prepared by ATC, dated July 30, 2001. Specifically, this letter addresses the fate of contamination detected in the vicinity of a former 550-gallon gasoline underground storage tank (UST) under the eastern portion of the Site building. Based upon the results of the Site Investigation, the historical review, and the groundwater modeling presented herein, ATC requests that a no further action letter be issued for this Site and the above referenced spill numbers be closed. Per our meeting with you in October, please forward this report to the Albany NYSDEC office for review.

Background

The Site is currently operated by U-Haul International as a truck rental and self-storage facility. All on-site truck-fueling operations have ceased, and therefore all potential petroleum storage tanks have been removed or properly abandoned. The Site is improved with a multi-floor building which occupies the entire parcel. The interior drive areas are covered in concrete. The Site lies at an elevation of seven feet above sea level and is 600 feet east of the Hudson River. Local topography is essentially flat and the area is developed with industrial and commercial properties. A Site Plan is provided as Attachment 1. Historical information regarding the petroleum releases at the Site was provided in ATC's May 18, 2000 Site Closure Letter. Copies of all available reports regarding petroleum releases at the Site were also attached with that letter. A brief summary is provided below:

- In 1994 American Hi-Tech, Inc. performed a Subsurface Site Investigation in the vicinity one abandoned 550-gallon gasoline UST and one abandoned 1,000-gallon fuel oil UST (refer to Site Plan). The results of the investigation revealed that volatile organic compounds (VOCs) were detected above New York State Department of Environmental Conservation Technical and Administrative Guidance Memorandum #4046 (TAGM Memo) Recommended Soil Cleanup Objectives in one soil sample from boring B-4. This boring was reportedly located adjacent to the abandoned 1,000-gallon fuel oil UST and was collected at the soil/groundwater interface. More recent information (the results of ground penetrating radar performed in May 2001) indicates that the 1,000-gallon abandoned fuel oil UST is further southwest of B-4.

- In 1997, Tyree Brothers Environmental Services, Inc. excavated and removed two 1,000-gallon gasoline USTs at the western portion of the Site (refer to Site Plan). NYSDEC Spill Number 97-00188 was issued for the Site. Post-excavation soil samples revealed that VOCs above the NYSDEC TAGM Memo Recommended Soil Cleanup Objectives were present in soil beneath the fill lines. Approximately 8.5 tons of petroleum-contaminated soil was excavated and removed from the Site from the vicinity of the remote fill lines. The soil was thermally treated and recycled at Posillico Brothers Asphalt Company in July 1997.

- In 1997, the NYSDEC and the New York City Fire Department responded to a report of free-phase petroleum penetrating through the basement walls of the on-site building. It was reported to ATC by U-Haul personnel, that free-phase petroleum had been spilled into the basement during a delivery. No free-phase product has since been reported at the Site either infiltrating into the basement or in any of the on-site monitoring wells.

- On July 31, 1997, Pinnacle Environmental Technologies (Pinnacle) issued a Site Assessment Report. The Site Assessment Report addressed the soil contamination detected during previous investigations. The report indicated that VOCs were detected above the TAGM Memo Recommended Soil Cleanup Objectives in two of the nine soil samples collected from three soil borings completed as part of the investigation, including the former fill line trench formerly excavated by Tyree. However, the contamination was only detected at 3 feet below grade. Samples collected from deeper intervals exhibited VOC concentrations below the NYSDEC TAGM Memo Recommended Soil Cleanup Objectives. Pinnacle installed three groundwater monitoring wells as part of their investigation. One well was installed adjacent to the former fill line trench. Groundwater samples were collected from the wells and the results indicated that total BTEX concentrations (benzene, toluene, ethylbenzene and xylene) exceeded the NYSDEC Ambient Groundwater Quality Criteria in wells MW-1 and MW-3. The total BTEX concentrations ranged from 82.7 micrograms per liter (ug/l) to 84 ug/l.

- Pinnacle initiated a groundwater-monitoring program involving biannual sampling and reporting of the three monitoring wells. The wells were sampled on May 31, 1997, March 6, 1998, June 20, 1998, November 22, 1998, March 31, 1999 and June 27, 1999. During this period, dissolved BTEX plus MTBE decreased to non-detect in MW-1, non-detect in MW-2 and fluctuated in MW-3. The last sampling event (June 27, 1999) indicated BTEX and MTBE concentrations in MW-3 at 45.8 ug/l and at 53 ug/l, respectively.

- In May 2001, ATC collected additional soil and groundwater samples to delineate the contamination around former boring B-4, to characterize the subsurface conditions along the boundary of the Site building, and to evaluate subsurface conditions downgradient of the abandoned 1,000-gallon fuel oil UST. The results indicated that low levels of petroleum-related BTEX and 2-methyl-naphthalene remain in the groundwater beneath the abandoned 550-gallon and 1,000-gallon USTs. The highest total BTEX concentration detected in the groundwater was 585.1 ppb (GP-6), near the abandoned 550-gallon gasoline UST. The location of GP-6 is shown on the Site Plan, provided as Attachment 1.

Groundwater Modeling

To evaluate the migration potential of the remaining residual BTEX beneath the Site, ATC utilized the Bioscreen Natural Attenuation Decision Support System Version 1.4 (Bioscreen) to model the fate and transport of the dissolved BTEX plume. The model was developed by the USEPA for use in determining when natural attenuation is an appropriate remedial action at petroleum spill sites. Bioscreen is a two dimensional model for simulation of the natural attenuation of organic compounds, with densities less than water, in groundwater, due to the processes of advection, dispersion, sorption, and biodegradation. The model simulates the attenuation of organic compounds using literature value and site-specific input parameters that correlate with the subsurface conditions beneath the Site.

ATC collected site-specific data to utilize in the model on October 24, 2001. One soil sample was collected and analyzed for total organic carbon, and two groundwater samples were collected for sulfate, nitrate, ferrous iron and methane. The laboratory data is provided as Attachment 2.

The input parameters used to run the model are presented on the following page:

Table 1. Model Input Parameters

Input Parameter	Input Value	Reference
Hydraulic Conductivity	2.2e-3 cm/sec	Field-Determined (Measured)
Hydraulic Gradient	0.0043 ft/ft	Field-Determined (Measured)
Porosity	0.2	Literature value, Groundwater and Wells, Driscol, F.G. 1986.
Longitudinal Dispersivity	13.3	From literature to achieve a 10:1 ratio of length vs width in a petroleum plume.
Vertical Dispersivity	1.3	
Retardation Factor (benzene)	1.6	Literature value, Zagorski and others, 1997.
First Order Decay Coefficient	1.4	Based on unacclimated aqueous aerobic and anaerobic biodegradation half life of Benzene from Handbook of Environmental Degradation Rates, Howard et al., 1991.
Delta Oxygen	2.0 mg/l	Field-Determined (Measured)
Delta Nitrate	0 mg/l	Field-Determined (Measured)
Observed Ferrous Iron	0 mg/l	Field-Determined (Measured)
Delta Sulfate	10.2 mg/l	Field-Determined (Measured)
Observed Methane	1.03 mg/l	Field-Determined (Measured)

In order to achieve a conservative estimate of the fate of the BTEX plume, a source area concentration greater than the actual levels detected was selected. ATC used an initial soluble mass of petroleum of 1,000,000 kilograms (kg). This mass would mimic a continual source of petroleum hydrocarbons dissolving into the water table. However, since all tanks have been taken out of service, this will result in a conservative modeled scenario.

In addition, ATC used current source area concentrations as inputs into the model in order to determine if the present concentrations of BTEX will migrate off-site and to determine attenuation times. The groundwater data collected during the subsurface investigation completed in May 2001 was used in the model (this data was provided as Attachment 5 of ATC's July 30, 2001 Site Investigation Report). The model output provides results under three scenarios: No biodegradation, First Order Decay and Instantaneous Reaction.

Groundwater Modeling Results

The results of the model are provided in Attachment 3.

No Biodegradation: After 15 years, the no biodegradation (dispersion only) model overestimates the measured values of BTEX in the downgradient geoprobe points by ten times the actual concentrations. In addition, the model predicts that the plume length is greater than 500 feet. Based on the site-specific groundwater data, it does not appear that the results of the no degradation model fit the actual data.

First Order Decay: The first order decay model matches the measured field data well. When the model is run with an initial source area concentration of 500 ppm (BTEX) and a soluble mass of 1,000,000 kg of BTEX, the results indicate that the maximum length of the BTEX plume will be 150 feet and the maximum concentration at this distance would be 0.001 ppm. Under this model scenario, which matches Site data, BTEX will not migrate off site. After 15 years, total BTEX concentrations will reduce to 0.037 ppm 50 feet downgradient of the source.

Instantaneous Reaction: This model scenario incorporates measured values for aerobic and anaerobic acceptors. The instantaneous reaction model does not match the measured field data and overestimates the concentrations of BTEX 25 feet from the source area even after 15 years. However, under this modeled scenario, the BTEX will travel only 50 feet in 15 years.

Model Discussions

The results of the Bioscreen groundwater model, using an initial source concentration of 500 ppm (current Site concentrations), with a soluble mass of 1,000,000 kg BTEX (conservative estimate), will not result in the migration of BTEX off the U-Haul property. The results suggest that natural attenuation is an appropriate remedial technology for the dissolved hydrocarbon plume and that a no further action letter should be issued. Further support for the natural attenuation approach for the Site was presented in ATC's July 2001 Site Investigation Report.

Sincerely,
ATC Associates Inc.

David M. Winslow, Ph.D.
Group Manager

Kristien VanMarcke
Sr. Project Manager

Attachments:
1. Site Plan
2. Laboratory Analytical Results
3. Bioscreen Modeling Results

ATTACHMENT 1
SITE PLAN

ATTACHMENT 2
LABORATORY ANALYTICAL RESULTS

ATTACHMENT 3
BIOSCREEN MODEL RESULTS

803062
PARTIAL

September 27, 2002

Ms. Michele Tipple
New York State Department of Environmental Conservation
Division of Environmental Remediation
Bureau of Spill Management
47-40 21st Street
Long Island City, NY 11101

Re: Underground Storage Tank Closure and Focused Subsurface Investigation
U-Haul Chelsea, Entity # 803-062
562 West 23rd Street
New York, New York
ATC Project # 15.75093.0055
NYSDEC Spill No. 02-05608

Dear Ms. Tipple:

ATC Associates Inc. (ATC) was retained Amerco Real Estate Company, to perform underground storage tank (UST) closure oversight activities and Focused Subsurface Investigation at Chelsea U-Haul Center, 562 West 23rd Street, New York, New York (The "Site").

INTRODUCTION

The scope of this project included removal of eight (8) 550-gallon fuel oil USTs and in-place closure of one (1) 1,000-gallon former fuel oil UST at the Site. The USTs were constructed of steel and were situated beneath a concrete pad, on northeastern portion of the Site buildings, as shown on the attached Site plan. The USTs were situated in five areas (see Attachment 1). Area 1 contained four (4) 550-gallon USTs, Area 2 contained one (1) 1,000-gallon UST and each Areas of 3, 4 and 5 contained one (1) 550-gallon USTs at the Site.

ATC's review of a 1976 Sanborn map revealed that buried underground storage tanks (USTs) were present beneath northeastern portion of the Site Buildings fronting West 23rd Street from approximately 1950 to 1981. Soil and groundwater samples were not collected from the northeastern portion of the Site during ATC's previous Subsurface Site Investigations performed in September 2000 through May 2001. Therefore, ATC recommended the removal or proper abandonment of these USTs located under the northeastern portion of the Site.

The suspect USTs located along the northeastern portion of the property were located using a backhoe. All USTs were drained of all liquids/products. The USTs were manually cleaned. The former 1,000-gallon petroleum UST was filled with concrete slurry by T.R. Winegar, Environmental Inc. (T.R.W.). The former eight (8) 550-gallon petroleum USTs were removed for off-site disposal. All manifests and receipts of lading for material transported off-site are provided in Attachment 3.

ATC collected confirmatory samples for laboratory analysis in the vicinity of the USTs to evaluate if subsurface soil quality had been adversely affected by the historical usage of these USTs. Laboratory analytical results of confirmatory samples indicated that soil samples contaminated with low levels of volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) above the applicable New York State Department of Environmental Conservation (NYSDEC) guidance values, were present within the vicinity of the USTs at the Site building. The NYSDEC was contacted and NYSDEC spill number 02-05608 was issued for the Site.

ATC subsequently performed a Subsurface Site Investigation in the vicinity of the USTs to evaluate if subsurface groundwater quality had been adversely affected by the USTs. Soil borings were drilled through the concrete slab within the vicinity of the UST excavation location within the Site building, and soil samples were collected for field screening and groundwater samples were collected for laboratory analysis.

SCOPE OF WORK

As part of the UST Closure and Investigation, The following tasks were completed:

- Removal of eight (8) 550-gallon USTs.
- In-place closure of one (1) 1,000-gallon UST.
- Confirmatory soil samples (five samples) were collected from each tank location for laboratory analysis.
- ATC collected four groundwater samples for laboratory analysis. The samples were analyzed for VOCs and PAHs under EPA Methods 8021 and 8270, respectively.
- Submittal of the soil samples to a New York State Department of Health (NYSDOH) certified laboratory for appropriate analysis.

REMOVAL OF 550-GALLON USTs

ATC oversaw removal of eight (8) 550-gallon petroleum USTs and the in place closure of one 1,000-gallon petroleum UST from July 15 through 18, 2002. Approximately x500-gallons of liquid (water mixture) and sludge were removed from the USTs and transported to off-site disposal facility. Subsequently, the USTs were drained of all product, and manually cleaned. Eight 550-gallon petroleum USTs were removed for off site disposal by T.R.W. Removal of the 1,000-gallon UST was not possible, since such an attempt would entail demolition of structural bearing walls at the Site building.

Approximately 2,500-gallons of petroleum sludge mixture was pumped from the USTs and transported to Clean Water of New York Facility (USEPA ID # NYD000968545) in Staten Island, New York. See Attachment 3 for waste manifests.

ATC inspected soil from the excavation. All soil beneath and surrounding the eight (8) 550-gallon USTs was free of any obvious signs of contamination. Field screening, using a photoionization detector (PID), detected no significant levels of ionizable volatile organic compounds (VOCs) in the endpoint soil samples collected. ATC collected one bottom endpoint soil sample and four sidewall endpoint soil samples from the each of the four (4) UST areas. These samples were submitted to a NYSDOH certified laboratory for analysis using USEPA Method 8021-VOCs and 8270-semivolatile organic compounds (SVOCs). See Attachment 3, Laboratory Results.

CLOSURE OF ONE 1,000-GALLON FORMER HEATING OIL UST

ATC oversaw the in-place closure of one (1) 1,000-gallon UST on July 18, 2002. Approximately 1,000-gallons of liquid (oily water) and sludge were removed from the UST and transported to the Clean Water of New York facility in Staten Island, New York (USEPA ID# NYD000968545). Subsequently, the UST was drained of all product, manually cleaned and filled it with concrete slurry by T.R.W.

ATC inspected soil from the excavation. Soil surrounding the tank exhibited slight petroleum odor. Field screening, using a PID detected 0.0 parts per million to 15 ppm. Removal of soil and the UST was not possible due to such an attempt would entail demolition of a structural bearing wall at the Site building. ATC collected endpoint soil samples. ATC collected one bottom endpoint soil sample and four sidewall endpoint soil samples from the tank excavation. These samples were submitted to a NYSDOH certified laboratory for analysis using USEPA Methods 8021-VOCs and 8270- SVOCs. See Attachment 3, Laboratory Results.

RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES

Soil samples were submitted to a laboratory that participates in the New York State Environmental Laboratory Accreditation Program (ELAP) for analysis. SciLab Boston, Inc. of Weymouth, MA., analyzed each soil sample for VOCs and PAHs in accordance with EPA Methods 8021 and 8270, respectively.

Laboratory analytical results of confirmatory samples indicated soil samples contaminated with low level VOCs and SVOCs above the applicable NYSDEC guidance values, were present within the vicinity of the USTs at the Site building. The NYSDEC was contacted and NYSDEC spill number 02-05608 was issued for the Site. Table 1 trough 5 summarizes the analytical results for the soil samples.

SUBSURFACE SITE INVESTIGATION

On August 30, 2002, ATC conducted a subsurface site investigation adjacent to and in the vicinity of the UST excavations (Pit #1 trough 4). A total of four (4) soil borings were drilled through the concrete slab in the Site building. Four groundwater samples were collected for laboratory analysis (the water table at the Site is approximately seven (7) feet below the surface of the floor slab). The samples were analyzed for VOCs and PAHs under EPA Methods 8021 and 8270, respectively. Relative soil boring locations are shown on the schematic diagram presented in Attachment 1.

Soil borings B-1, B-2, B-3 and B-4 were advanced in the immediate vicinity of the USTs to evaluate potential impacts from historical releases of petroleum to Site soil and groundwater. Since no field evidence of contamination, or volatile organic vapors were detected with the photoionized detector (PID) in any of the samples from these borings, and soil samples had been collected during the UST closure activities, no soil samples were submitted for laboratory analysis. Groundwater samples GW-1, GW-2, GW-3 and GW-4, collected from borings B-1, B-2, B-3 and B-4, and submitted for laboratory analysis.

GROUNDWATER SAMPLING & ANALYSES

ATC collected four (4) groundwater samples GW-1, GW-2, GW-3 and GW-4 for laboratory analysis from four borings (B-1, B-2, B-3, and B-4) using a Geoprobe groundwater-sampling unit. Groundwater samples were analyzed utilizing EPA Method 8021-VOCs and EPA Method 8270-SVOCs. Depth to groundwater at the Site is approximately seven (7) feet below surface of the floor slab.

Groundwater samples were placed in laboratory-supplied glassware, labeled, placed in a cooler with ice, and submitted to the laboratory. All sampling equipment was decontaminated between sampling events and between boring locations. Table 6 summarizes the analytical results for the groundwater samples.

RESULTS OF LABORATORY ANALYSIS

Groundwater samples were submitted to a laboratory that participates in the New York State Environmental Laboratory Accreditation Program (ELAP) for analysis. SciLab Boston, Inc. of Weymouth, MA., analyzed each groundwater sample for VOCs and PAHs in accordance with EPA Methods 8021 and 8270, respectively.

- Groundwater sample GW-2 collected from the vicinity of the 550-gallon USTs (downgradient of the Pit #1) contained 19.4 ppb of Benzene, 67 ppb of Ethylbenzene, 264 ppb of 1,2,4-Trimethylbenzene, 66.7 ppb of 1,3,5-Trimethylbenzene, 48.6 ppb of n-Propylbenzene, 255 ppb of total xylenes and 39.7 ppb of naphthalene. These concentrations are at or slightly above the NYSDEC Division of Water Technical and Operational Guidance Series (1,1,1) Ambient Water Quality Standards (NYSDEC TOGS Memo) standard of 5 ppb for most of compounds.

- Analytical results of groundwater samples GW-1 and GW-4 collected from the vicinity of the 550-gallon USTs (PIT #5 and PIT#4) at the Site indicated that concentration of VOCs and PAHs were below the laboratory methods detection limits.

- Analytical results of groundwater sample collected from the vicinity of the former 550-gallon petroleum UST (PIT #3) at the Site contained 10.0 ppb of 1,2,4-Trimethylbenzene and 5.1ppb of total xylenes.

CONCLUSIONS AND RECOMMENDATIONS

The USTs closure work performed at the Site is summarized as follows:

- Eight (8) 550-gallon USTs were removed by T.R.W.

- One (1) 1,000-gallon former heating oil UST was closed in-place and sealed with concrete slurry by T.R.W.

- All sludge and liquid from USTs was transported to the Clean Water of New York Facility (NYD000968545), in Staten Island, New York

- The laboratory results of confirmatory soil samples have documented that slightly elevated VOCs and SVOCs containing contaminants in excess of the NYSDEC TAGM Memo Soil Cleanup Objectives and Cleanup Levels exists in the vicinity of the former USTs at the Site. The NYSDEC was contacted and NYSDEC spill number 02-05608 was issued for the Site.

- The laboratory results of groundwater sample GW-2 collected vicinity of the Pit #1 has documented that slightly elevated VOCs and SVOCs containing contaminants in excess of the NYSDEC TAGM Memo Soil Cleanup Objectives and Cleanup Levels exists in the vicinity of the former USTs at the Site.

- None of the remaining groundwater samples (GW-1, GW-3 and GW-4) collected within the vicinity of the remaining USTs at the Site contains compounds above the NYSDEC TOGS Memo Standards.

Based upon the results of this study, low levels of petroleum-related VOCs and SVOCs exist in the groundwater collected vicinity of the four (4) 550-gallon USTs (Pit #1) beneath the Site building. Based on these findings, ATC recommends that the NYSDEC issue a No Further Action letter for the subject Site. The following conclusions support this recommendation.

- Based on the groundwater data (GW-1 through GW-4), the total VOC and SVOC concentrations at the Site range from none detect to 0.34 ppm.

- The risk of exposure to potential sensitive receptors at and around the Site is low. The Site is located in Manhattan, New York. Water is supplied to the Site and surrounding properties by a municipal water supply system and there are no potable or public supply wells in the area.

- The source of the minimal soil and groundwater contamination at the Site has been removed (USTs). Any existing contamination will naturally attenuate via the processes of migration, degradation and adsorption. Furthermore, the Site is paved and developed with a commercial building, limiting the infiltration of absorbed contamination to the water table.

ATC recommends that the spill number 02-05608 associated with this Site be closed and a No Further Action letter be issued by the NYSDEC.

Sincerely,
ATC ASSOCIATES INC.

Levent Eskicakit
Senior Project Manager

David Winslow, PhD.
Subsurface Group Manager

Attachments:

Attachment 1:	Site Sampling Plan with Boring Locations
Attachment 2:	Laboratory Results
Attachment 3:	Waste Manifests
Attachment 4:	Tank Registration Form
Attachment 5:	Prior Reports

cc: Ms. Reid Riner – Amerco Real Estate
cc: Ms. Dale Allison – ATC Associates Inc.

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803062

PARTIAL

July 5, 2002

Mr. Reid Riner
Manager, Fuels and Environmental
Amerco Real Estate Company
2727 North Central Avenue, Suite 500
Phoenix, AZ 85004

RE: REPORT ON DRUM REMOVAL
U-Haul Moving & Storage No. 803-62
562 West 23rd Street
New York, New York
ATC Project No. #15.75093.0047

Dear Mr. Riner:

ATC Associates Inc. (ATC) is pleased to submit this report on the investigation and disposal of the unknown drums found in a second floor rental storage unit at the U-Haul Storage facility at the above-referenced location.

On April 26, 2002 Mr. Curt Schmidt of ATC inspected the storage room with the drums. One 55-gallon steel drum was found with a label indicating that the drum contained impregnated activated carbon. The other six plastic drums contained unknown liquids. Five drums had labels indicating that the drums contained a solution that included formic acid and hydrogen fluoride. ATC then contracted CODE Environmental of Carteret, New Jersey to collect and analyze samples of the drum contents so the drums could be removed and properly disposed.

The results of the analyses indicated that four of the plastic drums contained a dilute aqueous formic acid and ammonium hydrogen fluoride solution. One of the plastic drums contained a dilute aqueous sodium bicarbonate solution. The sixth plastic drum contained an aqueous trifluoroacetic acid and ammonium hydrogen fluoride solution. The 55-gallon steel drum contained impregnated bituminous coal in the form of activated carbon pellets. All analyses indicated that each drum was non-hazardous, and non-regulated by the U.S. Department of Transportation and the Resource Conservation and Recovery Act. The aqueous solutions discovered at the storage facility are believed to be spent process liquids typically used in the cleaning and flushing of tap lines in breweries and/or taverns.

On June 21, 2002, the drums were removed from the storage facility and sent to the Cyclechem, Inc. facility in Elizabeth, New Jersey for treatment/recycling. The non-hazardous bill of lading, analytical results and profile sheets are attached to this letter report.

If you have any questions regarding this report, pleases feel free to call our office.

Sincerely,

ATC ASSOCIATES INC.

Curt Schmidt, P.G.
Senior Project Manager

David Winslow
Subsurface Investigation and
Remediation Group Manager

cc: Dale M. Allison – National Account Manager

Attachments:
Analytical Results
Profile Sheets
Bill of Lading

803062

(32102)

PHASE I ENVIRONMENTAL SITE ASSESSMENT
of
U-HAUL
ENTITY #803-62
562 WEST 23RD STREET
NEW YORK, NEW YORK 10011
ATC PROJECT NO: 15.75093.0050

Prepared for:
AMERCO REAL ESTATE COMPANY
2727 NORTH CENTRAL AVENUE, SUITE 500
PHOENIX, AZ 85004

NOVEMBER 1, 2002

Prepared by:

ATC
ASSOCIATES INC.
ENVIRONMENTAL, GEOTECHNICAL AND MATERIALS PROFESSIONALS
104 EAST 25TH STREET, 8TH FLOOR
NEW YORK, NY 10010
PHONE (212) 353-8280 * FAX (212) 979-8447
http://www.atc-enviro.com

November 4, 2002

Mr. Reid Riner
Director, Environmental & Facilities
Amerco Real Estate Company
2727 North Central Avenue, Suite 500
Phoenix, AZ 85004

Re: Phase I Environmental Site Assessment
U-Haul Center
Entity #803-62
562 West 23rd Street
New York, New York 10011
ATC Project Number 15.75093.0050

Dear Mr. Riner:

ATC Associates Inc. (ATC) has completed a Phase I Environmental Site Assessment (ESA) of the above-referenced property in accordance with the American Society for Testing and Materials (ASTM) Practice Designation E 1527-00: *Standard Practice for ESAs: Phase I ESA Process* and in accordance with the ATC Proposal dated April 10, 2002. This report includes the results of our findings from a visual reconnaissance, a limited visual survey for suspect asbestos-containing materials, a limited historical ownership and land use review, a records and regulatory review, and related sources.

ATC appreciates the opportunity to be of service to Amerco Real Estate Company and its successors, assigns and affiliates (collectively, "Amerco") for this project and we look forward to working with you on future assignments. If you have questions regarding the information in this report or if we can be of further assistance, please do not hesitate to contact the ATC -New York City office at (212) 353-8280.

Sincerely,
ATC Associates Inc.

Levent Eskicakit
Project Manager

David M. Winslow, Ph.D.
Subsurface Group Manager

cc: Dale M. Allison - ATC/National Accounts Manager

EXECUTIVE SUMMARY

On June 24, 2002, ATC Associates Inc. (ATC) conducted a Phase I Environmental Site Assessment (ESA) of the U-Haul Center located on the south side of West 23rd Street, New York, New York, hereinafter referred to as the "Site." The mailing address for the Site is 562 West 23rd Street, New York, New York. The objective of this Phase I ESA was to identify potential environmental concerns associated with the Site. To achieve this objective, the Phase I ESA included visual observations of the Site and limited observations of surrounding properties, a review of geologic information, a limited review of historical land use, a review of regulatory database listings, a review of relevant local agency records, and a review of previous environmental investigations and remediation. This assessment was conducted in accordance with the American Society for Testing and Materials (ASTM) Practice Designation E 1527-00: *Standard Practice for ESAs: Phase I ESA Process* and in accordance with the ATC Proposal dated April 10, 2002.

The Site is an approximately 1.722 acre irregular-shaped parcel of land improved with two (2) three-story commercial self storage buildings (a.k.a. Building "A" and Building "D") that encompasses approximately 40,000 square feet of space, two one-story rental vehicle storage building (a.k.a. Building "B", Building "C"), that encompasses approximately 20,000 square-feet of space, and a one-story vehicle maintenance building (Building "E") that encompasses approximately 10,000 square-feet of space. The remainder of the Site is paved with asphalt and is used as parking areas.

Records Review

The regulatory agency database identified four (4) registered underground storage tanks (USTs) (NYSDEC PBS #2-084069) located at the Site. The database record also indicated that one (1) 1,000-gallon and one (1) 550-gallon registered USTs were closed in place in 1993 a`nd that two (2) 1,000-gallon registered USTs were removed from the Site in 1997.

Regulatory agency databases also identified that the Site is listed in the Resource Conversation and Recovery Act (RCRIS) database, as a small quantity generator (SQG). This was likely due to the presence of several drums of material left by a former tenant in one of the storage areas. These drums were properly removed and disposed in June 2002.

Historical activities at the Site resulted in petroleum contaminated soil and groundwater. The sources of contamination were identified as underground storage tanks (USTs) located on the northwestern portion of the Site. The New York State Department of Environmental Conservation (NYSDEC) has assigned spill numbers 90-00199 and 9700188 to the Site. Soil remediation in the impacted areas has been completed. A groundwater remediation program consisting of natural attenuation with periodic monitoring was implemented for the remaining groundwater contamination with the approval of the NYSDEC. Based on the findings of this report, and those of ATC's previous investigations, it is ATC's opinion that environmental concerns associated with historical site activities have been thoroughly researched and adequately addressed according to applicable regulatory requirements. The NYSDEC has agreed to issue a no further action letter for the 1990 and 1997 spill numbers.

However, ATC's review of a 1976 sanborn map revealed that eight additional buried petroleum tanks were present beneath Site buildings "b", "c" and "e" (northeastern portion of the site) fronting West 23rd street from approximately 1950 to 1981. These USTs were removed from the Site on July 18, 2002. Confirmatory soil samples collected vicinity of the USTs indicated that soil samples contaminated with low levels of volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) above the applicable NYSDEC guidance values, were present within the vicinity of the USTs at the Site building. The NYSDEC was contacted and NYSDEC spill number 02-05608 was issued for the Site. ATC subsequently performed a subsurface Site investigation in the vicinity of the USTs to evaluate if subsurface groundwater quality had been adversely affected by these USTs. Based upon the results of this study, ATC requested a no further action letter be issued and NYSDEC spill no. 02-00199 for the Site to be closed. Therefore, ATC does not view this as a recognized environmental condition with regards to the Site.

- Regulatory agency databases also identified that the Site is listed in the Resource Conversation and Recovery Act (RCRIS) database, as a small quantity generator (SQG). This was likely due to the presence of several drums of material left by a former tenant in one of the storage areas. These drums were properly removed and disposed on in June 2002.

- The historic land use in the surrounding area was also determined through a historical Sanborn fire insurance map review. Based on this review, the Site is located in an area characterized by commercial, residential, and public school uses. The commercial uses historically consisted of and electric company, lumberyard, a gas station, machinery shops and automobile related services that occupied the area since at least 1920. However, based upon the results of the previous investigations it does not appear that these operations have impacted the Site groundwater quality.

- ATC conducted a limited visual observation of accessible areas of the Site building for suspect asbestos containing material (ACM). ATC observed the presence of suspect ACM in the form of sheetrock walls and acoustical ceiling tiles. However, ATC was advised that these finishes were installed during interior renovations completed in 1994. Therefore, ATC concludes that these materials are not likely to be ACM. ATC did not observe any older (i.e., pre-renovation) building materials that would likely contain asbestos. ATC also identified nonfriable suspect ACM in the form of roofing materials. Roof areas were not accessible during the course of the assessment and ATC has assumed that roofing materials are ACM. Exposed piping and steel beams within the structure were observed to be un-insulated or fiberglass insulated.

- ATC did not observe any friable ACM or thermal systems insulation (TSI). However, based on the date of construction of the U-Haul Center (circa 1900), it is possible that suspect friable ACM exists in inaccessible areas of the Site. Therefore, ATC recommends that a detailed asbestos investigation for the presence of both friable and nonfriable ACM be performed whenever future alteration or renovation activities are planned. If any ACM is identified, it must be addressed in accordance with applicable local, state, and federal regulations.

Conclusions

ATC has performed a Phase I Environmental Site Assessment in accordance with the scope and limitations of ASTM Practice E1527-00 at the U-Haul Center of Chelsea, located at 562 West 23rd Street, New York, New York.

Based on the findings presented in this report, ATC presents the following conclusions:

- Based upon the remediation efforts that have been completed for petroleum contaminated soils, and groundwater remediation program implemented for the Site and the fact that a "No Further Action Required" letter issued by the NYSDEC for the Site on February 22, 2002, ATC concludes that the historical impacts associated with the former petroleum USTs located along the northwestern portion of the Site do not represent a recognized environmental condition for the Site.

- Based on the results of previously conducted subsurface investigations by ATC, the additional (eight) USTs removed from the Site do not represent a recognized environmental condition for the Site.

- Based upon the results of previously conducted subsurface investigations, ATC concludes that potential groundwater degradation resulting from properties in the Site area do not represent a recognized environmental condition for the Site.

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FIGURES

APPENDICES

1.0 INTRODUCTION

ATC Associates Inc. (ATC) was authorized by Amerco Real Estate Company, to conduct a Phase I Environmental Site Assessment (ESA) of an approximately 1.722 acre parcel improved with a five attached warehouse buildings located at 562 West 23rd Street in New York, New York. This assessment was conducted in accordance with the ASTM Practice Designation E 1527-00: *Standard Practice for ESAs: Phase I ESA Process* and in accordance with the ATC Proposal dated April 10, 2002.

The primary purpose of this assessment was to identify documented and potential hazardous substance and/or petroleum impacts on the Site from on-site or off-site sources. In accordance with the above-referenced agreement, ATC performed walk-through observations of the Site, noted the use of adjacent properties, and conducted a search of readily available historical and regulatory records. More specifically, the scope of services included the following:

- **Site and Adjacent Property Observations**

  Visual observations of the Site and surrounding properties were made to identify potential sources or indications of chemical and/or petroleum impacts, such as underground storage tanks (USTs), aboveground storage tanks (ASTs), potential sources of polychlorinated biphenyls (PCBs), chemicals and hazardous materials, and areas with surface stains or stressed vegetation. In addition, the immediately adjacent properties were observed from the street, without being entered, for possible sources of impacts or environmental impairment that could migrate to the Site via surface water runoff, groundwater transport, or other pathways.

- **Geological Information**

  Published geological and groundwater information was obtained and reviewed for the Site vicinity.

- **Asbestos Identification**

  A limited asbestos survey, including sample collection and laboratory analysis, was conducted by the ATC for readily visible and accessible suspect asbestos-containing materials (ACM) and their general condition at the Site.

- **Historical Review**

  A review of historical Sanborn fire insurance maps, city directories, and other records for the Site and nearby properties was conducted to evaluate previous land use.

- **Federal and State Regulatory Review**

  The following regulatory databases were reviewed to identify use, generation, storage, treatment, or disposal of hazardous materials, or releases of such materials that may impact the Site: United States Environmental Protection Agency (USEPA) National Priorities List (NPL); Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS); Corrective Action Facilities (CORRACTS), Resource Conservation and Recovery Information System-Treatment, Storage, and Disposal facilities (RCRIS-TSD); RCRIS-Large Quantity Generators (RCRIS-LQG); RCRIS-Small Quantity Generators (RCRIS-SQG); Emergency Response Notification System (ERNS); NYS Inactive Hazardous Waste Sites

(SHWS), NYS Permitted Solid Waste/Landfill Facilities (SWF/LF), NYS Leaking Storage Tanks (LTANKS); and the NYS Registered Underground Storage Tank (UST).

- **Interviews with Site Representatives**

  Mr. Michael Whitley, U-Haul representative, accompanied ATC during the site visit and provided general information about the Site.

- **Municipal Records Review**

  A review of available local records from environmental regulatory authorities was performed to identify complaints, violations, citations, or inspections related to the Site.

2.0 PHYSICAL SITE DESCRIPTION

The Site is located at 562 West 23rd Street, New York, New York. The Site, currently occupied by the U-Haul Center, is located on the east side of West 23rd Street at the intersection of 11th Avenue and West 23rd Street. The Site, which consists of five attached warehouse buildings and parking area, is situated in the Borough of the Manhattan (New York County). The New York City Tax Assessor's office designation for 562 West 23rd Street is Block 694, Lot 65. The Site is zoned for commercial purposes (G9-Garage/Gas Station) by the New York City Zoning Department. The latitude for the Site is approximately 40° 44' 55.7" North and the longitude is approximately 74°0' 25.2" West. The surrounding area within the immediate vicinity of the Site is characterized by commercial and residential usage. A Site location map is included as **Figure 1**.

Mr. Levent Eskicakit, ATC Sr. Project Manager, conducted the Site visit on June 24, 2001. During the Site visit, U-Haul representative, Mr. Michael Whitley, who has been associated with the Site for approximately three years, accompanied the ATC representative. The weather was sunny with good visibility and the temperature was approximately 90 degrees Fahrenheit. The on-site reconnaissance consisted of a visual survey of the existing structures and Site property.

In addition to the on-site reconnaissance, readily available resources, including geologic maps, United States Geological Survey (USGS) topographic maps, city directories, regulatory records, and other related information, were reviewed. Photographs depicting conditions of the Site as observed during the Site visit are included in **Appendix A.**

2.1 General Site Conditions

2.1.1 Interior and Exterior Observations

Interior Observations

The Site is currently developed with five attached commercial self-storage warehouse building containing a self-storage area, an office area, a trailer hitch installation area, service area and paved parking area. The Site buildings are constructed of brick framing, concrete foundation, brick and masonry façade, and a built-up roofing system with concrete floors. The majority of the Building "A" and "D" are used as a self-storage facility on the second and third floor and as a parking lot, a rental office and the trailer hitch installation area on the first floor. Site Buildings "B" & "C" are used as parking lots. Site Building "E" is used as a vehicle maintenance center for trucks. The interior walls within the office area are constructed of sheetrock, and the ceiling is covered with suspended 2'x2' ceiling tiles. Vehicles enter and exit the Site from West 23rd Street. The former boiler room located within the basement of the Site Building "A" contains a 10,000-gallon, empty fuel oil aboveground storage tank (AST) for the former heating system at the Site. Currently, this area is being used as an additional storage space, and the AST has been purged of all remaining product and the fill and vent lines for this AST are sealed. No basement was observed at the Site Buildings "B", "C", "D" and "E" during the site inspection.

Exterior Observations

The Site is an approximately 1.722 acre rectangular-shaped parcel of land improved with four attached warehouse buildings that encompasses approximately 70,000 square-feet of space. The remainder of the Site is paved with asphalt and is used for parking. No open grounds or landscaped areas were observed at the Site. No discolored surfaces were noted at the Site grounds. The physical Site layout, including surrounding land use, is presented in **Figure 2.**

Site Topography

According to the USGS *Central Park, New York-New Jersey* Quadrangle Topographic Map (dated 1966, photorevised 1979), the elevation of the Site is approximately 10 feet above mean sea level. Based on the Site observations and a review of the topographic map, the topography across the Site slopes from northeast (upgradient) to the southwest (downgradient). A copy of the topographic map is included as **Figure 1**.

2.1.2 Area Geology and Hydrogeology

ATC's review of the U.S.G.S. 7.5 minute topographic map **(Central Park NY-NJ Quadrangle)** indicates the New York County is situated approximately 60 feet above mean sea level and is relatively level with less than 5 feet of topographic relief observed. A copy of the topographic map is included as Figure 1.

The New York County is underlain by approximately 20-40 feet of unconsolidated clays, silts, sands, and gravel, based on a report published by the United States Geological Survey. These materials were deposited directly by glacial activity as glacial till or as glaciological deposits. Bedrock underlies the unconsolidated material. Bedrock consists of a coarse, crystalline material, which has been subjected to a high degree of metamorphism and Precambrian deformation. It is expected that bedrock beneath the Manhattan is likely to be present at near surface depths.

The soils in the area of the Site are classified as Urban Land. Urban Land refers to soils that have been altered by urban development such as buildings and streets, where at least 85 percent of the surface is covered with asphalt, concrete or other impervious building material. Typically, these soils have been mixed with other materials such as brick and concrete, and characteristics can only be determined by on-site investigation.

The movement and direction of groundwater flow is influenced by many factors, including but not limited to the aquifer's hydraulic characteristics, surface and bedrock topography, the presence of surface water bodies and the influence of pumping wells. Preliminary estimates of groundwater flow direction usually consider surface topography and the presence of nearby surface water bodies. Based on the general southerly topographic gradient for the Site area, groundwater in the vicinity of the Site is expected to flow west. The depth of groundwater to be approximately 11 feet below ground surface (bgs) at the Site.

Local groundwater depth and flow direction can be influenced by additional factors (e.g., underground structures, seasonal fluctuations, soil and bedrock geology, and production wells), which are beyond the scope of this investigation. Groundwater in the Borough of the New York is non-potable and not used as a source of drinking water.

2.1.2 Sensitive Receptors

The entire Site property is covered with the Site buildings and paved parking areas. ATC did not observe any indicators of wetlands at the Site or on adjacent properties. According to wetland data provided by the U.S. Fish and Wildlife Services National Wetland Inventory, the Site is classified as "upland." Because the Site is not a designated wetland, regulations pertaining to wetlands do not appear to affect the Site.

According to a regulatory agency database obtained from Environmental Data Resources, Inc. (EDR), which included a review of the FIRMs with the Federal Emergency Management Agency (FEMA) for New York County, the Site is located within a 100-year flood plain.

During the Site and vicinity reconnaissance, obvious environmentally sensitive areas were not observed on, or adjacent to, the Site.

2.2 Storage Tanks

2.2.1 Underground Storage Tanks (USTs)

The Site is listed in the state regulatory agency database records as having three (3) 1,000-gallon and one (1) 550-gallon USTs (NYSDEC PBS #2-084069) at the Site. The database record also indicated that one (1) 1,000-gallon and one (1) 550-gallon registered USTs were closed in place in 1993 and that two (2) 1,000-gallon registered USTs were removed in 1997.

ATC reviewed a previous environmental report by American Hi-Tech, Inc., dated July, 1994, which indicated one (1) 1,000-gallon and one (1) 550-gallon USTs were located within the first floor area of the Site Building "A". These USTs reportedly failed a tank tightness test and NYSDEC spill number 90-00199 was issued for the Site. In 1997, Tyree Brothers Environmental Services, Inc. excavated and removed two 1,000-gallon USTs at the western portion of the Site (refer to Site Plan). NYSDEC Spill Number 97-00188 was issued for the Site. Post-excavation soil samples revealed that VOCs above the NYSDEC Recommended Soil Cleanup Objectives were present in soil beneath the fill lines. Approximately 8.5 tons of petroleum-contaminated soil was excavated and removed from the Site from the vicinity of the remote fill lines. The soil was thermally treated and recycled at Posillico Brothers Asphalt Company in July 1997. Subsequently, ATC conducted a focused subsurface investigation and site remediation at the Site from August through May 2001. The purpose of these investigations was to gather sufficient soil and groundwater quality data to evaluate the impact of the reported petroleum release on the Site. All soil and groundwater data was forwarded to the NYSDEC, and the NYSDEC closed the spill numbers 90-00199 and 9700188 for the Site On February 22, 2002.

However, ATC's review of a 1976 sanborn map revealed that eight additional buried petroleum tanks were present beneath Site buildings "b", "c" and "e" (northeastern portion of the site) fronting West 23rd street from approximately 1950 to 1981. These USTs were removed from the Site on July 18, 2002. Confirmatory soil samples collected vicinity of the USTs indicated that soil samples contaminated with low levels of volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) above the applicable NYSDEC guidance values, were present within the vicinity of the USTs at the Site building. The NYSDEC was contacted and NYSDEC spill number 02-05608 was issued for the Site. ATC subsequently performed a subsurface Site investigation in the vicinity of the USTs to evaluate if subsurface groundwater quality had been adversely affected by these USTs. Based upon the results of this study, ATC requested a no further action letter be issued and NYSDEC spill no. 02-00199 for the Site to be closed. Therefore, ATC does not view this as a recognized environmental condition with regards to the Site.

2.2.2 Aboveground Storage Tanks (ASTs)

At the time of the Site reconnaissance, four 275-gallon aboveground storage tanks (ASTs) containing engine oil were observed within the mechanical Building "E" of the Site. Additionally, one 10,000-gallon AST was also observed within the basement of the Building "A", a former boiler room area of the Site building. The U-Haul representative stated that this AST was used to supply fuel oil for the former heating system located at the Site prior to 1990. Currently this AST is closed and has not been in operation since 1990. There are currently no other ASTs located at the Site.

2.3 Polychlorinated Biphenyls (PCBs)

Fluorescent lights were noted throughout the Site building. Fluorescent light ballasts manufactured prior to 1979 may contain small quantities of PCBs. Due to access limitations, the light ballasts were not examined for labels identifying their PCB-content at the time of the Site survey. However, no indications of staining or leaking associated with the ballasts were noted. In addition, most of these ballasts have reportedly been changed with various renovation and maintenance activities over the last ten years. No evidence of any fluid-filled transformers or hydraulic equipment was observed at the Site.

2.4 Asbestos-Containing Materials (ACMs)

ATC conducted a limited visual observation of accessible areas of the Site building for suspect ACM. ATC identified the presence of suspect ACM in the forms of sheetrock walls and acoustical ceiling tiles. However, ATC was advised by the Site contact that these materials were installed during renovations completed in 1994. Therefore, ATC concludes that these materials are not ACM. ATC did not observe any older (i.e., pre-renovation) building materials that would likely contain asbestos. ATC also identified nonfriable suspect ACM in the form of roofing materials. Roof areas were not accessible during the course of the assessment and ATC has assumed that roofing materials are ACM. Exposed piping and steel beams within the structure were observed to be uninsulated or fiberglass insulated.

Based on the date of construction of the U-Haul Center (circa 1900), it is possible that friable asbestos-containing materials exist within the Site building. Therefore, ATC recommends that a detailed asbestos investigation for the presence of both friable and nonfriable ACM be performed whenever future alteration or renovation activities are planned. If any ACM is identified, it must be addressed in accordance with applicable local, state, and federal regulations.

2.5 Radon

According to information obtained from Environmental Data Resources, Inc. (EDR) of Southport, Connecticut, the EPA radon zone for Site area (zip code 10011) is Zone 2, which exhibits an indoor average level less than 1.2 pCi/L. The average activity level for six sites tested was reported by EDR as 1.2 pCi/L, which is well below the USEPA "action guideline" of 4.0 pCi/L. Therefore, ATC concludes that radon gas does not represent an environmental concern for the Site, and no further investigation is recommended.

2.6 Utilities

The rental self-storage areas of the building are not heated. The trailer hitch installation area is heated by two ceiling-hung natural gas-fired hot air blowers. The office area of the Site building is heated and cooled by natural gas fired air handlers.

Consolidated Edison (Con Ed), the local utility, supplies natural gas and electricity to the Site. The Site is provided with municipal water and municipal sewer services.

2.7 Waste Management and Chemical Handling

ATC did not observe bulk storage of chemicals on-site other than typical retail sized maintenance and cleaning supplies. All of these containers were labeled and no evidence of spills or leaks was observed. No hydraulic lifts were present at the Site. ATC was also informed that the primary operations at the Site consist of commercial self-storage, vehicle rental, and retail operations. Since no evidence of improper disposal of petroleum and/or hazardous materials was observed at the Site, ATC concludes that current Site use does not represent an environmental concern to the Site.

Operations at the Site generate non-hazardous municipal solid waste. This waste is stored in dumpsters located on-site. ATC observed no evidence of illegal or improper dumping, staining, or material mismanagement in the area of the dumpsters. Compactors or other central garbage collection areas were not observed at the Site.

3.0 ADJACENT LAND USE

Visual observations of the surrounding properties were made to identify potential sources or indications of chemical and/or petroleum impacts such as USTs, ASTs, potential sources of PCBs, chemicals and hazardous materials, and areas with surface stains or stressed vegetation. Properties in the immediate vicinity of the Site were examined from curbside.

The general area of the Site consists of commercial and residential land use. Refer to **Figure 2: Site Plan** for a presentation of surrounding properties. The following table summarizes the abutting property uses:

Direction	Abutting Facility Name/Description
North	West 23rd Street, followed by a commercial, warehouse and residential buildings.
South	Warehouse, commercial and residential buildings and West 22nd Street.
East	Commercial warehouse and residential buildings followed by a gas station.
West	11th Avenue followed by a park and west side highway followed by Hudson river.

None of the above-listed properties are listed in the regulatory agency database as known or suspected hazardous waste sites, or having histories of reported spills or violations. Therefore, ATC concludes that the activities or conditions at the neighboring properties are unlikely to have adversely impacted the Site. Please refer to the following Records Review and Site History section (Section 4.0) of this report for a more detailed description of the regulatory history of properties that are located in the vicinity of the Site.

4.0 RECORDS REVIEW AND SITE HISTORY

Regulatory agency records were reviewed to determine if the Site or any facility/incident within the researched distance of the Site (as defined by the ASTM standard) is, or has been, subject to regulatory action by federal, state, or local environmental agencies. In addition, past land uses were investigated to identify historical practices or conditions that may have impacted the Site. This included a review of historical Sanborn fire insurance maps, municipal records, and interviews with local governmental agency officials.

4.1 Standard Environmental Record Sources Review

A review of federal and state regulatory records was performed for the Site and surrounding properties located within a specified radius to identify use, generation, storage, treatment or disposal of hazardous materials and chemicals or release incidents of such materials which may impact the Site. This information was obtained from EDR (refer to **Appendix F** for a copy of the database report). It should be noted that the database report includes several non-ASTM databases and radius searches for off-site facilities beyond the standard ASTM requirements. These databases and facilities are not discussed in the following sections, as they are considered beyond the scope of work for this assessment. Any records obtained from a non-governmental source should have been updated within 90 days of the date the government agency last made the information publicly available.

Please note that the potential for the facilities identified through the database review to environmentally impact the Site was evaluated based solely on the distance and presumed topographic orientation (with respect to groundwater flow) of each facility relative to the Site. Furthermore, each facility's presumed topographic orientation was determined solely by a review of available USGS quadrangle topographic maps and observations made during the on-site inspection.

4.1.1 Federal Records

The federal environmental databases listed below were reviewed to obtain information pertaining to the Site and properties within the listed approximate search distance. Also listed are the month and year when the sources or databases were last updated.

TABLE 1: FEDERAL DATABASES SEARCHED IN REGULATORY REVIEW

Federal Database	Does Site Appears on List	Search Radius*	No. of Sites within Search Radius	Last Update
National Priorities List (NPL)	No	1 mile	0	02/04/02
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)	No	1/2 mile	0	03/25/02
Corrective Action Report (CORRACTS)	No	1 mile	0	07/12/01
Resource Conservation and Recovery Information System (RCRIS) - Treatment, Storage, and Disposal facilities (TSD)	No	1/2 mile	0	11/14/01
RCRIS – Hazardous Waste Generators (Large & Small Quantity Generators)	**Yes**	Site & adjacent	2	03/28/02
Emergency Response Notification System (ERNS)	No	Site	0	03/05/02

** The surrounding area search radius indicates the radial area (measured from the Site) for which the database review was performed.*
[1]This information is released on an infrequent basis by the USEPA.

THE SITE

As the above table indicates, the Site is identified in the Resource Conversation and Recovery Act database (RCRIS), as a Small Quantity generator. This was likely due to the presence of several drums of material left by a former tenant in one of the storage areas. These drums were properly removed and disposed on in June 2002.

SURROUNDING PROPERTIES

The following subsections provide a discussion of the surrounding properties that have been identified within the specified search radius and are listed in the table:

RCRIS – Hazardous Waste Generators (Large & Small Quantity Generators)

This list includes any operation that generates or transports hazardous waste and that must obtain a hazardous waste generator identification number or transporter permit. This regulatory agency database identified one RCRIS generator within adjoining of the Site:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Status / Available information
EMSIG MFG Corp. 521 West 23rd Street	706 feet/ ESE	Downgradient	Large quantity generator / No RCRA violations were listed

The above listed facility is not listed in any other regulatory agency databases as having a reported history of spills or violations. Therefore, ATC concludes this facility is unlikely to has adversely impacted the Site, and no further investigation is recommended.

4.1.2 State Records

The state environmental databases listed below were reviewed to obtain information pertaining to the Site and properties within the listed approximate search distance of the Site. Also listed are the month and year when the databases were last updated.

TABLE 2: STATE DATABASES SEARCHED IN REGULATORY REVIEW State Database	Does Site Appears on List	Search Radius*	No. of Sites within Search Radius	Last Update
State Inactive Hazardous Waste Site (SHWS)	No	1 mile	0	10/11/01
Permitted Solid Waste/Landfill Facilities (SWF/LF)	No	1/2 mile	0	03/28/02
Leaking Storage Tanks (LTANKS)	**Yes**	1/2 mile	50	02/20/02
New York State Spills (NY Spills)	**Yes**	Site	0	02/20/02
Registered Underground Storage Tanks (UST)	**Yes**	Site & adjacent	2	02/20/02
Major Oil Storage Facilities (MOSF)	No	1/2 mile	0	02/20/02

THE SITE

As the above-table indicates, the Site is identified as an LTANKS site, NY Spills site, and a registered UST facility.

The regulatory agency database indicated that the spills were listed due to a tank test failure in 1990 and contaminated soil associated with removal of two 1,000-gallon USTs in 1997. NYSDEC spill numbers 90-00199 and 97-00188 were assigned, respectively. As a result of these incidents, a number of subsurface investigations were conducted at the Site (See Section 4.2.5). All soil and groundwater data was forwarded to the NYSDEC, and cases were closed by the NYSDEC on February 22, 2002.

The database identified four registered USTs located at the Site. The database indicated that these USTs (three 1,000-gallon and one 550-gallon USTs) (NYSDEC PBS #2-084069) were located along the northwest side of the Site Building "A". The 550-gallon UST was closed in place along with 1,000-gallon heating oil UST in 1993. The two (2) 1,000-gallon gasoline USTs were removed from the Site in 1997.

The regulatory agency database indicated that the Site was listed within the NY spills database due to an accidental minor spill within the basement of the Site Building "A". NYSDEC was contacted and remedial corrective action taken and the case was closed by NYSDEC in 1993.

SURROUNDING PROPERTIES

The following subsections provide a discussion of the surrounding properties that have been identified within the specified search radius and are listed in the table:

<u>Leaking Storage Tanks (LTANKS)</u>

The EDR database identified a total of 50 LTANKS incidents within one-half mile of the Site. Thirty-two (32) of these incidents are assigned a "case closed" regulatory status with the NYSDEC. Therefore, ATC does not consider these incidents to be recognized environmental conditions for the Site. Eighteen (18) incidents remain "active" or "unknown" and are assumed to be unresolved with the NYSDEC. Of these 18 incidents, 15 are located at assumed hydraulic crossgradient or downgradient positions relative to the Site; therefore, ATC concludes that they do not represent potential environmental concerns for the Site. Three (3) incidents are located at assumed hydraulic upgradient positions relative to the Site. These three incidents are located greater than 1,800 feet from the Site with several roadways and fully developed city blocks in between. Based on distance and results of previous investigations, ATC concludes that these incidents are unlikely to have adversely impacted the Site. Therefore, no additional investigation of these incidents is recommended.

Registered Underground Storage Tanks (USTs)

The database identified two registered UST facilities located adjacent to the Site. These UST facilities are located at an assumed hydraulic downgradient position relative to the Site and, therefore, ATC concludes that they are unlikely to have adversely impacted the Site.

Orphan Sites

The database report included a section entitled "Orphan Summary." The locations of the facilities listed in this section cannot be mapped due to incomplete or inaccurate information. ATC reviewed this section and compared the names and addresses (if available) with information generated during the site visit. If a cross-reference could not be made, ATC assumed that the facilities were not within the specified search distances.

4.1.3 Local Records

ATC contacted the following local regulatory agencies to locate references to buildings, tanks or other structures, property usage or inspection reports which may indicate the presence, past use, or release of hazardous substances, wastes or petroleum products within the Site. Copies of local regulatory agency correspondences are presented in **Appendix G**. The results of the ATC local agency record review are presented below.

New York City Department of Buildings (NYCDOB)

ATC reviewed a NYCDOB printout for historical information pertaining to the Site. The printout identified the Site as Tax Block 694, Lot 65. No outstanding environmental control board (ECB) violations were identified for the Site.

New York City Fire Department (FDNY)

The FDNY maintains information pertaining to petroleum bulk storage tanks. A formal request has been forwarded to the FDNY on June 11, 2002 to obtain information concerning the Site. A response letter received from the FDNY stated that there was no environmental related information available in connection with the site.

New York City Department of Health (NYCDOH)

The NYCDOH, Bureau of Environmental Investigations (BEI) maintains files of health related environmental incidents in the City of New York. These incidents may include spills of hazardous chemicals, citizen's complaints regarding asbestos issues, or reports of chemical odors or fumes. NYCDOH information concerning the Site was requested in a formal letter dated June 11, 2002. A response letter received from the NYCDOH stated that there was no environmental related information available in connection with the site.

New York City Department of Environmental Protection (NYCDEP)

The NYCDEP maintains files of incidents involving environmentally regulated materials. The records maintained by NYCDEP include reports of spills of hazardous chemicals and citizen's complaints on environmental issues. NYCDEP information concerning the Site was requested in a formal letter dated June 11, 2002. A response letter received from the NYSDEC stated that there was no environmental related information available in connection with the site other than issues discussed on section 4.1.2.State Records of this report.

4.2 Historical Use Information Review

4.2.1 Sanborn Fire Insurance Maps

A search for fire insurance maps for the area of the Site was conducted by EDR. Copies of historical Sanborn fire insurance maps are included in **Appendix B.** The following are descriptions and interpretations from the available fire insurance map reviews:

Year	Comments
1890- 1899	**Site:** The Site appears to be occupied by current Site buildings. Machinery Shop Inc., occupies the Site buildings. **Surrounding Properties:** The surrounding properties are depicted as vacant land to the south, west and north. Consolidated Electric Corp., occupies the property to the east.
1899- 1911	**Site:** The Site exhibits no significant changes from the 1899 map. **Surrounding Properties:** The surrounding properties are depicted as commercial structures, residential dwellings, and Westinghouse Lamp Corp. to the east.
1911 – 1930	**Site:** The Site appears to be occupied by current structures. Bedding Supplies Corp and a lumberyard occupies the Site buildings. The sanborn maps also indicates that, there are one (1) 3,000-gallon gravity tank within Site Building "D" and one (1) 10,000-gallon gravity tank within the Site Building "C" at the Site. **Surrounding Properties:** The surrounding properties are depicted as commercial structures, residential dwellings, and vacant land.
1930 - 1976	**Site:** The Site appears to be occupied by the current structures. A garage, Truck leasing Corp, and Motor Freight Station occupies the Site buildings. The sanborn maps also indicates four gasoline USTs within the Site Building "D", two gasoline USTs within the Site Building "C" and one gasoline UST within Site Building "E". **Surrounding Properties:** The surrounding properties are depicted as commercial structures, residential dwellings, and vacant land.
1976 - 1985	**Site** The Site exhibits no significant changes from the 1976 map. **Surrounding Properties**: The surrounding properties exhibit no significant changes from 1976 map.
1985 – 1996	**Site:** The Site exhibits no significant changes from the 1985 map. **Surrounding Properties:** Surrounding properties to the north, south, east, and west appear similar to the 1985 map.

According to the historical Sanborn fire insurance maps, the Site was vacant prior to occupancy by a machinery wood factory, lumberyard, and garages. In the early 1900s, it is likely that the Site was redeveloped prior to the construction and operation of New York Motor Freight Yard, which operated at the Site to at least the 1960s. The current buildings, constructed in the 1880s and remodeled in 1933 was used as a freight warehouse from approximately 1939 to 1960, as a freight station and "auto storage" from approximately 1960 to 1970, and as a factory building for various commercial operations after 1970. Based upon the results of the prior investigations it does not appear that these operations have impacted the Site soil and or groundwater quality.

In addition, ATC's review of a 1976 Sanborn map revealed that eight buried gasoline tanks were present beneath Site Buildings "B", "D" and "E" (northern portion of the Site) fronting West 23rd Street from approximately 1950 to 1981. Soil and groundwater samples were not collect from the northeastern portion of the Site during ATC's subsurface site investigation performed in September 2000 through May 2001. Therefore, ATC recommended that a Focused Subsurface Site Investigation be performed at this area to determine whether the USTs are still present and whether the historic operation of these USTs has impacted Site soil and/or groundwater quality.

The historic land use in the surrounding area was also determined through a historical Sanborn fire insurance map review. Based on this review, the Site is located in an area characterized by commercial, residential, and public school uses. The commercial uses historically consisted of and electric company, lumberyards, a gas station, machinery shops and automobile related services that occupied the area since at least 1920. However, based upon the results of the previous investigations it does not appear that these operations have impacted the Site groundwater quality.

4.2.2 Aerial Photography

Aerial photographs were not used as a historical reference given their limited usefulness in long-developed New York City residential areas, the overall expense in obtaining them and the availability of nearly comprehensive coverage of the Site area by historical Sanborn fire insurance maps. Aerial photographs reveal rooftop views of structures at a small scale in an urban setting, and are therefore not a useful source of historical data for New York City sites.

4.2.3 City Directories

The Cole's city directories obtained from EDR were reviewed as part of this assessment. The city directories are available for the years 1951, 1954, 1960, 1965, 1970, 1975, 1980, 1986, 1990, 1998 and 2001. A copy of the city directories is included in **Appendix D**. The following table presents descriptions and interpretations from the historical city directory reviews:

Year	Listings
1920 through 1934	Riverview Commercial Garage Steinicker Garages.
1938 through 1963	Not Listed
1968 through 1978	Chelsea Moving Center Custom Truck Rental Corp
1988 through 2000	Uhaul Center of Chelsea Uhaul Co. Brown Samuel Jr.
2001 & 2002	U-Haul Co Move

Review of historical city directories confirmed that U-Haul has operated at the Site from approximately 1988 to the present. Residences and commercial facilities are listed in the surrounding properties. None of the listed off-site commercial enterprises are identified in the regulatory agency database reviewed as suspected hazardous waste sites or as having histories of reported spills or violations.

4.2.4 Interviews

ATC interviewed Mr. Michael Whitley, a U-Haul representative, to obtain general information about the Site. Information obtained from this interview has been referenced in the appropriate sections of this report.

4.2.5 Prior Reports

ATC reviewed previous environmental reports titled Subsurface Site Investigation, dated 1994, UST Closure Report, dated 1997, a Site Assessment Report, dated 1998, and a Focused Site Investigation and Remedial Investigation Report dated 2002 prepared by American Hi-Tech, Inc., Tyree brothers Environmental Services, Inc. Pinnacle Environmental Technologies (Pinnacle) and ATC, respectively. Copies of these reports are included in **Appendix H**. Pertinent findings associated with these Reports are discussed as follows:

- In 1993 one 1,000-gallon and one 550-gallon USTs (NYSDEC PBS #2-084069) located along the west side of the Site Building "A" were abandoned/closed in place in 1993.

- In 1994 American Hi-Tech, Inc. performed a Subsurface Site Investigation in the vicinity the abandoned 550-gallon gasoline UST and 1,000-gallon fuel oil USTs. The results of the investigation revealed that VOCs were detected above New York State Department of Environmental Conservation Technical and Administrative Guidance Memorandum #4046 (TAGM Memo) Recommended Soil Cleanup Objectives in one soil sample from boring B-4. This boring was reportedly located adjacent to the abandoned 1,000-gallon fuel oil UST and was collected at the soil/groundwater interface. More recent information (the results of a ground penetrating radar performed in May 2001) indicates that the 1,000-gallon abandoned fuel oil UST is further southwest of B-4.

- In 1997, Tyree Brothers Environmental Services, Inc. excavated and removed two 1,000-gallon gasoline USTs at the western portion of the Site (refer to the attached Site Plan). NYSDEC Spill Number 97-00188 was issued for the Site. Post-excavation soil samples revealed that VOCs above the NYSDEC TAGM Memo Recommended Soil Cleanup Objectives were present in soil beneath the fill lines. Approximately 8.5 tons of petroleum-contaminated soil were from the Site from the vicinity of the remote fill lines and transported off site. The soil was thermally treated and recycled at Posillico Brothers Asphalt Company in July 1997.

- On July 31, 1997, Pinnacle Environmental Technologies issued a Site Assessment Report. The Site Assessment Report evaluated the soil contamination detected during previous investigations. The report indicated that VOCs were detected above the TAGM Memo Recommended Soil Cleanup Objectives in two of the nine soil samples collected from three soil borings completed as part of the investigation, including the former fill line trench excavated by Tyree. However, the contamination was only detected at 3 feet below grade. Samples collected from deeper intervals exhibited VOC concentrations below the NYSDEC TAGM Memo Recommended Soil Cleanup Objectives. Pinnacle also installed three groundwater-monitoring wells as part of their investigation. Groundwater samples were collected from the wells and the results indicated that total BTEX concentrations (benzene, toluene, ethylbenzene and xylene) exceeded the NYSDEC Ambient Groundwater Quality Criteria in wells MW-1 and MW-3. The total BTEX concentrations ranged from 82.7 micrograms per liter (ug/l) to 84 ug/l.

- Pinnacle initiated a groundwater-monitoring program involving biannual sampling and reporting for the three monitoring wells. The wells were sampled on May 31, 1997, March 6, 1998, June 20, 1998, November 22, 1998, March 31, 1999 and June 27, 1999. During this period, dissolved BTEX plus MTBE decreased to non-detect in MW-1, non-detect in MW-2 and fluctuated in MW-3. The last sampling event (June 27, 1999) indicated BTEX and MTBE concentrations in MW-3 at 45.8 ug/l and at 53 ug/l, respectively.

- In May 2001, ATC collected additional soil and groundwater samples to delineate the contamination around former boring B-4, to characterize the subsurface conditions along the boundary of the Site building, and to evaluate subsurface conditions downgradient of the abandoned 1,000-gallon fuel oil UST. The results indicated that low levels of petroleum-related BTEX and 2-methyl-naphthalene remain in the groundwater beneath the abandoned 550-gallon and 1,000-gallon USTs. The highest total BTEX concentration detected in the groundwater was 585.1 ppb (GP-6), near the abandoned 550-gallon gasoline UST.

- In December 2001, ATC performed Bioscreen groundwater modeling to determine if any of the remaining dissolved phase contamination would migrate off-site. The results of the Bioscreen groundwater model suggested that the dissolved-phase contamination would not result in the migration of BTEX off the U-Haul property. The results suggest that natural attenuation was the appropriate remedial technology for the dissolved hydrocarbons and a no further action letter was requested by ATC Associates Inc.

- Based on the findings of the subsurface site investigation and remedial site investigation, ATC recommended that a "No Further Action Letter" be issued from the NYSDEC to close the spill case at the Site. On February 22, 2002, a "No Further Action Letter" was issued by the NYSDEC regarding the spill numbers 90-00199 and 97-00188 for the Site.

- ATC's review of a 1976 sanborn map revealed that eight additional buried petroleum tanks were present beneath Site buildings "B", "C" and "E" (northeastern portion of the site) fronting West 23rd street from approximately 1950 to 1981. These USTs were removed from the Site on July 18, 2002. Confirmatory soil samples collected vicinity of the USTs indicated that soil samples contaminated with low levels of volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) above the applicable NYSDEC guidance values, were present within the vicinity of the USTs at the Site building. The NYSDEC was contacted and NYSDEC spill number 02-05608 was issued for the Site. ATC subsequently performed a subsurface Site investigation in the vicinity of the USTs to evaluate if subsurface groundwater quality had been adversely affected by these USTs. Based upon the results of this study, ATC requested a no further action letter be issued and NYSDEC spill no. 02-00199 for the Site to be closed. Therefore, ATC does not view this as a recognized environmental condition with regards to the Site.

5.0 FINDINGS

Based on the results of this assessment, ATC presents the following findings:

- The Site is an approximately 1.722 acre, rectangular-shaped parcel of land improved with five attached warehouse buildings containing a rental self-storage area, an office area and a trailer hitch installation area that encompasses approximately 70,000 square-feet of space. The remainder of the Site is paved with asphalt and is used as parking areas.

- The commercial uses within neighboring areas have consisted of light commercial retail stores and residential properties since at least 1960. Therefore, ATC concludes that none of the adjoining properties have adversely impacted the Site groundwater quality.

- The regulatory agency database identified four (4) registered underground storage tanks (USTs) (NYSDEC PBS #2-084069) located at the Site. The database record also indicated that one (1) 1,000-gallon and one (1) 550-gallon registered USTs were closed in place in 1993 and that two (2) 1,000-gallon registered USTs were removed from the Site in 1997.

- Regulatory agency databases also identified that the Site is listed in the Resource Conversation and Recovery Act (RCRIS) database, as a small quantity generator (SQG). This was likely due to the presence of several drums of material left by a former tenant in one of the storage areas. These drums were properly removed and disposed in June 2002.

- Historical activities at the Site resulted in petroleum contaminated soil and groundwater. The sources of contamination were identified as underground storage tanks (USTs) located on the northwestern portion of the Site. The New York State Department of Environmental Conservation (NYSDEC) has assigned spill numbers 90-00199 and 9700188 to the Site. Soil remediation in the impacted areas has been completed. A groundwater remediation program consisting of natural attenuation with periodic monitoring was implemented for the remaining groundwater contamination with the approval of the NYSDEC. Based on the findings of this report, and those of ATC's previous investigations, it is ATC's opinion that environmental concerns associated with historical site activities have been thoroughly researched and adequately addressed according to applicable regulatory requirements. The NYSDEC has agreed to issue a no further action letter for the 1990 and 1997 spill numbers.

- ATC's review of a 1976 sanborn map revealed that eight additional buried petroleum tanks were present beneath Site buildings "b", "c" and "e" (northeastern portion of the site) fronting West 23rd street from approximately 1950 to 1981. These USTs were removed from the Site on July 18, 2002. Confirmatory soil samples collected vicinity of the USTs indicated that soil samples contaminated with low levels of volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) above the applicable NYSDEC guidance values, were present within the vicinity of the USTs at the Site building. The NYSDEC was contacted and NYSDEC spill number 02-05608 was issued for the Site. ATC subsequently performed a subsurface Site investigation in the vicinity of the USTs to evaluate if subsurface groundwater quality had been adversely affected by these USTs. Based upon the results of this study, ATC requested a no further action letter be issued and NYSDEC spill no. 02-00199 for the Site to be closed. Therefore, ATC does not view this as a recognized environmental condition with regards to the Site.

- Regulatory agency databases also identified that the Site is listed in the Resource Conversation and Recovery Act (RCRIS) database, as a small quantity generator (SQG). This was likely due to the presence of several drums of material left by a former tenant in one of the storage areas. These drums were properly removed and disposed on in June 2002.

- The historic land use in the surrounding area was also determined through a historical Sanborn fire insurance map review. Based on this review, the Site is located in an area characterized by commercial, residential, and public school uses. The commercial uses historically consisted of and electric company, lumberyards, a gas station, machinery shops and automobile related services that occupied the area since at least 1920. However, based upon the results of the previous investigations it does not appear that these operations have impacted the Site groundwater quality.

- ATC conducted a limited visual observation of accessible areas of the Site building for suspect asbestos containing material (ACM). ATC observed the presence of suspect ACM in the form of sheetrock walls and acoustical ceiling tiles. However, ATC was advised that these finishes were installed during interior renovations completed in 1994. Therefore, ATC concludes that these materials are not likely to be ACM. ATC did not observe any older (i.e., pre-renovation) building materials that would likely contain asbestos. ATC also identified nonfriable suspect ACM in the form of roofing materials. Roof areas were not accessible during the course of the assessment and ATC has assumed that roofing materials are ACM. Exposed piping and steel beams within the structure were observed to be un-insulated or fiberglass insulated.

- ATC did not observe any friable ACM or thermal systems insulation (TSI). However, based on the date of construction of the U-Haul Center (circa 1900), it is possible that suspect friable ACM exists in inaccessible areas of the Site. Therefore, ATC recommends that a detailed asbestos investigation for the presence of both friable and nonfriable ACM be performed whenever future alteration or renovation activities are planned. If any ACM is identified, it must be addressed in accordance with applicable local, state, and federal regulations.

- According the FIRMs for New York County, the Site is located within a 100-year flood plain.

6.0 CONCLUSIONS AND RECOMMENDATIONS

ATC has conducted a Phase I ESA of the Site in accordance with ASTM Practice E 1527-00. This Phase I ESA included a reconnaissance visit to the Site, a limited visual survey of suspect ACM, available environmental databases and related agency information for the Site and surrounding properties, interviews, limited prior land use records, historical Sanborn maps, published geologic information, and other related items. This information was used to evaluate existing or potential environmental impairment of the Site due to current or past land use disclosed by this study.

Based on the findings presented in this report, ATC presents the following conclusions:

- Based upon the remediation efforts that have been completed for petroleum contaminated soils, and groundwater remediation program implemented for the Site and the fact that a "No Further Action Required" letter issued by the NYSDEC for the Site on February 22, 2002, ATC concludes that the historical impacts associated with the former petroleum USTs located along the northwestern portion of the Site do not represent a recognized environmental condition for the Site.

- Based on the results of previously conducted subsurface investigations by ATC, the additional (eight) USTs removed from the Site do not represent a recognized environmental condition for the Site.

- Based upon the results of previously conducted subsurface investigations, ATC concludes that potential groundwater degradation resulting from properties in the Site area do not represent a recognized environmental condition for the Site.

7.0 LIMITATIONS

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with customary principles and practices in the fields of environmental science and engineering. This statement is in lieu of other statements either expressed or implied. This company is not responsible for the independent conclusions, opinions, or recommendations made by others based on the records review, site observations, and field exploration presented in this report.

It should be noted that environmental evaluations are inherently limited in the sense that conclusions are drawn and recommendations developed from information obtained from limited research and site evaluation. For these types of evaluations, it is often necessary to use information prepared by others, and ATC cannot be responsible for the accuracy of such information. Additionally, the passage of time may result in a change in the environmental characteristics at the Site and surrounding properties. This report does not warrant against future operations or conditions, nor does it warrant operations or conditions present of a type or at a location not investigated. This report is not a regulatory compliance audit and is not intended to satisfy the requirements of any state, federal, or local real estate transfer laws.

This report is intended for the sole use of Amerco Real Estate Company and its successors, assigns and affiliates (collectively Amerco) and may not be relied upon by any other party without the written consent of ATC. The scope of services performed in this evaluation may not be appropriate to satisfy the needs of other users, and use or re-use of this document or the findings, conclusions, or recommendations is at the risk of said user.

Subsurface conditions were not field investigated, as this was outside the scope of this study, and may differ from the conditions implied by the surficial observations. This study is not intended to assess or otherwise determine if soil impacts, waste emplacement, or groundwater impacts exist. These data are accessible only by subsurface material and groundwater sampling through the completion of soil borings and the installation of monitoring wells. The scope of work, in accordance with our agreement, did not include these activities.

It must be noted that no evaluation, no matter how thorough, can absolutely rule out the existence of hazardous materials at a given site. This assessment has been based on prior site history and observable conditions.

Our conclusions regarding the potential environmental impact of nearby, off-site facilities on the site are based on readily available information from the environmental databases and the assumed groundwater flow direction. A detailed file review of each facility was beyond the scope of work. Actual groundwater conditions, including direction of flow, can only be determined through the installation of monitoring wells.

ATC does not warrant the correctness, completeness, currentness, merchantability, or fitness of any information related to records review provided in this report. Such information is not the product of an independent review conducted by ATC, but is only publicly available environmental information maintained by federal, state, and local government agencies.

8.0 REFERENCES

Sources of Information

- Local Municipal Offices
  New York City Department of Buildings, June 11, 2002.
  New York City Fire Department, June 11, 2002.
  New York City Department of Health, June 11, 2002.
  New York City Department of Environmental Protection, June 11, 2002.
  New York City Department of Environmental Conservation, June 11, 2002.
  New York City Department of Zoning, Map 1d.

- American Society for Testing and Materials (ASTM) 2000, "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process," ASTM Designation E1527-00.

- Environmental Data Resources, Inc. (EDR), The EDR-Radius Map, U-Haul Center, 562 West 23rd Street, New York, NY 10011, dated May 11, 2002.

- EDR Sanborn Fire Insurance Maps: 1890, 1899, 1911, 1930, 1950, 1976, 1979, 1988, 1991, and 1996.

- The City Directories: 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000, 2001 and 2002.

- NYSDEC, Water Power and Control Commission Report titled *Groundwater in Bronx, New York, and Richmond Counties, with Summary Data on Kings and Queens Counties, New York City, New York.*

- Report titled *Focused Subsurface Site Investigation, U-Haul Center # 803-62, 562 West 23rd Street, New York, NY,* prepared by ATC.

- United States Department of Agriculture Soil Conservation Service, Soil Survey of Nassau County, New York (1981)

- United States Geological Survey (USGS) 7.5 Minute Series Topographic Quadrangle, Central Park, NY/NJ, 1966 photorevised 1979.

- United States Fish and Wildlife Service's Wetland Map, Jamaica, New York NW, reference code 40073-F7, photo year 1980.

Interviews

- Mr. Michael Whitley, U-Haul Site Representative.

FIGURES

APPENDIX A

PHOTOGRAPHIC DOCUMENTATION

APPENDIX B

HISTORICAL SANBORN MAPS

APPENDIX C

AERIAL PHOTOGRAPHS
(Not Used)

APPENDIX D

CITY DIRECTORIES

APPENDIX E

ACM BULK SAMPLING CHAIN OF CUSTODY AND LABORATORY ANALYTICAL RESULTS

(Not Used)

APPENDIX F

REGULATORY AGENCY DATABASE REPORT

APPENDIX G

RECORDS OF COMMUNICATION

APPENDIX H

PREVIOUS REPORTS

Record of

COMMUNICATION

ATC Project: 15.75093.0050

Contact name/title: Mr. Michael Whitley, U-Haul Site Representative

Agency/Department: U-Haul Center

Phone Number: (212) 515-6262

Date Contacted: June 11, 2002– Site Interview

Mr. Whitley told ATC, to the best of her knowledge, that there are no liens or lawsuits against the Site related to environmental issues.

ERM
Environmental Resources Management
5788 Widewaters Parkway, Dewitt, NY 13214
PH (315) 445-2554 x 27 FAX (315) 445-2543

20 November 2006

Mr. Joseph Peck
Environmental Specialist
Amerco Real Estate, Inc.
2727 N. Central Avenue, Suite 500
Phoenix, AZ 85004

RE: 5,000-Gallon Tank Closure
UHaul Facility 803062
562 W. 23rd Street
New York, New York
ERM Project No.: 00

Dear Mr. Peck:

This letter is to provide Amerco Real Estate with a brief narrative of the 5,000-gallon tank closure field activities conducted at the above referenced facility from 11 - 12 October 2006.

Background

At the request of UHaul, ERM conducted a site visit on 8 September 2006 and to visually inspect a 5,000-gallon tank located within the basement at the subject property. The subject tank was situated on a saddle and the ground beneath the tank was visible with no signs of staining. ERM obtained vapor readings around the exterior of tank with a photoionization detector (PID) and no readings greater than zero were not observed. The subject tank was reportedly used to store fuel oil; however, the tank had not been in use for over five years. Based on the safety risks associated with an empty and unsecured tank, UHaul requested permanent closure of the subject tank.

Closure Activities

From 11 -12 October 2006, William Marosits of ERM and Gary Hughs of Metro Environmental, a subcontractor to ERM completed closure activities. One 11 October 2006, the 5,000-gallon tank was opened and the interior of the tank was cleaned. During the cleaning activities, approximately one-gallon of fuel oil was removed from the subject tank. Following the cleanup of the tank interior, the fill, vent and supply lines of the subject tank were plugged with concrete.

On 12 October 2006, the (see Attachment A – Photographs) the subject tank was filled with a liquid acidic foaming and emulsifying agent (see Attachment C for the Material Safety and Data Sheet) and the manhole opening to the subject tank was bolted shut.

As required by local regulations, Title 3 of the RCNY(21-02), an affidavit of the tank closure was filed with the New York City Fire Department, Bureau of Fire Prevention (see Attachment B for closure documentation).

ERM appreciates the opportunity to provide Amerco with environmental consulting services. If you have any questions or comments, please do not hesitate to contact us at (315) 445-2554.

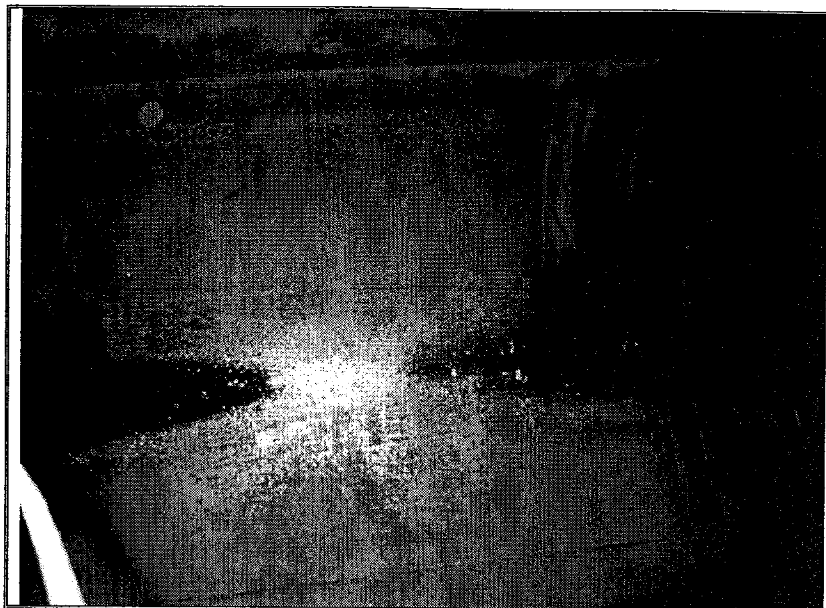
Sincerely,

Cecile D. Fleckten
Program Manager

Attachments

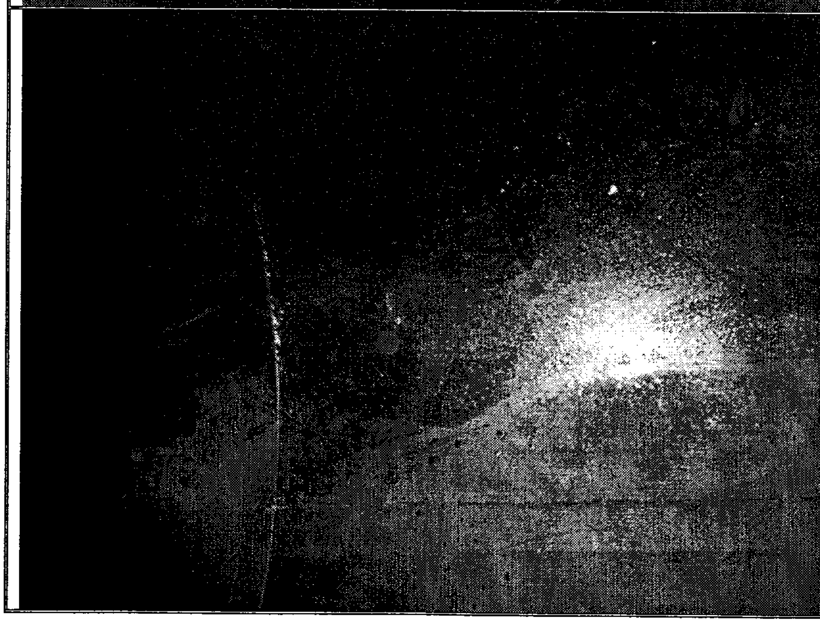
ATTACHMENT A

PHOTOGRAPHS

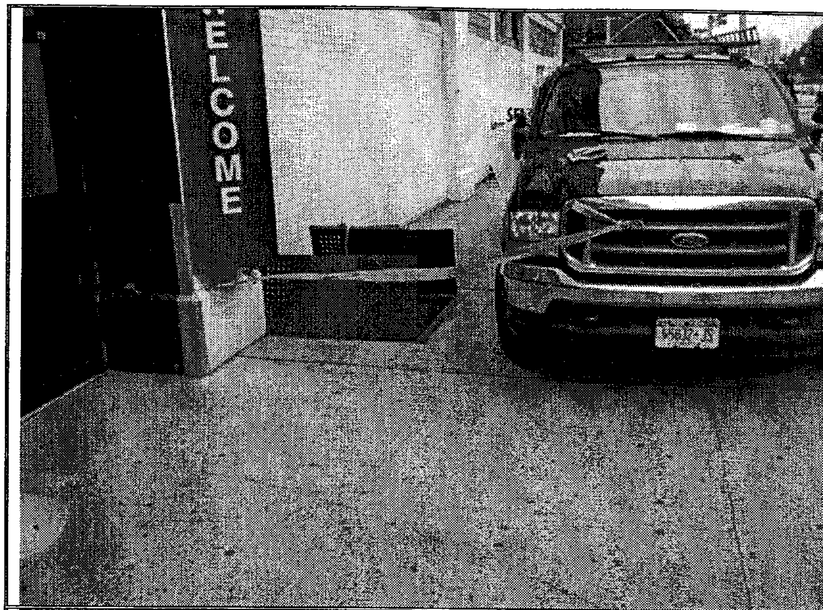


1. Picture of interior of tank with residual fuel.

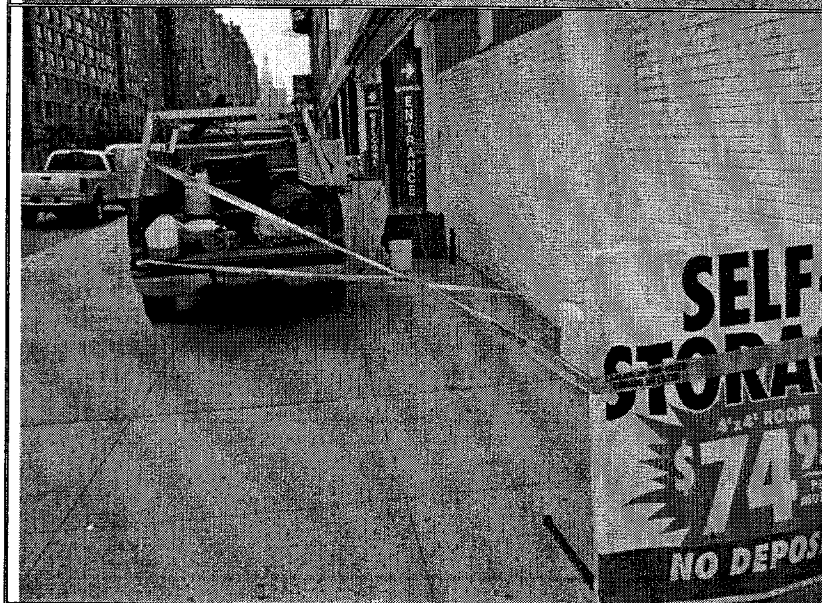
2. Picture of end of tank (boiler side).



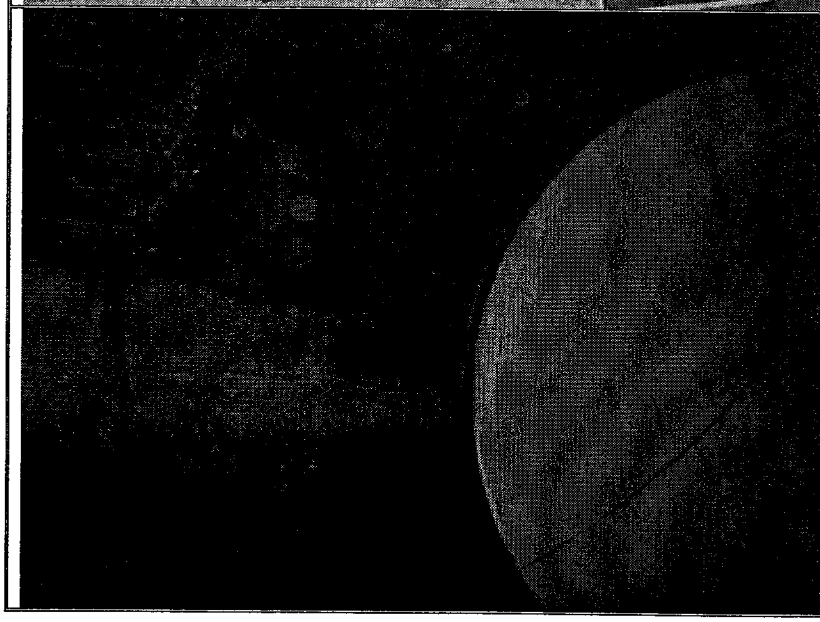
3. Picture of clean tank.



4. Picture of safety precautions near entrance to the basement.



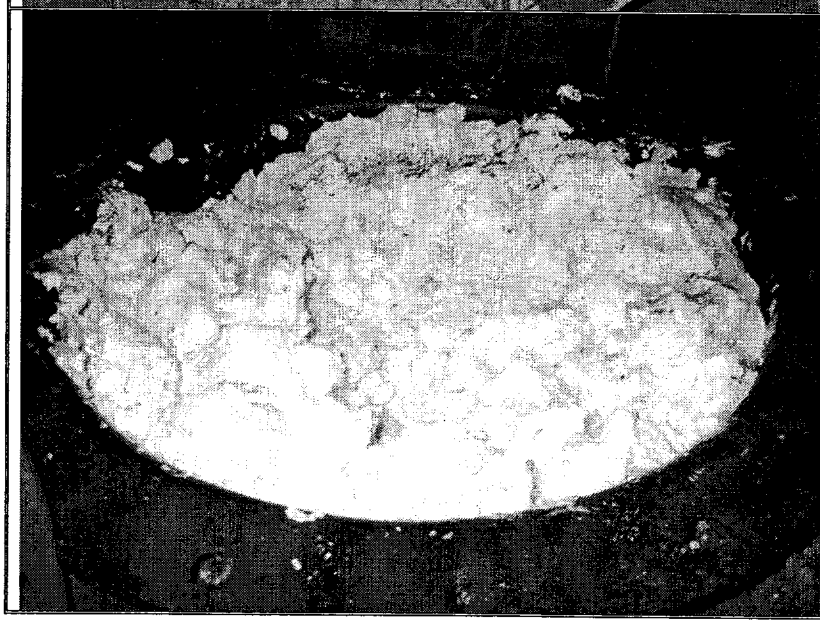
5. Picture of safety precautions taken during tank closure activities.



6. Picture of clean tank.

7. Picture of curb fill plugged with concrete.

8. Picture of gun used to fill tank with foam..



9. Picture of tank filled with foam.

ATTACHMENT B

CLOSURE DOCUMENTATION

MERCURY TANK & PUMP

233 Nevins Street
Brooklyn, N.Y. 11217
(718)624-4842

New York City Fire Department
Bureau of Fire Prevention
9 Metrotech
Brooklyn, N.Y. 11201

Re: Permanent decommissioning of one 5,000 gallon underground #2 fuel oil tank

AFFIDAVIT

To: Whom it may concern,

In accordance with Title 3 of the RCNY (21-02) I have supervised the permanent decommissioning of one 5,000 gallon, underground #2 fuel oil tank at 562 West 23rd Street Manhattan, N.Y.

1) The contents of the tank were completely removed.
2) The tank was thoroughly cleaned and purged of combustible vapors.
3) All pipes were plugged.
4) The fill box was cemented.
5) The tank was filled with foam
6) This work was performed on or about 11, October 2006

Sincerely

Mark Salamack
Underground Tank Installer
Certificate of License #80151715 (Expires 16, June 2009)

LASSALLE BEST JR.
Notary Public, State of New York
No. 24-0279100
Qualified in Queens County
Commission Expires March 30, 19 2009

Sworn before me this 22 day of October ,2006

__________________ Notary Public

ATTACHMENT C

MATERIAL SAFETY AND DATA SHEET

Material Safety Data Sheet

C.P. Chemical Co., Inc.
25 Home St.
White Plains, NY 10606
(914) 428-2517

NAME: **TRIPOLYMER® #105 TM TANK FOAMING RESIN**
TYPE: LIQUID, WATER BASED PHENOLIC, MELAMINE, METHYLENE LINKED AMINO SULFONAMIDE COPOLYMER RESIN
APPLICATION: PROPRIETARY PRODUCT OF C.P. CHEMICAL CO., INC.

SIGNAL WORD
THIS MATERIAL IS NOT A 'HEALTH HAZARD' OR A 'PHYSICAL HAZARD' AS DETERMINED WHEN REVIEWED ACCORDING TO THE REQUIREMENTS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION 29 CFR 1910.1200 "HAZARD COMMUNICATIONS" STANDARD AND THE FEDERAL HAZARDOUS SUBSTANCES ACT.

CAS REGISTRY NO. MATERIAL DESCRIPTION
NONE KNOWN TO C.P. CHEMICAL CO., INC.

PHYSICAL DATA

APPEARANCE	
COLOR	WHITE / HAZY LIQUID
ODOR	PASTE / MUSTY
WEIGHT PER GALLON	10.1 – 10.2 LBS.
STORAGE LIFE AT 70F	45 DAYS
pH @ 21C	7.0 – 7.3
FREE C_6H_5OH IN LIQUID RESIN	<.01% NOT DETECTED
ACTIVITY INDEX	45 – 50%
CARRIER (VEHICLE)	WATER

ACUTE HEALTH HAZARD DATA
SKIN ABSORPTION: NO HAZARDS KNOWN TO C.P. CHEMICAL CO., INC.
INGESTION: GIVE THE EMPLOYEE LARGE AMOUNTS OF WATER TO DRINK, AND STICK FINGER DOWN THROAT TO INDUCE VOMITING. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. CALL A PHYSICIAN IMMEDIATELY
INHALATION: NOT HARMFUL UNDER NORMAL CONDITIONS OF USE, HOWEVER, IF ATOMIZED LIQUID IS ALLOWED TO BECOME AIRBORNE, IT MAY CAUSE IRRITATION OF NOSE, THROAT, AND MUCOUS MEMBRANES.
SKIN: MAY CAUSE IRRITATION ON PROLONGED OR REPEATED CONTACT
EYES: MAY CAUSE IRRITATION ON PROLONGED OR REPEATED CONTACT

READ NEXT PAGE (CP568-1)

C.P. Chemical Co., Inc.
25 Home St.
White Plains, NY 10606
(914) 428-2517

NAME: TRIPOLYMER® #105 TM FOAMING RESIN
TYPE: LIQUID, WATER BASED PHENOL, MELAMINE, METHYLENE LINKED AMINO COPOLYMER RESIN
APPLICATION: PROPRIETARY PRODUCT OF C.P. CHEMICAL CO., INC.

HANDLING PRECAUTIONS
INHALATION: AVOID PROLONGED OR REPEATED BREATHING IF LIQUID BECOMES AEROSOL
SKIN: AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. WILL CAUSE DRYING OF SKIN
EYES: AVOID CONTACT WITH EYES. USE PROPER EYE PROTECTION. IF RESIN SOLUTION ENTERS THE EYE, FLUSH IMMEDIATELY WITH LARGE AMOUNTS OF COOL WATER. SEE A DOCTOR IMMEDIATELY.

HANDLE IN ACCORDANCE WITH GOOD INDUSTRIAL HYGIENE AND SAFETY PRACTICES.

EMERGENCY AND FIRST AID PROCEDURES
INGESTION: IF SWALLOWED, INDUCE VOMITING IMMEDIATELY BY GIVING TWO GLASSES OF WARM WATER AND STICKING FINGER DOWN THROAT. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. CALL A PHYSICIAN.
INHALATION: REMOVE TO FRESH AIR.
SKIN CONTACT: IN CASE OF IRRITATIONS, FROM LIQUID RESIN FLUSH WITH COOL WATER.
EYE CONTACT: FLUSH IMMEDIATELY WITH WATER, SEE A PHYSICIAN IMMEDIATELY.

FIRE AND EXPLOSION HAZARD DATA
WILL NOT BURN UNLESS WATER IS EVAPORATED.
SELF EXTINGUISHING WILL NOT SUPPORT COMBUSTION.

REACTIVITY DATA
IF WATER IS ALLOWED TO EVAPORATE, DRY POWDER WILL BECOME FLAMMABLE WITH STRONG OXIDIZERS. DO NOT STORE NEAR STRONG OXIDIZERS.
RESIN WILL REACT WITH STRONG ACIDS OR ALKALIS TO FORM SOLID MASSES.
MATERIAL IS STABLE AND NON-REACTIVE WITH METALS, METAL POWDERS, SOLVENTS, PETRO-CHEMICALS, OR COMBUSTIBLE MATERIALS.

CONTROL MEASURES
IF AIRBORNE LIQUID CONTAMINANTS ARE GENERATED WHEN MATERIAL IS HANDLED, SUFFICIENT VENTILATION IN VOLUME AND AIRFLOW PATTERNS SHOULD BE PROVIDED TO KEEP AIR CONTAMINANT CONCENTRATION LEVELS BELOW ACCEPTABLE CRITERIA.

READ NEXT PAGE (CP568-2)

C.P. Chemical Co., Inc.
25 Home St.
White Plains, NY 10606
(914) 428-2517

NAME: **TRIPOLYMER® #105 TM FOAMING RESIN**
TYPE: LIQUID, WATER BASED PHENOLIC, MELAMINE, METHYLENE LINKED AMINO COPOLYMER RESIN
APPLICATION: PROPRIETARY PRODUCT OF C.P. CHEMICAL CO., INC.

PERSONAL PROTECTION INFORMATION
WHERE AIR ATOMIZED LIQUID CONTAMINANTS CAN EXCEED ACCEPTABLE CRITERIA, USE NIOSH / MSHA APPROVED RESPIRATORY PROTECTION EQUIPMENT. RESPIRATORS SHOULD BE SELECTED BASED ON THE FORM AND CONCENTRATION OF CONTAMINANTS IN AIR IN ACCORDANCE WITH OSHA 29 CFR 1910.1200 OR OTHER APPLICABLE STANDARDS OR GUIDELINES. USE GOGGLES IF CONTACT IS LIKELY. WEAR IMPERVIOUS GLOVES AS REQUIRED TO PREVENT SKIN CONTACT.

WASTE DISPOSAL METHOD
RECOVER FREE LIQUID; ABSORB RESIDUE AND DISPOSE OF ACCORDING TO LOCAL, STATE, AND FEDERAL REQUIREMENTS.

STORAGE PRECAUTIONS
DO NOT FREEZE
STORE IN A COOL PLACE, HIGH TEMPERATURES SHORTEN STORAGE LIFE PMIU RESIN THICKENS WITH AGE, ROTATE STOCK IN STORAGE TO USE OLDEST FIRST. REFER TO PRODUCT SPECIFICATIONS.

DOT CLASSIFICATION
NOT REGULATED

THIS IS THE LAST PAGE
(CP568-3)

LAST REVISED 11/30/01

C.P. CHEMICAL CO., INC.
25 Home Street
White Plains, NY 10606
(914) 428-2517

MATERIAL SAFETY DATA SHEET

NAME: **TRIPOLYMER 105 TM FOAMING AGENT – CATALYST**
TYPE: LIQUID ACIDIC FOAMING & EMULSIFYING AGENT
APPLICATION: PROPRIETARY PRODUCT C.P. CHEMICAL CO., INC.

SIGNAL WORD = CORROSIVE

THIS MATERIAL WILL CAUSE IRRITATION TO SKIN AND EYES. FLUSH SKIN OR EYES WITH COPIUS AMOUNTS OF WATER. SEE A PHYSICIAN FOR EYE CONTACT OR IF INGESTED.

FIRST AID AS FOR STRONG ACID

CHEMICAL HAZARD RATING
HEALTH = 2 (MODERATE)
FIRE = 0 (LEAST)
REACTIVITY = 0 (LEAST)

29CFR1910.1200 HAZARDOUS INGREDIENTS / REPORTED HEALTH EFFECTS

CAS REGISTRY NO. 7664-38-2	30% PHOSPHORIC ACID
CAS REGISTRY NO. 27176-87-0	5 % DODECYLBENZENESULFONATE

PHYSICAL DATA

APPEARANCE	LIGHT BROWN / DARK RED LIQUID
ODOR	SWEET/MUSTY
WEIGHT PER GALLON	10.6 # GAL
FREE H_3PO_4	30%
STORAGE LIFE	INDEFINATE
PH @ 21 ^{C}	1.0 – 3.0
BOILING POINT	212 ^{F}
SOLUBILITY IN H_2O	COMPLETE
% H_20	65%

ACUTE HEALTH HAZARD DATA
DANGER CAUSES BURNS TO EYES AND SKIN
INGESTION: IF INGESTED, FIRST AID AS FOR STRONG ACID. CALL A PHYSICIAN.
VENTILATION: PROVIDE VENTILATION TO MINIMIZE EXPOSURE. LOCAL EXHAUST FAN PREFERRED.

READ NEXT PAGE
(CP569-1)

C.P. CHEMICAL CO., INC.
25 Home Street
White Plains, NY 10606
(914) 428-2517

MATERIAL SAFETY DATA SHEET

NAME: TRIPOLYMER 105 TM FOAMING AGENT – CATALYST
TYPE: LIQUID ACIDIC FOAMING & EMULSIFYING AGENT
APPLICATION: PROPRIETARY PRODUCT C.P. CHEMICAL CO., INC

ACUTE HEALTH HAZARD DATA -CONTINUED-

SKIN PROTECTION: WEAR APPROPRIATE IMPERVIOUS GLOVES AND PROTECTIVE CLOTHING TO PREVENT SKIN CONTACT. WEAR FACE SHIELDS AND IMPERVIOUS APRONS WHEN SPLASHING IS LIKELY. WASH CONTAMINATED SKIN PROMPTLY.

HANDLING PRECAUTIONS

INHALATION: AVOID PROLONGED OR REPEATED BREATHING OF VAPOR.
SKIN: AVOID PROLONGED OR REPEATED CONTACT WITH SKIN.
EYES: AVOID CONTACT WITH EYES.
HANDLE IN ACCORDANCE WITH GOOD INDUSTRIAL HYGENE AND SAFETY PRACTICES.

EMERGENCY AND FIRST AID PROCEDURES

INGESTION: IF SWALLOWED, WASH OUT MOUTH WITH WATER IMMEDIATELY BY GIVING PLENTY OF WATER. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONCIOUS PERSON. CALL A PHYSICIAN. OBTAIN MEDICAL ATTENTION URGENTLY. DO NOT INDUCE VOMITING. TREAT AS FOR STRONG ACID.

SKIN CONTACT: IN CASE OF IRRITATION, FLUSH WITH WATER.

EYE CONTACT: FLUSH THOROUGHLY WITH WATER. SEE A PHYSICIAN IMMEDIATELY.

FIRE AND EXPLOSION HAZARD DATA

WILL NOT BURN UNLESS WATER HAS EVAPORATED. IN CASE OF FIRE, USE WATER SPRAY, DRY CHEMICAL, FOAM, OR CO_2, USE WATER TO KEEP FIRE – EXPOSED CONTAINERS COOL.

REACTIVITY DATA

NORMALLY STABLE AS DEFINED IN NFPA 704-12 (4-3.1).
DECOMPOSITION PRODUCTS: SO_3, SO_2, H_2S, CO.

CONTROL MEASURES

IF AIRBORNE CONTAMINATES ARE GENERATED WHEN THE MATERIAL IS HEATED OR HANDLED, SUFFICIENT VENTILATION IN VOLUME AND AIR FLOW PATTERNS SOULD BE PROVIDED TO KEEP AIR CONTAMINANT CONCENTRATION LEVELS BELOW ACCEPTABLE CRITERIA.

READ NEXT PAGE
(CP569-2)

C.P. CHEMICAL CO., INC.
25 Home Street
White Plains, NY 10606
(914) 428-2517

MATERIAL SAFETY DATA SHEET

NAME: **TRIPOLYMER 105 TM FOAMING AGENT – CATALYST**
TYPE: LIQUID ACIDIC FOAMING & EMULSIFYING AGENT
APPLICATION: PROPRIETARY PRODUCT C.P. CHEMICAL CO., INC.

PERSONAL PROTECTION INFORMATION – CONTINUED -

WHERE AIR CONTAMINANTS CAN EXCEED ACCEPTABLE CRITERIA, USE NIOSH / MSHA APPROVED RESPIRATORY PROTECTION EQUIPMENT. RESPIRATORS SHOULD BE SELECTED BASED ON THE FORM AND CONCENTRATION OF CONTAMINANTES IN AIR IN ACCORDANCE WITH OSHA 29 CFR 1910.134 OR OTHER APPLICABLE STANDARDS OR GUIDELINES.

USE GOGGLES IF CONTACT IS LIKELY.

WEAR IMPERVIOUS GLOVES AS REQUIRED TO PREVENT SKIN CONTACT.

SPILL OR LEAK PROCEDURES

LARGE QUANTITIES: ENCLOSE WITH DIKING MATERIAL TO PREVENT SEEPAGE INTO NATURAL BODIES OF WATER, THEN CONSULT C.P. CHEMICAL CO., INC.

SMALL QUANTITIES: SOAK UP WITH ABSORBAND MATERIAL AND REMOVE TO A CHEMICAL DISPOSAL AREA.

WASTE DISPOSAL METHOD: RECOVER FREE LIQUID. ABSORB RESIDUE AND DISPOSE OF ACCORDING TO LOCAL, STATE, AND FEDERAL REQUIREMENTS.

STORAGE PRECAUTIONS:

NOT HARMED BY FREEZING.

STORE IN A COOL PLACE.

DOT HAZARD CLASSIFICATION

CORROSIVE MATERIAL / UN 1805

THIS IS THE LAST PAGE
(CP569-3)
MSDCFG

Last Revised: 11/30/01

PHASE I ENVIRONMENTAL SITE ASSESSMENT

U-Haul Site
562 West 23rd Street
New York, New York 10011

Prepared for
23rd and 11th Associates LLC
c/o The Related Companies
60 Columbus Circle
New York, NY 10023

Prepared by
integral consulting inc.
61 Broadway
Suite 1601
New York, NY 10006

December 2015

EXECUTIVE SUMMARY

Integral Engineering, P.C. (Integral) has completed a Phase I environmental site assessment (ESA) for the U-Haul property located at 562 West 23rd Street, Manhattan, New York (herein referred to as the "subject property"). The subject property is identified by NYC Department of Finance as Block 694, Lots 5, 60, 61, and 65. It is bound by 23rd Street to the north, 11th Avenue to the west, residential buildings and West 22nd Street to the south, and commercial warehouses and an art gallery to the east.

The subject property located in the West Chelsea neighborhood of Manhattan is comprised of four contiguous tax lots. The subject property is currently owned and operated by U-Haul International Inc. (U-Haul). The subject property's entire footprint contains three separate buildings, each designated with the letters; A, B and C that identifies their location on specific tax lots. Building-A encompasses Lot 65, located at the corner of West 23rd Street and 11th Avenue, and Lot 5 which adjoins the southeastern corner of Lot 65 and has frontage on West 22nd Street; Building-B encompasses Lot 61, which adjoins Lot 65 along its eastern property boundary; Building-C encompasses Lot 60, which adjoins Lot 61 to the east. The locations of Buildings A, B, C, and their associated Lot numbers are outlined on Figure 2.

Building-A (Lot 65) is a three story commercial building constructed of brick and concrete with a steel frame structure. Sanborn records indicate usage back to 1890 as a wood factory, lumber yard, vehicle garage, and vehicle service station (Sanborn). 1921 Sanborns depict Building-A (Lot 65) with commercial retail and partial parking on portions of the first floor, with additional parking on the second, and third floors. By the mid to late 1970's records show the building is predominantly used as a garage and vehicle service shop. Currently, no vehicle service operations remain, and Building-A (Lot 65) is used for moving supply retail, mini-storage units, U-haul rental vehicle hand washing and parking. Two separate basement areas exist within Building-A (Lot 65), which are accessed through separate Bilco doors located in the sidewalks on West 23rd Street, and along 11th Avenue. The current parking lot, which adjoins Building-A (Lot 65) to the south, contained a two-story warehouse in 1930, this was no longer present on the 1976 (Sanborn). This area is currently used by U-haul to park rental trucks.

Building A (Lot 5) was originally part of the lumber yard noted in 1890 (Sanborn) that was also partially located near Building-A (Lot 65). The first structure noted on this property was a four story iron works warehouse in 1911. The warehouse was primarily utilized as a vehicle garage and service center between 1930 and 1976 when it was converted to a single story storage warehouse and vehicle parking facility. A single story warehouse is first noted on the 1976 Sanborn, in place of the previously noted three story warehouse. Since that time, it has been predominately used as a garage with vehicle repair shops. Currently there are no vehicle repairs or services taking place, as it is currently used as U-haul vehicle parking garage only.

Building-B (Lot 61) is currently a single story garage constructed of brick and concrete, with a steel frame structure. 1890 Sanborns show Building-B (Lot 61) to be part of the wood factory and lumber yard also partially located near Building-A (Lots 65 and 5). The 1899 Sanborn shows a three story warehouse present on Lot 61, and that it was utilized as an iron works until 1950. EDR's Directory search identified "Brake Labs Inc." as the primary occupant from 1958 through 1973. Sanborn maps for this time period were not available for review, and there were no other records available providing more information on this occupant. As the occupant's name suggest the presence of laboratory in connection with automobile brakes, the lack of information on the environmentally sensitive records it is important to identify this as a data gap. This occupant has been called out as REC for this report, with a description provided in Section 8.1.

Building-C (Lot 60) is currently a single story garage constructed of brick and concrete, with a steel frame structure. The 1890 Sanborn shows a warehouse on Lot 60 which contained a bedding and pillow manufacturing factory until 1950. The warehouse located at Building-C (Lot 60) is shown to be a single story structure in 1976 (Sanborn). Since that time, it has been predominately used as garage with vehicle repair shops. Currently, no vehicle repairs or services taking place, as they are currently used for U-haul vehicle parking garages only.

EDR's Certified Sanborn Map Report (Appendix D) and Radius Map Report (Appendix E) show that the subject property has garaged vehicles as far back as the mid 1920's, and provided vehicle services from the 1930's to the late 1980's. Building-A (Lot 65) has currently has abandoned below its first floor; one 1,000-gallon diesel UST, one 1,000-gallon gasoline UST, one 1,000-gallon No. 2 fuel oil UST, one 550-gallon gasoline UST, and a 5,000-gallon No. 2 fuel oil AST. Locations of these USTs are depicted on Figure 3. The 5,000-gallon AST is located in the basement of Building-A (Lot 65). The access to the basement is through Bilco doors located on West 23rd Street. Two 1,000-gallon USTs (diesel and gasoline) were connected to a pump island formally located at the current vehicle hand washing area. This hand washing area is located on the first floor of Building-A (Lot 65), near the western property boundary adjoining 11th Avenue. Current locations of these now abandoned tanks are reported to be below the ground floor within Building-A (Lot 65).

Additional environmental reports (Section 3.3), outline eight 550-gallon USTs (containing diesel and gasoline); and one 1,000-gallon No. 2 fuel oil UST, which existed at Building-B (Lot 60), Building-C (Lot 61), and Building-D (adjoins Lot 61 to the east, and is not part of the subject property). The 550-gallon gasoline and diesel USTs were excavated then removed in 2002, and the 1,000-gallon No. 2 fuel oil UST was abandoned in place as there were foundational elements surrounding the tank (ATC, 2002). The exact location of this UST is considered a data-gap, as the records provided for Integral's review did not provide this information. However, Figure 3 provides the approximate location this abandoned UST and the eight USTs removed from Building-B (Lot 60) and Building-C (Lot 61).

This Assessment has revealed evidence of five onsite Recognized Environmental Conditions (REC) in connection with the subject property.

REC 1 – Historic Site Usage of Automotive Services and Petroleum Storage

Environmental records show that the subject property historically dispensed fuels, serviced vehicles, contained potentially up to fifteen USTs, and currently contains a closed out AST. Previous environmental reporting indicates the following tanks have been abandoned in place at Building-A (Lot 65); one 1,000-gallon diesel UST, one 1,000-gallon gasoline UST, one 1,000-gallon No. 2 fuel oil UST, one 550-gallon gasoline UST, and a 5,000-gallon No. 2 fuel oil AST. The 5,000-gallon AST is located in the basement of Building-A (Lot 65). The access to the basement is through Bilco doors located on West 23rd Street. Locations of these abandoned tanks are reported to be below the ground floor within Building-A (Lot 65).

Additionally, Building-B (Lot 60), Building-C (Lot 61) are associated with eight excavated 550-gallon USTs (containing diesel and gasoline); and one 1,000-gallon No. 2 fuel oil UST. The 1,000-gallon No. 2 fuel oil UST was abandoned in place as there were foundational elements surrounding the tanks (ATC, 2002). The exact location of this UST is considered a data-gap, as the records provided for Integral's review did not include this information. However, Figure 3 provides the approximate location this abandoned UST and the eight USTs excavated from Building-B (Lot 60) and Building-C (Lot 61).

Identified in EDR's NY Historical UST Database search (Section 3.4.3.2), the locations of a 550-gallon steel gasoline UST closed out and removed at an unreported date and the 1,000-gallon steel leaded gasoline UST closed in place in June, 1991 have not been identified. These two USTs are not discussed in previous reports summarized in section 3.3, as those records only go back to 1994. The unknown location of these former USTs is considered a data gap and a REC, as the current presence of petroleum impacts to the subsurface of the subject property cannot be assessed

The historical presence of automotive services, storage and dispensing of petroleum products, and the presence of abandoned USTs and an AST, with a lack of closure assessments, at the subject property is considered a REC.

<u>REC 2 – NYSDEC Spill Numbers 9000199, 9700188, and 0205608</u>

Environmental records show that the subject property has been listed under NYSDEC spill numbers 9000199, 9700188, and 0205608. Each of these spills has been closed out by NYSDEC following minimal soil excavation and a more extensive groundwater monitoring investigation (Section 3.3). Remaining petroleum impacts to soil and groundwater is expected to exist, as no further action letters (NFA) were issued on the basis that residual impacts would naturally degrade, and would not migrate outside the boundary of the subject property.

The expected presence of petroleum impacts to the subsurface soils and groundwater at the subject property is considered a REC.

<u>REC 3 – Brake Labs Inc. Occupant in Building-B (Lot 61)</u>

EDR's Directory search identified "Brake Labs Inc." as the primary occupant from 1958 through 1973 at Building-B (lot 61). Sanborn maps for this time period were not available for review as there was no coverage. Additional review of EDR's Radius Report, and FOIL did not provide more information on this occupant. The occupant's name suggests the presence of laboratory with unknown operations, and is considered a REC.

<u>REC 4 – Report on Drum Removal, 562 West 23rd Street, NY, NY, ATC Associates, Inc., 2002</u>

In June 2002, seven previously discovered (April 26, 2002) drums located on the second floor storage room of Building-A (Lot 65) were removed from the subject property and sent to Cyclechem in NJ. Laboratory analysis of the contents indicated that four plastic drums contained dilute aqueous formic acid and ammonium hydrogen fluoride solution; one plastic drum contained a dilute aqueous sodium bicarbonate solution; 1 plastic drum contained an aqueous trifluoroacetic acid and ammonium hydrogen fluoride solution; and a 55-gallon steel drum contained spent GAC. Analysis indicated that each drum was non-hazardous and non-regulated under RCRA. According to ATC, the aqueous solutions discovered are believed to be spent process liquids typically used in the cleaning and flushing of tap lines in breweries and/or taverns.

The presence of waste chemical storage described in this letter is outside the typical use of the Building-A (Lot 65) as well as the remainder of the subject property. Chemical storage of this nature, while chemically non-hazardous, is a-typical and without a more detailed assessment of this condition, adverse environmental impacts to the subject property cannot be ruled out.

Therefore, the historical presence of chemical storage described in this letter is considered a REC.

REC 5 – E-Designation for the Subject Property

Hazardous Materials and Noise E-Designations have been assigned to Lots 60, 61 and 65 by New York City's Mayor's Office of Environmental Remediation (OER). Future redevelopment of the subject property will need to comply with OER and NYC Department of Buildings (DOB) requirements in order to obtain DOB permits for new buildings or alterations. Upon completion of any site redevelopment, a remedial action report will be required in order to obtain a Notice of Satisfaction from OER. E-designations assigned to the subject property are considered a REC.

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ACRONYMS AND ABBREVIATIONS

AGWS	Ambient Water Quality Standards
AST	aboveground storage tank
ASTM	ASTM International
AUL	activity and use limitation
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CORRACTS	Corrective Action Sites
CREC	controlled recognized environmental condition
EDR	Environmental Data Resources Inc.
EPA	U.S. Environmental Protection Agency
FOIA	Freedom of Information Act
FOIL	Freedom of Information Law
HREC	historical recognized environmental condition
Integral	Integral Engineering, P.C.
LAST	Leaking Aboveground Storage Tank Incidents Management Database
LUST	Leaking Underground Storage Tank Incidents Management Database
LUST TRUST	Leaking Underground Storage Tank Trust Fund
MTBE	Methyl Tertiary Butyl Ether
NYSDEC	New York State Department of Environmental Conservation
NPL	National Priority List
RCRA	Resource Conservation and Recovery Act
REC	recognized environmental condition
SHWS	state hazardous waste site(s)
UST	underground storage tank
VEC App	Vapor Encroachment Condition Application Software [EDR]

1 INTRODUCTION

1.1 SITE DESCRIPTION

Integral Engineering, P.C. (Integral) has completed a Phase I Environmental Site Assessment (ESA) for the U-Haul property located at 562 West 23rd Street, Manhattan, New York (herein referred to as the "subject property"). The subject property is identified by NYC Department of Finance as Block 694, Lots 5, 60, 61, and 65. It is bound by 23rd Street to the north, 11th Avenue to the west, residential buildings and West 22nd Street to the south, and commercial warehouses and an art gallery to the east.

The subject property located in the West Chelsea neighborhood of Manhattan and is comprised of four contiguous tax lots. The subject property is currently owned and operated by U-Haul International Inc. (U-Haul). The subject property's entire footprint contains three separate buildings, each designated with the letters; A, B and C that identifies their location on specific tax lots. Building-A encompasses Lot 65, located at the corner of West 23rd Street and 11th Avenue, and Lot 5 which adjoins the southeastern corner of Lot 65 and has frontage on West 22nd Street; Building-B encompasses Lot 61, which adjoins Lot 65 along its eastern property boundary; Building-C encompasses Lot 60, which adjoins Lot 61 to the east. The locations of Buildings A, B, C, and their associated Lot numbers are depicted on Figure 2.

Building-A (Lot 65) is a three story commercial building constructed of brick and concrete with a steel frame. Review of historic fire insurance maps (Sanborns) indicates usage of Lot 65 as a wood factory, lumber yard, vehicle garage, and vehicle service station since 1890. Sanborn maps depict Lot 65 with commercial retail and partial parking on portions of the first floor, with additional parking on the second, and third floors, but by the mid to late 1970's indicate the building is predominantly used as a garage and vehicle service shop. Currently, no vehicle service operations remain, and Lot 65 is used as moving supply retail, mini-storage unit rentals, and U-haul vehicle rental, hand washing, and parking. Two separate basement areas exist within the Lot 65 portion of Building-A, which are accessed through two sets of Bilco doors located in the sidewalks on West 23rd Street and along 11th Avenue. Review of Sanborn maps indicate that the unimproved portion of Lot 65, located south of Building-A, formerly housed a two-story warehouse in 1930. This building was no longer depicted on the 1976 map. This area is currently used by U-haul for vehicle parking.

The portion of Building-A, which is located on Lot 5 was originally part of the lumber yard noted in 1890 Sanborn that was also partially located near Building-A (Lot 65). The first structure noted on this property was a four story iron works warehouse in 1911. The warehouse was primarily utilized as a vehicle garage and service center between 1930 and 1976 when it was converted to a single story storage warehouse and vehicle parking facility. A single story warehouse is first noted on the 1976 Sanborn, in place of the previously noted three story warehouse. Since that time, it has been predominately used as a garage with vehicle repair shops. Currently there are no vehicle repairs or services taking place, as it is currently used as U-haul vehicle parking garage only.

Building-B (Lot 61) is currently a single story garage constructed of brick and concrete, with a steel frame structure. 1890 Sanborns show Building-B (Lot 61) to be part of the wood factory and lumber yard also partially located near Building-A (Lots 65 and 5). The 1899 Sanborn shows a three story warehouse present on Lot 61, and that it was utilized as an iron works until 1950. EDR's Directory search identified "Brake Labs Inc." as the primary occupant from 1958 through 1973. Sanborn maps for this time period were not available for review, and there were no other records available providing more information on this occupant. As the occupant's name suggest the presence of laboratory in connection with automobile brakes, the lack of information on the environmentally sensitive records it is important to identify this as a data gap. This occupant has been called out as REC for this report, with a description provided in Section 8.1.

Building-C located on Lot 60 is currently a single story garage constructed of brick and concrete with a steel frame. The 1890 Sanborn shows a warehouse on Lot 60 which contained a bedding and pillow manufacturing factory until 1950. In 1976 the warehouse was depicted as a single story structure with use indicated to be an "Motor Frt. Sta."Since that time, it has been predominately used as garage with vehicle repair shops. Currently, no vehicle repairs or services taking place, as they are currently used for U-haul vehicle parking garages only.

EDR's Certified Sanborn Map Report (Appendix D) and Radius Map Report (Appendix E) show that the subject property has garaged vehicles as far back as the mid 1920's, and provided vehicle services from the 1930's to the late 1980's. Building-A (Lot 65) has currently has abandoned below its first floor; one 1,000-gallon diesel UST, one 1,000-gallon gasoline UST, one 1,000-gallon No. 2 fuel oil UST, one 550-gallon gasoline UST, and a 5,000-gallon No. 2 fuel oil AST. Locations of these USTs are depicted on Figure 3. The 5,000-gallon AST is located in the basement of Building-A (Lot 65). The access to the basement is through Bilco doors located on West 23rd Street. Two 1,000-gallon USTs (diesel and gasoline) were connected to a pump island formally located at the current vehicle hand washing area. This hand washing area is located on the first floor of Building-A (Lot 65), near the western property boundary adjoining 11th Avenue. Current locations of these now abandoned tanks are reported to be below the ground floor within Building-A (Lot 65).

Additional environmental reports (Section 3.3), outline eight 550-gallon USTs (containing diesel and gasoline); and one 1,000-gallon No. 2 fuel oil UST, which existed at Building-B (Lot 60), Building-C (Lot 61), and Building-D (adjoins Lot 61 to the east, and is not part of the subject property). The 550-gallon gasoline and diesel USTs were excavated then removed in 2002, and the 1,000-gallon No. 2 fuel oil UST was abandoned in place as there were foundational elements surrounding the tank (ATC, 2002). The exact location of this UST is considered a data-gap, as the records provided for Integral's review did not provide this information. However, Figure 3 provides the approximate location this abandoned UST and the eight USTs removed from Building-B (Lot 60) and Building-C (Lot 61).

A site location map is included as Figure 1. A general site plan is included as Figure 2.

1.2 PURPOSE AND SCOPE OF SERVICES

This Phase I ESA was conducted for the subject property identified as 562 West 23rd Street, New York. The ESA has been prepared by Integral in general accordance with the ASTM International (ASTM) E1527-13 *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* and is intended for the sole use of 23rd and 11th Associates LLC and The Related Companies (the user).

The purpose of this assessment is to identify recognized environmental conditions (RECs) at the subject property, as defined by the ASTM E1527-13 standard. Completion of this report may be used to satisfy one of the requirements for the user to qualify for the innocent landowner, contiguous property owner, or bona fide prospective purchaser limitations pursuant to Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), thereby constituting all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice, as defined by CERCLA 42 U.S.C. §9601(35)(B).

The Scope of Services for this Phase I ESA included the following tasks:

- Subject property and vicinity reconnaissance
- Subject property and vicinity description and physical setting
- Historical source review and description of historical subject property conditions
- Interviews with owners, operators, and/or occupants of the subject property and/or local officials, when available
- Review of environmental databases and regulatory agency records
- Review of previous environmental reports/documentation, as applicable
- Review of environmental liens
- Preparation of a report summarizing findings, opinions, and conclusions.

Pursuant to the ASTM E1527-13 standard, recommendations to conduct Phase II sampling or other assessment activities are not required to be included in this report. Integral can provide such recommendations upon request.

1.3 ADDITIONAL SERVICES

No additional services were performed outside the scope of the ASTM E1527-13 standard. For reference, out-of-scope services may include but are not limited to:

- Asbestos
- Radon
- Lead-based paint
- Lead in drinking water
- Wetlands
- Regulatory compliance
- Cultural and historic resources
- Industrial hygiene
- Health and safety
- Ecological resources
- Endangered species
- Indoor air quality including vapor intrusion
- Biological agents
- Mold

1.4 LIMITATIONS AND DEVIATIONS

1.4.1 Accuracy and Completeness

The ASTM E1527-13 standard recognizes inherent limitations for Phase I ESAs that apply to this report, including:

- Uncertainty not eliminated—No Phase I ESA can wholly eliminate uncertainty regarding the potential for RECs in connection with a subject property. Data gaps identified during this ESA are discussed in Section 8.2.
- Not exhaustive—A Phase I ESA is not an exhaustive investigation.
- Past uses of the property—A review of standard historical sources at intervals less than five years is not required.

A Phase I ESA is a limited inquiry into a property's environmental status; it cannot wholly eliminate uncertainty and is not an exhaustive assessment to discover every potential source of environmental liability. This ESA was performed in general accordance with ASTM E1527-13. Integral has endeavored to meet this standard of care, which may be limited by conditions encountered during performance, the scope of work, or inability to review information not received by the report date. Where appropriate, these limitations are discussed in the report and an evaluation of their significance with respect to our findings has been conducted.

In conducting the limited scope of services described herein, certain sources of information and public records, some of which may document environmental concerns, were not reviewed. The Phase I ESA is intended to reduce, but not eliminate, uncertainty regarding the potential for RECs. No warranties, express or implied, are intended or made. The limitations herein must be considered when the user of this report formulates opinions as to risks associated with the site or otherwise uses the report for any other purpose. These risks may be further evaluated, but not eliminated, through additional research or assessment.

This report presents Integral's observations, findings, and conclusions as they existed at the time of the property reconnaissance. Integral makes no representation or warranty that past or current operations at the property are or have been in compliance with all applicable federal, state, and local laws, regulations, and codes. Integral makes no guarantees as to the accuracy or completeness of information obtained from others during the course of this ESA. It is possible that information exists beyond the scope of this assessment or that information was not provided to Integral. Additional information subsequently provided, discovered, or produced may alter findings or conclusions made in this report. Integral is under no obligation to update this report to reflect such subsequent information. The findings presented in this report are based on reasonably ascertainable information and observed property conditions at the time of the assessment.

This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not assessed. Regardless of the findings stated in this report, Integral is not responsible for consequences or conditions arising from facts that were not fully disclosed during the assessment.

Environmental Data Resources Inc. (EDR), an independent data research company, provided the government agency databases referenced in this report. Information regarding surrounding area properties was requested for approximate minimum search distances and was assumed to be correct and complete unless obviously contradicted by Integral's observations or other credible, referenced sources reviewed during the assessment.

Integral does not provide legal advice. Any reference to legal issues or terms is provided as part of the general environmental risk assessment and is not a substitute for the advice of competent legal counsel.

1.4.2 User Reliance / Continued Validity

This ESA was prepared for the exclusive use and reliance of 23rd and 11th Associates LLC and The Related Companies (the user). Use or reliance by any other party is prohibited without the written authorization of Integral.

This report is presumed to be valid, in accordance with, and subject to the limitations specified in the ASTM E1527-13 standard, for a period of 180 days from completion, or until the user obtains specific information that may materially alter a finding, opinion, or conclusion in this report or until the user is notified by Integral that it has obtained specific information that may materially alter a finding, opinion, or conclusion in this report. Additionally, pursuant to the ASTM E1527-13 standard, this report is presumed valid if completed less than 180 days prior to the date of acquisition of the property or (for transactions not involving an acquisition) the date of the intended transaction.

2 SUBJECT PROPERTY DESCRIPTION

2.1 LOCATION

Tax Block:	694
Tax Lots:	5, 60, 61, and 65
City:	Manhattan
County:	New York
State:	New York
Property Owner:	U-Haul International Inc.

2.2 IMPROVEMENTS

Current improvements are listed in the following table.

Feature	Description
Buildings:	Lot 65 is improved with a 3-story commercial building.
	Lot 61 is improved with a single story building, utilized as a parking garage.
	Lot 60 is improved with a single story building, utilized as a parking garage.
	Lot 5 is improved with a single story building, utilized for storage and vehicle parking.
Exterior areas:	A portion of Lot 65 is unimproved, capped, and utilized for parking.
Utilities:	NYC Municipal water, sewer, electric, and gas.

2.3 CURRENT AND HISTORICAL USE

2.3.1 Current Subject Property Use(s)

The subject property is currently used as a retail and commercial U-Haul facility which consist of the following uses: vehicle rental, vehicle washing (hand), parking, moving supply retail, and mini-storage unit rental. Additionally, two residential apartments are present in Building - A.

2.3.2 Previous Owner and Operator Information

Based on information provided by the User (Section 5) and the historic records review (Section 3) conducted as part of this ESA, previous owner and operator information, organized by tax lot, is outlined below.

Subject Property Owner – Lot 65	**From**	**To**
Unknown Lumber Yard Owner	1890	1921
Unknown Garage Owner	1921	1930
Unknown Contractor Supplies and Garage Owner	1930	1957
Unknown Repair Shop and Garage Owner	1957	Unknown
Barrington Moore	Unknown	1970
Barrington Moore Jr. and Peter Van Cortlandt	1970	1973
Moore Nominee Corp.	1973	1977
U-Haul Company of Metro NYC	1977	Current
Subject Property Operator – Lot 65	**From**	**To**
Unknown Lumber Yard and Wood Factory	1890	1921
Riverview Commercial Garage, Unknown Restaurant	1921	1930
Contractor Supplies, N.Y. Post Society Mission	1930	1957
Unknown Garage, Vehicle Repair shop, and Factory	1957	1963
Custom Truck Rental Corp.	1976	1978
Chelsea Moving Center	1978	1983
U-Haul	1983	Current
Subject Property Owner – Lot 61	**From**	**To**
Unknown Lumber Yard Owner	1890	1911
Unknown Iron Works Owner	1911	1958
Unknown Garage Owner	1958	Unknown
Ross F. Eadie, Robert L. Graham III, James N. Wells Sons, and Clement M. Odgen	Unknown	1977
Ogden Nominee Corp	1977	1979
U-Haul Company of Metro NYC	1979	Current

Subject Property Operator – Lot 61	**From**	**To**
Unknown Lumber Yard and Wood Factory	1890	1911
Unknown Iron Works	1911	1958
Brake Labs Inc.	1958	1979
U-Haul	1979	Current
Subject Property Owner – Lot 60	**From**	**To**
Unknown Lumber Yard Owner	1890	1927
Unknown Bedding Supplies Owner	1927	1963
Unknown Repair Shop and Garage Owner	1963	Unknown
Margaret Bradley, Ross Eadie, William Imhof	Unknown	1971
Alan and Hugh Bradley	1971	1979
Alan Bradley and Bilhar Inc.	1979	1980
U-Haul Company of Metro NYC	1980	Current
Subject Property Operator – Lot 60	**From**	**To**
Unknown Lumber Yard and Wood Factory	1890	1927
Mitchell P.C. Co. Bedding & Pillow Supplies	1927	1963
Unknown Garage, Truck Leasing, and Vehicle Repair Shop	1963	1980
U-Haul	1980	Current
Subject Property Owner – Lot 5	**From**	**To**
Unknown Lumber Yard and Wood Factory Owner	1890	1930
Unknown Auto House Owner	1930	1937
Unknown Garage, and Iron Works Owner	1937	1956
Unknown Shipping Container Facility Owner	1956	Unknown
Catherine Garvey	Unknown	1966
Grace Hunt	1966	1977
U-Haul Company of Metro NYC	1977	Current

Subject Property Operator – Lot 5	**From**	**To**
Unknown Lumber Yard and Wood Factory	1890	1930
Unknown Auto House	1930	1937
Unknown Garage, and Iron Works	1937	1956
Unknown Shipping Container Facility	1956	1985
Chelsea Rental and Repairs	1985	1977
U-Haul	1977	Current

2.4 PHYSICAL SETTING

Site Elevation:	Elevation ranges from approximately 6 to 7 ft. above mean sea level (msl) across the subject property (Appendix E).
Site Topography:	The topography of the subject property is relatively level with a gentle slope west towards the Hudson River. The entire area surrounding the subject property is urban land which has been developed, and manually contoured to be level with street grade.
Surrounding Properties:	Urban setting with industrial, commercial, and residential improvements.
Local Soils:	Urban Land – Historical Fill; silty sands at depth (Appendix E).
Local Geology:	According to the Bedrock and Engineering Geologic Maps of New York County and Parts of Kings and Queens Counties, New York, and Parts of Bergen and Hudson Counties, New Jersey (Baskerville 1994), the geology in the vicinity of the subject property includes interbedded units of the following from the Hartland Formation (Middle Ordovician and Lower Cambrian carbonate rocks): 1. Gray and gray-weathering, fine-grained quartz-feldspar granulite containing minor biotite and garnet; 2. Fine- to coarse-grained, gray- to tan-weathering, quartzofeldspathic, muscovite- biotite-garnet schist. The muscovite flakes are commonly large and may give outcrops a “spangled” or shiny metallic look; some outcrops have knotty kyanite surfaces; 3. Dark-greenish-black quartz-biotite-hornblende amphibolites; weathers black or rusty along fractures. The Hartland here is in thrust-fault contact with the underlying Manhattan Schist on the Cameron’s Line thrust, which goes beneath the Jurassic and Triassic Newark basin sediments (Baskerville, 1994).
Groundwater Depth:	Based on the proximity to the Hudson River depth to groundwater is expected to be shallow (less than 10 feet below grade).

Groundwater Flow:	Local groundwater flow is expected to trend west toward the Hudson River.
Nearest Surface Water:	The Hudson River is approximately 525 ft. from the western boundary of the subject property.
Flood Zones:	The subject property exists within a 100-year flood zone (FEMA 2015). FEMA flood zones for the surrounding area are provided on Figure 4.

2.5 SURROUNDING PROPERTY USES

Direction	**Adjoining Properties**	**Surrounding Properties**
North	West 23rd Street, and Multi-story Residential Buildings	Commercial/Residential Buildings
South	Multi-story Residential Buildings	Commercial/Residential Buildings
East	Multi-story Commercial and Residential Buildings; Commercial building east of Lot 60 is occupied by U-Haul	Commercial/Residential Buildings, The High Line
West	11th Avenue and Chelsea Water Side Park	Pier 63, and Chelsea Piers Sports and Entertainment Complex

3 HISTORICAL SEARCH

According to ASTM Standard E1527-13, all obvious uses of the subject property shall be identified from the present, back to the subject property's obvious first developed use, including agricultural use, or back to 1940, whichever is earlier. A search was performed for available aerial photographs (Appendix A), historical topographic maps (Appendix B), Sanborn Maps (Appendix C), city directories (Appendix D), and Department of Buildings (DOB) records (Appendix F).

3.1 SOURCES OF INFORMATION

Information regarding the historical uses of the subject property and the vicinity was obtained from various publicly available and practically reviewable sources including: aerial photographs; Sanborn fire insurance maps; topographical maps; city directories; and an environmental database report. Historical research documentation is included in the appendices.

3.2 HISTORICAL USE INFORMATION

Historical use information regarding the subject property and surrounding properties was obtained from aerial photographs (scale 1" = 500') dated 1924, 1940, 1943, 1951, 1954, 1961, 1966, 1974, 1976, 1980, 1985, 1991, 2006, 2008 - 2010 and 2011; Sanborn fire insurance maps dated 1890, 1899, 1904, 1911, 1919, 1922, 1928, 1930, 1950, 1975, 1976, 1979, 1980, 1982, 1985, 1987, 1988, 1991 - 1995, 2001 - 2004, and 2005; topographic maps dated 1898, 1900, 1905, 1947, 1955, 1966, 1979, 1995, and 2013; city directories dated 1920, 1923, 1927, 1931, 1934, 1938, 1942, 1947, 1950, 1956, 1958, 1963, 1968, 1973, 1978, 1983, 1988, 1993, 1996, 1998, 2000, 2006, 2008, and 2013; department of building (DOB) records dated 1921, 1937, 1957, 1958, 1960, 1963, and 1969

3.2.1 Subject Property Operational History

As the subject property consists of several lots (Lot 5, 60, 61, and 65), each of these lots have been called out, where necessary, for clarification purposes.

Year	Source	Subject Property History
1890	Sanborn Map	"Kindling-Wood Factory & Lumber Yard" is noted to occupy present day lots 5, 61, and 65. A boiler is noted near the central boundary closest to 23rd Street, within this factory. An unmarked building exists at Lot 60, with a boiler noted at the southeast corner of this lot.
1898	Topographic Map	The block encompassing the subject property is defined, no other demarcations are noted.

Year	Source	Subject Property History
1899	Sanborn Map	"Kindling-Wood Factory & Lumber Yard" still occupies Lot 5 and 65, with boiler and AST now noted. A three-story building occupies Lot 61 with a boiler noted in the basement. The previously unmarked building at Lot 60 is now noted to be six stories, with the boiler still present.
1900	Topographic Map	No significant changes are noted in comparison to the 1898 topographic map.
1904	Sanborn Map	Coverage of the subject property was not provided for this time period.
1905	Topographic Map	No significant changes are noted in comparison to the 1900 topographic map
1911	Sanborn Map	Lots 5 and 65 are still occupied by a single-story warehouse containing lumber operations noted as "Wood Yard" and "Storage of Wood." A restaurant is also noted on Lot 65 along the West 23rd Street frontage. The southern portion of Lot 65 and the whole of Lot 5 are now occupied two and four story flat metal frame buildings respectively; with an upright AST noted near the northern boundary of Lot 5. Lot 61 is now noted as an "Iron Works," with an upright boiler in the basement. No significant changes are noted at Lot 60.
1919	Sanborn Map	Coverage of the subject property was not provided for this time period, only surrounding properties were available.
1921	DOB Records	A certificate of occupancy for Lot 65 outlines a property with a basement and 3 stories; the basement contains a boiler room; 1st story contains stores and a garage; 2nd and 3rd stories are used a garage.
1922	Sanborn Map	Provided maps for this time period show no details for the subject property.
1924	Aerial Photo	The resolution of the photo for this time period is poor; however, the roofs of the buildings which occupy the subject property are visible.
1927-1942	Directory Search	The telephone directory for 1927 identifies "Mitchell P.R. Co" as the occupant of Lot 60. Bedding supplies and Pillows are associated with this occupant.
1927	Directory Search	The telephone directory identifies "Wigton-Abbott Corp.", "Michaels Engineering Co.", "Levgar Structural Co.", and "Levering & Garrigues Co. Structural Steel" as the occupants of Lot 61.
1928	Sanborn Map	Coverage of the subject property was not provided for this time period, only surrounding properties were available.
1927	Directory Search	The telephone directory identifies "Riverview Commercial Garage" as the main occupant of Lot 65.

Year	Source	Subject Property History
1930	Sanborn Map	Lot 65 is now occupied by a three story garage structure, with a two-story warehouse noted as "N.Y. Post Society Mission" adjoining the warehouse to the south. The warehouse is noted to contain two 1,000-gallon gasoline USTs, near the boiler previously identified. The four-story metal frame building on Lot 5 is now noted as an Auto House. Lot 61 is a three-story building noted to have "contractor supplies" on the first floor, with offices on the second and third floors. Lot 60 is identified as "Manufg. Bedding Supplies", and contains a 10,000-gallon gravity tank (non-petroleum) on the roof.
1937	DOB Records	A certificate of occupancy for Lot 5 outlines a property with four stories; 1st story is a public garage; 2nd and 3rd stories are used as an iron works, and 4th story is a used for ornamental plaster works.
1940	Aerial Photo	The resolution of the photo for this time period is poor; no significant observations are visible
1942	Directory Search	The telephone directory identifies "Bremer H Confect. NY" as an occupant of Lot 65.
1943	Aerial Photo	The roofs of the buildings which occupy the subject property are visible; no significant changes are noted.
1947	Topographic Map	The block is denoted on the map, with no additional detail provided.
1947-1950	Directory Search	Lot 61's telephone directory for this time period identifies "Lewisohn Sales Co. Inc" as an occupant.
1950	Sanborn Map	No significant changes are noted at Lots 60, 61, and 65 for this time period. A gasoline tank (volume and contents not provided) is first noted along the 22nd Street frontage for Lot 5.
1951	Aerial Photo	The roofs of the buildings which occupy the subject property are visible; a shadow of the 10,000-gallon gravity tank (water supply) can be seen on Lot 60. No other significant changes are noted.
1954	Aerial Photo	No significant changes are noted in comparison to the 1951 aerial photo.
1955	Topographic Map	The block is denoted on the map, and tinted pink signifying urban land. No other significant changes are noted.
1957	DOB Records	A certificate of occupancy for Lot 61 outlines a single-story building used as a motor vehicle repair shop and garage. A gasoline tank (volume and contents not provided) installation is noted for approval on April 10, 1957.
1956-1958	Directory Search	Lot 5's telephone directory identifies several occupants who are associated with shipping supplies, plastic containers, and cardboard boxes.
1958	Directory Search	Lot 60's telephone directory identifies "Perfection Gear Co." as an occupant.

Year	Source	Subject Property History
1958	DOB Records	A certificate of occupancy for Lot 5 outlines a single story building with a mezzanine area; the 1st story is a garage, and the 2nd contains offices. Gasoline tank (volume and contents not provided) installation is noted for approval on April 14, 1958. It is unknown if this approval is related to the previously identified gasoline tank depicted on the 1950 Sanborn or a newly installed tank.
1958-1973	Directory Search	Lot 61's telephone directory identifies "Brake Labs Inc." as an occupant.
1960	DOB Records	A certificate of occupancy for Lot 65 outlines a property with a basement and three stories; the basement contains a boiler room; 1st and 2nd stories are used as a garage; and the 3rd story is used as a factory. Fuel oil system is approved for installation on February 17, 1960; as is a gasoline tank installation on October 18, 1960.
1961	Aerial Photo	No significant changes are noted in comparison to the 1954 Aerial photo.
1963	Directory Search	Lot 65's telephone directory identifies "Custom Truck Rental Corp." as an occupant.
1963	DOB Records	A certificate of occupancy for Lot 60 outlines a property with a single-story used for a trucking terminal, motor vehicle repair shop, and garage storage for automobiles.
1963-1968	Directory Search	Lot 5's telephone directory identifies numerous occupants who are associated with shipping supplies, plastic containers, and cardboard boxes; as well as "Warren Displays"
1966	Aerial Photo	No significant changes are noted at Lots 5. The buildings at lots 60 and 61 now appear to only be a single story at this time; the two-story warehouse adjoining the south wall of the warehouse on Lot 65 now appears to be demolished at this time.
1969	DOB Records	A certificate of occupancy for Lot 65 shows the grade level is now approved for commercial vehicle storage use.
1973-1978	Directory Search	Lot 5's telephone directory identifies as "Warren Displays Inc." as the main occupant.
1974	Aerial Photo	A parking lot is visible at the southern wall of the warehouse on Lot 65. No other significant changes are noted.
1968-1973	Directory Search	Lot 65's telephone directory identifies "Chelsea Leasing Corp." and "Briggs Leasing Corp." as the occupants.
1968-1978	Directory Search	Lot 60's telephone directory identifies "Streichler Trucking Co." as the occupant.

Year	Source	Subject Property History
1978	Directory Search	Lot 65's telephone directory identifies "Chelsea Moving Center." as the occupant.
1978	Directory Search	Lot 61's telephone directory identifies "JHT Leasing Corp." as the main occupant.
1975	Sanborn Map	Provided maps for this time period show no details for the subject property.
1976	Sanborn Map	"Truck Parking" is now noted south of the garage warehouse on Lot 65; the gasoline tank identified in the aforementioned DOB records from 1960 is not depicted. Lot 61 shows a modification (dated 1956), to a single story building, 2 unmarked circles (1 likely associated with 1958 DOB records indicating the installation of a gasoline tank), are noted near the West 23rd Street frontage. Lot 60 is also a single story automotive garage noted as "Motor Frt. Sta." Lot 5 is a garage noted as "Truck Leasing Garage"; the above mentioned gasoline tank(s) : 1950 Sanborn and 1958 DOB records are not depicted.
1976	Aerial Photo	The resolution of the photo for this time period is poor with no significantly visible changes to the subject property noted.
1979	Sanborn Map	The aforementioned unmarked circles noted on Lot 61 are clearly labeled as "GTS" for gasoline tanks.. No other significant changes are noted for the remainder of the subject property.
1979	Topographic Map	No significant changes are noted in comparison to the 1955 topographic map.
1980-1987	Sanborn Maps	No significant changes are noted in comparison to the 1979 Sanborn map.
1980-1991	Aerial Photos	No significant changes are noted in comparison to the 1976 aerial photo; except in 1985 the aerial photos are now in color.
1983	Directory Search	Lot 65's telephone directory identifies "Michaels Cleaners Two" as an occupant at 170 11th Avenue.
1983	Directory Search	Lot 5's telephone directory identifies "Chelsea Rental Repair Service Inc." as an occupant.
1983-1998	Directory Search	Lot 65's telephone directory identifies U-Haul operations are present at the 562 West 23rd Street address.
1988	Sanborn Map	Lots 60 and 61 are noted to be commercial structures, and Lot 65 is noted to be a warehouse structure; no other significant changes are noted for the subject property.
1991-1993	Sanborn Map	No significant changes are noted in comparison to the 1988 Sanborn map.

Year	Source	Subject Property History
1994	Sanborn Map	The south portion of Lot 61, and the whole of Lot 65 and Lot 5 are not visible during this time period; no changes are noted at north portion of Lot 61, or at the whole of Lot 60.
1995	Topographic Map	The subject property is not visible in the maps provided for this time period, only surrounding properties are available.
1995-1996	Sanborn Map	No significant changes are noted in comparison to the 1993 Sanborn Map.
2001	Sanborn Map	Lot 60 is noted to be part of "U-Haul Storage & Rental". No other significant changes are noted for the subject property.
2002-2005	Sanborn Map	Lots 60, 61, and 65 are all noted to be associated with U-Haul operations and are labeled "U-Haul Storage & Rental", "U-Haul Garage", and "U-Haul Self Storage" respectively. Lot 5 remains labeled as "Truck Leasing Garage".
2006-2011	Aerial Photos	No significant changes are noted in comparison to the 1985 aerial photo.
2013	Topographic Map	The block which contains the subject property is demarcated and is west of the 10 foot elevation contour.

3.2.2 Adjoining Property History

Year	Source	Adjoining Property History:
1890	Sanborn Map	*Northern Boundary*: Across West 23rd Street a lumber yard is noted
		Eastern Boundary: East of Lot 60 a machine shop is noted; east of Lot 5 a lye factory is noted.
		Southern Boundary: No structures are defined across West 22nd Street
		Western Boundary: Across 11th Avenue, "NY Lake Erie & Western R.R. Co." railroad tracks are noted.
1898	Topographic Map	*All Boundaries*: Blocks are demarcated.
1899	Sanborn Map	*Eastern Boundary*: East of Lot 60, "Brighton Cotton Mills" is newly noted; the lye factory remains east of Lot 5.
		Remaining Boundaries: No significant changes are noted in comparison to the 1890 Sanborn map.
1900	Topographic Map	*All Boundaries*: Blocks are demarcated.

Year	Source	Adjoining Property History:
1904	Sanborn Map	*Southern Boundary*: Across West 22nd Street, lumber storage is visible for the first time.
		Remaining Boundaries: Structures are not depicted in remaining directions on the maps provided for this time period.
1905	Topographic Map	*All Boundaries*: No significant changes are noted in comparison to the 1900 topographic Map.
1911	Sanborn Map	*Northern Boundary*: Across West 23rd Street a four story hotel and a three story freight depot with offices are noted.
		Eastern Boundary: East of Lot 60, the former cotton mill warehouse is not labeled, the boiler room area is depicted with three rectangular boilers; east of Lot 5 the former lye factory is not labeled and a five-story factory is noted, with private water pipes.
		Southern Boundary: There is no map coverage across West 22nd Street for this time period.
		Western Boundary: A park is now visible across 11th Avenue.
1919	Sanborn Map	*Southern Boundary*: A three story warehouse is noted across West 22nd Street; "Hopkins Manuf's Co." is noted to manufacture wagons and carriages.
		Remaining Boundaries: There is no map coverage for this time period.
1922	Sanborn Map	*Western Boundary*: A 12-inch water pipe is noted in the center of 11th Avenue, with a park also noted.
		Remaining Boundaries: There is no detailed map coverage for this time period.
1924	Aerial Photo	*Western Boundary*: The park boundaries are visible
		Remaining Boundaries: The roofs of adjoining properties are visible.
1928	Sanborn Map	*Western Boundary*: A 12-inch water pipe is noted in the center of 11th Avenue, with the park also noted.
		Remaining Boundaries: There is no detailed map coverage for this time period.
1930	Sanborn Map	*Northern Boundary*: Across West 23rd Street the hotel remains with a tank visible in its southeastern corner; the former freight depot is now noted to be "The Autocar Company" garage service station. Three tanks associated with the service station exist near the West 23rd Street frontage, but their contents are not noted.
		Eastern Boundary: East of Lots 60 is a four-story warehouse; east of Lot 5 is a two-story steel storage building and a five-story warehouse with a tank noted.
		Southern Boundary: There is no detailed map coverage for this time period.

Year	Source	Adjoining Property History:
		Western Boundary: The park is still visible across 11th Avenue, as is the prosed ramp for Henry Hudson Parkway (currently Route 9A).
1940-1976	Aerial Photo	*Western Boundary*: The park is still visible across 11th Avenue, as is the ramp for Route 9A.
		Remaining Boundaries: The roofs of adjoining properties are visible.
1947	Topographic Map	*Western Boundary:* The Henry Hudson Highway is visible as Route 9A.
		Remaining Boundaries: No significant changes are noted in comparison to the 1905 topographic Map.
1950	Sanborn Map	*Northern Boundary*: Across West 23rd Street the hotel and "Autocar Company" service station are still noted. Three tanks associated with the service station exist near the West 23rd Street frontage, but their contents are not noted.
		Eastern Boundary: East of Lots 60 is a four-story warehouse labeled "Garage Service Station"; east of Lot 5 is a two story steel storage building with a single story factory in the location of the former five story warehouse.
		Southern Boundary: A four and five floor warehouse exists across West 22nd Street. The use of the warehouse is not depicted.
		Western Boundary: The park (Thomas F. Smith Park) is visible across 11th Avenue, as is the ramp for Route 9A.
1955-1966	Topographic Map	*All Boundaries*: The surrounding blocks are tinted pink, signifying urban land use, and the 10 foot elevation contour runs through the western third of Block 694.
1975	Sanborn Map	*Southern Boundary*: A four and five floor warehouse exists across West 22nd Street. The four-story warehouse is labeled "Glass W.Ho". *Western Boundary:* No significant changes are noted in this direction. *Remaining Boundaries*: There is no detailed map coverage for this time period.
1976	Sanborn Map	*Northern Boundary*: Across West 23rd Street no significant changes are noted in comparison with 1950 map.
		Eastern Boundary: East of Lots 60 is a four story warehouse labeled "Garage" now has four gas tanks labeled within the building; east of Lot 5 is a two-story steel storage building, and a single-story factory which now shows two gas tanks at the central portion of the West 22nd Street frontage.
		Southern Boundary: There is no detailed map coverage for this time period.
		Western Boundary: No significant changes are noted in this direction.

Year	Source	Adjoining Property History:
1979	Sanborn Map	*Northern Boundary*: No significant changes are noted in comparison to the 1976 map. *Eastern Boundary*: No significant changes are noted in comparison to the 1976 map; except that the single story factory (east of Lot 5) is now labeled "Motor Frt. Sta." *Southern and Western Boundaries*: No significant changes are noted in comparison to the 1976 map.
1979	Topographic Map	*All Boundaries*: No significant changes are noted during this time period in comparison to the 1955 map.
1980	Sanborn Map	*All Boundaries*: No significant changes are noted during this time period in comparison with the 1979 map.
1980	Aerial Photo	*Western Boundary*: Route 9A, which as formally elevated, now exists at ground level. *All Other Boundaries*: No significant changes are noted in comparison to the 1976 photo.
1982	Sanborn Map	*Southern Boundary*: There is no detailed map coverage for this time period. *All Other Boundaries*: No significant changes are noted in comparison to the 1980 map.
1985	Sanborn Map	*All Boundaries*: No significant changes are noted in comparison to the 1982 map.
1985	Aerial Photos	*All Boundaries*: No significant changes are noted in comparison to the 1980 photo; except the photo is now in color.
1987	Sanborn Map	*All Boundaries*: No significant changes are noted in comparison to the 1985 map.
1988-1991	Sanborn Map	*Eastern Boundary*: The gas tanks located in the warehouse east of Lot 60 are no longer depicted. *Western Boundary*: Route 9A overpass is not noted. *All Other Boundaries*: No significant changes are noted in comparison to the 1987 photo; except the commercial and warehouse structures are now labeled with "C's" and "W's".
1991	Aerial Photo	*All Boundaries*: No significant changes are noted in comparison to the 1985 photo.
1992-1996	Sanborn Map	*All Boundaries*: No significant changes are noted in comparison to the 1991 map.

Year	Source	Adjoining Property History:
1995	Topographic Map	*All Boundaries*: The subject property is not depicted on the maps provided for this time period.
2001-2002	Sanborn Map	*Eastern Boundary*: The warehouse east of Lot 60 is not labeled as "U-Haul Stg'e & Rental".
		All Other Boundaries: No significant changes are noted in comparison to the 1991 map.
2003	Sanborn Map	*Northern Boundary*: The lot which formally contained the Autocar service station and associated tanks is now unmarked.
		Eastern Boundary: No significant changes are noted in comparison to the 2002 map.
		Southern Boundary: No significant changes are noted in comparison to the 2002 map; except that the three-story warehouse on the corner of West 22nd Street and 11th Avenue is now labeled as "Chelsea-P Art Museum."
		Western Boundary: Route 9A is now depicted as Twelfth Avenue.
2004-2005	Sanborn Map	*Northern Boundary*: The formerly unmarked lot now contains a large apartment building that is eleven stories high.
		Remaining Boundaries: No significant changes are noted in comparison to the 2003 map.
2006-2011	Aerial Photo	*Northern Boundary*: A large apartment building that is eleven stories high is first visible in 2006.
		Remaining Boundaries: No significant changes are noted in comparison to the 1991 photo.

3.2.3 Surrounding Property History

Year	Source	Surrounding Property History:
1890	Sanborn Map	*North*: Across West 23rd Street several lumber yards and stable houses are noted
		East: On the eastern portion of Block 694 "Consolidated Electric Light Company" and "American Tobacco Company" occupy the central majority of the block, with residences noted at the near 10th Avenue.
		South: Map coverage is not available across West 22nd Street for this time period.

Year	Source	Surrounding Property History:
		West: Railroad tracks and Stables houses are noted on neighboring blocks.
1898	Topographic Map	*All Directions*: Blocks are demarcated, with loading docks noted along the Hudson River to the west.
1899	Sanborn Map	*North*: Across West 23rd Street several lumber yards and stable houses are still noted.
		East: On the eastern portion of Block 694 "Sawer-Man Electric Co." and "American Tobacco" occupy the central majority of the block, with residences noted at the near 10th Avenue.
		South: Map coverage is not available across West 22nd Street for this time period.
		West: Railroad tracks and rail car houses are noted on neighboring blocks.
1900	Topographic Map	*All Directions*: No significant changes are noted in comparison to the 1898 map.
1904	Sanborn Map	*South*: Across West 22nd Street, lumber storage, cabinetry shops, and dairy trucking operations are visible for the first time.
		Remaining Directions: Map coverage is not available in the remaining directions for this time period.
1905	Topographic Map	*All Directions*: No significant changes are noted in comparison to the 1900 Topographic Map.
1911	Sanborn Map	*North*: Across West 23rd Street lumber and wagon yards, freight depot with a coal pocket and hotels are noted.
		East: "Westinghouse Lamp Company" and "The American Tobacco Company" occupy the central majority of Block 694, with residences noted at the near 10th Avenue.
		South: Map coverage is not available across West 22nd Street for this time period.
		West: A park and street car storage yard is visible across 11th Avenue.
1919	Sanborn Map	*South*: Several warehouses are depicted with numerous commercial operations related to trucking and storage noted.
		Remaining Directions: Map coverage is not available for this time period.
1922	Sanborn Map	*West*: Portions of the loading docks are noted by the Hudson River.
		Remaining Directions: The map for this time period outlines the blocks of the area, but provides little detail on lot utilization.
1924	Aerial Photo	*West*: The loading docks along the Hudson River are visible.

Year	Source	Surrounding Property History:
		Remaining Directions: The surrounding area is densely populated with numerous warehouse structures noted.
1928	Sanborn Map	*West*: Portions of the loading docks are noted by the Hudson River.
		Remaining Directions: The map for this time period outlines the blocks of the area, but provides little detail on lot utilization.
1930	Sanborn Map	*North*: Across West 23rd Street property use appears to be predominantly commercial with several garages and machine shops depicted.
		East: On the eastern portion of Block 694 the former "Westinghouse Lamp Company" warehouse is now vacant and "The American Tobacco Company" is noted as "Spear & Company Furniture Warehouse". Residences are noted closer to 10th Avenue.
		South: The map for this time period south of West 22nd Street is not visible in the records provided by EDR (Appendix D).
		West: The park and rail car storage are still visible across 11th Avenue, as is the prosed ramp for Henry Hudson Parkway (currently Route 9A).
1940-1943	Aerial Photo	*West*: The ramp for Route 9A, Hudson River loading docks, and park are still visible across 11th Avenue. Street car parking can be seen across 11th Avenue to the northwest.
		East: An elevated railway is visible for this first time in 1940 on the eastern portion of Block 964.
		Remaining Directions: The surrounding area is densely populated with numerous warehouse structures noted.
1947	Topographic Map	*West:* The Henry Hudson Highway is visible as Route 9A, and the loading docks along the Hudson River are noted as "Smith Park".
		Remaining Directions: No significant changes are noted in comparison to the 1905 Topographic Map; except the 10th Avenue elevated railway is visible
1950	Sanborn Map	*North*: Across West 23rd Street numerous warehouses are noted to contain Laundry operations.
		East: "Spear & Company", a furniture warehouse, occupies the majority of the central portion of Block 694, with residences and the elevated railway noted.
		South: Several warehouses exist across West 22nd Street; warehouse operations are not depicted. d.
		West: Thomas F. Smith Park is visible across 11th Avenue, as is the ramp for Route 9A. The former rail car storage yard is now depicted as "General Motors Truck Sales & Services". A filling station with five gasoline tanks is noted on the northwest corner opposite the subject property.

Year	Source	Surrounding Property History:
1951-1961	Aerial Photo	*East*: Two parking areas are noted under the elevated railway on the eastern portion of Block 964 for the first time in 1951.
		West: A filling station is visible at the northwest corner of 11th Avenue across from the subject property.
		Remaining Directions: The surrounding area is densely populated with numerous warehouse structures noted.
1955-1979	Topographic Map	*All Directions*: The surrounding blocks are designated as urban land, and the 10 foot elevation contour runs through the western third of Block 694.
1966-1976	Aerial Photo	*West*: The ramp for Route 9A, Hudson River loading docks, and park are still visible across 11th Avenue. Truck loading docks are noted on the blocks to the northwest.
		Remaining Directions: The surrounding area is densely populated with numerous warehouse structures noted; no significant changes noted in comparison to the 1966 photo.
1975	Sanborn Map	*South and West*: No significant changes are noted in this direction in comparison to the 1950 map; except a boiler room is now noted at the Hudson River dock located at the intersection of 11th Avenue and 22nd Street.
		Remaining Directions The map for this time period north of West 22nd Street is not visible in the records provided by EDR (Appendix D).
1976	Sanborn Map	*North*: Across West 23rd Street the previously depicted laundry warehouses are primarily noted as parking garages.
		East: Furniture warehouses still occupy the majority of the central portion of Block 694, with residences and the elevated railway noted further east.
		South: The map for this time period south of West 22nd Street is not visible in the records provided by EDR (Appendix D)..
		West: The former filling station is noted to be “Truck Park’g”. No other significant changes are noted in this direction.
1979-1980	Sanborn Map	*All Directions:* No significant changes are noted in comparison to the 1976 map.
1980	Aerial Photo	*West*: Route 9A, which was formerly elevated, now exists at ground level and the loading docks appear to have undergone renovations.
		All Other Directions: No significant changes are noted in comparison to the 1976 photo.
1982	Sanborn Map	*South*: The map for this time period south of West 22nd Street is not visible in the records provided by EDR (Appendix D).

Year	Source	Surrounding Property History:
		All Other Directions: No significant changes are noted during this time period in comparison with the 1980 map.
1985-1996	Sanborn Map	*All Directions*: No significant changes in use are noted in comparison to the 1982 map.
1985-1991	Aerial Photos	*All Directions*: No significant changes are noted in comparison to the 1980 photo; except the photo is in color.
1995	Topographic Map	*All Directions*: The surrounding properties are not depicted on the maps provided for this time period.
2001-2002	Sanborn Map	*North*: A large residential building is depicted across West 23rd Street in the center of block 695.
		East: Several warehouses, previously depicted as commercial warehouses, are now occupied by mini-storage units and art galleries.
		South: No significant changes are noted in comparison to the 1996 map.
		West: The Hudson River docks are now noted as "Chelsea Piers Sports and Entertainment Center"; the boiler room is still visible.
2003-2005	Sanborn Map	*North*: A large residential building is depicted west of the previously depicted building (2001-2002) across West 23rd Street in the center of Block 695.
		East: No significant changes are noted in comparison to the 2002 map.
		South: No significant changes are noted in comparison to the 2002 map.
		West: Route 9A is now depicted as Twelfth Avenue.
2006-2009	Aerial Photo	*North:* The new residential towers or visible across West 23rd Street.
		West: Chelsea Piers Sports and Entertainment center is visible for the first time.
		Remaining Directions: No significant changes are noted in comparison to the 1991 photo.
2010-2011	Aerial Photo	*West*: A new park is visible along the Hudson River
		Remaining Boundaries: No significant changes are noted in comparison to the 2009 photo.

3.3 PREVIOUS REPORTS

Integral performed a review of several documents provided by the User. These documents reported numerous environmental imperatives associated with the removal or abandonment of several USTs and/or ASTs on the subject property from 1993 through 2002. The majority of these actions took place on Lot 65. Each document is listed below in section 3.3.1 and their findings and conclusions are summarized in section 3.3.2. Copies of available environmental records and reports are included in their entirety, as received, in Appendix F.

3.3.1 User Provided Documents

1. Boring Report, U-Haul Corporation New York City, American Hi-Tech, Inc., 1994.
2. Tank Removal Letter, U-Haul #803-62 562 West 23rd Street, New York, NY, Tyree Brothers Environmental Services, Inc., April 1997.
3. Closure Report for the Excavation of Underground Storage Tanks, U-Haul #803-62 562 West 23rd Street, New York, NY, Tyree Brothers Environmental Services, Inc., July 1997.
4. Site Assessment Report; U-Haul Moving Center #803-62, 562 West 23rd Street, New York, NY, Pinnacle Environmental Technologies, 1997.
5. Groundwater Sampling Report, 562 West 23rd Street, New York, NY, Pinnacle Environmental Technologies, 1998.
6. Quarterly Groundwater Sampling Reports, 562 West 23rd Street, New York, NY, Pinnacle Environmental Technologies, 1999.
7. Site Closure Letter, NYSDEC Spills 9000199 & 9700188, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2000.
8. Site Investigation Report, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2001.
9. Supplement to the Site Investigation Report, Groundwater Modeling, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2001.
10. Underground Storage Tank Closure and Focused Subsurface Investigation, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2002.
11. Report on Drum Removal, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2002.
12. Phase I Environmental Site Assessment, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2002.
13. 5,000-gallon Tank Closure Report, 562 West 23rd Street, New York, NY, Environmental Resources Management, 2006.

3.3.2 Summary of Findings and Conclusions from Documents provided by the User

3.3.2.1 Boring Report, U-Haul Corporation New York City, American Hi-Tech, Inc., 1994

American Hi-Tech (AHT) identifies the subject property as Site #9 (Building-A [Lot65])and notes it to be NYSDEC PBS Facility No. 2-084069 with two active 1,000-gallon USTs which store gasoline and diesel, a closed in place 550-gallon gasoline UST, and a removed 1,000-gallon fuel oil UST.
AHT performed a Subsurface Site Investigation in the vicinity the abandoned 550-gallon and 1,000-gallon USTs. The results of the investigation revealed that VOCs were present in subject property soils above NYSDEC applicable soil cleanup objectives in boring B-4. This boring was reportedly located adjacent to the abandoned 1,000-gallon fuel oil UST and was collected at the soil and groundwater interface.

Subsequent to a tank test failure, a spill was reported to the NYSDEC and assigned Spill No. 9000199[1]. After a number of tank removal/closure actions and monitoring of groundwater, this spill was closed in 2000. The spill closure is summarized in Section 3.3.2.7.

3.3.2.2 Tank Removal Letter, U-Haul #803-62 562 West 23rd Street, New York, NY, Tyree Brothers Environmental Services, Inc., April 1997

In April 1997, Tyree Brothers Environmental Services, Inc. cut and cleaned two 1,000-gallon USTs, located in Building-A and removed their associated piping. Excavation of the USTs was anticipated during this time, however a spill was encountered during tank decommissioning, and therefore the USTs were left in place for excavation at a later date. NYSDEC Spill Number 9700188 was assigned to the property. The spill was closed in February 2002, and is summarized in Section 3.3.2.9.

3.3.2.3 Closure Report for the Excavation of Underground Storage Tanks, U-Haul #803-62 562 West 23rd Street, New York, NY, Tyree Brothers Environmental Services, Inc., July 1997

In July 1997, Tyree Brothers Environmental Services, Inc. excavated and removed one 1,000-gallon gasoline UST and one 1,000-gallon diesel UST within the western portion of Building-A (Lot 65). These USTs were connected to a previously demolished pump island, located near Building-A'sexit onto 11th Avenue. NYSDEC Spill Number 9700188 was issued for the subject property. Post-excavation soil samples revealed that VOCs were present in soil beneath the fill lines (located under the sidewalk adjacent at 11th Avenue) at concentrations exceeding NYSDEC applicable soil cleanup objectives. Approximately 8.5 tons of petroleum-contaminated soil was excavated and removed from the subject property in the vicinity of the

[1] It appears that the NYSDEC recorded the date of this spill incorrectly, documenting it as having taken place in 1990.

remote fill lines. The soil was thermally treated and recycled at Posillico Brothers Asphalt Company in July 1997. Spill closure is summarized in Section 3.3.2.9.

3.3.2.4 Site Assessment Report; U-Haul Moving Center #803-62, 562 West 23rd Street, New York, NY, Pinnacle Environmental Technologies, 1997

In 1997, NYSDEC and NYCFD responded to a report of free-phase petroleum penetrating through Building A's (Lot 65) southern basement wall, accessed through 11th Avenue bilco doors. It was reported to ATC Associates Inc. (ATC), an environmental and geotechnical firm, that free-phase petroleum had been spilled into the basement during a delivery. No free phase product has since been reported in the basement or in any of the monitoring wells.

On July 31, 1997, Pinnacle Environmental Technologies (Pinnacle) issued a Site Assessment Report (SAR). The report indicated that VOCs were detected at concentrations exceeding NYSDEC applicable soil cleanup objectives in two of nine soil samples collected from three soil borings completed as part of the investigation, including the former fill line trench adjacent to 11th Avenue and formerly excavated by Tyree. However, the contamination was only detected at three feet below grade. Samples collected from deeper intervals exhibited VOC concentrations below applicable soil cleanup objectives. Pinnacle installed three groundwater monitoring wells (MW-1, MW-2, and MW-3) as part of their investigation on the western boundary of Building-A (Lot 65) adjacent to 11th Avenue. One well was installed adjacent to the former fill line trench. Groundwater samples were collected from the wells and the results indicated that total BTEX concentrations exceeded the NYSDEC Ambient Groundwater Quality Criteria in wells MW-1 and MW-3. The total BTEX concentrations ranged from 82.7 (ug/l) to 84 ug/l. Pinnacle concluded that no further remedial action (soil excavation) appeared to be required at this time as soil impacts were adequately defined, with a recommendation to conduct quarterly monitoring and sampling of the three monitoring wells submitted and approved by NYSDEC.

3.3.2.5 Groundwater Sampling Report, 562 West 23rd Street, New York, NY, Pinnacle Environmental Technologies, 1998

Pinnacle initiated a groundwater-monitoring program involving biannual sampling and reporting of the three monitoring wells (MW-1, MW-2, and MW-3). This report identified groundwater at approximately 6.06 ftbg, with flow estimated toward the northeast. The current sampling event (June 20, 1998) indicated minor BTEX detections, and MTBE concentrations in MW-2 and MW-3 at 79.0 ug/l and at 36 ug/l, respectively.

3.3.2.6 Quarterly Groundwater Sampling Reports, 562 West 23rd Street, New York, NY, Pinnacle Environmental Technologies, 1999

Continued implementation of the groundwater monitoring program, initiated by Pinnacle, is summarized through up to June 27, 1999. Groundwater was measured at depths between 6.06 and 6.81 ftbg. During this period, dissolved BTEX and MTBE decreased to non-detect in MW-1, non-detect in MW-2 and fluctuated in MW-3. The last sampling event (June 27, 1999) indicated BTEX and MTBE concentrations in MW-3 at 45.8 ug/l and at 53 ug/l, respectively.

3.3.2.7 Site Closure Letter, NYSDEC Spills 9000199 & 9700188, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2000

Dated May 18, 2000, ATC summarized previous remedial actions and groundwater monitoring and petitioned NYSDEC to close Spills 9000199 and 9700188 and submit a no further action (NFA) letter. On June 21, 2000 NYSDEC closed out Spill 9000199, and left 9700188 open pending additional investigations.

3.3.2.8 Site Investigation Report, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2001

On May 15, 2001, ATC collected additional soil and groundwater samples to delineate the contamination around former boring B-4, to characterize the subsurface conditions along the western boundary of Building-A (Lot 65), and to evaluate subsurface conditions down gradient of the abandoned 1,000-gallon fuel oil UST. The results indicated that low levels of petroleum-related BTEX and 2-methyl-naphthalene remain in the groundwater beneath the abandoned 550-gallon and 1,000-gallon USTs. The highest total BTEX concentration detected in the groundwater was 585.1 ppb (GP-6), near the abandoned 550-gallon gasoline UST. This investigation helped to support closure of NYSDEC Spill Number 9700188 (Section 3.3.2.9).

3.3.2.9 Supplement to the Site Investigation Report, Groundwater Modeling, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2001

In December 2001, ATC performed Bioscreen groundwater modeling to determine if any of the remaining dissolved phase contamination would migrate outside of Building A's (Lot 65) footprint for NYSDEC Spill Number 9700188. The results of the Bioscreen groundwater model suggested that the dissolved-phase contamination would not result in the migration of BTEX off the U-Haul property. The results suggested that natural attenuation was the appropriate remedial technology for the dissolved hydrocarbons and a no further action letter was requested by ATC.

Based upon a review of this and previous reports the NYSDEC issued a no further action letter for the subject property on February 22, 2002 and NYSDEC Spill Number 9700188 was closed.

In May 2002, ATC abandoned the three groundwater monitoring wells located at the subject property in accordance with NYSDEC guidelines.

3.3.2.10 Underground Storage Tank Closure and Focused Subsurface Investigation, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2002

In July 2002 ATC oversaw the removal of eight 550-gallon petroleum USTs and the in place closure of one 1,000-gallon heating oil UST in Building-B (Lot 61), Building C (Lot 60), and Building-D (adjoins Lot 60 to the east; not part of the subject property). ATC collected endpoint samples in the vicinity of the former USTs. Laboratory analysis indicated that VOCs and SVOCs were present at concentrations exceeding applicable soil cleanup objectives. The NYSDEC was contracted and spill number 0205608 was assigned to the subject property.

Subsequently, ATC performed a Subsurface Site Investigation in order to assess groundwater quality in the area of the former USTs. Four groundwater samples were collected and analyzed for VOCs and SVOCs. Laboratory analysis indicated that 1 groundwater sample contained elevated concentrations of VOCs and SVOCs exceeding AGWS. Based on the low levels at which VOCs and SVOCs were present in the soil and groundwater and the minimal risk of exposure, ATC recommended NYSDEC issue a NFA letter and close spill #0205608.

Based upon a review of these reports the NYSDEC issued a no further action letter for the subject property on December 10, 2002 and NYSDEC Spill Number 0205608 was closed.

3.3.2.11 Report on Drum Removal, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2002

In June 2002, seven previously discovered (April 26, 2002) drums located on the second floor storage room of Building-A (Lot 65) were removed from the subject property and sent to Cyclechem in NJ. Laboratory analysis of the contents indicated that four plastic drums contained dilute aqueous formic acid and ammonium hydrogen fluoride solution; one plastic drum contained a dilute aqueous sodium bicarbonate solution; 1 plastic drum contained an aqueous trifluoroacetic acid and ammonium hydrogen fluoride solution; and a 55-gallon steel drum contained spent granular activated carobon (GAC). Analysis indicated that each drum was non-hazardous and non-regulated under RCRA. According to ATC, the aqueous solutions discovered are believed to be spent process liquids typically used in the cleaning and flushing of tap lines in breweries and/or taverns.

The presence of waste chemical storage described in this letter is outside the typical use of the Building-A (Lot 65) as well as the remainder of the subject property. Chemical storage of this nature, while chemically non-hazardous, is a-typical and without a more detailed assessment of this condition, adverse environmental impacts to the subject property cannot be ruled out. Therefore, the historical presence of chemical storage described in this letter is considered a REC.

3.3.2.12 Phase I Environmental Site Assessment, 562 West 23rd Street, New York, NY, ATC Associates, Inc., 2002

Dated November 1, 2001, this Phase I ESA was completed at the subject property in ATC for the use of Americo Real Estate Company. The ESA was completed in accordance with the ASTM E1527-00. Following their review of available resources, ATC concluded that the historical presence of USTs and their associated spill numbers at the subject property were not recognized environmental concerns.

3.3.2.13 5,000-gallon Tank Closure Report, 562 West 23rd Street, New York, NY, Environmental Resources Management, 2006

In October 2006, ERM abandoned in place a 5,000-gallon #2 fuel oil AST in the basement of Building-A. The AST was filled with foam, and all pipes were plugged. No samples were collected.

Following review of these reports it is important to note that the subject property currently contains two abandoned 1,000-gallon USTs, one abandoned 550-gallon UST, and an abandoned 5,000-gallon AST. The current locations of these abandoned tanks have not been assessed but are known to be within the bounds of Lot 65, 61, and 60.

3.4 ENVIRONMENTAL DATABASE SEARCH

A search of regulatory databases was performed by EDR, including federal, state, and local databases that maintain records regarding potential and actual environmental threats within search distances specified in ASTM E1527-13. The minimum search distance for specific government records varies from 0.0 miles (subject property only) to 1.0 mile, in accordance with the requirements of ASTM E1527-13.

Integral reviewed each environmental database on a record-by-record basis from federal, state, and local sources provided in the November 10, 2015, *Radius Map* report (Appendix E). The environmental databases contained listings for the subject property and listings of properties within the specified radii, which are discussed in the subsequent sections.

It should be noted that several orphan sites (i.e., sites where the address information is insufficient to locate the property on the EDR maps) were identified. Based on a review of available information provided for the orphan sites, none appear to be related to the subject property. The EDR report, which includes a complete list of orphan sites, is provided in Appendix E.

3.4.1 Federal Databases

The standard environmental records searched in EDR's *Radius Map* report (Appendix E) include the following federal databases: the National Priority List (NPL); Delisted NPL; Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS); CERCLIS No Further Remedial Action Planned site list; Resource Conservation and Recovery Act (RCRA) Corrective Action Sites (CORRACTS) facilities list; RCRA non-CORRACTS Transporters, Storage, and Disposal Facilities list; RCRA Generators list; Institutional Controls / Engineering Controls registries; and the Emergency Response Notification System list.

EDR's records review of the above standard federal environmental record lists identified numerous sites within 1 mile of the subject property. Sites of environmental concern that have the potential to impact the subject property have been discussed in this section (including relative distance, direction, and assumed hydraulic gradient). A detailed description of RECs, CRECs, HRECs, or *de minimis* conditions, if any, resulting from these listings has been provided in the Findings and Opinions section of this report (Section 8).

3.4.1.1 National Priority List (NPL)

The NPL is the United States Environmental Protection Agency's (U.S. EPA's) database of some of the most serious uncontrolled or abandoned hazardous waste sites identified for probable remedial action under the Superfund Program. These sites may constitute an immediate threat to human health and the environment. Due to the amount of public attention focused on NPL sites, they pose a significant risk of stigmatizing surrounding properties and potentially impacting property values.

The subject property was not listed as an NPL site. However, one NPL site was listed within a mile radius of the subject property.

Lower Elevation:

- *Hudson River PCBs* (500 feet west and relatively down gradient of the subject property) – Assigned the EPA ID NYD980763841, this listing identifies PCB related impacts to the Hudson River sediments.

The above listings identified in the NPL does not represent a REC, CREC, HREC, or *de minimis* condition as it is unlikely to affect the subject property due to it's lower elevation and proximity to the subject property.

3.4.1.2 CERCLIS

Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) is a compilation of known or suspected, uncontrolled or abandoned hazardous waste sites which the U.S. EPA has investigated or plans to investigate for a release or threatened release of hazardous substances pursuant to the Superfund Act of 1980 (CERCLA). Some of these sites may constitute a potential threat to human health and the environment. While it has been determined by the U.S. EPA that some CERCLIS sites require no action, others could pose a real or perceived environmental threat to neighboring properties, thus affecting property values.

The subject property was not listed in the CERCLIS database; however one listing was identified within a one half-mile radius of the subject.

Lower Elevation:

- *Hudson River PCBs* (500 feet west and relatively down gradient of the subject property) – Assigned the EPA ID NYD980763841, and Site ID 0202229, this listing's past actions and current status have been outlined in this listing.

The above listings identified in CERCLIS does not represent a REC, CREC, HREC, or *de minimis* condition as it is unlikely to affect the subject property due to it's lower elevation and proximity to the subject property.

3.4.1.3 Federal CERCLIS NFRAP Site List (CERC-NFRAP)

Sites listed in this database have been removed and archived from the inventory of CERCLIS sites. Due to their archived status, all assessments made on these sites have satisfied the EPA's guidelines and regulations and therefore, no additional steps will be taken to list these sites on the NPL.

The subject property was not listed in the CERC-FRAP database. However, one property within a half mile radius to the subject property has been identified.

Higher Elevation:

- *Manhattan General Mail Facility* (0.42 miles east northeast and at a relatively higher elevation to the subject property) West 28th & 9th Avenue.

The above listing identified in the CERC-NFRAP listings does not represent a REC, CREC, HREC, or *de minimis* condition as it is unlikely to affect the subject property due to its proximity (0.42 miles).

3.4.1.4 RCRA Large Quantity Generators

RCRA Large Quantity Generators (RCRA-LQG) generate 1,000 kg or more of hazardous waste during any calendar month; or generate more than 100 kg if any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month; or generates 1 kg or less of acutely hazardous waste during any calendar month, and accumulates more than 1 kg of acutely hazardous waste at any time; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates more than 100 kg of that material at any time.

The subject property was not listed in the RCRA-LQG database. However, four listings within a quarter mile radius have been identified.

Based on our review of these four listings, Integral has determined that these sites do not represent a REC, CREC, HREC, or *de minimis* condition, as the generation of hazardous waste does not, by itself, constitute an environmental condition that could potentially impact the subject property. Additionally, the listings do not adjoin the subject property, nor do they exist within proximity of concern. Therefore it is unlikely that potential impacts, if any, would affect the subject property.

3.4.1.5 RCRA-SQG

The RCRA Small Quantity Generators (RCRA-SQG) list contains sites which generate, transport, store, treat, and/or dispose of hazardous waste in quantities greater than 100 kilograms, but less than 1,000 kilograms per month.

The subject property was not listed within the RCRA-SQG database. However, three properties within a quarter mile radius to the subject property were identified.

Following review of the three listings, Integral has determined that they do not represent a REC, CREC, HREC, or *de minimis* condition, as the generation of hazardous waste does not, by itself, constitute an environmental condition that could potentially impact the subject property. Additionally, the listings do not adjoin the subject property, nor do they exist within a proximity of concern. Therefore it is unlikely that potential impacts, if any, would affect the subject property.

3.4.1.6 RCRA-CESQG

RCRA Conditionally Exempt Small Quantity Generators (RCRA-CESQG) generate 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg of less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time; 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, wastes or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste.

The subject property was not listed in the RCRA-CESQG database. However, twenty-one properties were identified within a quarter mile radius of the subject property.

Based on our review of these listings, Integral has determined that these sites do not represent a REC, CREC, HREC, or *de minimis* condition, as the generation of hazardous waste does not, by itself, constitute an environmental condition that could potentially impact the subject property. Additionally, the listings do not adjoin the subject property, nor do they exist within a proximity of concern. Therefore it is unlikely that potential impacts, if any, would affect the subject property.

3.4.1.7 Engineering Control Site List

This listing from U.S. EPA contains sites with engineering controls in place. These controls include caps, building foundations, liners, and treatment methods to eliminate pathways for regulated substances to enter the environment and/or affect human health.

The subject property was not listed on the Engineering Control site list. However, one property was identified within a half mile radius of the subject property.

Lower Elevation:

- *Hudson River PCBs* (500 feet west and relatively down gradient of the subject property) – Assigned the EPA ID NYD980763841

Based on our review of this listing, Integral has determined that this site does not represent a REC, CREC, HREC, or *de minimis* condition as it is unlikely to affect the subject property due to its lower elevation and proximity to the subject property.

3.4.1.8 Institutional Control Site List

This listing from U.S. EPA contains sites where institutional controls are in place. Institutional controls include administrative declarations such as use restrictions, construction restrictions, property use restrictions, and remediation care requirements used to prevent exposure to contaminants remaining on site. Deed restrictions are typically included in institutional controls.

The Subject Property was not identified on the Institutional Control site list. However, one property was identified within a half mile radius of the subject property.

Lower Elevation:

- *Hudson River PCBs* (500 feet west and relatively down gradient of the subject property) – Assigned the EPA ID NYD980763841

Based on our review of this listing, Integral has determined that this site does not represent a REC, CREC, HREC, or *de minimis* condition as it is unlikely to affect the subject property due to its lower elevation and proximity to the subject property.

3.4.2 State Databases

The state records reviewed include the state and tribal equivalent NPL, state and tribal equivalent CERCLIS, state and tribal landfill and/or solid waste disposal site lists, state and tribal leaking storage tank lists, state and tribal registered storage tanks lists, state and tribal institutional control / engineering control registries, state and tribal voluntary cleanup sites, and state and tribal brownfield sites.

EDR's records review of the above standard state environmental records lists numerous properties within 1 mile of the subject property. All sites of environmental concern that have the potential to impact the subject property have been outlined in this section based on their environmental records listing. A detailed description of any RECs, CRECs, HRECs, or *de minimis* conditions identified in association with these listings has been provided in the findings and opinions section of this report (Section 8).

3.4.2.1 State and Tribal Equivalent CERCLIS (NY SHWS and NJ SHWS)

Also referred to as the State Superfund Program, the Inactive Hazardous Waste Disposal Site Remedial Program is the cleanup program for inactive hazardous waste sites.

NY SHWS

The subject property was not listed in the NY SHWS database. However, one property was listed within a one mile radius of the subject property.

Based on our review of this listing, Integral has determined that this site does not represent a REC, CREC, HREC, or *de minimis* condition as it is unlikely to affect the subject property due to its lower elevation and proximity to the subject property.

NJ SHWS

The subject property was not listed in the NJ SHWS database. However, seven properties were listed within a one mile radius of the subject property.

Based on our review of these listings, Integral has determined that these sites do not represent a REC, CREC, HREC, or *de minimis* condition as it is unlikely to affect the subject property as they exist on the western bank the Hudson River, opposite the subject property.

3.4.2.2 NY SWF/LF

The Solid Waste Facilities/Landfill (SWF/LF) Sites records typically contain an inventory of solid waste disposal facilities or landfills in a particular site.

A review of the NY SWF/LF list revealed that there no NY SWF/LF records for the subject property. However, three listings were within a half of a mile radius of the subject property. Based on our review of the listings, Integral has determined that these properties do not represent a REC, CREC, HREC, or *de minimis* condition as it is unlikely that potential impacts would travel the distance to affect the subject property (greater than 0.25 miles).

3.4.2.3 State and Tribal Leaking Storage Tank Lists

NY LTANKS

An inventory of reported leaking underground storage tank (UST) incidents is included in the Leaking Storage Tank Incident Report Database (NY LTANKS).

A review of NY LTANKS findings has revealed that there are records that share the same address for the subject property in this database.

Subject Property:

- *562 West 23rd Street (Block 694, Lot 65)* – NYSDEC Spill number 0205608 was opened on August 27, 2002 following the abandonment of a 1,000-gallon UST. The UST was cleaned and accessible soils were excavated from around the UST, however it could not be removed due to foundation issues. The spill was closed on December 10, 2002 by NYSDEC, following review of a closure report which summarized tank closure, soil excavation, and groundwater sampling results. NYSDEC described contamination as localized.

Spill number 0205608 (also identified in section 3.3.2.9) summarized above in the NY LTANKS listing does represent a REC as petroleum impacts remediated to the satisfaction of NYSDEC, which affected the soil and groundwater present underneath the subject property, may still have residual contamination in locations not previously accessible.

Previously identified Spill Numbers 9000199 and 9700188 (Section 3.3) were not identified in EDR's NY LTANKS database search.

Continued review of NY TLANKS findings has revealed sixty-seven additional NY LTANKS listings within a half mile of the subject property. Spills which are at close proximity and at a higher elevation to the subject property have been outlined below.

Higher Elevation:

- *Mendon Leasing and Edison Parking Garage* (265 feet east southeast and relatively at a higher elevation than the subject property) 527 West 23rd Street – Several spills are associated with this address and have been outlined below:
    - NYSDEC Spill number 8605564 was opened on December 3, 1986 following the testing and failure of a UST. The spill is noted closed on the same day it was opened.
    - NYSDEC Spill number 9808740 was opened on October 14, 1994 following the testing and failure of a UST. The spill is noted closed on May 27, 2004.
    - NYSDEC Spill number 9511782 was opened on December 18, 1995 following the testing and failure of a UST. The spill is noted closed on May 27, 2004.
    - NYSDEC Spill number 9513588 was opened on January 1, 1996 following the testing and failure of one of six USTs. The spill is noted closed on February 22, 2001.
- *Mary Boone Gallery* (294 feet east and relatively at a higher elevation to the subject property) 537-541 West 24th Street – NYSDEC Spill number 0005393 was opened on August 5, 2000 following the testing and failure of a gasoline and fuel oil USTs. The spill is noted closed on June 8, 2007.
- *201 11th Avenue Manhattan USPS*(319 feet north and relatively at a higher elevation to the subject property) 201 11th Avenue – Multiple NYSDEC spills are associated with this site and have been outlined below:
    - NYSDEC Spill number 8908706 was opened on November 27, 1989 following the testing and failure of a UST. The spill is noted closed on March 4, 2003.
    - NYSDEC Spill number 9005469 was related to a small gasket leak on a fuel oil UST. The spill was closed on May, 11, 1990.
- *Commercial Building* (375 feet east and relatively at a higher elevation to the subject property) 521 West 23rd Street – NYSDEC Spill number 1010869 was opened on January 24, 2011 following the testing and failure of a USTs. The spill is noted closed on November 27, 2012.

Based on our review of the listings above and the remainder of the NY LTANKS listings, Integral has determined that these properties do not represent a REC, CREC, HREC, or *de minimis* condition as it is unlikely that impacts will travel the distance to affect the subject property, as the spills reported have been documented under the regulatory authority of NYSDEC, and have been remediated to their satisfaction prior to closure.

3.4.2.4 State and Tribal Registered Storage Tank List

NY UST

The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of RCRA. The data comes from the NYSDEC.

A review of NY UST findings has revealed that there are records that share the same address for the subject property in this database.

Subject Property:

- *562 West 23rd Street (Block 694, Lot 65)* – Identified by Site ID: 2-804069, this listing identifies two USTs that were closed out on Aril 11, 1997. A 1,000-gallon steel gasoline UST and a 1,000-gallon steel diesel UST were removed and closed out.

The former presence of USTs outlined in this listing does represent a REC as petroleum impacts associated with these USTs which were remediated to the satisfaction of NYSDEC, and affected the soil and groundwater present underneath the subject property, may still have residual contamination in locations not previously accessible.

The four USTs present in this listing where identified in the previous reporting summarized in the Section 3.3. The subject property's additional nine USTs discussed in Section 3.3, were not identified in EDR's NY UST database search.

Continued review of NY UST findings has revealed forty-one additional NY UST listings within a quarter mile of the subject property. Spills which are at close proximity and at a higher elevation to the subject property have been outlined below.

Equal/Higher Elevation:

- *Dia Art Foundation* (214 feet south southeast and at a relatively higher elevation to the subject property) 548 West 22nd Street – Identified by Site ID: 2-272256, this is a closed petroleum bulk storage (PBS) site. One 5,000-gallon steel No. 2 fuel oil UST was closed out on 12/1/1990.
- *Costco Wholesale Corporation* (264 feet east southeast and relatively at a higher elevation to the subject property) 527 West 23rd Street – Identified by Site ID: 2-032220, this is closed out PBS site. One 550-gallon steel diesel UST was closed in place on 11/1/99; also three 550-gallon steel diesel USTs, and six 550-gallon steel gasoline USTs were removed and closed out on 11/1/99.

- *Dynamic Delivery Corporation* (362 feet north northeast and relatively at an equal or higher elevation to the subject property) 202-208 11th Avenue – Identified by Site ID: 2-108154, this is closed out PBS site. Two 2,000-gallon steel gasoline USTs; four 550-gallon steel gasoline USTs; and one 5,000-gallon steel diesel UST, were closed in place around April 1, 1999. A 3,000-gallon steel No. 2 Fuel Oil was closed out and removed, a close out date is not provided in the records searched.
- *547-551 West 21st Street* (371 feet south hand relatively at a higher elevation to the subject property) 547-551 West 21sr Street – Identified by Site ID: 2-612191, this is closed out PBS site. Two 750-gallon steel USTs were removed and closed out on 9/25/2031. The contents of these USTs are not reported.

Based on review of the above summarized and additional offsite NY UST listings, Integral has determined that these remaining properties do not represent a REC, CREC, HREC, or *de minimis* condition as the potential of impacts to travel the distance to affect the subject property is unlikely.

Chemical Bulk Storage Site Listing (NY CBS)

Facilities identified within this database, store regulated hazardous substances in ASTs with capacities of 185 gallons or greater, or in USTs of any size.

The subject property was not identified in this listing. However, two listings were identified within a quarter mile radius of the subject property.

Based on review of the offsite NY CBS listings, Integral has determined that these properties do not represent a REC, CREC, HREC, or *de minimis* condition as they are at a lower elevation and the potential for impacts to travel the distance to affect the subject property is unlikely.

NY AST

The Above Storage Tank database contains registered ASTs. The data comes from the NYSDEC.

A review of AST findings has revealed that there are records that share the same address for the subject property in this database.

Subject Property:

- *562 West 23rd Street (Block 694, Lot 65)* – Identified by Facility ID: 2-084069, the subject property is noted to have a 5,000-gallon No.2 fuel oil AST which was closed in place in October, 2006 and filled with foam.

The presence of the closed in place AST outlined in this listing does represent a REC since there is a potential for petroleum impacts that could affect the soil and groundwater present underneath the subject property.

Continued review of NY AST findings has revealed forty-five additional NY AST listings within a quarter mile of the subject property. Spills which are at close proximity and at a higher elevation to the subject property have been outlined below.

Equal/Higher Elevation:

- *Chelsea Inn, Inc.* (113 feet north and at a relatively higher elevation to the subject property) 184 11th Avenue – Identified with facility ID: 2-606197 this site contains an in-service 2,500-gallon steel No. 2 fuel oil AST.

- *The Tate* (212 feet east northeast and at a relatively higher elevation to the subject property) 535 West 23rd Street – Identified with facility ID: 2-608031 this site contains an in-service 10,000-gallon steel No. 6 fuel oil AST, which was installed in September, 2002.

- *Dia Art Foundation* (214 feet south southeast and at a relatively higher elevation to the subject property) 548 West 22nd Street – Identified by Facility ID: 2-272256 this site contains a closed out and converted 275-gallon steel No. 2 fuel oil AST, which was installed in September, 1990.

- *Abis Auto Repair* (220 feet north and at a relatively equal elevation to the subject property) 196 11th Avenue – Identified by Facility ID: 2-606715 this site contains an active 275-gallon steel waste oil AST.

- *Marais* (295 feet east southeast and at a relatively higher elevation to the subject property) 520 West 23rd Street – Identified by Facility ID: 2-609043 this site contains an active 7,000-gallon steel No. 2 fuel oil AST, which was installed in November, 2002.

Based on our review of the above offsite and remaining listings, Integral has determined that these properties do not represent a REC, CREC, HREC, or *de minimis* condition as the potential of impacts to travel the distance to affect the subject property is unlikely.

3.4.2.5 State and Tribal Institutional Controls / Engineering Controls Registries

The sites listed in this registry database have either institutional or engineering controls in place. Institutional controls include administrative measures to restrict exposure to contaminants remaining on site. Engineering controls include various physical constructs or treatment methods to eliminate the exposure of regulated substances to environmental media or human health.

NY ENGINEERING and INSTITUTIONAL CONTROLS

The subject property was not listed in either of these databases. However, two properties were listed in both databases within a half mile radius of the subject property:

Based on our review of the these listings, Integral has determined that these properties do not represent a REC, CREC, HREC, or *de minimis* condition as the potential of impacts to travel the distance to affect the subject property is unlikely.

3.4.2.6 NYSDEC VCP and NYSDEC BROWNFIELDS

NY VCP

The voluntary remedial program uses private monies to remediate contaminated sites to levels allowing for the sites' productive use. The program covers a wide variety of modestly contaminated sites.

The subject property was not listed in this database. However, one property was listed within a half mile radius of the subject property.

Based on our review of the this listing, Integral has determined that this property does not represent a REC, CREC, HREC, or *de minimis* condition as the potential of impacts to travel the distance to affect the subject property is unlikely.

NY BROWNFIELDS

New York State Brownfield Cleanup Sites are defined as abandoned, idled, or under-utilized industrial and commercial sites where expansion or redevelopment is complicated by real or perceived environmental contamination.

The subject property was not listed in NY Brownfields database. However, eight NY BROWNFIELDS sites are within one half mile of the subject property.

While entry into the BCP programs ensures appropriate site remediation guidelines and protocols have been followed, there remains a potential for historic migration of residual impacts offsite. Review of these eight sites has shown they are not located adjacent to the subject property, and potential residual impacts are unlikely to affect the subject property. Therefore, these sites are not considered to be RECs, CRECs, HRECs, or d*e minimis* conditions.

3.4.3 Additional Environmental Records

3.4.3.1 Local Brownfield Lists

US Brownfields

Facilities identified in this database are included in EPAs listing of Brownfield properties from the *Cleanups in My Community program*, which provides information to the community as it is provided to the EPA.

The subject property was not listed in US Brownfields database. However, one US BROWNFIELDS site within one half mile of the subject property was identified. Review of this site (The Highline, located approximately 400 feet east southeast) has shown it is not located adjacent to the subject property, and potential impacts are unlikely to affect the subject property. Therefore, this site is not considered to be RECs, CRECs, HRECs, or d*e minimis* conditions.

3.4.3.2 Local Lists of Registered Storage Tanks

NY Historical USTs

Facilities identified in this list have petroleum storage capacities in excess of 1,100 gallons and less than 400,000 gallons. Detailed information is provided per site, but is no longer updated due to the sensitive nature of the information involved.

A review of NY HIST USTs findings has revealed that there are records that share the same address for the subject property in this database.

Subject Property:

- *562 West 23rd Street (Block 694, Lot 65)* – Identified by PBS Number 2-084069, this listing identifies a 550-gallon steel gasoline UST which was closed out and removed (date has not been reported); and 1,000-gallon steel leaded gasoline UST which was closed in place in June, 1991.

Review of the above in the NY HIST USTs listing does represent a REC since petroleum impacts likely remain which may affect the soil and groundwater present underneath the subject property and there has been no assessment on the locations of these removed USTs.

The above Historical USTs were not identified in previous environmental records (Section 3.3), which identified thirteen USTs at the subject property. Building-A (Lot 65) included one 1,000-gallon diesel UST; one 1,000-gallon gasoline UST; one 1,000-gallon No. 2 fuel oil UST; and one 550-gallon gasoline UST. Eight 550-gallon USTs (containing diesel and gasoline); and one 1,000-gallon No. 2 fuel oil UST, existed at Building-B (Lot 60), Building-C (Lot 61). Available PBS records provided by the user (Appendix F) show PBS Number 2-080469 does match this listing, however the two USTs in this listing are not shown.

A continued review of the NY HIST UST list identified eighteen properties within a quarter mile radius of the subject property. Several properties are at close proximity and at a higher elevation to the subject property, but have been previously identified in the NY LTANKS and NY UST sections and do not need to be repeated here.

Based on our review of the these listings, Integral has determined that these properties do not represent a REC, CREC, HREC, or *de minimis* condition as the potential of impacts to travel the distance to affect the subject property is unlikely.

3.4.3.3 Records of Emergency Release Reports

NY Spills

This database includes data collected on spills reported to the NYSDEC and is required by one of or more of the following: Article 12 of the Navigation Law, 6 NYCRR Section 613.8 (from PBS Regs), or 6 NYCRR Section 595.2 (from CBS Regs). It includes spills and tank test failures active as of April 1, 1986 to present.

A review of NY Spills findings has revealed that there are records that share the same address for the subject property in this database.

Subject Property:

- *562 West 23rd Street (Block 694, Lot 65)* – Two closed out NYSDEC spill numbers were identified and have been outlined below:
    - NYSDEC Spill No. 9700188 – Originally reported in April, 1997, this spill was issued NFA by NYSDEC on 2/22/2002, following favorable results obtained from onsite groundwater wells.
    - NYSDEC Spill No. 9305627 – Originally reported in August 5, 1993, this spill was closed by NYSDEC on August 6, 1993, as the spill was minimal in nature.

Spill number 9700188 summarized above in the NY Spills listing does represent a REC since petroleum impacts likely remain which affect the soil and groundwater present underneath the subject property. NYSDEC Spill No. 9305627 does not represent a REC, CREC, HREC, or *de minimis* condition, as this minimal spill is unlikely to affect the subject site.

A continued review of the NY Spills list has revealed sixty-four listings within an eighth mile of the subject property. Properties and their respective spill numbers which are at a higher elevation and at close proximity to the subject property have been outlined below.

Higher Elevation:

- *543-547 West 23rd Street* (119 feet east and at a relatively higher elevation than the subject property) 543-547 West 23rd Street – Originally reported on December 15, 1986, this NO. 2 fuel oil spill was closed by NYSDEC on December16, 1986, as the spill was minimal in nature.

- *535 West 23rd Street (Trench)* (212 feet east and at a relatively higher elevation than the subject property) 535 West 23rd Street – Originally reported on March 1, 2011, this No. 4 fuel oil spill was closed by NYSDEC on August 2, 2011, as the spill was discovered to be a localized event.

- *548 West 22rd Street* (214 feet south southeast and at a relatively higher elevation than the subject property) 548 West 22rd Street – Originally reported on September 17, 2008, this No. 2 fuel oil spill was closed by NYSDEC on December 29, 2014, as the spill was remediated with favorable groundwater results noted.

- *Mendon Leasing and Edison Parking Garage* (265 feet east southeast and relatively at a higher elevation than the subject property) 527 West 23rd Street – NYSDEC Spill No. 9605688 is associated previously discussed spills identified above in NY LTANKS listings (section 3.4.2.3). Spill 9605688 was approved for NFA by NYSDEC on September 22, 2008.

Following review of the above summarized sites, Integral has determined the current and historical presence of petroleum spills in close proximity to the subject property is considered a HREC.

The remaining listings and their associated spill numbers are not considered to be a REC, CREC, HREC, or *de minimis* condition; as the review indicated they were minor in nature and are identified as having been closed by NYSDEC. Additionally, the potential of impacts to travel the distance to affect the subject property, for the remaining listings, is unlikely.

Spills 90

This database includes spill and release records available exclusively from First Search databases; which may include chemical, oil and/or hazardous substance spills recorded after 1990.

The subject property was not listed in Spills 90 database. However, one property within one eighth mile of the subject property was identified. Review of this site (Bayview Correctional Facility, located approximately 0.112 miles south) has shown it is not located adjacent to the subject property, and potential impacts are unlikely to affect the subject property. Therefore, this site is not considered to be RECs, CRECs, HRECs, or d*e minimis* condition.

3.4.3.4 Other Ascertainable Records

RCRA Non-Generators / No Longer Regulated

These listings include properties which may have selective information about the generation, transport, storage, treatment and/or disposal of hazardous waste was defined by RCRA.

A review of the RCRA Non-Generators / No Longer Regulated listing has revealed that there are two listings for the subject property.

Subject Property:

- *562 West 23rd Street (Block 694, Lot 65)* – Identified under the facility name "Con Edison", this listing notes that the handler does not currently generate hazardous waste, and has used EPA I.D NYP00414971 in the past.

- *562 West 23rd Street (Block 694, Lot 65)* – Identified under the facility name "U-Haul Center Chelsea", this listing notes that the handler does not currently generate hazardous waste, and has used EPA I.D NYR000040477 in the past. The waste code D001 (ignitable waster) is identified.

A continued review of the NY Spills list has revealed sixty listings within a quarter mile of the subject property. These remaining listings are not considered to be a REC, CREC, HREC, or *de minimis* condition; as the review indicated the potential of impacts to travel the distance to affect the subject property is unlikely.

Record of Decision (ROD)

These documents mandate a permanent remedy at an NPL site containing technical and health information to aid in the cleanup.

A review of the ROD listings revealed that there are no listings for the subject property. However, one site at a lower elevation was reported within one mile of the subject property. This site, the Hudson River, was already discussed in section 3.4.1.1 and does note represent a REC, CREC, HREC, or *de minimis* condition.

NY Drycleaners

This database provides a listing of registered dry cleaning facilities and is provided by the NYSDEC.

A review of the NY Drycleaners listings revealed that there are no listings for the subject property. However, one site has been identified within a quarter mile radius. This site does not adjoin the subject property and is at proximity unlikely to affect the subject property. Therefore this listing is not considered a REC, HREC, CREC, or *de minimis* condition.

NYC E Designation

Environmental (E) Designations requires that the owner of the site conduct testing, sampling protocol, and remediation where appropriate, to the satisfaction of the NYCDEP before issuance of a building permit by the Department of Buildings (DOB) pursuant to the provisions of Section 11-15 of the Zoning Resolution (Environmental Requirements).

A review of the E Designation listings revealed that there are three listings for the subject property.

Subject Property:

- *552 West 23rd Street (Block 694, Lot61)* – An E-designation (E-142) exists for "Underground Gasoline Storage Tanks Testing Protocol", and "Window Wall Attenuation & Alternate Ventilation."

- *548 West 23rd Street (Block 694, Lot60)* – An E-designation (E-92) exists for "Underground Gasoline Storage Tanks Testing Protocol", and "Window Wall Attenuation & Alternate Ventilation."

- *170 11th Avenue (Block 694, Lot 65)* – An E-designation (E-142) exists for "Underground Gasoline Storage Tanks Testing Protocol", and "Window Wall Attenuation & Alternate Ventilation."

E-Designations summarized above do represent a REC for the subject property, as this institutional control will require an investigation of potential petroleum impacts to the subsurface.

The remaining twenty-seven E-designation listings have been reviewed, and it has been determined these listings will unlikely affect the subject property and therefore do not represent REC, CREC, HREC, or *de minimis* condition.

NY Manifests

The EPA manifest program tracks hazardous waste from the time it leaves the generator facility where it is produced, until it reaches the off-site waste management facility that will store, treat or dispose of the hazardous waste. This cradle-to-grave tracking system ensures that hazardous waste is transported from the place of generation to the place of ultimate disposal without being tampered with, dumped, or otherwise illegally disposed of along the way.

A review of the NY Manifests list has revealed two listings for the subject property.

Subject Property:

- *562 West 23rd Street (Con Edison)* – Identified under EPA ID NYP004147971, 40 gallons of an unidentified waste was disposed of via drums in February, 2007.

- *562 West 23rd Street (U-Haul Center Chelsea)* – Identified under EPA ID NYR000040477, 275 gallons of a non-listed ignitable waste (D001) was disposed of via drums in June, 1997.

Listings for the subject property and the additional 98 reviewed listings are not considered to be a REC, CREC, HREC, or *de minimis* condition; as the review indicated the potential of impacts to affect the subject property is unlikely. These records do not match the June 2002 drum disposal outlined in section 3.3.2.11.

NJ Manifests

A review of the NJ Manifests list has revealed no listings for the subject property. However, there are seven NJ MANIFESTS sites within one quarter mile of the subject property.

Based on review of these listings, they are not considered to be a REC, CREC, HREC, or *de minimis* condition; as the review indicated the potential of impacts to affect the subject property is unlikely.

3.4.4 EDR High Risk Historical Records

3.4.4.1 Manufactured Gas Plants (MGP)

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas [manufactured gas plants (MGP)] compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800s to 1950s to produce a gas that could be distributed and used as fuel. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludge's, oils, and other compounds are potentially hazardous to human health and the environment. The byproducts from this process were frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

A review of the EDR MGP list, as provided by EDR, has revealed that the there are no EDR MGP sites associated with the subject property. However, four listings have been identified within a mile radius of the subject property.

None of these listings are located at an adjoining boundary of the subject property. As the location of these properties is a proximity were impacts are unlikely to affect the subject property, it has been determined that these listings do not represent a REC, CREC, HREC, or *de minimis* condition.

3.4.4.2 EDR US Historical Automotive Stations

EDR has searched selected national collections of business directories and has collected listings of potential has station / filling station / service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, included gas station / filling station / service station establishments. The categories reviewed included, but were not limited to has, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records" (HRHR). EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

A review of the EDR US Historical Automotive Station list indicated that the subject property is not listed. Additional review of these listings revealed that there are sixteen EDR US Historical Automotive Station sites within one quarter mile of the subject property.

These listings have been cross-checked against the UST, LUST, and NY SPILLS databases and we have determined that they do not represent a REC, CREC, HREC or *de minimis* condition.

3.4.4.3 EDR US Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR classifies these sites as, in their opinion, HRHR.

A review of the EDR US Historical Cleaners list indicated that the subject property is not listed. Additional review of these listings revealed that there are two EDR US Historical Cleaner sites within one quarter mile of the subject property.

These listings have been cross-checked against the UST, LUST, and NY SPILLS databases and we have determined that they do not represent a REC, CREC, HREC or *de minimis* condition.

3.5 FREEDOM OF INFORMATION REQUESTS

On November 17, 2015 Integral sent Freedom of Information Law (FOIL) requests to the U.S. EPA, NYSDEC, New York State Department of Health (NYSDOH), the New York City Fire Department (FDNY), and the City of New York Department of Environmental Protection (NYCDEP) for the subject property. Online resources provided by the NYC Department of Buildings, and the Automated City Register Information System (ACRIS), were utilized to collect subject property information. FOIL requests and responses, when available, are provided in Appendix F.

Each agency was provided the Block and Lot number and/or the corresponding physical address for the subject property. From each agency, Integral requested any information or copies of files regarding environmental conditions, such as environmental permits, notices of violations, spill/discharge incidents, storage or disposal of hazardous substances, Underground Storage Tanks (USTs), Leaking Underground Storage Tanks (LUSTs), asbestos abatement and any other environmental reports.

3.5.1 U.S. EPA

Integral submitted a FOIL Request to the U.S. EPA on November 17, 2015. An automated search of appropriate EPA databases did not locate any environmental records.

3.5.2 NYSDEC

Integral received submitted a FOIL request to NYSDEC on November 17, 2015. If any additional pertinent information is determined after the production of this report as a result of these searches, an addendum to this Phase I ESA will be prepared.

3.5.3 NYSDOH

The NYSDOH has acknowledged FOIL Request No. 15-11-229, which pertains to the subject property, but has not provided a formal response on available records. If any additional pertinent information is determined after the production of this report as a result of these searches, an addendum to this Phase I ESA will be prepared.

3.5.4 NYCDEP

Integral submitted a FOIL Request to the NYCDEP on November 17, 2015. At this time, no response has been received. If any additional pertinent information is determined after the production of this report as a result of these searches, an addendum to this Phase I ESA will be prepared.

3.5.5 City of New York Fire Department

On November 23, 2015, Integral submitted a Fuel Tank Special Request Form and a Violation Special Report Request Form to the New York City Fire Department (FDNY) for the subject property. Integral has not received a response from the FDNY. If any additional pertinent information is determined after the production of this report as a result of these searches, an addendum to this ESA will be prepared.

3.5.6 City of New York Department of Buildings

Integral conducted an online review of the City of New York Department of Buildings (DOB) records for the subject property on November 18, 2015. No violations were identified that would constitute a REC, CREC, HREC or *de minimis* condition. Certificates of occupancy, when available, were incorporated into Section 3.2.1.

3.5.7 Automated City Register Information System

Integral conducted an online review of the ACRIS records for the subject property on November 18, 2015. No violations were identified that would constitute a REC, CREC, HREC or *de minimis* condition. Available deed information was incorporated into Section 2.3 of this report.

4 SITE RECONNAISSANCE

4.1 SUBJECT PROPERTY INSPECTION DATA

Inspection Date:	November 19, 2015
Integral Personnel:	Samuel McTavey
Other Parties:	Ian Brown, U-Haul General Manager
Weather	Light Rain, 50 degrees

4.2 INTERIOR AND EXTERIOR OBSERVATIONS

Unless otherwise noted, the items listed in the table below appeared in good condition with no visual evidence of staining, deterioration or a discharge of hazardous materials. Items where further description is warranted are discussed in the sections following the table.

Item	**Present (Yes/ Yes-Historic/ No)**	**Description**
Hazardous material storage or handling areas	NO	
Aboveground storage tanks (ASTs) and associated piping	YES	Abandoned 5,000-gallon tank in basement accessed through bilco doors on West 23rd Street.
Underground storage tanks (USTs) and associated piping	NO	
Drums & containers (>5 gallons)	NO	
Odors	NO	
Pools of liquid, including surface water bodies and sumps (hazardous substances or substances likely to be hazardous only)	NO	
Polychlorinated Biphenyls (PCBs) / Transformers	NO	

Stains or corrosion	YES	Minor automobile fluid staining noted on garage floors of Lots 60 and 61.
Drains and Sumps	YES	Several sumps exist in the garage and basement areas of Lots 61 and 65. Additionally, Lot 65 contains a zipper drain at the automobile hand wash station near 11th Avenue.
Pits, ponds, and lagoons	NO	
Stressed vegetation	NO	
Historic fill or other fill material	NO	
Waste water (including storm water or any discharge into a drain, ditch, underground injection system, or stream on or adjacent to the Site)	NO	
Wells (including dry wells, irrigation wells, injection wells, abandoned wells, or other wells.	YES	Two abandoned well, both decommissioned, were identified on the sidewalk adjacent to 11th Avenue near Building-A (Lot 65).
Septic systems or cesspools	NO	

The subject property is located in the West Chelsea neighborhood of Manhattan and is comprised of four contiguous tax lots. The subject property is currently owned and operated by U-Haul International Inc. (U-Haul). The subject property's entire footprint contains three separate buildings, each designated with the letters; A, B and C that identifies their location on specific tax lots. Building-A encompasses Lot 65, located at the corner of West 23rd Street and 11th Avenue, and Lot 5 which adjoins the southeastern corner of Lot 65 and has frontage on West 22nd Street; Building-B encompasses Lot 61, which adjoins Lot 65 along its eastern property boundary; Building-C encompasses Lot 60, which adjoins Lot 61 to the east. The locations of Buildings A, B, C, and their associated tax lot numbers are outlined on Figure 2.

Building-A (Lot 65) is a three story commercial building constructed of brick and concrete with a steel frame structure. Building-A (Lot 65) does not currently contain vehicle service operations, and is now used for moving supply retail, mini-storage units, vehicle hand washing and parking. The building contains a service elevator at its eastern corner, which services all floors and has a machine room located on the roof. Two basement areas exist within Building-A (Lot 65), which are each accessed through separate Bilco doors in the adjoining sidewalks on West 23rd Street, and along 11th Avenue. The West 23rd Street Bilco doors lead to an boiler room containing a closed in place (foam filled) 5,000-gallon No. 2 fuel oil AST, inactive fuel oil boiler system, and two sump areas with discharge pumps reportedly connected to the combined sewer. A concrete mud slab has been poured in this room. The 11th Avenue Bilco doors lead to a basement area which contains Building-A's (Lot 65) sewer line, and one sump area with a discharge reportedly connected to a combined sewer. A concrete mud slab has also been poured in this room. Adjoining Building-A (Lot 65) to the south is a paved parking, which is the only exposed area of the subject property. The area is currently used by U-haul for rental vehicle parking, and is the only exterior area of the subject property

The first floor of Building-A (Lot 65) contains U-Haul's show room and retail space, as well as an interior driveway. Entry to the driveway is at West 23rd Street, exits onto 11th Avenue, and is utilized for vehicle rental drop-offs and pick-ups. A vehicle hand wash station is present before the driveway exit at 11th Avenue. A pressure washer, containerized vacuum system, and car washing detergents are utilized to clean vehicles. Waters generated from vehicle washing are captured in a zipper drain, which is plumbed to the buildings combined sewer line, and discharged into NYC's combined municipal sewer system. The second floor of Building-A (Lot 65) contains mini-storage units, a single apartment, and rental truck parking. A vehicle ramp is present at the southern wall of the building and runs from the second floor, down to a gated exit at 11th Avenue. On the second floor, a boiler room is located adjacent to the service elevator, which contains the hot water heater and gas boiler that service the mini-storage units on the second and third floors. A smaller boiler room is present near the western corner of the third floor, which provides heat and hot water to the apartments on the second and third floors. The third floor of Building-A (Lot 65) contains mini-storage units and an apartment. The service elevators mechanical room is located on the roof and looks to be in good working order, with no staining noted. Two vents were noted on the roof, which appear to be remnants of the abandoned fuel oil heating system noted in the basement.

Building-A (Lot 5) consists of a single-story storage warehouse, with portions also used for vehicle parking.

Building-B (Lot 61) and Building-C (Lot 60) are single story garages brick and concrete with a steel frame structure. Five rows of parking are marked out, where approximately seven vehicles can park in line. Electric and water utilities are noted on the shared wall, between Building-B and Building-C, near West 23rd Street. Automobile fluid staining was noted on the concrete floors of both these garage areas.

Photographs taken during the reconnaissance are provided in Appendix G.

4.2.1 Hazardous Substances

Hazardous substances including raw materials; finished products and formulations; hazardous wastes; hazardous constituents and pollutants including intermediates and byproducts that are currently present at the subject property; and unidentified substance containers (when open or damaged, and containing unidentified substances suspected of being hazardous or petroleum products) were not identified at the subject property.

4.2.2 Underground Storage Tanks

Integral did not observe any evidence of the presence of any active USTs (vent pipes or fill ports) on the subject property. However, environmental records do identify the presence of several abandoned in place USTs.

4.2.1 Aboveground Storage Tanks

Integral observed the presence of (1) 5,000-gallon abandoned AST, and its associated vent pipes on the subject property. This AST is located in the basement accessed through the bilco doors located on West 23rd Street. No significant signs of petroleum release were noted during a visual inspection of the AST area. A concrete block wall encompasses the lower half of the AST, making a detailed inspection directly below the AST impossible at this time.

5 USER PROVIDED INFORMATION

According to ASTM E1527-13 standards, certain tasks that may help identify the presence of RECs associated with the site are generally conducted by the Phase I ESA user. These tasks include reviewing title records for environmental liens or activity and land use limitations, providing specialized knowledge related to RECs at the site (e.g., information about previous ownership or environmental litigation), and providing explanations for significant reduction in the subject property purchase price. 23rd and 11th Associates LLC and The Related Companies provided this information, when available and has completed the user questionnaire, which is included in Appendix H. Specific documents provided by the user include:

5.1 TITLE AND JUDICIAL RECORDS FOR ENVIRONMENTAL LIENS OR AULS

The user was not aware of environmental concerns associated with title or judicial records, or the existence of environmental liens or activity and use limitations (AULs) for the subject property.

5.2 SPECIALIZED KNOWLEDGE

The user was aware of the historical use of the subject property, and has provided past environmental site assessments, and environmental reporting completed at the subject property. These records have been included in the report accordingly.

5.3 PROPERTY VALUE REDUCTION ISSUES

The user was not aware of property valuation reduction issues regarding the subject property.

5.4 COMMONLY KNOWN OR REASONABLY ASCERTAINABLE INFORMATION

Commonly known/reasonably ascertainable information was provided to Integral by the user in the form historical environmental documentation previously described.

5.5 REASON FOR CONDUCTING PHASE I

It is Integral's understanding that the User requires a Phase I for establishing an initial evaluation of the presence of recognized environmental conditions in connection with the subject property in order to determine suitability for property development.

6 INTERVIEWS

The following persons were interviewed to obtain historically and/or environmentally pertinent information regarding RECs associated with the subject property.

- Ian Brown, U-Haul – General Manager

The information provided in this interview is discussed and referenced in the text.

7 VAPOR MIGRATION

This section outlines the potential of hazardous substances and/or petroleum products to migrate through the subsurface. Results have been obtained through EDR's Vapor Encroachment Condition Application Software (VEC App) in order to satisfy the ASTM E2600-10 Tier I screening process. The VEC App was used to identify potential areas of concern both within and outside the borders of the subject property.

Results of the VEC App screening process revealed that a VEC cannot be ruled out to exist on the subject property as a result of the historic presence of a petroleum spills and USTs on the subject property. Additionally, numerous upgradient and cross-gradient sites within a 0.33-mile radius of the subject property pose potential vapor migration/intrusion risks. The majority of potential areas of concern identified in the report are related to the database listings. A summary of these findings can be found in the EDR VEC App generated report included as Appendix I.

Following review of the subject property and surrounding sites, Integral determined that the possibility of vapor migration onto the subject property cannot be ruled out. However, while potentially impacted soil vapor migration exists, a large majority of the subject property is capped with concrete or asphalt, which hinders vapor intrusion. Further, as it is not improved with any buildings, an open air condition exists. Since the potential for impacted soil vapor migration exists, but it is unlikely to adversely affect human health or the present environment, a *de minimis* condition exists.

8 FINDINGS / OPINIONS

Based upon information obtained during the site reconnaissance, review of environmental databases and historic information and contact with federal, state, and local agencies, the following recognized environmental conditions (RECs), historic recognized environmental conditions (HRECs), de minimis conditions and data gaps were identified:.

8.1 RECOGNIZED ENVIRONMENTAL CONDITIONS

This Assessment has revealed evidence of five onsite Recognized Environmental Conditions (REC) in connection with the subject property.

REC 1 – Historic Site Usage of Automotive Services and Petroleum Storage

Environmental records show that the subject property historically dispensed fuels, serviced vehicles, contained potentially up to fifteen USTs, and currently contains a closed out AST. Previous environmental reporting indicates the following tanks have been abandoned in place at Building-A (Lot 65); one 1,000-gallon diesel UST, one 1,000-gallon gasoline UST, one 1,000-gallon No. 2 fuel oil UST, one 550-gallon gasoline UST, and a 5,000-gallon No. 2 fuel oil AST. The 5,000-gallon AST is located in the basement of Building-A (Lot 65). The access to the basement is through Bilco doors located on West 23rd Street. Locations of these abandoned tanks are reported to be below the ground floor within Building-A (Lot 65).

Additionally, Building-B (Lot 60), Building-C (Lot 61) are associated with eight excavated 550-gallon USTs (containing diesel and gasoline); and one 1,000-gallon No. 2 fuel oil UST. The 1,000-gallon No. 2 fuel oil UST was abandoned in place as there were foundational elements surrounding the tanks (ATC, 2002). The exact location of this UST is considered a data-gap, as the records provided for Integral's review did not include this information. However, Figure 3 provides the approximate location this abandoned UST and the eight USTs excavated from Building-B (Lot 60) and Building-C (Lot 61).

Identified in EDR's NY Historical UST Database search (Section 3.4.3.2), the locations of a 550-gallon steel gasoline UST closed out and removed at an unreported date and the 1,000-gallon steel leaded gasoline UST closed in place in June, 1991 have not been identified. These two USTs are not discussed in previous reports summarized in section 3.3, as those records only go back to 1994. The unknown location of these former USTs is considered a data gap and a REC, as the current presence of petroleum impacts to the subsurface of the subject property cannot be assessed

The historical presence of automotive services, storage and dispensing of petroleum products, and the presence of abandoned USTs and an AST, with a lack of closure assessments, at the subject property is considered a REC.

REC 2 – NYSDEC Spill Numbers 9000199, 9700188, and 0205608

Environmental records show that the subject property has been listed under NYSDEC spill numbers 9000199, 9700188, and 0205608. Each of these spills has been closed out by NYSDEC following minimal soil excavation and a more extensive groundwater monitoring investigation (Section 3.3). Remaining petroleum impacts to soil and groundwater is expected to exist, as no further action letters (NFA) were issued on the basis that residual impacts would naturally degrade, and would not migrate outside the boundary of the subject property.

The expected presence of petroleum impacts to the subsurface soils and groundwater at the subject property is considered a REC.

REC 3 – Brake Labs Inc. Occupant in Building-B (Lot 61)

EDR's Directory search identified "Brake Labs Inc." as the primary occupant from 1958 through 1973 at Building-B (lot 61). Sanborn maps for this time period were not available for review as there was no coverage. Additional review of EDR's Radius Report, and FOIL did not provide more information on this occupant. The occupant's name suggests the presence of laboratory with unknown operations, and is considered a REC.

REC 4 – Report on Drum Removal, 562 West 23rd Street, NY, NY, ATC Associates, Inc., 2002

In June 2002, seven previously discovered (April 26, 2002) drums located on the second floor storage room of Building-A (Lot 65) were removed from the subject property and sent to Cyclechem in NJ. Laboratory analysis of the contents indicated that four plastic drums contained dilute aqueous formic acid and ammonium hydrogen fluoride solution; one plastic drum contained a dilute aqueous sodium bicarbonate solution; 1 plastic drum contained an aqueous trifluoroacetic acid and ammonium hydrogen fluoride solution; and a 55-gallon steel drum contained spent GAC. Analysis indicated that each drum was non-hazardous and non-regulated under RCRA. According to ATC, the aqueous solutions discovered are believed to be spent process liquids typically used in the cleaning and flushing of tap lines in breweries and/or taverns.

The presence of waste chemical storage described in this letter is outside the typical use of the Building-A (Lot 65) as well as the remainder of the subject property. Chemical storage of this nature, while chemically non-hazardous, is a-typical and without a more detailed assessment of this condition, adverse environmental impacts to the subject property cannot be ruled out. Therefore, the historical presence of chemical storage described in this letter is considered a REC.

REC 5 – E-Designation for the Subject Property

Hazardous Materials and Noise E-Designations have been assigned to Lots 60, 61 and 65 by New York City's Mayor's Office of Environmental Remediation (OER). Future redevelopment of the subject property will need to comply with OER and NYC Department of Buildings (DOB) requirements in order to obtain DOB permits for new buildings or alterations. Upon completion of any site redevelopment, a remedial action report will be required in order to obtain a Notice of Satisfaction from OER. E-designations assigned to the subject property are considered a REC.

8.2 HISTORIC RECOGNIZED ENVIRONMENTAL CONDITIONS

Historic Recognized Environmental Conditions (HRECs) are environmental conditions which, in the past, would have been considered RECs, but which may or may not be considered RECs currently.

This Assessment has revealed evidence of one HREC in connection with the subject property.

HREC 1 – Historical Petroleum Spills and USTs in the Surrounding Area

The subject property is surrounded by numerous properties with historical releases of petroleum identified by the NYSDEC Spills Database, as well as numerous USTs. The majority of these spills and USTs have been remediated or removed to the satisfaction of the NYSDEC. The historical presence of petroleum spills and USTs in the surrounding area which have been closed to the satisfaction of the NYSDEC is not a REC; however it is considered a HREC.

8.3 DE MINIMIS CONDITIONS

A *de minimis* condition is defined by ASTM 1527-13 as a condition that generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be *de minimis* are not RECs.

A review of records for the surrounding area identified one (1) *de minimis* condition that exists at the subject property.

***De Minimis 1*: VEC Application Screen**

The VEC App process revealed that the subject property and numerous upgradient and cross-gradient sites within a 0.33-mile radius of the subject property, pose potential vapor migration/intrusion risks (Section 7). The majority of potential areas of concern identified in the report were related to database listings. Following review of the subject property and surrounding sites, Integral determined that the possibility of vapor migration onto the subject property cannot be ruled out. However, while potentially impacted soil vapor migration exists, a large majority of the subject property is capped with concrete or asphalt, which hinders vapor intrusion. Further, as it is not improved with any buildings, an open air condition exists. Since the potential for impacted soil vapor migration exists, but is unlikely to adversely affect human health or the present environment, a *de minimis* condition exists.

8.4 DATA GAPS

The exact location of the eight removed 550-gallon USTs, and one closed in place 1,000-gallon UST, associated with NYSDEC spill number 0205608, located on Lots 60 and 61 could not be determined. However, reviewed records from 2002 (Section 3.3) did provide an approximate location for these USTs, therefore this data gap is not considered significant.

EDR's Directory search identified "Brake Labs Inc." as the primary occupant from 1958 through 1973. Sanborn maps for this time period were not available for review, and there were no other records available providing more information on this occupant. As the occupant's name suggests the presence of a laboratory in connection with the service of automobile brakes, and there is no other information available for review which could confirm or deny the presence of a REC, it is important to identify this as a data gap.

Identified in EDR's NY Historical UST Database search (Section 3.4.3.2) the locations of a 550-gallon steel gasoline UST closed out and removed at an unreported date, and the 1,000-gallon steel leaded gasoline UST closed in place in June, 1991 have not been identified. These two USTs are not discussed in previous reports summarized in section 3.3, as those records only go back to 1994. The unknown location of these former USTs is considered a data gap and a REC, as the current presence of petroleum impacts to the subsurface of the subject property cannot be assessed.

No additional significant data gaps were identified.

8.5 EXCEPTIONS OR DELETIONS FROM ASTM E-1527-13

No city, state, or government officials were interviewed to gain information indicating RECs in connection with the subject property as part of this Assessment. Because FOIL requests or equivalent internet searches were submitted to state and government agencies for processing, additional pertinent information relative to the subject property would not be expected from these parties, were they to have been interviewed.

9 CONCLUSIONS

Integral completed this Assessment in general conformance with the scope and limitations of ASTM Practice E 1527-13 for the U-Haul site located at 562 West 23rd Street, New York (the subject property). The subject property is further identified by Block 694, Lots 5, 60, 61, and 65. It is bound by 23rd Street to the north, 11th Avenue to the west, two-four story residential buildings and West 22nd Street to the south, with a three-story commercial warehouses and single-story art gallery to the east. Any exceptions to, deletions, or deviations from this practice are described in the Findings and Opinions (Section 8) portion of this report. This Assessment has revealed no evidence of controlled recognized environmental conditions or business environmental risks.

10 DECLARATION

I, Kevin McCarty, declare that, to the best of my professional knowledge and belief, I meet the definition of an Environmental Professional as defined in Section 312.10 of 40 CFR 312; and I have the specific qualifications based on education, training and experience to assess a site of the nature, history and setting of the subject Site. I have developed and performed the All Appropriate Inquires in conformance with the standards and practice set forth in 40 CFR Part 312.

Kevin McCarty, P.G.
Environmental Professional

PHASE I ESA REFERENCES

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February 29, 2016

Via Email <JHarris@Related.com>

Mr. Jim Harris
The Related Companies
60 Columbus Circle
New York, NY 10023

Subject: **Limited Phase II Investigation**
562 West 23rd Street, New York, NY
Block 694, Lots 5, 60, 61, and 65

Dear Mr. Harris:

Integral Engineering P. C. (Integral) has prepared this Limited Phase II Report (Report) on behalf of 23rd and 11th Associates, L.L.C. for the property located at 555 West 22nd Street (Block 694, Lots 5, 60, 61 and 65), New York, NY (Site).

This Report presents the results of the Limited Phase II Investigation performed onsite by Integral in February 2016. Additionally, this Report includes a brief discussion of Site history, physical setting, and methodologies employed during the Investigation.

SITE DESCRIPTION

The Site is located in a mixed use area of the West Chelsea section of the Borough of Manhattan. The site is comprised of four tax lots (approx. 31,820 SF) identified on New York City tax maps as Block 694, Lots 5, 60, 61 and 65. The Site is bounded to the north by West 23rd Street, to the east by 10th Avenue, to the south by West 22nd Street, and to the west by 11th Avenue. A USGS Topographic Map is included as Figure 1. A Site plan showing the Site property boundaries is included as Figure 2.

The Site is improved with multiple connected one-to-three-story brick buildings used entirely by U-Haul as a retail and commercial U-Haul facility which consist of the following uses: vehicle rental, vehicle washing (hand), parking, moving supply retail, and mini-storage unit rental. An asphalt paved lot, facing 11th Avenue, is used for truck storage.

SITE HISTORY

Environmental records indicate that historic Site uses included: lumber yard, iron works, garage, automotive repair services, and storage and dispensing of petroleum products. It is unknown whether U-Haul continued to dispense gasoline after taking title to the property in the late 1970's/early 1980's. Currently, no vehicle repair or fueling takes place onsite.

A Phase I Environmental Site Assessment (ESA) conducted by Integral in December 2015 identified the following recognized environmental conditions (RECs) in association with the Site:

1. Historic Site Usage for Automotive Services and Petroleum Storage
2. NYSDEC Spill Numbers 9000199, 9700188, and 0205608 [all closed]
3. Historic Site Occupancy by Brake Labs Inc.
4. Historic Site Usage for Chemical Storage
5. Presence of a Hazardous Materials E-Designation

Detailed descriptions of the above referenced RECs are included in the Phase I ESA Report; Appendix A to this Report.

Subsurface Investigations

Numerous environmental actions/investigations associated with the procedural mandates of New York State Department of Environmental Conservation (NYSDEC) Spills Program and the removal or abandonment of several underground storage tanks (USTs) and/or above ground storage tanks (ASTs) have been conducted on the Site from 1991 through 2006. The majority of these actions took place on Lot 65. Based on the data collected as part of these actions/investigations, prior usage of the Site for petroleum storage and fueling has historically impacted both soil and groundwater.

PHYSICAL SETTING

The Site incorporates approximately .73 acres of fairly level land situated in the City of New York, New York County, New York. The Site is mapped on the Jersey City, NY-NJ Quadrant 7.5 Minute Topographic Map, published by the United States Geological Survey (USGS). Review of the topographic map indicates that the Site is located approximately 7 feet above sea level (NAVD 88).

Based on the proximity to the Hudson River groundwater flow direction is expected to be westerly. Groundwater was encountered at ~9 feet below grade (ft-bg).

LIMITED PHASE II SCOPE OF WORK

The Limited Phase II Investigation was performed to evaluate current subsurface soil conditions beneath the Site. The Investigation consisted of the advancement of 12 soil borings to investigate the potential of onsite soil sources, evaluate previously identified RECs, and investigate areas of the Site that have not been previously investigated. Soil boring locations are depicted on Figure 3.

The following detailed scope of work was implemented at the Site:

- Advanced 2 to 4 borings within each tax lot to the groundwater/soil interface (~9 feet below grade (ftbg)). A total of 12 borings were advanced over the Site.
- Borings were located with bias toward areas of concern identified in the 2015 Phase I ESA
- One soil sample was collected from each boring for chemical analysis at the soil/water interface or area of highest suspected contamination. These samples were analyzed for the following:
    - TCL VOCs via EPA Method 8260C
    - TCL SVOCs via EPA Method 8270D
    - TAL Metals via EPA Method 6010C/7471B
- One soil sample was also collected and held from each boring from the 0-2′ interval directly below the slab. These samples (secondary samples) were held pending the analytical results of the samples collected from the soil/water interface or highest level of suspected contamination (primary samples). The secondary samples were analyzed only if the results of every primary sample within a single lot met Restricted Residential Soil Cleanup Objectives (SCOs). Secondary samples, if run, were analyzed for the following:
    - TCL SVOCs via EPA Method 8270D
    - Target Analyte List (TAL) Metals via EPA Method 6010C/7471B
    - Polychlorinated Biphenyls (PCBs) via EPA Method 8082A
    - Pesticides via EPA Method 8081B

METHODOLOGY

Continuous soil sampling was performed with a track mounted Geoprobe® utilizing direct push technology to the groundwater interface depth, approximately 8 to 10 ftbg. Continuous soil samples were collected using five (5) foot macrocore samplers fitted with dedicated acetate liners. The soil/fill retrieved from each sampler was field screened with a photoionization detector (PID) for VOCs and described by Integral field personnel on boring logs, included as Appendix B. Additionally, evidence of contamination (e.g., Non Aqueous Phase Liquid [NAPL], sheens, odors, staining, elevated PID readings) was documented by Integral field personnel.

Soil samples selected for laboratory analysis were placed in laboratory supplied containers, sealed and labeled, and placed in a cooler and chilled to 4^{o}C for transport under chain-of-custody procedures. Soil samples were submitted to Alpha Analytical Laboratory of Westborough, MA, NYSDOH ELAP #11148, via courier service and analyzed for all of the compounds included in NYCRR Part 375 SCOs and Final CP-51 SCLs.

RESULTS

VOCs

Minor exceedences of petroleum related VOCs above Unrestricted Use SCOs were detected in soil samples collected from 2 borings: SB-08 [7.5-8.5] and SB-02 [8-9].

Metals

Concentrations of lead found in Site soils range from 30 ppm in SB-07[6.5-7.5′] to 980 ppm in SB-08[1-2′] exceeding its Restricted Residential Soil Cleanup Objective (RRSCO) of 400 ppm. Concentrations of mercury found in Site soils range from .06 ppm in SB-07[6.5-7.5′] to .96 ppm in SB-05[1-2′] exceeding its RRSCO of .81 ppm.

Polycyclic Aromatic Hydrocarbons (PAHs)

Concentrations of benzo(a)anthracene found in Site soils range from non-detect (ND) in SB-07[6.5-7.5′] to 11 ppm in SB-02[2-3′] exceeding its RRSCO of 1 ppm. Concentrations of benzo(a)pyrene found in Site soils range from ND in 4 of 18 samples to 20 ppm in SB-10[1-2′] exceeding its RRSCO of 1 ppm. Concentrations of benzo(b)fluoranthene found in Site soils range from ND in 3 of 18 samples to 19 ppm in SB-10[1-2′] exceeding its RRSCO of 1 ppm. Concentrations of benzo(k)fluoranthene found in Site soils range from ND in 4 of 18 samples to 8.5 ppm in SB-10[1-2′] exceeding its RRSCO of 3.9 ppm. Concentrations of chysene found in Site soils range from ND in 4 of 18 samples to 9.8 ppm in SB-02[2-3′] exceeding its RRSCO of 3.9 ppm. Concentrations of dibenzo(a,h)anthracene found in Site soils range from ND in 7 of 18 samples to 5.2 ppm in SB-08[1-2′] exceeding its RRSCO of .33 ppm. Concentrations of indeno(1,2,3-cd)pyrene found in Site soils range from ND in 4 of 18 samples to 19 ppm in SB-08[1-2′] exceeding its RRSCO of .5 ppm.

CONCLUSIONS

Low levels of petroleum related compounds are present in soils below Lot 65 and Lot 60 and are consistent with areas of former onsite petroleum storage (see Figure 4).

Elevated concentrations of PAHs and metals (specifically: lead and mercury) above RRSCOs are present in soils/fill material site-wide from approximately 0-10 ft-bg (see Figures 4 and 5) and are the presence of historic fill material.

Should there be any comments or questions on the Limited Phase II Investigation, please contact Alana Carroll at 212.440.6706 for more information.

Sincerely,

Alana M. Carroll
Senior Managing Scientist

Enclosures:

Figures 1-5
Tables 1-5
Appendix A – Phase I ESA
Appendix B – Boring Logs

integral consulting inc.

Figure 1.
Site Location
Limited Phase II Investigation
562 West 23rd Steet, Manhattan 10011

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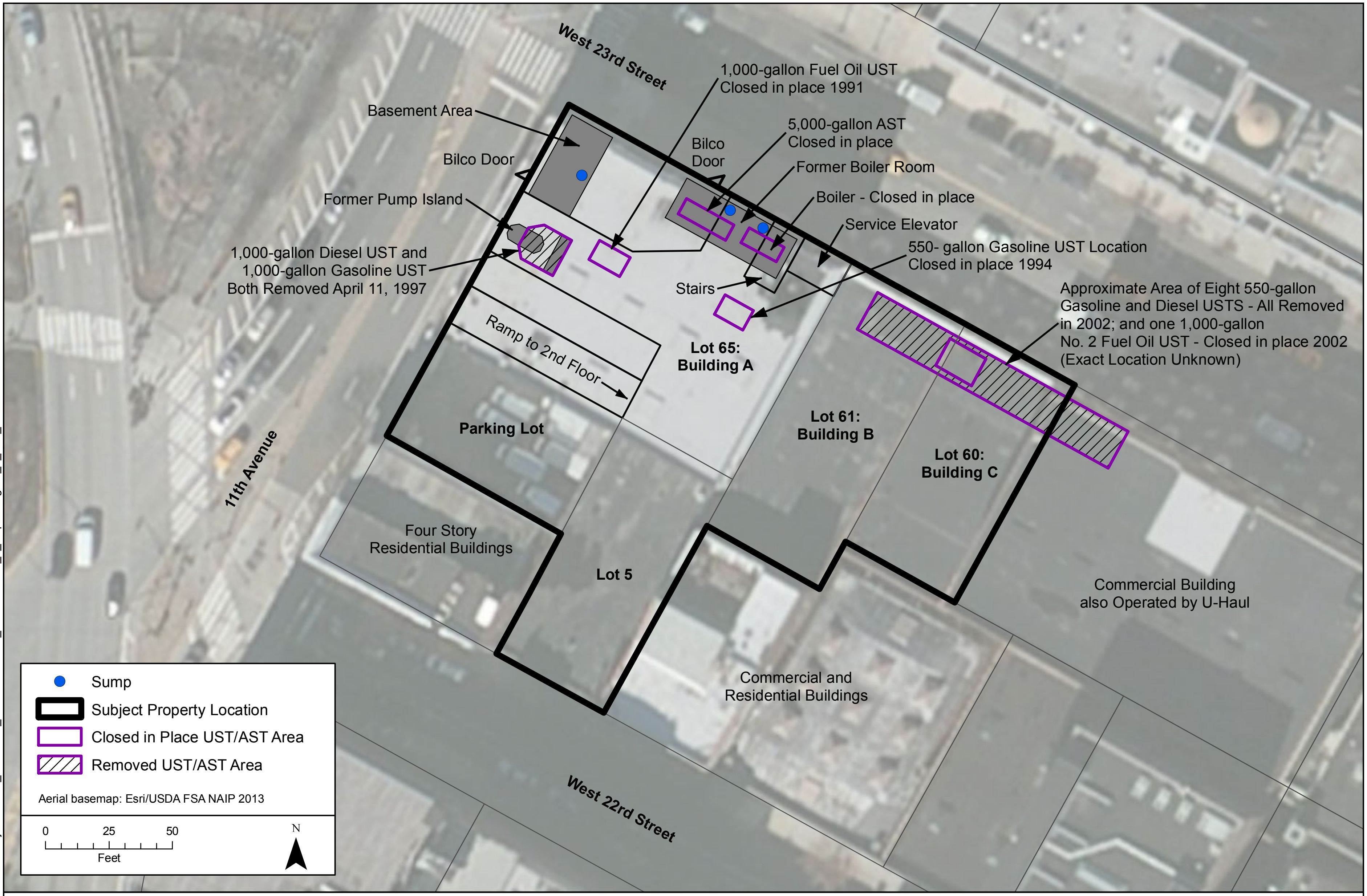

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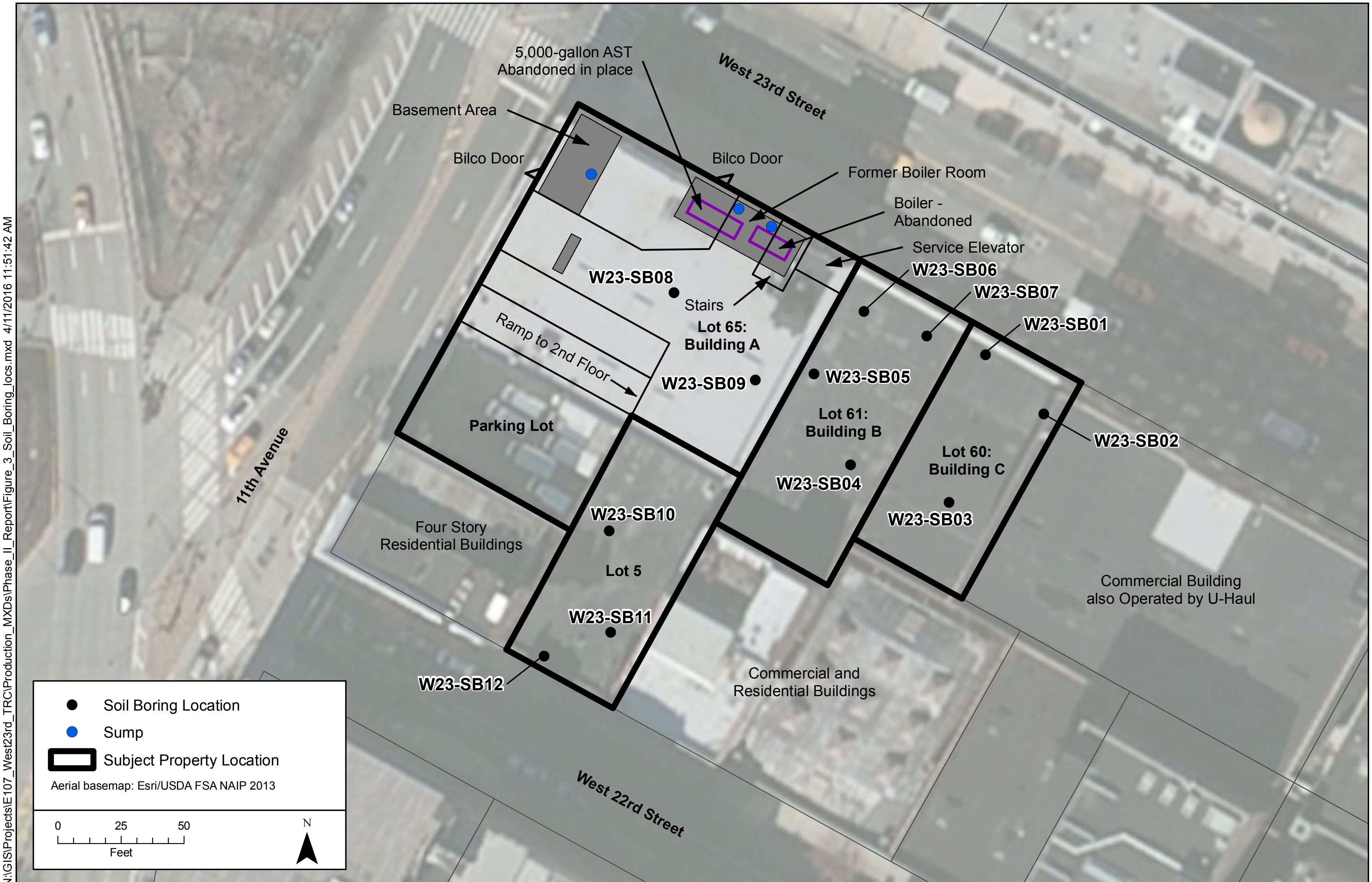
Figure 2.
General Site Plan indicating Areas of Concern
Limited Phase II Investigation
562 West 23rd Street, Manhattan, NY 10011



integral consulting inc.

Figure 3.
Soil Boring Locations
Limited Phase II Investigation
562 West 23rd Steet, Manhattan 10011

W23-SB09		
2/2/2015	1-2'	6-7'
Volatile Organics		
Benzene	ND	NT
Ethylbenzene	ND	NT
Xylenes, Total	0.00077J	NT
n-Propylbenzene	ND	NT
Semivolatile Organics		
Benzo(a)anthracene	0.068J	0.04J
Benzo(a)pyrene	0.082J	ND
Benzo(b)fluoranthene	0.094J	0.053
Benzo(k)fluoranthene	0.036J	0.018J
Chrysene	0.059J	0.035J
Dibenzo(a,h)anthracene	ND	ND
Indeno(1,2,3-cd)Pyrene	0.044J	0.027J

W23-SB08		
2/2/2015	1-2'	7.5-8.5'
Volatile Organics		
Benzene	NT	***0.44J***
Ethylbenzene	NT	ND
Xylenes, Total	NT	ND
n-Propylbenzene	NT	***8***
Semivolatile Organics		
Benzo(a)anthracene	**8.2**	ND
Benzo(a)pyrene	**18**	ND
Benzo(b)fluoranthene	**18**	ND
Benzo(k)fluoranthene	**5.2**	ND
Chrysene	**7.8**	ND
Dibenzo(a,h)anthracene	**5.2**	ND
Indeno(1,2,3-cd)Pyrene	**19**	ND

W23-SB05	
2/1/2016	1-2'
Volatile Organics	
Benzene	ND
Ethylbenzene	ND
Xylenes, Total	ND
n-Propylbenzene	ND
Semivolatile Organics	
Benzo(a)anthracene	**8.3**
Benzo(a)pyrene	**14**
Benzo(b)fluoranthene	**16**
Benzo(k)fluoranthene	**5.3**
Chrysene	**7.6**
Dibenzo(a,h)anthracene	**3.1**
Indeno(1,2,3-cd)Pyrene	**9.1**

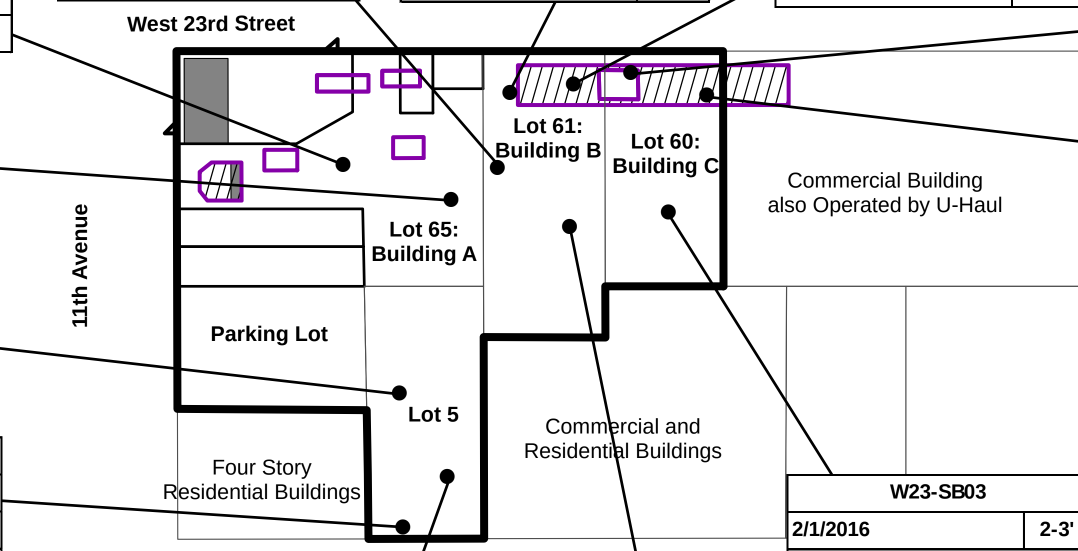
W23-SB06	
2/1/2016	1-2'
Volatile Organics	
Benzene	ND
Ethylbenzene	ND
Xylenes, Total	ND
n-Propylbenzene	ND
Semivolatile Organics	
Benzo(a)anthracene	0.16
Benzo(a)pyrene	0.24
Benzo(b)fluoranthene	0.24
Benzo(k)fluoranthene	0.12
Chrysene	0.14
Dibenzo(a,h)anthracene	0.045J
Indeno(1,2,3-cd)Pyrene	0.16

W23-SB07	
2/2/2015	6.5-7.5'
Volatile Organics	
Benzene	ND
Ethylbenzene	ND
Xylenes, Total	ND
n-Propylbenzene	ND
Semivolatile Organics	
Benzo(a)anthracene	ND
Benzo(a)pyrene	ND
Benzo(b)fluoranthene	ND
Benzo(k)fluoranthene	ND
Chrysene	ND
Dibenzo(a,h)anthracene	ND
Indeno(1,2,3-cd)Pyrene	ND

W23-SB01		
2/1/2016	2-3'	9-10'
Volatile Organics		
Benzene	NT	ND
Ethylbenzene	NT	ND
Xylenes, Total	NT	ND
n-Propylbenzene	NT	ND
Semivolatile Organics		
Benzo(a)anthracene	**1.2**	ND
Benzo(a)pyrene	**1.2**	ND
Benzo(b)fluoranthene	**1.5**	ND
Benzo(k)fluoranthene	0.55	ND
Chrysene	***1***	ND
Dibenzo(a,h)anthracene	0.17	ND
Indeno(1,2,3-cd)Pyrene	**0.88**	ND

- Soil Boring Location
- Closed in Place UST/AST Area
- Removed UST/AST Area
- Subject Property Location

Sample ID		
Date	**NY-RESRR	*NY-UNRES
Depth		
Analyte	mg/kg	mg/kg
Volatile Organics		
Benzene	4.8	0.06
Ethylbenzene	41	1
Xylenes, Total	100	0.26
n-Propylbenzene	100	3.9
Semivolatile Organics		
Benzo(a)anthracene	1	1
Benzo(a)pyrene	1	1
Benzo(b)fluoranthene	1	1
Benzo(k)fluoranthene	3.9	0.8
Chrysene	3.9	1
Dibenzo(a,h)anthracene	0.33	0.33
Indeno(1,2,3-cd)Pyrene	0.5	0.5



W23-SB02			
2/1/2016	2-3'	8-9'	8-9' DUP
Volatile Organics			
Benzene	NT	ND	ND
Ethylbenzene	NT	***1.2J***	0.34J
Xylenes, Total	NT	***0.59J***	0.19J
n-Propylbenzene	NT	***15***	***5.5***
Semivolatile Organics			
Benzo(a)anthracene	**11**	0.028J	0.22
Benzo(a)pyrene	**10**	ND	0.35
Benzo(b)fluoranthene	**13**	0.042J	0.35
Benzo(k)fluoranthene	**4.6**	ND	0.16
Chrysene	**9.8**	0.026J	0.2
Dibenzo(a,h)anthracene	**1.6**	ND	0.071J
Indeno(1,2,3-cd)Pyrene	**6.9**	ND	0.2

W23-SB10	
2/2/2015	1-2'
Volatile Organics	
Benzene	ND
Ethylbenzene	ND
Xylenes, Total	0.0012J
n-Propylbenzene	ND
Semivolatile Organics	
Benzo(a)anthracene	**9.4**
Benzo(a)pyrene	**20**
Benzo(b)fluoranthene	**19**
Benzo(k)fluoranthene	**8.5**
Chrysene	**8.5**
Dibenzo(a,h)anthracene	**3.7**
Indeno(1,2,3-cd)Pyrene	**14**

W23-SB12	
2/2/2015	1-2'
Volatile Organics	
Benzene	ND
Ethylbenzene	ND
Xylenes, Total	0.0008J
n-Propylbenzene	ND
Semivolatile Organics	
Benzo(a)anthracene	**3.3**
Benzo(a)pyrene	**4.6**
Benzo(b)fluoranthene	**5.8**
Benzo(k)fluoranthene	***1.8***
Chrysene	***3.3***
Dibenzo(a,h)anthracene	**0.85**
Indeno(1,2,3-cd)Pyrene	**3.9**

W23-SB11		
2/2/2015	1-2'	6.5-7.5'
Volatile Organics		
Benzene	NT	ND
Ethylbenzene	NT	ND
Xylenes, Total	NT	ND
n-Propylbenzene	NT	ND
Semivolatile Organics		
Benzo(a)anthracene	**1.8**	0.039J
Benzo(a)pyrene	**3.6**	0.054J
Benzo(b)fluoranthene	**3.6**	0.052J
Benzo(k)fluoranthene	***1.2***	ND
Chrysene	***1.6***	0.033J
Dibenzo(a,h)anthracene	**0.65**	ND
Indeno(1,2,3-cd)Pyrene	**3.5**	0.033J

W23-SB04	
2/1/2016	5-7'
Volatile Organics	
Benzene	ND
Ethylbenzene	ND
Xylenes, Total	ND
n-Propylbenzene	ND
Semivolatile Organics	
Benzo(a)anthracene	**4.5**
Benzo(a)pyrene	**4.8**
Benzo(b)fluoranthene	**5.2**
Benzo(k)fluoranthene	***3.4***
Chrysene	***3.6***
Dibenzo(a,h)anthracene	**1.1**
Indeno(1,2,3-cd)Pyrene	**2.7**

W23-SB03	
2/1/2016	2-3'
Volatile Organics	
Benzene	ND
Ethylbenzene	ND
Xylenes, Total	ND
n-Propylbenzene	ND
Semivolatile Organics	
Benzo(a)anthracene	**7**
Benzo(a)pyrene	**6.3**
Benzo(b)fluoranthene	**9.8**
Benzo(k)fluoranthene	***2.6***
Chrysene	**6**
Dibenzo(a,h)anthracene	**1.5**
Indeno(1,2,3-cd)Pyrene	**3.6**

Notes:
1. **Bold** and *Italicized* value indicates concentration exceeds Unrestricted SCOs
2. **Bold** and shaded value indicates concentration exceeds Restricted-Residential SCOs
3. J = Estimated value
4. ND = Not Detected
5. NT = Not Tested
6. * = 6 NYCRR Part 375-6.8(a) Unrestricted Use SCOs
7. ** = 6 NYCRR Part 375-6.8(b) Restricted Residential Use SCOs
8. All results are in mg/kg
9. Results from Limited Phase II Investigation, Integral Engineering, 2016

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0 40 80
Feet

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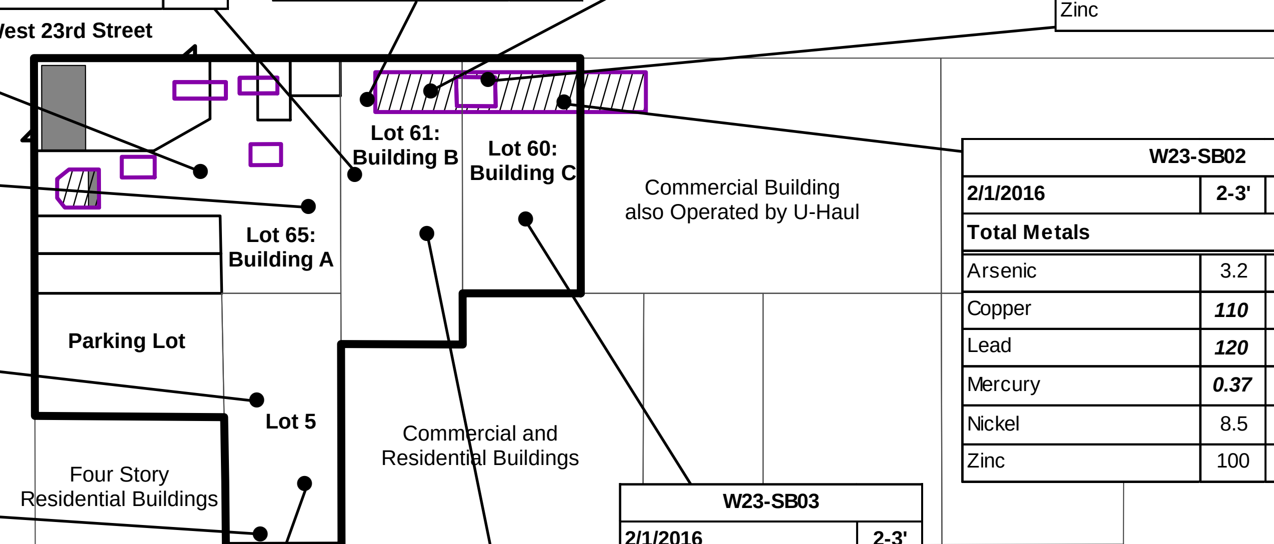
Figure 4.
Soil Sampling Results - VOCs and SVOCs
Limited Phase II Investigation
562 West 23rd Street, Manhattan, NY 10011



- ● Soil Boring Location
- Closed in Place UST/AST Area
- Removed UST/AST Area
- Subject Property Location

W23-SB09		
2/2/2015	1-2'	6-7'
Total Metals		
Arsenic	5.4	3.6
Copper	27	16
Lead	***100***	***96***
Mercury	***0.3***	**1.2**
Nickel	11	12
Zinc	47	32

W23-SB08		
2/2/2015	1-2'	7.5-8.5'
Total Metals		
Arsenic	**18**	3
Copper	44	16
Lead	**980**	***120***
Mercury	***0.25***	***0.26***
Nickel	14	14
Zinc	***170***	39

W23-SB05	
2/1/2016	1-2'
Total Metals	
Arsenic	***16***
Copper	***60***
Lead	***350***
Mercury	**0.96**
Nickel	12
Zinc	**170**

W23-SB06	
2/1/2016	1-2'
Total Metals	
Arsenic	**33**
Copper	***73***
Lead	**420**
Mercury	***0.77***
Nickel	11
Zinc	**140**

W23-SB07	
2/2/2015	6.5-7.5'
Total Metals	
Arsenic	3.5
Copper	13
Lead	30
Mercury	0.06J
Nickel	18
Zinc	28

W23-SB01		
2/1/2016	2-3'	9-10'
Total Metals		
Arsenic	2.8	1.6
Copper	***73***	13
Lead	***87***	37
Mercury	***0.68***	***0.22***
Nickel	7.1	9
Zinc	***320***	26

W23-SB02			
2/1/2016	2-3'	8-9'	8-9' DUP
Total Metals			
Arsenic	3.2	11	***14***
Copper	***110***	***57***	***57***
Lead	***120***	***150***	**580**
Mercury	***0.37***	0.14	***0.38***
Nickel	8.5	16	**110**
Zinc	100	48	**140**

W23-SB10	
2/2/2015	1-2'
Total Metals	
Arsenic	5.5
Copper	30
Lead	***88***
Mercury	0.14
Nickel	15
Zinc	93

W23-SB12	
2/2/2015	1-2'
Total Metals	
Arsenic	3.8
Copper	***90***
Lead	***280***
Mercury	***0.25***
Nickel	9.8
Zinc	***110***

W23-SB11		
2/2/2015	1-2'	6.5-7.5'
Total Metals		
Arsenic	3	3.3
Copper	49	14
Lead	***94***	***120***
Mercury	***0.28***	***0.7***
Nickel	14	9
Zinc	56	33

W23-SB04	
2/1/2016	5-7'
Total Metals	
Arsenic	6.6
Copper	29
Lead	***110***
Mercury	0.1
Nickel	13
Zinc	93

W23-SB03	
2/1/2016	2-3'
Total Metals	
Arsenic	4.2
Copper	***220***
Lead	***210***
Mercury	***0.51***
Nickel	9.2
Zinc	**140**

Sample ID		
Date	**NY-RESRR	*NY-UNRES
Depth		
Analyte	mg/kg	mg/kg
Total Metals		
Arsenic	16	13
Copper	270	50
Lead	400	63
Mercury	0.81	0.18
Nickel	310	30
Zinc	10000	109

Notes:
1. ***Bold*** and *Italicized* value indicates concentration exceeds Unrestricted SCOs
2. **Bold and shaded** value indicates concentration exceeds Restricted-Residential SCOs
3. J = Estimated value
4. * = 6 NYCRR Part 375-6.8(a) Unrestricted Use SCOs
5. ** = 6 NYCRR Part 375-6.8(b) Restricted Residential Use SCOs
6. All results are in mg/kg
7. Results from Limited Phase II Investigation, Integral Engineering, 2016

0 40 80
Feet

N

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New York, New York 10006
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Figure 5.
Soil Sample Results - Metals
Limited Phase II Investigation
562 West 23rd Street, Manhattan, NY 10011

TABLE 1

Soil Analytical Data Summary - VOCs
Phase II Subsurface Investigation
Block 699, Lot 5, 60, 61, and 65
Manhattan, New York

Sample ID Lab Sample ID Sample Date Sample Media Unit of Measure	**NY-RESRR	*NY-UNRES	W23-SB01 (9-10') L1602637-01 2/1/2016 Soil mg/kg	W23-SB02 (8-9') L1602637-02 2/1/2016 Soil mg/kg	W23-SB02 (8-9') DUPLICATE L1602637-07 2/1/2016 Soil mg/kg	W23-SB03 (2-3') L1602637-03 2/1/2016 Soil mg/kg	W23-SB04 (5-7') L1602637-04 2/1/2016 Soil mg/kg	W23-SB05 (1-2') L1602637-05 2/1/2016 Soil mg/kg	W23-SB06 (1-2') L1602637-06 2/1/2016 Soil mg/kg	W23-SB07 (6.5-7.5') L1602736-01 2/2/2016 Soil mg/kg	W23-SB08 (7.5-8.5') L1602736-02 2/2/2016 Soil mg/kg	W23-SB09 (1-2') L1602736-03 2/2/2016 Soil mg/kg	W23-SB10 (1-2') L1602736-04 2/2/2016 Soil mg/kg	W23-SB11 (6.5-7.5') L1602736-05 2/2/2016 Soil mg/kg	W23-SB12 (1-2') L1602736-06 2/2/2016 Soil mg/kg
Volatile Organics															
Methylene chloride	100	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	26	0.27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	49	0.37	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0016J	ND	ND
Carbon tetrachloride	2.4	0.76	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0024	ND	ND
1,2-Dichloropropane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	19	1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.034	0.00059J	0.0083
Chlorobenzene	100	1.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	3.1	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	100	0.68	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0016	ND	0.0031
Bromodichloromethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropene, Total	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	4.8	0.06	ND	ND	ND	ND	ND	ND	ND	ND	***0.44J***	ND	ND	ND	ND
Toluene	100	0.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0016J	0.00064J	ND
Ethylbenzene	41	1	ND	***1.2J***	0.34J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	0.9	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	100	0.33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	100	0.19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	21	0.47	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0011
1,2-Dichlorobenzene	100	1.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	49	2.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	13	1.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl tert butyl ether	100	0.93	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p/m-Xylene	NS	NS	ND	0.59J	0.19J	ND	ND	ND	ND	ND	ND	0.00077J	0.0012J	ND	ND
o-Xylene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0008J
Xylenes, Total	100	0.26	ND	***0.59J***	0.19J	ND	ND	ND	ND	ND	ND	0.00077J	0.0012J	ND	0.0008J
cis-1,2-Dichloroethene	100	0.25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene, Total	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	100	0.05	0.026	ND	ND	0.01J	0.0054J	0.012	0.0049J	0.019	ND	0.028	0.0069J	0.034	0.041
Carbon disulfide	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0012J	ND
2-Butanone	100	0.12	0.0053J	ND	ND	ND	ND	ND	ND	0.0023J	ND	ND	ND	0.0054J	0.0036J
Vinyl acetate	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromobenzene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	100	12	ND	4.2	2	ND	ND	ND	ND	ND	3.6	ND	ND	ND	ND
sec-Butylbenzene	100	11	ND	3.1	1.3	ND	ND	ND	ND	ND	2.8	ND	ND	ND	ND
tert-Butylbenzene	100	5.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Chlorotoluene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Chlorotoluene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	NS	NS	ND	7.8	2.4	ND	ND	ND	ND	ND	4.4	ND	ND	ND	ND
p-Isopropyltoluene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	1.4	ND	ND	ND	0.0016
Naphthalene	100	12	ND	1.6J	0.97J	0.0034J	ND	ND	ND	ND	1.4J	ND	ND	ND	ND
Acrylonitrile	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	100	3.9	ND	***15***	***5.5***	ND	ND	ND	ND	ND	***8***	ND	ND	ND	ND
1,2,3-Trichlorobenzene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	52	8.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0015J	ND	0.0013J
1,2,4-Trimethylbenzene	52	3.6	ND	1J	0.4J	ND	ND	ND	ND	ND	ND	ND	0.0026J	ND	0.0014J
1,4-Dioxane	13	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Diethylbenzene	NS	NS	ND	10	5.1	ND	ND	ND	ND	ND	3.8	ND	0.00057J	ND	0.00046J
p-Ethyltoluene	NS	NS	ND	0.58J	ND	ND	ND	ND	ND	ND	0.45J	ND	0.0012J	ND	0.00057J
1,2,4,5-Tetramethylbenzene	NS	NS	ND	36	22	ND	ND	ND	ND	ND	6.3	ND	ND	ND	ND
Ethyl ether	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,4-Dichloro-2-butene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
Bold and *Italicized* value indicates concentration exceeds Unrestricted SCOs
Bold and shaded value indicates concentration exceeds Restricted-Residential SCOs
J = Estimated value
ND = Not detected
NS = No Standard
* = 6 NYCRR Part 375-6.8(a) Unrestricted Use SCOs
** = 6 NYCRR Part 375-6.8(b) Restricted Residential Use SCOs Restricted-Residential

TABLE 2

Soil Analytical Data Summary - SVOCs
Phase II Subsurface Investigation
Block 699, Lot 5, 60, 61, and 65
Manhattan, New York

Sample ID Lab Sample ID Sample Date Sample Media Unit of Measure	**NY-RESRR	*NY-UNRES	W23-SB01 (2-3') L1602637-08 2/1/2016 Soil mg/kg	W23-SB01 (9-10') L1602637-01 2/1/2016 Soil mg/kg	W23-SB02 (2-3') L1602637-09 2/1/2016 Soil mg/kg	W23-SB02 (8-9') L1602637-02 2/1/2016 Soil mg/kg	W23-SB02 (8-9') DUPLICATE L1602637-07 2/1/2016 Soil mg/kg	W23-SB03 (2-3') L1602637-03 2/1/2016 Soil mg/kg	W23-SB04 (5-7') L1602637-04 2/1/2016 Soil mg/kg	W23-SB05 (1-2') L1602637-05 2/1/2016 Soil mg/kg	W23-SB06 (1-2') L1602637-06 2/1/2016 Soil mg/kg	W23-SB07 (6.5-7.5') L1602736-01 2/2/2016 Soil mg/kg	W23-SB08 (1-2') L1602736-08 2/2/2016 Soil mg/kg	W23-SB08 (7.5-8.5') L1602736-02 2/2/2016 Soil mg/kg	W23-SB09 (1-2') L1602736-03 2/2/2016 Soil mg/kg	W23-SB09 (6-7') L1602736-09 2/2/2016 Soil mg/kg	W23-SB10 (1-2') L1602736-04 2/2/2016 Soil mg/kg	W23-SB11 (1-2') L1602736-11 2/2/2016 Soil mg/kg	W23-SB11 (6.5-7.5') L1602736-05 2/2/2016 Soil mg/kg	W23-SB12 (1-2') L1602736-06 2/2/2016 Soil mg/kg
Semivolatile Organics																				
1,2,4-Trichlorobenzene	NS	NS	-	ND	-	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
1,2-Dichlorobenzene	100	1.1	-	ND	-	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
1,3-Dichlorobenzene	49	2.4	-	ND	-	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
1,4-Dichlorobenzene	13	1.8	-	ND	-	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
Benzoic Acid	NS	NS	-	ND	-	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
Benzyl Alcohol	NS	NS	-	ND	-	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	-	ND	-	ND	ND
Acenaphthene	100	20	0.13J	ND	1	ND	ND	0.6	0.26	0.62	ND	ND	0.94	ND	ND	ND	1	0.17	ND	0.16
2-Chloronaphthalene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobenzene	1.2	0.33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-chloroethyl)ether	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3,3'-Dichlorobenzidine	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-Dinitrotoluene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	100	100	2.3	ND	23	0.037J	0.25	15	5.8	8.8	0.18	ND	7.3	ND	0.097J	0.032J	9.2	1.6	0.033J	5.4
4-Chlorophenyl phenyl ether	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-chloroisopropyl)ether	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-chloroethoxy)methane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachloroethane	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isophorone	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.034J
Naphthalene	100	12	0.062J	ND	0.97	ND	ND	0.28	0.094J	0.34J	ND	ND	1.7	0.86	ND	ND	0.36J	0.17J	ND	0.23
Nitrobenzene	15	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NitrosoDiPhenylAmine(NDPA)/DPA	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Nitrosodi-n-propylamine	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-Ethylhexyl)phthalate	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butyl benzyl phthalate	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butylphthalate	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octylphthalate	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diethyl phthalate	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dimethyl phthalate	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	1	1	***1.2***	ND	***11***	0.028J	0.22	***7***	***4.5***	***8.3***	0.16	ND	***8.2***	ND	0.068J	0.04J	***9.4***	***1.8***	0.039J	***3.3***
Benzo(a)pyrene	1	1	***1.2***	ND	***10***	ND	0.35	***6.3***	***4.8***	***14***	0.24	ND	***18***	ND	0.082J	ND	***20***	***3.6***	0.054J	***4.6***
Benzo(b)fluoranthene	1	1	***1.5***	ND	***13***	0.042J	0.35	***9.8***	***5.2***	***16***	0.24	ND	***18***	ND	0.094J	0.053	***19***	***3.6***	0.052J	***5.8***
Benzo(k)fluoranthene	3.9	0.8	0.55	ND	***4.6***	ND	0.16	***2.6***	***3.4***	***5.3***	0.12	ND	***5.2***	ND	0.036J	0.018J	***8.5***	***1.2***	ND	***1.8***
Chrysene	3.9	1	***1***	ND	***9.8***	0.026J	0.2	***6***	***3.6***	***7.6***	0.14	ND	***7.8***	ND	0.059J	0.035J	***8.5***	***1.6***	0.033J	***3.3***
Acenaphthylene	100	100	0.2	ND	1.9	ND	ND	0.66	0.034J	0.11J	ND	ND	0.16	ND	ND	ND	ND	0.079J	ND	0.47
Anthracene	100	100	0.39	ND	4.2	ND	0.064J	2.2	1.3	1.7	ND	ND	1.4	ND	ND	ND	1.7	0.32	ND	0.62
Benzo(ghi)perylene	100	100	0.78	ND	6.8	0.034J	0.22	4	2.7	9.2	0.17	ND	16	ND	0.054J	0.025J	17	3.1	0.043J	3.6
Fluorene	100	30	0.1J	ND	0.8	ND	ND	0.6	0.14J	0.28J	ND	ND	0.35	ND	ND	ND	0.38J	0.074J	ND	0.12J
Phenanthrene	100	100	1.2	ND	15E	0.05J	0.21	6.9	3.5	4.8	0.083J	ND	4	ND	0.066J	0.024J	5.1	0.91	ND	2.4
Dibenzo(a,h)anthracene	0.33	0.33	0.17	ND	***1.6***	ND	0.071J	***1.5***	***1.1***	***3.1***	0.045J	ND	***5.2***	ND	ND	ND	***3.7***	***0.65***	ND	***0.85***
Indeno(1,2,3-cd)Pyrene	0.5	0.5	***0.88***	ND	***6.9***	ND	0.2	***3.6***	***2.7***	***9.1***	0.16	ND	***19***	ND	0.044J	0.027J	***14***	***3.5***	0.033J	***3.9***
Pyrene	100	100	2	ND	17E	0.035J	0.24	13	4.6	7.8	0.16	ND	7.2	ND	0.09J	0.036J	9.2	1.6	0.033J	5.2
4-Chloroaniline	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitroaniline	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-Nitroaniline	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitroaniline	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	59	7	0.057J	ND	1	ND	ND	0.29	0.14J	0.28J	ND	ND	0.28	ND	ND	ND	0.28J	0.059J	ND	0.13J
2-Methylnaphthalene	NS	NS	0.024J	ND	0.42	0.1J	0.2J	0.1J	0.041J	0.13J	ND	ND	0.94	1.1	ND	ND	0.12J	0.095J	ND	0.1J
2,4,6-Trichlorophenol	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
P-Chloro-M-Cresol	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dichlorophenol	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	NS	NS	ND	ND	0.067J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitrophenol	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrophenol	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,6-Dinitro-o-cresol	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	6.7	0.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenol	100	0.33	ND	ND	0.082J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylphenol	100	0.33	ND	ND	0.042J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-Methylphenol/4-Methylphenol	100	0.33	ND	ND	0.16J	ND	ND	0.045J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.038J	ND
2,4,5-Trichlorophenol	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbazole	NS	NS	0.16J	ND	1.7	ND	ND	0.84	0.45	0.68J	ND	ND	0.7	ND	ND	ND	0.96	0.17J	ND	0.27
4-Nitrophenol	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Bromophenyl phenyl ether	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzaldehyde	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Caprolactam	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Acetophenone	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Biphenyl	NS	NS	ND	ND	0.16J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4,5-Tetrachlorobenzene	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Atrazine	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
2,3,4,6-Tetrachlorophenol	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-

Notes:
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Bold and shaded value indicates
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** = 6 NYCRR Part 375-6.8(b)

TABLE 3

Soil Analytical Data Summary - Total Metals
Phase II Subsurface Investigation
Block 699, Lot 5, 60, 61, and 65
Manhattan, New York

Sample ID Lab Sample ID Sample Date Sample Media Unit of Measure	*NY-RESRR	**NY-UNRES	W23-SB01 (2-3') L1602637-08 2/1/2016 Soil mg/kg	W23-SB01 (9-10') L1602637-01 2/1/2016 Soil mg/kg	W23-SB02 (2-3') L1602637-09 2/1/2016 Soil mg/kg	W23-SB02 (8-9') L1602637-02 2/1/2016 Soil mg/kg	W23-SB02 (8-9') DUPLICATE L1602637-07 2/1/2016 Soil mg/kg	W23-SB03 (2-3') L1602637-03 2/1/2016 Soil mg/kg	W23-SB04 (5-7') L1602637-04 2/1/2016 Soil mg/kg	W23-SB05 (1-2') L1602637-05 2/1/2016 Soil mg/kg	W23-SB06 (1-2') L1602637-06 2/1/2016 Soil mg/kg	W23-SB07 (6.5-7.5') L1602736-01 2/2/2016 Soil mg/kg	W23-SB08 (1-2') L1602736-08 2/2/2016 Soil mg/kg	W23-SB08 (7.5-8.5') L1602736-02 2/2/2016 Soil mg/kg	W23-SB09 (1-2') L1602736-03 2/2/2016 Soil mg/kg	W23-SB09 (6-7') L1602736-09 2/2/2016 Soil mg/kg	W23-SB10 (1-2') L1602736-04 2/2/2016 Soil mg/kg	W23-SB11 (1-2') L1602736-11 2/2/2016 Soil mg/kg	W23-SB11 (6.5-7.5') L1602736-05 2/2/2016 Soil mg/kg	W23-SB12 (1-2') L1602736-06 2/2/2016 Soil mg/kg
Total Metals																				
Aluminum, Total	NS	NS	1900	7300	3700	6300	7600	3500	7000	4200	5200	6800	5000	6600	7100	6600	6300	4700	5800	4700
Antimony, Total	NS	NS	18	ND	1.8J	1.4J	ND	3.8J	1.4J	3.1J	ND	ND	6.4	ND	1J	1J	0.79J	1.5J	ND	1.4J
Arsenic, Total	16	13	2.8	1.6	3.2	11	***14***	4.2	6.6	***16***	***33***	3.5	***18***	3	5.4	3.6	5.5	3	3.3	3.8
Barium, Total	400	350	110	68	89	60	85	100	120	180	180	54	86	61	110	65	74	93	83	63
Beryllium, Total	72	7.2	0.1J	0.27J	0.13J	0.3J	0.29J	0.14J	0.32J	0.26J	0.38J	0.3J	0.37J	0.29J	0.32J	0.3J	0.55	0.29J	0.28J	0.24J
Cadmium, Total	4.3	2.5	0.22J	ND	0.13J	ND	ND	ND	ND	0.1J	ND	ND	ND	ND	ND	ND	ND	0.09J	ND	ND
Calcium, Total	NS	NS	12000	2900	22000	8100	30000	36000	5700	8100	5900	22000	9100	9500	6200	4000	3700	23000	9000	16000
Chromium, Total	NS	NS	10	14	9.5	18	18	8	13	26	12	10	16	11	11	11	12	11	11	8.7
Cobalt, Total	NS	NS	6.7	4.9	3.7	5.2	11	2.9	5.3	4.8	4.8	5	5.6	4.9	4.6	5.5	5.4	4.2	3.5	3.5
Copper, Total	270	50	***73***	13	***110***	***57***	***57***	***220***	29	***60***	***73***	13	44	16	27	16	30	49	14	***90***
Iron, Total	NS	NS	6400	10000	8200	13000	20000	8700	14000	20000	11000	12000	17000	13000	12000	12000	13000	8700	9300	12000
Lead, Total	400	63	***87***	37	***120***	***150***	***580***	***210***	***110***	***350***	***420***	30	***980***	***120***	***100***	***96***	***88***	***94***	***120***	***280***
Magnesium, Total	NS	NS	1400	2200	3600	2600	9900	2800	2200	1800	1400	3600	1400	2500	2300	2500	2000	2600	2100	2200
Manganese, Total	2000	1600	87	130	160	170	540	170	130	210	140	350	140	180	210	170	260	260	190	200
Mercury, Total	0.81	0.18	***0.68***	***0.22***	***0.37***	0.14	***0.38***	***0.51***	0.1	***0.96***	***0.77***	0.06J	***0.25***	***0.26***	***0.3***	***1.2***	0.14	***0.28***	***0.7***	***0.25***
Nickel, Total	310	30	7.1	9	8.5	16	**110**	9.2	13	12	11	18	14	14	11	12	15	14	9	9.8
Potassium, Total	NS	NS	420	980	1200	640	1200	820	820	1000	1000	630	680	750	1500	1200	710	970	1000	740
Selenium, Total	180	3.9	ND	0.43J	ND	1.8J	1.6J	0.42J	0.44J	1.4J	0.83J	0.52J	0.6J	0.55J	0.48J	ND	0.34J	ND	0.35J	0.52J
Silver, Total	180	2	0.2J	ND	0.26J	ND	0.42J	0.45J	ND	0.27J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium, Total	NS	NS	580	190	790	540	700	390	320	950	580	250	1400	640	230	280	320	650	240	280
Thallium, Total	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium, Total	NS	NS	7.4	19	12	18	41	13	16	16	15	15	12	13	16	14	15	15	14	12
Zinc, Total	10000	109	***320***	26	100	48	**140**	**140**	93	**170**	**140**	28	***170***	39	47	32	93	56	33	***110***

Notes:
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- = Not Analyzed
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** = 6 NYCRR Part 375-6.8(b)

TABLE 4

Soil Analytical Data Summary - Pesticides
Phase II Subsurface Investigation
Block 699, Lot 5, 60, 61, and 65
Manhattan, New York

Sample ID Lab Sample ID Sample Date Sample Media Unit of Measure	*NY-RESRR	**NY-UNRES	W23-SB01 (2-3') L1602637-08 2/1/2016 Soil mg/kg	W23-SB01 (9-10') L1602637-01 2/1/2016 Soil mg/kg	W23-SB02 (2-3') L1602637-09 2/1/2016 Soil mg/kg	W23-SB02 (8-9') L1602637-02 2/1/2016 Soil mg/kg	W23-SB02 (8-9') DUPLICATE L1602637-07 2/1/2016 Soil mg/kg	W23-SB03 (2-3') L1602637-03 2/1/2016 Soil mg/kg	W23-SB04 (5-7') L1602637-04 2/1/2016 Soil mg/kg	W23-SB05 (1-2') L1602637-05 2/1/2016 Soil mg/kg	W23-SB06 (1-2') L1602637-06 2/1/2016 Soil mg/kg	W23-SB07 (6.5-7.5') L1602736-01 2/2/2016 Soil mg/kg	W23-SB08 (1-2') L1602736-08 2/2/2016 Soil mg/kg	W23-SB08 (7.5-8.5') L1602736-02 2/2/2016 Soil mg/kg	W23-SB09 (1-2') L1602736-03 2/2/2016 Soil mg/kg	W23-SB09 (6-7') L1602736-09 2/2/2016 Soil mg/kg	W23-SB10 (1-2') L1602736-04 2/2/2016 Soil mg/kg	W23-SB11 (1-2') L1602736-11 2/2/2016 Soil mg/kg	W23-SB11 (6.5-7.5') L1602736-05 2/2/2016 Soil mg/kg	W23-SB12 (1-2') L1602736-06 2/2/2016 Soil mg/kg
Pesticides																				
Delta-BHC	100	0.04	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Lindane	1.3	0.1	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Alpha-BHC	0.48	0.02	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Beta-BHC	0.36	0.036	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Heptachlor	2.1	0.042	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Aldrin	0.097	0.005	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Heptachlor epoxide	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Endrin	11	0.014	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Endrin aldehyde	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Endrin ketone	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Dieldrin	0.2	0.005	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
4,4'-DDE	8.9	0.0033	ND	-	***0.0296***	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
4,4'-DDD	13	0.0033	ND	-	0.00189	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
4,4'-DDT	7.9	0.0033	ND	-	***0.0195***	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Endosulfan I	24	2.4	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Endosulfan II	24	2.4	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Endosulfan sulfate	24	2.4	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Methoxychlor	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Toxaphene	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Chlordane	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
cis-Chlordane	4.2	0.094	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
trans-Chlordane	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-

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** = 6 NYCRR Part 375-

TABLE 5

Soil Analytical Data Summary - PCBs
Phase II Subsurface Investigation
Block 699, Lot 5, 60, 61, and 65
Manhattan, New York

Sample ID Lab Sample ID Sample Date Sample Media Unit of Measure	*NY-RESRR	**NY-UNRES	W23-SB01 (2-3') L1602637-08 2/1/2016 Soil mg/kg	W23-SB01 (9-10') L1602637-01 2/1/2016 Soil mg/kg	W23-SB02 (2-3') L1602637-09 2/1/2016 Soil mg/kg	W23-SB02 (8-9') L1602637-02 2/1/2016 Soil mg/kg	W23-SB02 (8-9') DUPLICATE L1602637-07 2/1/2016 Soil mg/kg	W23-SB03 (2-3') L1602637-03 2/1/2016 Soil mg/kg	W23-SB04 (5-7') L1602637-04 2/1/2016 Soil mg/kg	W23-SB05 (1-2') L1602637-05 2/1/2016 Soil mg/kg	W23-SB06 (1-2') L1602637-06 2/1/2016 Soil mg/kg	W23-SB07 (6.5-7.5') L1602736-01 2/2/2016 Soil mg/kg	W23-SB08 (1-2') L1602736-08 2/2/2016 Soil mg/kg	W23-SB08 (7.5-8.5') L1602736-02 2/2/2016 Soil mg/kg	W23-SB09 (1-2') L1602736-03 2/2/2016 Soil mg/kg	W23-SB09 (6-7') L1602736-09 2/2/2016 Soil mg/kg	W23-SB10 (1-2') L1602736-04 2/2/2016 Soil mg/kg	W23-SB11 (1-2') L1602736-11 2/2/2016 Soil mg/kg	W23-SB11 (6.5-7.5') L1602736-05 2/2/2016 Soil mg/kg	W23-SB12 (1-2') L1602736-06 2/2/2016 Soil mg/kg
Polychlorinated Biphenyls (PCBs)																				
Aroclor 1016	1	0.1	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Aroclor 1221	1	0.1	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Aroclor 1232	1	0.1	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Aroclor 1242	1	0.1	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Aroclor 1248	1	0.1	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Aroclor 1254	1	0.1	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Aroclor 1260	1	0.1	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	0.0156J	-	-
Aroclor 1262	1	0.1	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
Aroclor 1268	1	0.1	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	ND	-	-
PCBs, Total	NS	NS	ND	-	ND	-	-	-	-	-	-	-	ND	-	-	ND	-	0.0156J	-	-

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** = 6 NYCRR Part

SUPPORTING PLANS

APPENDIX B: FIELD SAMPLING PLAN (FSP)

APPENDIX C: QUALITY ASSURANCE PROJECT PLAN (QAPP)

APPENDIX D: HEALTH AND SAFETY PLAN WITH COMMUNITY AIR MONITORING PLAN (HASP/CAMP)

APPENDIX B

FIELD SAMPLING PLAN

U-Haul Site
555 West 22nd Street
New York, New York 10011
NYSDEC BCP No. C231101

Submitted to:
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau B
625 Broadway, 12th Floor
Albany, NY 12233-7020

Prepared for
23rd and 11th Associates LLC
c/o The Related Companies
60 Columbus Circle
New York, NY 10023

Prepared by

integral engineering p.c.
61 Broadway
Suite 1601
New York, NY 10006

Final
October 2016

Affiliated with Integral Consulting Inc.

CONTENTS

1 INTRODUCTION

The following Field Sampling Plan (FSP) describes in detail the sampling and data gathering methods and procedures to be used during the Remedial Investigation activities at the property located at 555 West 22nd Street (Block 694, Lots 5, 60, 61 and 65), New York, NY (Site), outlined in the Remedial Investigation (RI) Work Plan.

This FSP should be used in conjunction with the Quality Assurance Project Plan (QAPP) (Appendix C to the RIWP) and Health and Safety Plan (HASP) (Appendix D to the RIWP), both developed by Integral Engineering P.C. for the RI activities at the Site.

1.1 SITE LOCATION

The Site is located in a mixed use area of the West Chelsea section of the Borough of Manhattan. The Site is comprised of four tax lots (approximately 31,820 SF) identified on New York City tax maps as Block 694 Lots 5, 60, 61, and 65. The Site is bounded to the north by West 23rd Street, to the east by 10th Avenue, to the south by West 22nd Street, and to the west by 11th Avenue.

1.2 SAMPLING OBJECTIVE

The objective of the sampling is to define the nature and extent of historical fill material present onsite; delineate the horizontal and vertical extent of contaminants (if present) in soil, groundwater, and soil vapor beneath the Site; evaluate potential offsite impacts to groundwater from contamination, if present; evaluate the potential for soil vapor to migrate offsite via preferred pathways, if present; evaluate the potential presence of unidentified underground storage tanks; to determine whether remedial action is needed to protect human health and the environment; and to produce data of sufficient quantity and quality to support remediation of the Site.

1.3 FIELD ACTIVITIES

The Remedial Investigation (RI) will include the following scope of work:

- Ground penetrating radar (GPR) will be utilized to evaluate the potential presence of unidentified and/or unconfirmed USTs and will aid in the identification of potential utilities, piping, and other subsurface infrastructure in the vicinity of proposed boring areas;

- Eighteen (18) soil borings will be installed around the Site to evaluate subsurface soil conditions to the depth of approximately 17 ftbg (one foot below the anticipated excavation depth). Borings will be continuously screened and evaluated for their physical characteristics and appropriate intervals will be identified for sample collection;

- Install three (3) permanent groundwater monitoring wells, screened across the groundwater interface, and five (5) temporary wells. Following well installation and development, groundwater samples will be collected in accordance with EPA's *Low Flow Purging and Sampling Procedures for the Collection of Groundwater Samples from Monitoring Wells* (Low Flow Procedures, January 2010);

- Install six (6) soil vapor points, collect soil vapor from six (6) points, collect one (1) indoor air sample, and collect one (1) ambient air sample per day while conducting the vapor/indoor air portion of the RI.

All sampling will be conducted in accordance with the FSP, QAPP, and HASP.

1.3.1 Onsite Personnel, Roles, and Responsibilities

Personnel:

- Integral Project Manager: Alana Carroll (Office: 212-440-6706; Cell: 646-895-1403)
- Integral Field Staff: Jordan Junion (Office: 212-440-6705; Cell: 414-315-8977)

Roles and Responsibilities:

Integral Project Manager: Oversees the performance of field activities and directs deviations from the RI Work Plan (if necessary).

Integral Field Staff:

- Manages the implementation of the RI
- Oversees and directs subcontractors
- Collects samples for data analysis
- Controls sample handling, packaging and shipment

1.3.2 Field Logbook

All field activities will be carefully documented in field logbooks. Entries will be of sufficient detail that a complete daily record of significant events, observations, and measurements is obtained. The field books will provide a legal record of the activities conducted at the site. Accordingly:

- Field books will be bound with consecutively numbered pages;
- Field books will be controlled by the field staff while field work is in progress;

- Logbooks will be waterproof;
- Entries will be signed and dated at the conclusion of each day of field work;
- Erroneous entries made while fieldwork is in progress will be corrected by the person that made the entries. Corrections will be made by drawing a line through the error, entering the correct information, and initialing the correction;
- Corrections made after departing the field will be made by the person who made the original entries. The correction will be made by drawing a line through the error, entering the correct information, and initialing and dating the time of the correction; and
- The Integral Project Manager will control field books when fieldwork is not in progress.

At a minimum, daily field book entries will include the following information:

- Date and page number on each page or set of pages;
- Location of field activity;
- Date and time of entry;
- Names and titles of field team members;
- Names and titles of any site visitors and site contacts;
- Weather information: temperature, cloud coverage, wind speed and direction;
- Purpose of field activity;
- A detailed description of the fieldwork conducted observations and any measurements or readings. Where appropriate, a hand-drawn sketch map will also be included that identifies significant landmarks, features, sample locations, and utilities; and
- When appropriate, boring numbers, well numbers, sample point ID or key activities should be identified on the top of each page to facilitate retrieval of data at a later date.

1.3.3 Ground Penetrating Radar

A ground penetrating radar (GPR) survey is proposed to be conducted over the entire Site (where accessible) prior to the advancement of soil borings. The GPR survey will evaluate the potential presence of unidentified and/or unconfirmed USTs and will aid in the identification of potential utilities, piping, and other subsurface infrastructure. The GPR survey will involve traversing the Site with a portable digital pulse GPR system in order to obtain detailed horizontal profiles. Spacing of the traverse lines will be dependent upon the interference and resolution. Typical depth range for GPR equipment is primarily governed by Site-specific lithology. The majority of buried utilities and structures are expected to be positioned above the groundwater table (less than 9 ftbg).

1.3.4 Sample Collection and Analysis

1.3.4.1 Soil Sampling

In order to characterize the soil at the Site, the following scope of work will be implemented:

- Advance an estimated eighteen (18) soil borings at and around the Site to evaluate the subsurface soil conditions to the depth of approximately 17 ftbg (one foot below the anticipated excavation depth). The borings are intended to evaluate the horizontal and vertical extent of impacts (if present); assess the condition of soils to be left onsite; assess the soil conditions around and downgradient of the AOCs; evaluate potential sources (on and offsite); evaluate potential offsite migration of onsite impacts (if present); and assist in the presentation of Alternative Analysis and remedy recommendations;
- Evaluate physical characteristics of the entire soil/fill column in each boring and identify appropriate intervals from which samples will be collected;
- Collect soil samples via EPA Method 5035/5035A; and
- Analyze soil samples for:
    - TCL VOCs via EPA Method 8260C.
    - TCL SVOCs via EPA Method 8270D;
    - Target Analyte List (TAL) Metals via EPA Method 6010C/7471B;
    - Polychlorinated Biphenyls (PCBs) via EPA Method 8082A; and
    - Pesticides via EPA Method 8081B.

Based on field measurements and observations, boring locations may be moved or added. Prior to modifications being made with regard to the above-described placement, coordination with NYSDEC will take place. Proposed soil boring locations are shown on Figure 10 of the RIWP.

Prior to the advancement of soil borings, all locations will be cleared for utilities and subsurface infrastructure using GPR. Continuous soil sampling will be conducted for all borings. It is anticipated that two (2) soil samples will be analyzed per boring. As a default, one (1) soil sample will be collected from the interval exhibiting the highest PID reading or visual/olfactory impact and one (1) sample will be collected from the interval directly below the anticipated development excavation depth (~17 ftbg). If no obvious signs of impacts are observed within the soil column, a soil sample will be collected from the interval directly above the groundwater interface (~9 ftbg). If additional impacted or questionable zones are identified, samples will be collected from those areas for analysis. All samples are expected to be collected from two (2) foot intervals, but the intervals may be expanded or contracted based upon material recovery and identification of impacts.

Delineation borings may be advanced in areas where impacts were observed from visual or olfactory cues, or via a photoionization detector (PID). Delineation borings will be advanced radiating out from any proposed onsite soil boring (i.e., within the Site building based on the most reasonable access) that show signs of impact. Delineation borings will be advanced until no obvious signs of impacts are observed or access limitations prevent any further investigation. Samples analyzed from delineation borings showing no impacts will be collected consistent with the previous sample interval selected from the proposed boring that exhibited impacts. Samples collected from delineation borings terminated due to access limitations will be selected from the area of highest suspected impact.

This delineation process focuses the subsurface soil investigation on probable source areas, while obtaining a more complete data set and eliminating multiple mobilizations. The analysis of impacted soil and potential source area delineation will assist in evaluation of the remedy. This delineation process focuses the subsurface soil investigation on probable source areas, while obtaining a more complete data set and eliminating multiple mobilizations. The analysis of impacted soil and potential source area delineation will assist in evaluation of the remedy.

Impact will be determined in the field by a Qualified Environmental Professional (QEP) via screening for VOCs using a PID and visual/olfactory indication.

Soil borings will be installed using a track mounted or Bobcat Geoprobe® utilizing direct push technology to the groundwater interface depth, approximately 17 ftbg. Continuous soil samples will be collected using four (4) or five (5) foot macrocore samplers fitted with dedicated acetate liners. The soil/fill retrieved from each sampler will be field screened with a PID for VOCs and described by Integral field personnel on boring logs. Evidence of contamination (e.g., Non Aqueous Phase Liquid [NAPL], sheens, odors, staining, elevated PID readings) will be documented by Integral field personnel. Product samples, if encountered, will be submitted for gas chromatography-mass spectrometer fingerprint analysis.

Soil samples selected for laboratory analysis will be placed in laboratory supplied containers, sealed and labeled, and placed in a cooler and chilled to 4oC for transport under chain-of-custody procedures. Soil samples will be submitted to a NYSDOH ELAP-certified laboratory via courier service under standard chain-of-custody protocol and analyzed for all of the compounds included in 6 NYCRR Part 375 SCOs and Final CP-51 SCLs.

1.3.4.2 Groundwater Sampling

The following scope of work is proposed to further characterize the groundwater at the Site:

- Collect groundwater samples from five (5) soil boring locations;
- Install three (3) permanent groundwater monitoring wells, screened across the groundwater interface;
- Survey all newly-installed wells;
- Collect one (1) round of depth-to-groundwater measurements from newly-installed wells;

- Evaluate groundwater elevations and present groundwater contours;
- Purge all wells in accordance with DER-10 requirements and collect samples for laboratory analysis. All purging and sampling will be performed in accordance with proper program protocols. Samples will be collected from each of the three (3) proposed wells; and
- Analyze groundwater samples for:
    - TCL VOCs via USEPA Method 8260C.
    - TCL SVOCs via USEPA Method 8270D;
    - TAL Metals via USEPA Method 6010C/7471B (filtered and unfiltered);
    - PCBs via USEPA Method 8082A; and
    - Pesticides via USEPA Method 8081B.

Samples selected for full scan analysis will be collected from locations that indicate potential impact through visual, olfactory or field meter readings. If no impact areas or locations are identified, samples for full scan sample analysis will be selected randomly.

All well locations will be installed concurrent with a soil boring location. Proposed well locations are shown on Figure 10 of the RIWP. Monitoring well construction will follow the protocol described below. Monitoring wells installed within the sidewalk will be installed using a track mounted Geoprobe outfitted with 4¼" hollow-stem auger attachments. Monitoring wells installed within the Site building will be installed using a track mounted or Bobcat Geoprobe, depending on access limitations. Interior wells installed utilizing a Bobcat Geoprobe will be constructed of 1" PVC riser and screen in order to achieve the proper annular space around each well, and will follow the same general construction as the 2" sidewalk wells described below. If any significant impacts are identified, well materials may be altered to prevent detriment to PVC screen material.

Sidewalk wells will be installed approximately 5-6' below the groundwater table (expected to be at approximately 9 ftbg) in order to collect samples in the shallow saturated zone. The wells will be constructed of 2" diameter PVC riser with 10' of .020" slotted PVC screen. The screen interval will straddle the groundwater interface. The annular space around the well will be filled with No. 2 Morie quartz sand to a depth of 2' above the top of the well screen, followed by 2' of bentonite, then backfilled with screened (unimpacted) soil cuttings to 1' below grade. The wells will be finished with 6" of bentonite pellets placed below a locking flush-mounted road box, set in a cement apron. Development will be performed by purging the water column in order to remove sediment disturbed by the drilling process. Purge water will be collected and containerized for proper management and disposal.

Sampling of the monitoring wells is anticipated to take place approximately one week following their installation. Following purging, one (1) representative groundwater sample will be collected from each well, using dedicated polyethylene tubing attached to a peristaltic pump capable of low flow control. During purging, water quality indicators (pH, temperature, specific conductivity, and turbidity) will be monitored using a flow through cell while purging. Purging is considered complete when field parameters have stabilized (e.g., turbidity reading of 5 NTU). Groundwater samples will be collected according to *EPA's Low Flow Purging and Sampling Procedures for the Collection of Groundwater Samples from Monitoring Wells* (Low Flow Procedures, January 2010).

The groundwater samples will be pumped directly into laboratory-supplied sample bottles. Samples will be collected, cooled, properly packaged to prevent breakage, and submitted to a NYSDOH ELAP-certified laboratory via courier service under standard chain-of-custody protocol.

1.3.4.3 Soil Vapor and Air Sampling

The scope of work proposed for the characterization of soil vapor onsite focuses on the potential for offsite migration of onsite contaminants (if present), as well as the potential for onsite migration of contaminants from offsite sources. The results of soil vapor and air sampling will assist in evaluating future onsite engineering controls.

The following scope of work is proposed to characterize the soil vapor at the Site:

- Install six (6) soil vapor points;
- Purge and collect soil vapor samples from six (6) points;
- Collect one (1) indoor air sample from Building A (Lot 65);
- Collect one (1) ambient air sample; and
- Analyze all soil vapor, indoor air and ambient air samples for TO-15 VOCs.

Proposed soil vapor sampling locations are shown on Figure 10 of the RIWP.

Each soil vapor probe will be installed approximately 2" below the building or parking area slab using dedicated 1/8" Teflon tubing. The tubing will be implanted into the hole and the annular space sealed with bentonite to prevent ambient air from entering the area around the probe. Once the seal is secure, a "T" fitting and valve will be connected on the above-surface end of the tubing. A syringe will be used to purge the vapors in the probe and tubing of three volumes. As required by the NYSDOH, a helium (He) tracer will be used as part of the sampling process and all testing will follow the NYSDOH Soil Vapor Guidance. Prior to sample collection, the He vapor will be screened using a field meter and the measurement recorded at each soil vapor sampling location. Prior to sample collection, a multi-gas meter will be used to measure the concentration of O2, CO2, and CH4 in each probe, to assess the subsurface chemistry (e.g. redox state). Following this procedure, the soil vapor samples will be collected in clean, batch certified, two (2) liter SummaTM canisters at flow rates no greater than 200 ml/min.

Soil vapor samples will be collected over a period of two (2) hours. Soil vapor samples will be analyzed for VOCs via USEPA Method TO-15 at a NYSDOH ELAP-certified analytical laboratory.

<u>Indoor and Ambient Air Samples</u>

In accordance with the NYSDOH Guidance for Evaluating Soil Vapor Intrusion, one (1) indoor air sample and one (1) ambient air sample (per sampling day) will be collected prior to the collection of sub-slab soil vapor samples . One (1) indoor air sample will be collected from Building A (Lot 65). The indoor air sample will be collected in the breathing zone (approximately four (4) to six (6) feet above the floor). One background ambient air sample will also be collected per day along West 23rd Street. Indoor and background air samples will be collected in six (6) liter, batch-certified clean SUMMATM canisters attached to 8-hour flow controllers. Samples will be collected at flow rates no greater than 200 ml/min.

For each sub-slab soil vapor, soil vapor, indoor, and background sample, the start time, end time, maximum and minimum temperature, and beginning and final ambient temperature will be recorded. Indoor and ambient air samples will be collected over a period of eight (8) hours and will be analyzed for VOCs via USEPA Method TO-15 at a NYSDOH ELAP-certified analytical laboratory.

1.3.5 Equipment Decontamination

Where possible, samples will be collected using new, dedicated sampling equipment so that decontamination is not required. All non-dedicated drilling tools, equipment and sampling equipment will be decontaminated between boring locations using potable tap water and a phosphate-free detergent (e.g., Alconox) and/or a steam cleaner. All non-dedicated sampling equipment will be decontaminated after each sampler is recovered. Decontamination water will be collected and disposed as investigation-derived waste (IDW).

1.3.6 Investigation Derived Waste

It is anticipated that soil cuttings and groundwater will be generated during Site characterization activities. The cutting from drilling operations will be placed on protective sheeting, screened with a PID, and either used to backfill the bore hole (if screening indicates no/minimal VOCs) or placed into 55-gallon steel drums. Cutting determined to be inadequate for backfill, along with redevelopment and purge water, will be drummed, characterized and disposed of off-site in accordance with federal, state and local regulations.

Used personal protective equipment (PPE) and other non-hazardous materials that come into contact with chlorinated solvents will be drummed and disposed of off-site in accordance with federal, state and local regulations.

1.3.7 Field Instrument Calibration

All field screening and sampling instruments (e.g., temperature-conductivity-pH probes) that require calibration prior to operation will be calibrated daily in accordance with the manufacturer's instructions. All instrument calibrations will be documented in the project field book and in instrument calibration logs for the various pieces of equipment. Instrument operating manuals will be maintained onsite by the field team.

APPENDIX C

QUALITY ASSURANCE PROJECT PLAN

U-Haul Site
555 West 22nd Street
New York, New York 10011
NYSDEC BCP No. C231101

Submitted to:
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau B
625 Broadway, 12th Floor
Albany, NY 12233-7020

Prepared for
23rd and 11th Associates LLC
c/o The Related Companies
60 Columbus Circle
New York, NY 10023

Prepared by:

integral engineering p.c.

61 Broadway
Suite 1601
New York, NY 10006

Final
October 2016

Affiliated with Integral Consulting Inc.

CONTENTS

1 INTRODUCTION

This Quality Assurance Project Plan (QAPP) has been developed for the Remedial Investigation (RI) Work Plan prepared for the property located at 555 West 22nd Street (Block 694, Lots 5, 60, 61 and 65), New York, NY (Site).

The Site is located in a mixed use area of the West Chelsea section of the Borough of Manhattan. The Site is comprised of four tax lots (approximately 31,820 SF) identified on New York City tax maps as Block 694 Lots 5, 60, 61, and 65. The Site is bounded to the north by West 23rd Street, to the east by 10th Avenue, to the south by West 22nd Street, and to the west by 11th Avenue.

1.1 PROJECT SCOPE AND QAPP OBJECTIVE

The proposed scope of work includes the following:

- Advancement of borings for soil, groundwater and/or soil vapor sampling at several locations around the site; and,
- Collection of soil, groundwater, soil vapor, and indoor and ambient air samples from soil borings, monitoring wells and temporary soil vapor points.

The objective of the QAPP is to detail the policies, organization, objectives, functional activities and specific quality assurance/quality control (QA/QC) activities designed to achieve the data quality goals or objectives of the Remedial Investigation Work Plan (Work Plan). This QAPP addresses how the acquisition and handling of samples and the review and reporting of data will be documented for quality control (QC) purposes. Specifically, this QAPP address the following:

- The procedures to be used to collect, preserve, package, and transport samples;
- Field data collection and record keeping;
- Data management;
- Chain-of-custody procedures; and,
- Determination of precision, accuracy, completeness, representativeness, decision rules, comparability and level of QC effort.

2 PROJECT ORGANIZATION

The personnel detailed are responsible for the implementation of the QAPP. Integral Engineering PC (Integral) will implement the Work Plan on behalf of 23rd and 11th Associates LLC (Participant) once approved by the New York State Department of Environmental Conservation (NYSDEC).

The Qualified Environmental Professional will be Kevin McCarty, P.G., Principal at Integral. Mr. McCarty is a professional geologist with nearly 20 years of experience in the New York City metropolitan area. He has designed and implemented subsurface investigations and is proficient in groundwater modeling, design of groundwater treatment systems, and soil remediation. He has managed numerous projects focused on compliance with the requirements of the New York State Brownfield Cleanup and spills programs and the New York City "e" designation program. Mr. McCarty also has extensive experience coordinating with New York State and New York City regulatory agencies. Mr. McCarty received his BA in Geology from Western Connecticut State University.

The Quality Assurance Officer will be Mr. Keith Brodock, P.E., Senior Managing Engineer at Integral. Mr. Brodock is an is a professional engineer with over 10 years of experience in environmental risk analysis, real estate portfolio liability estimation, transactional risk evaluation, remediation design, and decision management science. One of his primary responsibilities is managing and quantifying transactional risks for brownfield properties. Mr. Brodock routinely consults purchasers and sellers on the regulatory climate, technical interpretations, and risk mitigation measures. He frequently supports fate and transport modeling of vapor intrusion cases and engineering designs for remediation systems. Mr. Brodock received his BS in Chemical Engineering from Clarkson University. Mr. Brodock has experience with analytical methods, data interpretation and validation, the development of sampling plans, quality control procedures and auditing requirements and techniques. Mr. Brodock will review sampling procedures and certify that the data was collected and analyzed using the appropriate procedures and will not be directly involved in the collection and analysis of samples from the Site. Mr. Brodock has, in conjunction with the Project Manager, developed the sampling and analytical portion of this QAPP.

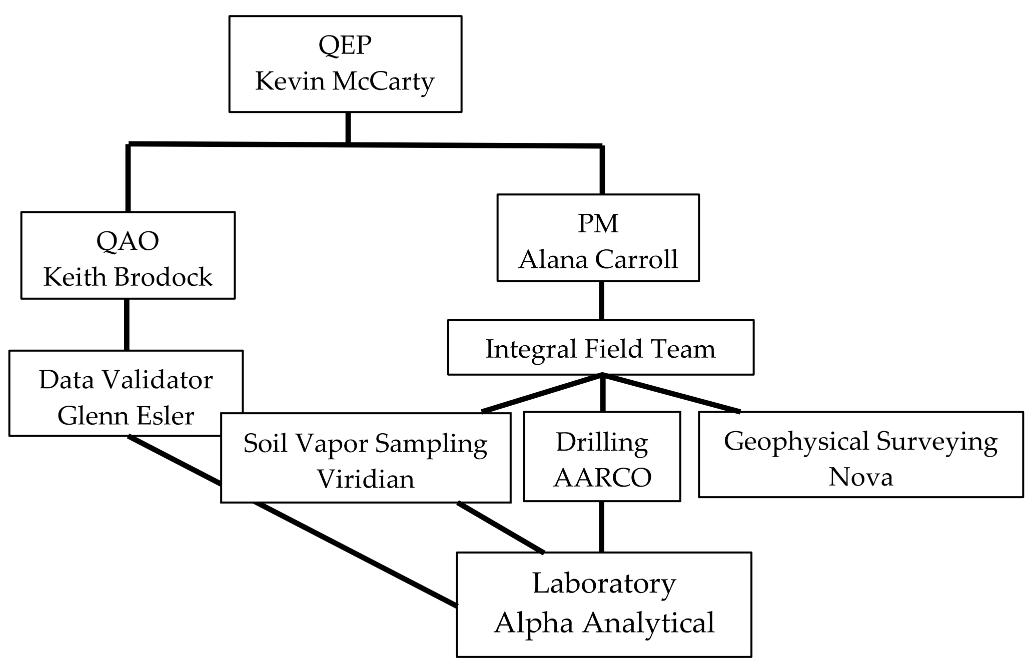
The Project Manager will be Mrs. Alana Carroll, Senior Managing Geologist at Integral. Mrs. Carroll is an environmental geologist with over 10 years of experience in all aspects of site assessment, investigation, remediation and development and implementation of remedial strategies. Her experience involves managing a variety of environmental consulting and engineering projects in the New York metropolitan area, specializing in remedial investigations, conceptual site modeling, and remedial design and implementation. Ms. Carroll provides analytical, technical, and regulatory guidance to clients, including developers and environmental attorneys, on a variety of projects in various stages of investigation, remediation, and redevelopment and has managed projects in the New York State Brownfield Cleanup Program, the New York State Department of Environmental Conservation (NYSDEC) Spills and Voluntary Cleanup Programs, and New York City "e" Designation Program. Mrs. Carroll received her BS in Geology from Hofstra University and will receive her MA in Geology from Brooklyn College in the fall of 2016.

Data validation will be performed by Mr. Glenn Esler, a Scientist at Integral and a certified laboratory auditor. Mr. Esler has more than 30 years of experience in the field of environmental chemistry, including 15 years in quality assurance and data quality management and 5 years as a GC/MS analyst. His technical specialties include design and implementation of laboratory quality management programs, laboratory and field audits, and data interpretation and assessment of compliance with regulatory requirements and project objectives. He has an in-depth working knowledge of EPA environmental analytical methods and EPA Contract Laboratory Program (CLP) national functional guidelines for data review. Mr. Esler received his BS in Geography from Portland State University and AS in Chemistry from Millersville University.

Project personnel resumes are included in Attachment C1.

In addition, Integral will utilize subcontractors for drilling (AARCO Environmental of Lindenhurst, NY) soil vapor sampling (Viridian Inc. of Upper Montclair, NJ), geophysical survey (Nova Geophysical Services of Douglaston, NY), surveying (Donald Stedge, P.L.S, of Goshen, NY) and laboratory services (Alpha Analytical of Mahwah, NJ).

An organization chart for the implementation of the Remedial Investigation Work Plan and QAPP is below.



3 SAMPLING AND DECONTAMINATION PROCEDURES

A detailed description of the procedures to be used during this program for collection of the soil, groundwater, soil vapor, and ambient air samples is provided below. Proposed sample locations are shown on Figure 10 of the RI Work Plan. An Analytical Methods/Quality Assurance Summary is provided in Table 1, included below in Section 3.11.

3.1 LEVEL OF EFFORT FOR QC SAMPLES

Field blank, trip blank, field duplicate samples and matrix spike (MS) / matrix spike duplicate (MSD) will be analyzed to assess the quality of the data resulting from the field sampling and analytical programs. Each type of QC sample is discussed below.

- Field and trip blanks consisting of distilled water will be submitted to the analytical laboratories to provide the means to assess the quality of the data resulting from the field-sampling program. Field (equipment) blank samples are analyzed to check for procedural chemical constituents at the facility that may cause sample contamination. Trip blanks are used to assess the potential for contamination of samples due to contaminant migration during sample shipment and storage.

- Duplicate samples are analyzed to check for sampling and analytical reproducibility.

- MS/MSD samples provide information about the effect of the sample matrix on the digestion and measurement methodology

The general level of QC effort will be one (1) field duplicate and one (1) field blank (when non-dedicated equipment is used) for every 20 or fewer investigative samples of a given matrix. Additional sample volume will also be provided to the laboratory to allow one (1) site-specific MS/MSD for every 20 or fewer investigative samples of a given matrix. One (1) trip blank will be included along with each sample delivery group of VOC samples.

The analytical laboratory will be certified under the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) in the appropriate categories. NYSDEC Analytical Services Protocol (ASP) Category B deliverables will be prepared by the laboratory.

3.2 SAMPLE HANDLING

Samples will be picked up by the laboratory or delivered to the laboratory in person by the sampler, or transported to the laboratory by overnight courier. All samples will be shipped to the laboratory to arrive within 48 hours after collection, and the laboratory will adhere to the analytical holding times for these analyses, as listed in the July 2005 NYSDEC ASP.

3.3 CUSTODY PROCEDURES

Sample custody will be controlled and maintained through the chain-of-custody procedures. The chain of custody is the means by which the possession and handling of samples is tracked from the site to the laboratory. Sample containers will be cleaned and preserved at the laboratory before shipment to the Site. The following sections (Sections 3.4 and 3.5) describe procedures for maintaining sample custody from the time samples are collected to the time they are received by the analytical laboratory.

3.4 SAMPLE STORAGE

Samples will be stored in secure limited-access areas. Iced coolers or refrigerators will be maintained at 4°C, 2°C, or as required by the applicable regulatory program. The temperatures of all refrigerated storage areas are monitored and recorded a minimum of once per day. Deviations of temperature from the applicable range require corrective action, including moving samples to another storage location, if necessary.

3.5 SAMPLE CUSTODY

Sample custody is defined by this document as the following:

- The sample is in someone's actual possession;
- The sample is in someone's view after being in his or her physical possession;
- The sample was in someone's possession and then locked, sealed, or secured in a manner that prevents unsuspected tampering; or,
- The sample is placed in a designated and secured area.
- Samples will be removed from storage areas by the sample custodian or laboratory personnel and transported to secure laboratory areas for analysis. Access to the laboratory and sample storage areas is restricted to laboratory personnel and escorted visitors only; all areas of the laboratory are therefore considered secure.

Laboratory documentation used to establish chain of custody and sample identification may include the following:

- Field chains of custody or other paperwork that arrives with the sample;
- Laboratory chain of custody;

- Sample labels or tags attached to each sample container;
- Sample custody seals;
- Sample preparation logs (i.e., extraction and digestion information) recorded in hardbound laboratory books, filled out in legible handwriting, and signed and dated by the chemist;
- Sample analysis logs (e.g., metals, GC/MS, etc.) information recorded in hardbound laboratory books that are filled out in legible handwriting, and signed and dated by the chemist;
- Sample storage log (same as the laboratory chain of custody); and,
- Sample disposition log, which documents sample disposal by a contracted waste disposal company.

3.6 SAMPLE TRACKING

All samples will be maintained in the appropriate coolers prior to and after analysis. Laboratory analysts will remove and return their samples, as needed. Samples that require internal chain of custody procedures will be relinquished to the analysts by the sample custodians. The analyst and sample custodian will sign the original chain of custody relinquishing custody of the samples from the sample custodian to the analyst. When the samples are returned, the analyst will sign the original chain of custody returning sample custody to the sample custodian. Sample extracts will be relinquished to the instrumentation analysts by the preparatory analysts. Each preparation department will track internal chain of custody through their logbooks/spreadsheets.

Any change in the sample during the time of custody will be noted on the chain of custody (e.g., sample breakage or depletion).

3.7 SOIL BORING ADVANCEMENT

Depending on access, soil borings will be installed using a track mounted or limited access Bobcat Geoprobe® utilizing direct push technology to the groundwater interface depth, approximately 17 ftbg. Continuous soil samples will be collected using four (4) or five (5) foot macrocore samplers fitted with dedicated acetate liners. Proper decontamination procedures will be followed after each sampler is recovered.

New, dedicated disposable acetate sleeves will be used for all soil samples collected using the Geoprobe. The sleeve for each sample interval will be opened and the soil within scanned for volatile organic compounds (VOCs) using a photoionization detector (PID) and geologically described using the Unified Soil Classification System, including documentation of observations regarding potential contamination such as odors, staining, etc. All descriptions and observations will be documented in a field notebook.

3.7.1 Soil Sampling

It is anticipated that two (2) soil samples will be analyzed per boring. As a default, one (1) soil sample will be collected from the interval exhibiting the highest PID reading or visual/olfactory impact and one (1) sample will be collected from the interval directly below the anticipated development excavation depth (~17 ftbg). If no obvious signs of impacts are observed within the soil column, a soil sample will be collected from the interval directly above the groundwater interface (~9 ftbg). If additional impacted or questionable zones are identified, samples will be collected from those areas for analysis. All samples are expected to be collected from two (2) foot intervals, but the intervals may be expanded or contracted based upon material recovery and identification of impacts.

VOC soil samples will be placed in laboratory provided En Core samplers (En Novative Technologies, Inc.). All other soil samples will be placed in laboratory supplied glass containers. All samples will be sealed, labeled, cooled to 4°C in the field, and transported under chain-of-custody command to the designated laboratory for analysis. Product samples, if encountered, will be submitted for gas chromatography-mass spectrometer fingerprint analysis.

All soil samples will be analyzed for VOCs via EPA Method 8260C; semi-volatile organic compounds (SVOCs) via EPA Method 8270D; Target Analyte List (TAL) Metals via EPA Method 6010C/7471B; Polychlorinated Biphenyls (PCBs) via USEPA Method 8082A; and Pesticides via USEPA 8081B. The samples will be submitted for laboratory analysis with a NYSDEC ASP Category B data package.

3.8 MONITORING WELL INSTALLATION AND DEVELOPMENT

Monitoring wells installed within the sidewalk will be installed using a track mounted Geoprobe outfitted with 4¼″ hollow-stem auger attachments. Monitoring wells installed within the Site building will be installed using a track mounted or Bobcat Geoprobe, depending on access limitations. Interior wells installed utilizing a Bobcat Geoprobe will be constructed of 1″ PVC riser and screen in order to achieve the proper annular space around each well, and will follow the same general construction as the 2″ sidewalk wells described below. If any significant impacts are identified, well materials may be altered to prevent detriment to PVC screen material.

Sidewalk wells will be installed approximately 5-6′ below the groundwater table (expected to be approximately at 9 ftbg) in order to collect samples in the shallow saturated zone. The wells will be constructed of 2″ diameter PVC riser with 10′ of .020″ slotted PVC screen. The screen interval will straddle the groundwater interface. The annular space around the well will be filled with No. 2 Morie quartz sand to a depth of 2′ above the top of the well screen, followed by

2′ of bentonite, then backfilled with screened (unimpacted) soil cuttings to 1′ below grade. The wells will be finished with 6″ of bentonite pellets placed below a locking flush-mounted road box, set in a cement apron. Development will be performed by purging the water column in order to remove sediment disturbed by the drilling process. Purge water will be collected and containerized for proper management and disposal. Monitoring wells will be developed after a competent bentonite seal has been established.

All wells will be surveyed to a common Site datum.

3.8.1 Groundwater Sampling

Prior to sample collection, static water levels will be measured and recorded from all monitoring wells. Following water level measurement, Integral will purge and sample monitoring wells using low-flow/minimal drawdown purge and sample collection procedures. Prior to sample collection, groundwater will be evacuated from each well at a low-flow rate (typically less than 0.1 L/min). Field measurements for pH, temperature, turbidity, dissolved oxygen, specific conductance, oxidation-reduction potential and water level, as well as visual and olfactory field observations, will be periodically recorded and monitored for stabilization in overburden wells. Purging will be considered complete when pH, specific conductivity, dissolved oxygen and temperature stabilize and when turbidity measurements fall below 50 Nephelometric Turbidity Units (NTU), or become stable above 50 NTU. If stabilization does not occur or the well has been purged and recovery cannot maintain the pace of low flow purging, a sample will be collected and a notation will be made in the field book.

Stability is defined as variation between field measurements of 10 percent or less and no overall upward or downward trend in the measurements. Upon stabilization of field parameters, groundwater samples will be collected and analyzed as discussed below.

Wells will be purged and sampled using dedicated pump tubing following low-flow/minimal drawdown purge and sample collection procedures, as described above. The pump will be decontaminated between samples and the tubing will be replaced.

Groundwater samples will be collected for laboratory analysis through dedicated tubing. Prior to, and immediately following collection of groundwater samples, field measurements for pH, specific conductance, temperature, dissolved oxygen, turbidity and depth-to-water, as well as visual and olfactory field observations will be recorded. All collected groundwater samples will be placed in pre-cleaned, pre-preserved laboratory provided sample bottles, cooled to 4°C in the field, and transported under chain-of-custody command to the designated laboratory for analysis.

All groundwater samples will be analyzed for VOCs via EPA Method 8260C; SVOCs via EPA Method 8270D; TAL Metals via EPA Method 6010C/7472B (filtered and unfiltered); PCBs via EPA Method 8082A; and Pesticides via EPA 8081B. The samples will be submitted for laboratory analysis with a NYSDEC ASP Category B data package.

3.9 TEMPORARY SOIL VAPOR POINT INSTALLATION

Temporary soil vapor points will be installed using a hand held hammer drill. Each soil vapor probe will be installed approximately 2" below the slab using dedicated 1/8" Teflon tubing. The tubing will be implanted into the hole and the annular space sealed with bentonite to prevent ambient air from entering the area around the probe. The bentonite seal will be left to set overnight. Once the seal is secure, a "T" fitting and valve will be connected on the above-surface end of the tubing. A syringe will be used to purge the vapors in the probe and tubing of three volumes.

3.9.1 Soil Vapor, Indoor, and Ambient Air Sampling

Soil Vapor Samples

As required by NYSDOH, a helium (He) tracer will be used as part of the sampling process and all testing will follow the NYSDOH Soil Vapor Guidance[1]. Prior to sample collection, the He vapor will be screened using a field meter and the measurement recorded at each soil vapor sampling location. Prior to sample collection, a multi-gas meter will be used to measure the concentration of O_2, CO_2, and CH_4 in each probe, to assess the subsurface chemistry (e.g. redox state). Following this procedure, the soil vapor samples will be collected in clean, batch certified, two (2) liter Summa™ canisters at flow rates no greater than 200 ml/min.

A sample log sheet will be maintained summarizing sample identification, date and time of sample collection, sampling depth, identity of samplers, sampling methods and devices, soil vapor purge volumes, volume of the soil vapor extracted, vacuum of canisters before and after the samples are collected, apparent moisture content of the sampling zone and chain of custody.

Soil vapor samples will be collected over a period of two (2) hours. Soil vapor samples will be analyzed for VOCs via USEPA Method TO-15 at a NYSDOH ELAP-certified analytical laboratory.

Indoor and Ambient Air Samples

In accordance with the NYSDOH *Guidance for Evaluating Soil Vapor Intrusion*, one (1) indoor air samples and one (1) ambient air sample (per sampling day) will be collected prior to the collection of sub-slab soil vapor samples[2]. One (1) indoor air sample will be collected from Building A (Lot 65). Indoor air samples will be collected in the breathing zone (approximately four (4) to six (6) feet above the floor). One background ambient air sample will also be collected per day along West 23rd Street. Indoor and background air samples will be collected in six (6) liter, batch-certified clean SUMMA™ canisters attached to 8-hour flow controllers. Samples will be collected at flow rates no greater than 200 ml/min.

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1 *Guidance for Evaluating Soil Vapor Intrusion in the State of New York, Final*. October 2006.

2 This limits interference from the soil vapor matrix.

For each sub-slab soil vapor, soil vapor, indoor, and background sample, the start time, end time, maximum and minimum temperature, and beginning and final ambient temperature will be recorded. Indoor and ambient air samples will be collected over a period of eight (8) hours and will be analyzed for VOCs via USEPA Method TO-15 at a NYSDOH ELAP-certified analytical laboratory.

3.10 ANALYTICAL METHODS/QUALITY ASSURANCE SUMMARY TABLE

A summary of the analytical methods and quality assurance methods are included in Table 1, below.

Table 1
Analytical Methods/Quality Assurance Summary

<table>
<tr><th rowspan="2">Matrix</th><th rowspan="2">Proposed Samples</th><th colspan="4">QA/QC Samples</th><th rowspan="2">Total # Samples</th><th rowspan="2">Analytical Parameter</th><th rowspan="2">Method</th><th rowspan="2">Preservative</th><th rowspan="2">Holding Time</th><th rowspan="2">Container</th></tr>
<tr><th>TB</th><th>FB</th><th>DUP</th><th>MS/MSD</th></tr>
<tr><td rowspan="2">Soil</td><td>Unknown</td><td>0</td><td>0</td><td>0</td><td>0</td><td>--</td><td>Fingerprint</td><td>8100M</td><td rowspan="2">Cool to 4°C</td><td rowspan="5">14 days to perform analysis on all except VOCs from EnCores (48 hour HT)</td><td>(1) 250 mL glass bottle</td></tr>
<tr><td>36</td><td>5</td><td>1</td><td>2</td><td>2/2</td><td>48</td><td>All VOCs; SVOCs; Metals; PCBs: Pests</td><td>8260C; 8270D; 6010C/7471B; 8082A; 8081B</td><td>(3) 5-gram En Core; All other parameters: (1) 100ml amber glass jar.</td></tr>
<tr><td>Groundwater</td><td>8</td><td>2</td><td>1</td><td>1</td><td>1/1</td><td>14</td><td>All VOCs; SVOCs; Metals; PCBs: Pests</td><td>8260C; 8270D; 6010C/7472B; 8082A; 8081B</td><td>Cool to 4°C, VOCs: pH<2 with HCl; with HNO3</td><td>(3) 40 mL glass vials; (2) 1L amber glass; (1) 500ml plastic bottle preserved; (1) 500ml plastic bottle non preserved; (2) 1L amber glass</td></tr>
<tr><td>Soil Vapor</td><td>6</td><td>0</td><td>0</td><td>1</td><td>0</td><td>7</td><td rowspan="2">VOCs</td><td rowspan="2">TO-15</td><td rowspan="2">None</td><td>2 L Summa</td></tr>
<tr><td>Indoor/ Ambient Air</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>6 L Summa</td></tr>
</table>

3.11 DECONTAMINATION

Where possible, samples will be collected using new, dedicated sampling equipment so that decontamination is not required. All non-dedicated drilling tools, equipment and sampling equipment will be decontaminated between boring locations using potable tap water and a phosphate-free detergent (e.g., Alconox) and/or a steam cleaner. All non-dedicated sampling equipment will also have a final rinse with deionized water. Decontamination water will be collected and disposed as investigation-derived waste (IDW).

3.12 DATA REVIEW AND REPORTING

The NYSDEC ASP Category B data package will be validated by an independent data validation subconsultant (resume provided in Attachment C1) and a DUSR summarizing the results of the data validation process will be prepared. All reported analytical results will be qualified as necessary by the data validation and will be reviewed and compared against background concentrations and/or applicable New York State criteria:

Soil – Restricted Residential Use Soil Cleanup Objectives (SCOs), Site-specific SCOs and Supplemental Soil Cleanup Levels (SCLs) as listed in 6NYCRR Part 375 and NYSDEC Commissioner's Policy CP-51;

Groundwater – NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) (1.1.1) Ambient Water Quality Standards (AWQSs) and Guidance Values and Groundwater Effluent Limitations; and,

Soil Vapor – Guidance for Evaluating Soil Vapor Intrusion in the State of New York Matrices.

A report documenting the Remedial Investigation will be prepared, and will describe Site conditions and document applicable observations made during the sample collection. In addition, the report will include a description of the sampling procedures, tabulated sample results and an assessment of the data and conclusions. The laboratory data packages, DUSR, soil vapor point construction diagrams, and field notes will be included in the report as appendices. All data will also be submitted electronically to NYSDEC via the Environmental Information Management System (EIMS) in EqUIS format.

Attachment C1

Resumes

Integral Consulting Inc.
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New York, NY 10006

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facsimile: 212.962.4302
kbrodock@integral-corp.com

Keith P. Brodock, P.E., LEED AP
Senior Managing Engineer

PROFESSIONAL PROFILE

Mr. Keith Brodock is a professional engineer with more than 10 years of experience in environmental risk analysis, real estate portfolio liability estimation, transactional risk evaluation, remediation and stormwater design, and construction management. One of his primary responsibilities is managing and quantifying transactional risks for brownfield properties. Mr. Brodock routinely consults purchasers and sellers on the regulatory climate, technical interpretations, and risk mitigation measures, including engineering designs and implementation. He frequently supports fate and transport modeling of vapor intrusion cases and engineering designs for mitigation systems. Mr. Brodock utilizes data management software, including GIS and EQuIS, to conceptualize and simply explain the spatial distribution and meaning of environmental data. He also serves as resident engineer on multiple construction projects in the New York City area.

CREDENTIALS AND PROFESSIONAL HONORS

B.S., Chemical Engineering, Clarkson University, Potsdam, New York, 2003

Professional Engineer, Delaware (License No. 18630), New York (License No. 089004), Maryland (License No. 44309)
Leadership in Energy and Environmental Design Accredited Professional (2009)

CONTINUING EDUCATION AND TRAINING

Hazardous Waste Operations and Emergency Response 40-Hour Certification (2003 to present)
Hazardous Waste Operations Management and Supervisor 8-Hour Certification (2004)
OSHA 10-Hour Construction Safety Training (2012)
New York State (NYS) Asbestos Project Designer Training
Transportation Worker Identification Credential (Expires 2020)

PROFESSIONAL AFFILIATIONS

Urban Land Institute, Redevelopment and Reuse Product Council (2012 to present)
Urban Land Institute, New York District Council, Mentoring Co-Chair (2013 to present)
Urban Land Institute, NY Mentor Program Chair (2011 to 2013)

National Society of Professional Engineers (2011 to present)
Montclair Environmental Commission, Alternate Commissioner (2013 to present)

RELEVANT EXPERIENCE

Real Estate Transactions

Private Acquisition of Excess Government Property, Washington, DC—Advised joint venture client on potential environmental liabilities associated with the acquisition of the steam-generating West Heating Plant in Washington, DC. Performed scenario analysis of potential contamination events (in soil, groundwater, and building materials) and developed expected costs therefor. Our evaluation allowed the joint venture client to move forward with and win the auction. During contracting, supported the procurement of environmental insurance for added risk protection. Continuing to support joint venture client with NPDES permit compliance.

Superfund Property Disposition and Liability Transfer, Wall, New Jersey—Advised on the sale of 650-acre encompassing a federal Superfund site and more than 600 historical tenants. Assisted with development of the selected remediation proposal for a $1.5 million shooting range cleanup. Provided review of liability transfer offer, including cost/benefit analysis, insurance funding, and remediation cost-overrun risk using Monte Carlo modeling. Supported negotiations with EPA and the U.S. Department of Justice (USDOJ) to allow private takeover of remediation activities. Performed New Jersey Industrial Site Recovery Act investigation of more than 600 historical tenants as a requirement of the transaction.

Real Estate Portfolio Acquisition Support, Staten Island, New York—As part of client's acquisition of real estate investment trust, advised on environmental risks of the Staten Island property. With a state Superfund manufactured gas plant (MGP) site adjacent to the property, communicated potential liabilities to client. Worked in conjunction with seller's environmental consultant to conduct a soil gas / indoor air evaluation. Performed critical review of seller's soil vapor report.

Brownfield Program Property Disposition, Manhattan, New York—Supported the transaction of two properties that completed the New York State Brownfields Cleanup Program. One property contained a school under construction and the other was a vacant lot. Helped to provide the buyer's team with a complete understanding of the environmental history, and prepared an engineering certification attesting to compliance with ongoing monitoring requirements.

Cypress Equities Land Acquisition, King of Prussia, Pennsylvania—Advised on pending land acquisition deal after conducting an in-depth environmental review and limited subsurface investigation. Developed a probabilistic cost estimate spanning the identifiable areas of concern for all of the multiple investigation/remediation scenarios applicable under the Act 2 regulations in Pennsylvania.

Not-for-Profit Land Acquisition and Development, New York, New York—Supported a not-for-profit organization in the acquisition and development of various tracts of land to build a charter school. Assisted with the Phase I evaluations. Prepared scopes of work for Phase II investigations. Managed the development of the regulatory interaction strategy with the New York City School Construction Authority. Provided sound engineering support for the development of subsurface remediation/mitigation measures for the protection of schoolchildren's health.

Phase I Investigations, Various Properties, New Jersey, Arkansas, New York, Connecticut—Conducted Phase I and Phase I/II hybrid investigations according to ASTM standards, both pre- and post-EPA All Appropriate Inquiries. Integrated state requirements into the analyses. Included radon, drinking water, and indoor air analysis, as required.

Brownfields

Public Charter School Construction, Mott Haven, Bronx, New York—Managed the environmental remediation and construction for the KIPP Bronx New York City (NYC) school. As owners' representative, assisted with generating specifications for the work, leading to zero successful change orders. Worked with the design engineer to develop the remediation system using green design principles. Led the project team overseeing the implementation of the remediation and led the office team reviewing submittals from the contractors. The remediation included contaminated soil excavation and disposal, installation of a sub-slab depressurization system (SSDS) and vapor barrier, underground storage tank (UST) removal, and petroleum spill closeout. Collaborated with structural, geotechnical, and electrical engineers. Worked with New York State Department of Environmental Conservation (NYSDEC) spills (Region 2) and environmental remediation (Albany) groups, School Construction Authority (Industrial & Environmental Health, and NYC Office of Environmental Remediation (OER) to obtain full regulatory approval. Supported the construction manager in determining eligibility of contractor claims for additional funds based on compliance with the specifications.

Petroleum Remediation System Design and Implementation, Gravesend, Brooklyn, New York—Provided professional engineering services to repair and restart a pneumatic petroleum recovery system in accordance with a NYSDEC-approved remedial action plan for a major oil storage facility on the water. After that system was destroyed in Superstorm Sandy, evaluated and implemented a skimmer recovery system to remove the petroleum. Provided oversight for the preparation of engineering estimates and schedules for completion.

RCRA Storage Area Closure, Long Island City, New York—Managed the closure of a hazardous waste storage area under the NYS RCRA program. Developed and certified (as the engineer-of-record) the RCRA closure plan. Oversaw the investigation and subsequent disposition of the impoundment area. Sealed the closure report and worked with NYSDEC to conduct the final facility inspection as the final step to closure.

Slag and Sewage Site, Past Costs and River Sediment Evaluation, Fox Point Park, Wilmington, Delaware—Managed the past cost evaluation, including human health risk assessment, and the sediment investigation in the Delaware River. Evaluated past costs from Delaware

Department of Natural Resources and Environmental Control (DNREC) for investigation and remediation liability attributable to the client. Worked with the risk assessment group to evaluate whether site risk was a cause for remediation, and whether the unacceptable risk was related to the client's alleged site constituents. Led communications with DNREC, Delaware Department of Justice, and federal trustees regarding natural resource damages, cooperative assessment, and scope of work for the RI/FS of OU-2 (Delaware River).

Industrial Scrap Recycling Site, Bronx, New York—Engineer in responsible charge for petroleum storage and stormwater management compliance. Oversaw preparation of spill prevention, control, and countermeasures; stormwater pollution prevention plan; and multi-sector general permit documentation under NYSDEC. Determined feasibility of industrial stormwater discharge to either a surface water body or city storm sewer. Evaluated historical bulkhead construction utilizing photogrammetry techniques to determine wetland adjacent area status.

Petroleum Spill Closure and PCB Investigation for Redevelopment, Long Island City, Queens, New York—Managed a UST removal/closure, petroleum spill closure, and PCB investigation for the redevelopment of a former warehouse into a large distribution facility for a national shipping carrier. Worked with NYSDEC to develop the scope of investigation and remediation. Oversaw the soil materials management at the site.

Warehouse Expansion on Waterfront Superfund Site, Maspeth, Queens, New York—Provided professional engineering services developing the site remedial design of a NYSDEC engineered cap. Assisted in developing the construction phasing to minimize potential exposure to site workers and the community. Oversaw the site stormwater treatment design by the site civil engineer.

Risk Assessment and Building Engineering Control Evaluation, Former MGP Site, Manhattan, New York—Professional Engineer and project manager for annual engineering control (waterproofing and air exchange system) inspections and repairs, as needed. Led team of vapor intrusion experts and risk assessors to evaluate potential human health effects for construction workers in subsurface structure rebuilding damaged mechanical, electrical, and plumbing systems, including the air exchange system engineering control that were damaged during Superstorm Sandy.

State Superfund Remediation and Stormwater Design, Maspeth, Queens, New York—Acted as engineer in responsible charge of the design of a state superfund remedial cap. Remedial cap was designed for direct discharge of stormwater to Newtown Creek. Collaborated with NYSDOT and NYSDEC to develop a design consistent with the needs of both agencies. NYSDOT would be constructing the designed cap as part of their construction of a nearby bridge.

Residential Development, City Island, Bronx, New York—Supported the construction of a residential development on City Island by providing certainty on cost and schedule. Collaborated with NYC OER to develop a scope of work to define remediation areas.

Provided strategy for the remedial action, and assisted with the integration of remediation into construction.

Mixed-Use Development at Former Dry Cleaner Site, Manhattan, New York—Provided engineering oversight for vapor intrusion evaluation and mitigation design at a Brownfield Cleanup Program site. Engineer in responsible charge for Brownfield Cleanup Program activities. Worked with NYSDEC, client, and the current property owner to identify a mitigation strategy to prevent future infiltration of soil gas with elevated chlorinated solvent concentrations. Currently overseeing the preparation of investigation work plan to delineate known soil and groundwater concentrations of dry cleaning fluid.

Former Woodhaven Bowl Site, Forest Hills, Queens, New York—Managed the team to concurrently satisfy five regulatory agencies (including NYS and NYC agencies), a then current landowner inexperienced at brownfield redevelopment, and a demanding future tenant with an extremely tight construction schedule to facilitate redevelopment. Utilized careful, advanced planning to facilitate the evaluation of each stakeholder's objectives. Used direct-sensing equipment (membrane interface probe) to quickly evaluate the potential release areas. Designed and oversaw the construction of a SSDS serving 40,000 ft^2 of retail space. Achieved the project objectives by delivering a building ready for development by the tenant.

Residual Light Nonaqueous Phase Liquid (LNAPL) Investigation/Remediation, Long Island City, New York—Designed and managed the investigation and remedial actions at a former fueling depot. Identified data gaps in the previous consultant's work and designed a characterization plan to reduce the uncertainties in the conceptual site model. The characterization plan was integrated with the remedial action plan so only one field mobilization was necessary. Design included an *in situ* chemical oxidant injection as the remedial action. The remedial action is currently being implemented.

Subsurface Investigation and Tank Removal, Jersey City, New Jersey—Managed a subsurface investigation at a warehousing property that contained railroad sidings, improperly closed USTs and an aboveground fueling operation. Coordinated the removal/closure of the fueling operation and building demolition. Provided consultation on the investigation results to assist the client in securing financing for the property.

Former Oil Terminal Investigation and Remediation, Brooklyn, New York—Supported the property owner through negotiations with the NYSDEC, as part of a groundbreaking deal where NYSDEC agreed to clean up a state Superfund site that was owned by a private entity. Assisted the inter-governmental team with triad planning and design to achieve a rapid subsurface investigation/characterization. Developed a work plan that included demolition and disposal of PCB-containing equipment.

Dual-Phase Extraction and Discharge Compliance Engineering, Northern New Jersey—Led a team to deploy a packaged solution to lower the concentrations of non-compliant water being discharged to a river, in which 60 percent of the chemicals causing the exceedance could not be identified by conventional laboratory techniques. Implemented enhancements to a high-vacuum, dual-phase extraction (DPE) remediation system, resulting in increased mass removal rates and system uptime. Achieved long-term cost savings in the form of decreased time onsite and automated task development. Developing a comprehensive systems management tool that uses engineering statistics to prescribe proactive solutions to maintenance and system exceedance issues. Created a U.S. Securities and Exchange Commission (SEC)-compliant cost estimate model that encompasses various remediation strategies through end-of-project lifecycle.

Surfactant Soil Remediation, Margate City, New Jersey—Project engineer and subcontractor manager for the remediation of a #2 fuel oil release beneath a residence. Applied an innovative surfactant flushing program to mobilize and extract adsorbed fuel oil from the soils. Careful planning and immediate reaction to changing site conditions were necessary to prevent further oil migration or the settling of a $3 million mansion. Successful management of multiple subcontractors led to a soils closure within the project deadline.

Subsurface MGP Investigation, Manhattan, New York—Evaluated and interpreted the results of more than 700 samples collected during a subsurface investigation at a former MGP site. Composed the data analysis portion of the site characterization report for submittal to NYSDEC. Also supported subsurface field activities while acting as client liaison to the public.

Dual-Phase Remediation System Improvements, Newark, New Jersey—Analyzed performance issues of a catalytic oxidizer, part of a DPE remediation system. Determined that the control system was failing and causing false alarms. Led the team to implement a redesigned alarm system to better diagnose system trouble conditions.

Heavy Metal Statistical Source Separation, Virginia—Supported team in separating heavy metal contamination sources through electron microscopy and elemental analysis. Based on the differing elemental properties of various sources of lead, employed the use of statistical analysis to parse the portion of contamination that was likely attributable to the client from the entire mass, thereby saving money in remediation costs.

Biennial Certification Reporting, Various Locations, New Jersey—Oversaw biannual monitoring activities and biennial certification filings as part of New Jersey Department of Environmental Protection (NJDEP) agreements. Coordinated scheduling with clients and tenants for biannual property inspections. Completed biennial certification reporting process to NJDEP and various local entities.

Vapor Intrusion

Pilot Test and SSDS Installation, Lakewood, Washington—Senior technical oversight for SSDS pilot test and installation for a national car rental location. Evaluated vapor intrusion conditions and prepared potential mitigation strategies. Supported staff in developing a scope of work for subcontractor, and advised on testing and installation coordination and execution.

Vapor Intrusion Investigation, Williamsburg, Brooklyn, New York—Professional engineer for vapor intrusion investigation at a former dry cleaning fluid distribution facility applying for the Brownfield Cleanup Program. Reviewed offsite soil vapor data to develop a conceptual site model as the basis for a soil vapor intrusion investigation program. Supported the application of the facility to the Brownfield Cleanup Program.

Vapor Intrusion Evaluation, Woodside, Queens, New York—Developed strategy for vapor intrusion evaluation and potential mitigation to protect residents and move forward with refinancing. Reviewed strategy with NYSDEC and New York State Department of Health (NYSDOH). Worked with the lender to satisfy their requirements to continue with refinancing.

Farrand Controls State Superfund Site, Valhalla, New York—Identified source and fate and transport of vapor-phase chlorinated solvents within a commercial/industrial operation to support the construction of a mitigation action. Traced the airflows from four distinct heating/cooling zones throughout the building to understand mixing and transport of the chlorinated solvents, as the highest readings of vapors did not match the site conditions. Identified the entry point of the vapors from contaminated groundwater beneath the site. Performed a pilot test for and designed an active SSDS for the slab-on-grade portions of the building. Recommended a cost-effective solution to mitigate vapor intrusion in the building basement.

Vapor Intrusion Investigation, Cranford, New Jersey—Managed vapor intrusion investigation on properties adjoining a chlorinated solvent spill. Negotiated access agreements with abutting property owners and tenants. Organized subcontractors' work to minimize business interruption while still maintaining the integrity of the investigation. Educated the neighboring property owners on the significance of the results and communicated continuing action plans to them.

Mayflower Cleaners State Superfund Site, Great Neck, New York—Evaluated the fate and transport of multiple sources of tetrachloroethylene (PCE; dry cleaning fluid) to support the preparation of a remedial action. The fate and transport evaluation included a known source beneath the slab of the building and a potential source from the adjacent dry cleaning operation. Developed a conceptual airflow model. Created the communication strategy with the regulatory agencies. Designed and managed the implementation of an interim remedial measure to mitigate the flow of PCE vapors from beneath the slab to the occupied tenant space. Currently implementing the record of decision with NYSDEC.

Vapor Intrusion Mitigation and Groundwater Investigation, Mahopac, New York—Designed and installed an SSDS after performing a sub-slab communication test for NYSDOH and NYSDEC. Responsible for coordination of annual system inspection and reporting, and tenant/owner education and guidance. Also coordinated quarterly groundwater sample reporting to NYSDEC.

Chemical Release Investigation with Vapor Intrusion Testing and Mitigation, Ridgefield, New Jersey—Oversaw field investigation to delineate a diving chlorinated solvent plume in a windowed confining layer. Developed a permanent vapor intrusion mitigation plan after conducting an indoor air investigation that revealed potential impacts to human health.

Assisted in designing, permitting, and installing the SSDS intended to disperse organic vapors before entering the office building. Implemented risk mitigation plan that included automatic remote notification if the SSDS failed.

Financial Analysis and Reporting

Streamlined SEC Environmental Liability Reporting, Seattle, Washington—Using Lean techniques, developed a streamlined budgeting and liability reporting process that increases value while adhering to reporting regulations. With focus on increasing stakeholder value, merged the budget process that the consultant team used with the SEC liability reporting process that the client desired. Developed software to automate the reporting and updating procedure. Worked with the corporate liability manager to conform to both SEC and internal accounting policies.

Real Estate Portfolio Valuation, Long Island, New York—Developed defensible liability estimates, which led to a $7 million savings in an IRS settlement. Working with a real estate appraiser, evaluated the assets and environmental liabilities in a 17-property portfolio at three key points in time. A remedial strategies matrix for the different time periods was merged into a decision tree with the properties' contamination characteristics using Monte Carlo simulation. An effective combination of computer estimation/ simulation tools (RACER and Monte Carlo) was used to justifiably support the estimates to the IRS.

Environmental Remediation Estimates Using Monte Carlo Analysis, Various Locations, U.S.—Determined and communicated environmental remediation cost risk to clients. Assisted owners with their internal budgeting process to communicate to their management the likely, best, and worst case scenarios. By understanding the range of costs associated with the project, management was equipped to make better decisions on expense allocation. Certain projects incorporated the management science of decision-tree analysis to consider alternate remedial technologies. In fact, the client was able to select a remedy based on the risk profile.

Remedial Strategy Selection through Probabilistic Estimating, Central Vermont Public Service, Vermont—Provided probabilistic estimating for different remedial strategies that helped the client to decide which decision-tree path was most appropriate for its business model. Utilized decision management tools in conjunction with cost estimates and sensitivity analyses to provide a full understanding of the likely results of choosing one strategy over another.

Remedial Scenario Cost Estimating, Various Locations, U.S.—Developed large-scale remediation cost estimates using RACER for an automobile-industry client. Based on the remedial investigation data results, created low/medium/high range cost estimates that encompassed a "no further action" option all the way to installing and operating high-end remediation systems for many years. These cost estimates were presented to the court as part of a package to support emerging from bankruptcy.

Defensible Environmental Liability Reports, Various Locations, U.S.—Performed multiple mathematical simulations for cost estimation and disclosure under Sarbanes-Oxley reporting requirements for environmental liability. Incorporated decision management structures into multiple-site and multiple-option estimates. Results provided were defensible estimates that evaluated entire liability portfolios.

Geothermal Testing and Design

First-Ever Standing Water Column (Open-Loop) Geothermal Study, New Haven, Connecticut—Designed first-ever geothermal standing water column exchange study to characterize the thermal capacity of the proposed geothermal cooling system. The study simulated system loads and observed subsurface effects to qualify wells to sustain continued operations while preventing emergency discharges (bleed-off) to the local sewer authority. Results include determining the effects of various temperature differentials, load cycling, and high-permeability zones. The study results were subsequently utilized to design the optimal geothermal well network by minimizing the cost of the wells while ensuring adequate thermal capacity during peak loading. This work was performed as part of an overall sustainable design effort under the Leadership in Energy and Environmental Design (LEED) New Construction program. The project was awarded LEED Platinum certification.

Standing Water Column Geothermal Design, New Haven, Connecticut—Conducted a geothermal response test for a private developer constructing a 700,000 square foot residential/retail complex. The results of the geothermal response test were used to design the optimal geothermal network that would provide an efficient level of heating/cooling for the building. This project has been selected by the U.S. Green Building Council as a pilot project for the LEED Program for Neighborhood Development.

Automated Closed-Loop Geothermal Analysis, Cambridge, Massachusetts—Assisted in constructing an automated geothermal closed-loop test that conformed to American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) building specifications. Modified existing open-loop thermal response testing equipment to perform unmanned closed-loop tests of shallow geothermal wells. Automated the system to perpetually adjust to stay in conformance with ASHRAE test methods. The equipment included a remote monitoring component for instantaneous data review and troubleshooting.

Property Management

Building Environmental Management, New York, New York—Oversaw emergency response to building water intrusion events to prevent the growth and subsequent abatement of mold spores. Conducted property visits to review Phase I action item implementation.

Litigation

Litigation Support for Petroleum and Chlorinated Solvent Releases, Edgemere, Queens, New York—Alprof Realty v. Corporation of the Presiding Bishop of The Church of Jesus Christ of Latter-day Saints, Civ. No. 09-cv-05190 (U.S.D.C. E.D.N.Y.): Provided litigation support for the Church against a plaintiff that alleged responsibility for a chlorinated solvent plume allegedly migrating to the plaintiff's site from the defendant's property. Analyzed the subsurface information and identified erroneous depictions in the other expert's work. Identified potential release points and developed transport mechanisms utilizing the scientific method that demonstrated that contamination from defendant's property did not significantly flow onto plaintiff's property.

Litigation Support for Petroleum Source Identification and Cleanup Evaluation, Poughkeepsie, New York—Marist College and Marist Real Property Services, Inc. v. Chazen Engineering Services Inc., et al., Index No. 2365/09 (Supreme Court, State of New York, Dutchess County): Provided litigation support for Harris Corporation against plaintiffs alleging widespread petroleum contamination from a former owner' UST. Demonstrated that few petroleum impacts, if any, were attributable to Harris, and that the vast majority of excavated materials were either not contaminated or contaminated from other sources. Further demonstrated that most of the soils were excavated for construction purposes, rather than for remediating a petroleum spill, and, therefore, only the incremental cost of disposal would be attributable to the petroleum impacts.

Litigation Support for Construction Defect Claim, Portsmouth/Tiverton, Rhode Island—Cashman Equipment Corporation, Inc. v. Cardi Corporation, Inc., et al., C.A. NO. PC 11-2488 (Rhode Island Superior Court): Provided litigation support for a construction contractor against a subcontractor. Supported expert engineer in applying photogrammetry techniques to site construction photos in order to evaluate the placement of structural foundation elements (now encased in concrete). Concluded that the structural elements were not placed in accordance with the design drawings.

Litigation Support for Lead Impacts, Carteret, New Jersey—Reichhold, Inc. v. United States Metal Refining Company, et al., Civ. No. 03-453 (U.S.D.C., D.N.J.): Provided litigation support for a large, multinational mining and refining company against a plaintiff that alleged responsibility for lead impacts at a previously owned site. After review of the data, developed visual aids for court showing that the lead impacts were generally limited to areas where the plaintiff raised the grade with fill. Supported the science and legal teams during trial preparation and throughout the trial by gathering additional supporting evidence and generating opinions on new evidence submitted by plaintiff and testimony by plaintiff's consultants.

Litigation Support for an Oil Spill Investigation, Long Island City, Queens, New York—DMJ Associates, L.L.C. v. Capasso, et al., Civ. No. 07-285 (U.S.D.C., E.D.N.Y.): Provided litigation support for a New York City developer that resulted in rapid settlement of the case. Designed and executed a field investigation to locate preferential pathways for mobilized LNAPL across multiple properties and a local waterway. Examined chemical fingerprints to determine the extent of migration. Scientifically demonstrated that not only did the LNAPL contaminate the property at hand, but also contaminated adjacent properties and was discharging directly into the Newtown Creek.

Litigation Support for Federal Superfund Site, Lawrence Aviation Industries, Port Jefferson, Long Island, New York—United States of America v. Lawrence Aviation Industries, Inc., et al., Civ. No. 04-818 (U.S.D.C., E.D.N.Y.)*:* Provided litigation support for Lawrence Aviation Industries (LAI) to defend against a USDOJ lawsuit alleging widespread trichloroethylene contamination. After reviewing the investigation reports, determined that there was no scientific link to a portion of the alleged contamination, and, in fact, there appeared to be a second source. Appeared before USDOJ and EPA to argue these new findings in favor of LAI. Additionally, discussed the potential for EPA to relinquish site control to LAI, so that LAI could implement a more modern and effective remedial strategy, rather than the antiquated, likely-unsuccessful technology mandated in the record of decision.

Underground Storage Tank Release Date Determination, Southern New Jersey—Used statistical analysis to determine when a UST began leaking. Conducted a detailed analysis of the fuel delivery receipts as compared to the local weather conditions. Using statistical methods, the initial discharge time frame was determined with 95 percent confidence.

Litigation Support for a Release Migrating toward I-95, Secaucus, New Jersey—Provided opinion on remedial investigation and action plans to negotiate a delay in litigation (with client). Worked with opposing party to incorporate additional scope of work into its investigation plan to fully characterize the release to groundwater. By successfully working with the opposing party's consultant, was able to delay the expense of trial for the client.

Litigation Support, Various Locations, New Jersey and New York—Provided technical review and opinions on various legal matters, mostly involving allocating liability for contamination. Disputed claims of scientific certainty for age-dating analyses of various methods. Collected and analyzed samples to produce independent liability allocation opinions.

PRESENTATIONS/POSTERS

Brodock, K., J. Rhodes, and P. Tornatore. 2005. Improving experience-based engineering estimates for environmental liabilities using Decisioneering® software. National Groundwater Association Conference on Remediation: Site Closure and the Total Cost of Cleanup.

Rhodes, J., and K. Brodock. 2005. Estimating environmental liabilities using probabilistic engineering methods. Web seminar.

Brodock, K., and J. Rhodes. 2005. Engineering estimates for environmental liability à la Crystal Ball. Crystal Ball Users Conference.

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Alana M. Carroll
Senior Managing Scientist

PROFESSIONAL PROFILE

Ms. Alana Carroll is an environmental geologist with experience managing a variety of environmental consulting projects in the New York metropolitan area and specializing in remedial investigations, conceptual site modeling, and remedial design and implementation. Ms. Carroll provides analytical, technical, and regulatory guidance to clients, including developers and environmental attorneys, on a variety of projects in various stages of investigation, remediation, and redevelopment and has managed projects in the New York State Brownfield Cleanup Program, the New York State Department of Environmental Conservation (NYSDEC) Spills and Voluntary Cleanup Programs, and New York City "e" Designation Program.

CREDENTIALS AND PROFESSIONAL HONORS

B.S., Geology, Hofstra University, Uniondale, New York, 2003

CONTINUING EDUCATION AND TRAINING

Graduate Coursework, Master's Program, Geology, Brooklyn College, Brooklyn, New York
Hazardous Waste Operations and Emergency Response 40-Hour Certification (2004; refreshers 2005, 2006, 2007, 2009, 2010, 2011, and 2012)
First Aid and CPR Certified (2012)
Amtrak Contractor Safety Training (2010 and 2011)

PROFESSIONAL AFFILIATIONS

Member of Geologic Society of America
Member of New Partners for Community Revitalization

RELEVANT EXPERIENCE

New York State Brownfield Cleanup Program, 520 West 28th Street, West Chelsea, Manhattan, New York—Managed multiple investigations to address New York State Spills, New York City E-Designation, and New York State Brownfield Cleanup programs. Prepared scopes of work to address requirements of both state and city regulations. Coordinated with city, state, and adjacent property owners for full scale excavation. Negotiated a nuanced approach to support excavation that allowed material to be left onsite, while still meeting a Track 1 Cleanup.

New York State Brownfield Cleanup Program, Willets Point Development, Queens, New York—Managed the Brownfield Cleanup Program application and Phase I environmental site assessment effort for 45 parcels of industrialized land. Coordinated with multiple interested parties, including New York City Department of Housing Preservation and Development and the Economic Development Corporation.

New York State Brownfield Cleanup Program, 1299 First Avenue, East Side, Manhattan, New York—Managed multiple investigations to address onsite chlorinated solvent DNAPL in bedrock fractures. Site challenges included investigation and remedial action within existing, occupied building sites.

New York State Brownfield Cleanup Program, 34th Street and 42nd Street, West Side, Manhattan, New York—Designed and managed multiple investigations to address New York State Spills and Brownfield Cleanup programs. Prepared scopes of work to address requirements of both state regulations and those agreed to by the former owner. Coordinated with NYSDEC to modify scopes based on field observations and limitations, which resulted in not having to mobilize for additional investigations. Coordinated with multiple entities for access to perform investigations, including Javits Convention Center, Amtrak, New York City Department of Transportation, Metropolitan Transit Authority, and their contractors. Developed a three-phase analysis plan with the laboratory to determine the minimum required extent of excavation next to an Amtrak line while limiting analytical costs, decreasing in the extent of excavation, and lowering disposal and structural support requirement costs.

New York State Brownfield Cleanup Program 388 Bridge Street, Downtown Brooklyn, New York—Designed and managed all on- and offsite investigations of soil, soil gas, groundwater, and indoor air, including coordination of staff and subcontractors. Prepared investigation reports for submittal to client, project team, NYSDEC and the New York State Department of Health (NYSDOH). Participated in project team decision making with clients, lawyers, construction manager, and other consultants. Managed New York City Transit approvals for subsurface investigations near subway lines. Coordinated offsite access in residences, commercial spaces, and a private school. Participated in soil vapor extraction pilot test implementation and reporting. Helped with implementation of an offsite subslab depressurization system in an existing building; activities included system design/layout, installation oversight, testing, and long-term operation and maintenance. Responsible for NYSDEC/NYSDOH coordination and reporting for all investigations. Tracked project activities for inclusion in NYSDEC/NYSDOH programmatic submittals, including monthly reports and remedial schedules.

New York Department of Environmental Remediation, Class 2 State Superfund, Laurel Hill Site, Queens, New York—Managed multiphase, multiparcel project involving design, installation, and ongoing operation, maintenance, and monitoring of six remedial caps. Site challenges included the division of the site into individual parcels that were independent of one another; subsequently, each parcel had a stormwater management design individual to the surrounding parcels. Other site challenges included the site position in a wetlands area fronting Newtown Creek and working with the New York City Department of Transportation to facilitate its schedule for the adjacent Kosciusko Bridge restoration.

New York State Brownfield Cleanup Program, Uniforms for Industry, Queens, New York—Designed and managed an alternative approach to the offsite soil vapor intrusion investigation. Utilized soil vapor modeling to evaluate potential human health risks and migration probabilities. Provided support for the design of a retrofitted passive venting system.

New York City Voluntary Cleanup Program West 28th Street, West Chelsea Manhattan, New York—Managed multiple investigations for satisfaction of E-Designations on a site below the High Line. Challenges included coordination with an adjacent property full scale excavation and construction excavation beneath the High Line.

New York State Spills Program, Gotham Center, Queens, New York—Responsible for proposal and budget development, subcontractor selection and coordination, negotiation, and preparation of subcontractor terms and agreements, budget, and invoice review for a comprehensive subsurface investigation. Prepared and implemented scope of work for delineation of soil contamination and calculation of contaminant mass estimates. Subsequent to interpretation of site data and subgrade characteristics, developed and presented remedial alternatives and associated costs for internal and client project teams. Prepared remedial investigation report in coordination with the New York City Economic Development Corporation and the client for submittal to state regulators.

New York State Brownfield Cleanup Program, Uniforms for Industry, Queens, New York—Designed and managed an alternative approach to the off-site soil vapor intrusion investigation. Utilized soil vapor modeling to evaluate potential human health risks and migration probabilities. Provided support for the design of a retrofitted passive venting system.

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Glenn Esler
Scientist

PROFESSIONAL PROFILE

Mr. Esler has more than 30 years of experience in the field of environmental chemistry, including 15 years in quality assurance and data quality management and 5 years as a GC/MS analyst. His technical specialties include design and implementation of laboratory quality management programs, laboratory and field audits, and data interpretation and assessment of compliance with regulatory requirements and project objectives. He has an in-depth working knowledge of EPA environmental analytical methods and EPA Contract Laboratory Program (CLP) national functional guidelines for data review. His experience includes environmental analysis, data verification and validation, preparation of quality assurance documentation, and coordination of subcontracting laboratories. He is also credentialed as a Certified Laboratory Auditor.

CREDENTIALS AND PROFESSIONAL HONORS

Sustainability Leadership Program Certificate, University of Oregon, Portland, Oregon, 2013
B.S., Geography, Portland State University, Portland, Oregon, 2008
A.S., Chemistry, Millersville University, Millersville, Pennsylvania, 1984

Certified Laboratory Auditor, iNARTE, 2009

CONTINUING EDUCATION AND TRAINING

EPA Office of Emergency and Remedial Response, 40-Hour Health and Safety Course (2010)
Certified Laboratory Auditor Training and Credentialing Program, iNARTE (2009)
Naval Sea Systems Command Laboratory Quality and Accreditation Office Sampling and Laboratory Testing E-Learning Training (2009)
Radiometric Data Validation, American Radiochemistry Society (2009)
SDSFIE Web Online Training Course (2005)
Analysts Guide to NELAC Assessment Short Course, Advanced Systems, Inc. (2004)
Basics of Quality Improvement Short Course, University of Delaware (1996)
Environmental Data Quality Short Course, American Chemical Society (1992)

RELEVANT EXPERIENCE

Quality Assurance and Quality Control

Airplane Manufacturer Superfund Site Laboratory and Field Audits, Washington—Conducted onsite laboratory and field audits in support of remedial action and treatment systems related to groundwater contamination. Wrote final report that provided an assessment of the laboratory and field sampling team's performance and ability to provide high-quality, defensible data, and areas where improvements are required.

NOAA, Lower Duwamish River (LDR), Washington—Conducted research related to the Natural Resources Damage Assessment program for PAH allocation in LDR sediments. Research was based on PAH footprint maps, tax parcel information, data from EPA and Ecology files, site histories, and other publically available reports produced over the last several decades. Also used Google Earth and ESRI's ArcView to aid in allocation to multiple sites along the LDR.

Energy Distribution Company, Indiana—Assisted with work plan preparation, laboratory coordination, and data validation, data review, and data quality assessment on public sewer sediments and stormwater sampling at the site. The site was identified as a potential source of PCBs to a public sewer system and river sediments associated with a National Priorities List site.

Railroad Transportation Laboratory Audits, Multiple Sites, United States—Conducted onsite laboratory audits and provided assistance in conjunction with the Laboratory Management Program. The program included establishment of a web site for distributing program information, development of a web-based project management tool to handle laboratory projects, documentation of laboratory procedures in an online and hardcopy manual, solicitation and establishment of standardized pricing for laboratory work, and presentation of the program to railroad officials, laboratories, and consultants. Also audited laboratories analyzing NPDES samples on behalf of client: evaluated laboratory reports for completeness, verification of reporting limits, and laboratory standard operating procedures. Wrote final report that provided an assessment of the laboratory's performance and ability to provide high quality, defensible data, and areas where improvements were required.

Cleanup of Base Oil/Water Separators, Air Force Center for Environmental Excellence, Grissom Air Reserve Base, Indiana—Assisted with quality assurance project plan (QAPP) preparation and DQOs and performed data validation, data review, and data quality assessment in conjunction with the site activities, which included sampling, analyzing, cleaning, collecting, removing, manifesting, and properly disposing of materials for nine oil/water separators in accordance with applicable state regulations.

Selfridge Air National Guard Base, Michigan—Assisted with QAPP preparation and formulation of DQOs for the collection of data to support the evaluation of the corrective action measures, site characterization, and determination of extent of contamination at a Michigan Air National Guard Base.

U.S. Department of the Navy, Naval Facilities Engineering Command Southwest, California—Assisted with the preparation of the pre-design sampling and analysis plan and remedial action work plan for the remedial design and remedial action at IR Site 1. Also assisted with laboratory procurement of analytical services and procurement of third-party data validation services.

Groundwater Monitoring Program, Arizona—Assisted in the development of the site-wide quality assurance management plan and the QAPP for an EPA Superfund site. Contaminants of concern were VOCs and perchlorate. Activities included groundwater program planning and execution, groundwater sampling, quarterly and annual reporting, QA/QC, data validation, and project problem solving. Supported the Project QA Manager, which included providing data validation, tracking quality control parameters, and handling laboratory data quality issues.

Partial Database Rebuild for a Sawmill Facility, Montana—Provided technical support for the partial reconstruction of the project database after discrepancies were found during quality assurance activities. Review third-party data validation reports and updated associated electronic data deliverables as appropriate.

Emergency Response at Bulk Chemical Terminal, New Orleans, Louisiana—Assisted with data analyses and audit of the analytical laboratory charges for samples collected related to the emergency response and cleanup of a chemical spill caused by flooding of a bulk chemical terminal during Hurricane Isaac.

Engineering Evaluation and Cost Analysis for a Former Chemical Manufacturing Facility, Portland, Oregon—Revised project QAPP based on EPA comments on a sediment sampling work plan, which was prepared to collect data for pre-remedial design to address sediments adjacent to the site. Coordinated with analytical laboratories for methods, quality control criteria, SOPs, quality assurance documentation, and costs for additional analyses. Researched and co-authored technical memorandum to EPA on the passive sampling effort to measure the freely dissolved porewater concentrations of DDT and its metabolites, PCDD/Fs, and PCBs described in the porewater chemistry section of the work plan.

Project Chemistry

Rail Yard Air Monitoring, Various Sites, Montana—Served as project chemist for semiannual air sampling program related to indoor air monitoring at several active rail yards throughout Montana. Oversaw data validation effort using various air analytical methods, including EPA TO-15 and MADEP VPH. Reviewed data validation reports and associated electronic data deliverables.

Air National Guard, One Clean Program, Multiple Sites, North/Midwest Region—Served as project chemist and oversaw preparation of the QAPP, data validation, and data management for this accelerated turnaround project, which included field investigation activities to determine the presence of environmental contamination at identified areas of concern at 38 sites at 11 installations in the Air National Guard's North/Midwest Region.

Oversaw the following: management of all analytical data using the Equis data management tool; Level III data validation consistent with the Environmental Restoration Program Air National Guard Investigation Guidance; creation of export templates from the database; generation of data tables for the Site Inspection Report; and the electronic data deliverables for the ESOH-MIS database.

Niblack Mining Corporation, Ketchikan, Alaska—Prepared a QAPP revision in support of routine monitoring of surface water and groundwater quality. Assisted in coordinating project logistics, sending sampling equipment to a remote location in Alaska, and subsequent delivery of samples to the analytical laboratory. Monitored laboratory's progress on sample analyses and reviewed and validated analytical results. Supported preparation of data quality reports summarizing analytical results.

Water Quality Monitoring for a Volcanogenic Massive Sulfide Mine Exploration Project, Alaska—Assisted with QAPP preparation in support of monitoring of surface water and groundwater quality. Assisted in coordinating project logistics, sending sampling equipment to a remote location in Alaska, and subsequent delivery of samples to the analytical laboratory. Monitored laboratories' progress on sample analyses and reviewed and validated analytical results.

Data Management and Validation

Deepwater Horizon Oil Spill, Natural Resource Damage Assessment—Working in conjunction with the natural resource damage assessment team responding to the *Deepwater Horizon* accident and oil spill in the Gulf of Mexico on behalf of BP Exploration & Production Inc. Provided chemistry support and performed data validation and review of data validation reports associated with the environmental sample collection activities.

Industrial Site Data Validation, Vancouver, Washington—Performed data validation for a project involving the presence of chlorinated solvents at an active manufacturing facility in Vancouver, Washington. Project included groundwater monitoring and nearby residential air sample analyses, which are being used by the Washington State Department of Ecology for human health risk assessment.

Electrical Equipment Repair Facility Site Investigation Data Validation and Data Quality Assessment, Oregon—Performed data validation, data review, and data quality assessment for the site investigation of historical PCB releases at an electrical equipment inspection, service, and repair facility. The site was identified by the Oregon Department of Environmental Quality as a potential source of PCBs detected in the public stormwater system and in Willamette River sediments.

Groundwater Monitoring Program Data Validation, Beaverton, Oregon—Performed validation of groundwater chemistry results generated as part of a RCRA Corrective Action Program. Monitoring required for the project included VOCs and Appendix IX List compounds.

Fort Lewis Thermal Remediation Project Data Review and Validation, Fort Lewis, Washington—Performed chemical data review and validation on project data, including water and air samples for hydrocarbon and VOC analyses, using GC/photoionization detector and GC/MS, for a remediation project at Fort Lewis using electric resistance heating. The project was designed by U.S. Army Corps of Engineers to be performed using near-real-time data from a mobile laboratory to make decisions about the remediation process using the Triad Approach.

Field Investigation Oversight and Report Preparation for a Coal-Fired Electrical Power Plant, Indiana—Performed data validation for a large environmental investigation of a coal-fired power plant. Data included groundwater, soils, and plant tissues.

Interim Remedial Actions/PCB Soil Removals, Cape Canaveral Air Force Station, Brevard County, Florida—Performed data validation and data assessment for a RCRA Interim Measures delineation and cleanup effort at Space Launch Complex 40 at Cape Canaveral Air Station, Florida. The project involved delineating TSCA levels in soil to determine PCB concentrations >50 ppm.

Voluntary Property Assessment (VPA) Activities, Former Crosstie Chipping Facility, Alabama—Performed data validation and data assessment for VPA investigation activities. Work included collection of numerous soil, sediment, surface water, groundwater, and macroinvertebrate samples to evaluate the extent of PAH impacts to the site and surrounding areas resulting from former crosstie chipping operations.

Former Truck Manufacturing Facility Remediation Data Validation and Data Quality Assessment, Washington—Performed data validation, data review, and data quality assessment for remediation of a former truck manufacturing facility located adjacent to the Duwamish River. The project work consisted of the collection of stormwater and tidal sediments.

Memphis Air National Guard, Memphis, Tennessee—Performed data quality review and data assessment on VOC data from the risk assessment and remediation of petroleum-impacted soil and groundwater.

White Swan Cleaners/Sun Cleaners Superfund Site, New Jersey—Performed data validation on CLP data, and data quality review and assessment on the data for ongoing collection activities related to a Settlement Agreement with EPA Region 2 to conduct a RI/FS of a regional site that has been contaminated by tetrachloroethylene (PCE or "perc"). PCE (a dry cleaning solvent) has potentially impacted municipal water supply wells at a popular shoreline resort community.

Former Pharmaceuticals Facility Data Validation, Oregon—Performed data validation on the results related to the release of VOCs on the site. The primary contaminants of concern included trichloroethene, *cis*-1, 2-dichloroethene, and vinyl chloride, which were found at concentrations indicative of dense non-aqueous phase liquid.

Former Industrial Site Water Sampling Data Validation and Data Quality Assessment, New Jersey—Performed data validation, data review, and data quality assessment on the annual drinking water sampling at all homes surrounding a former industrial site, where the chemicals of concern in groundwater include VOCs—primarily 1,1,1-trichloroethane, 1,1-dichloroethylene, and 1,1-dichloroethane.

Groundwater and Surface Water Monitoring, Naval Facilities Engineering Command (NAVFAC), Fort Gordon, Georgia—Performed data validation, data review, and data quality assessment on quarterly groundwater sampling. Quarterly monitoring of groundwater and surface water was performed under a NAVFAC contract in compliance with NPDES for a wastewater treatment facility and land-application system at the Pointes West Army Recreation Area in Columbia County, Georgia.

Site Characterization at Industrial Operation, Seattle, Washington—Performed data validation, data review, and data quality assessment on the soil boring and groundwater sampling at the site. Site activities included site characterization (i.e., field assessment, focused site characterization report, project management) at an industrial operation approximately 2.1 acres in size located in Seattle, Washington. The site was impacted with metals, PCBs, PAHs, TPH, and VOCs.

West Virginia Department of Environmental Protection Brownfield Sites Data Validation and Data Quality Assessment, West Virginia—Performed data validation, data review, and data quality assessment using EPA Region 3 modifications to CLP National Functional Guidelines associated with Phase I surface soil sampling and follow-up Phase II subsurface soil sampling, groundwater investigations, and surface water and sediment sampling at various Brownfield sites throughout West Virginia.

Massachusetts Military Reservation Closure Data Validation, Cape Cod, Massachusetts—Performed data validation of samples submitted for explosives compounds analysis and perchlorate, which are associated with verification that post-excavation bottom soils and expansion area soils are below established action levels in order to obtain closure determination for the CS-19 and CS-18 Source Area sites at the Massachusetts Military Reservation in Cape Cod. Soil samples from the expansion areas were collected using the multi-increment sampling approach proposed by Cold Regions Research and Engineering Laboratory.

Susanville Sawmill and Cogeneration Facility, Susanville, California—Performed expedited data validation and associated report writing associated with air, water, soil, and product samples collected during the overall scope of work, which included site investigations and remediation at the proposed treatment cell area and fuel and maintenance area.

Rosiclare Mine Site, Rosiclare, Illinois—Performed data validation of soil, sediment, and groundwater samples and report writing for the RI/FS effort associated with issues involving historical fluorspar mine tailings.

Rental Car Maintenance Facility, San Jose, California—Performed expedited data validation and report writing associated with samples collected during the overall scope of work, which included removal and disposal of USTs, an AST, below-ground hydraulic lifts, and a car wash structure.

Former Ashland Lease Area, Shoreham Facility, Minneapolis, Minnesota—Performed data validation of quarterly groundwater samples analyzed for anions, conventional parameters, and VOCs and report writing for the monitoring program for the four remedial actions currently underway at the site: Soil Vapor Extraction, Light Non-Aqueous Phase Liquid Monitoring and Recovery, Till Bioremediation, and Outwash Pump and Treat.

Smeltertown Superfund Site OU1, Salida, Colorado—Performed data validation of groundwater samples analyzed for metals and report writing for the annual groundwater monitoring program.

Chemical Distribution Facility, Santa Ana, California—Performed data validation of semiannual groundwater samples analyzed for PCE, TCE, chemical degradation products of PCE and TCE, and 1,4-dioxane and report writing as part of oversight of groundwater monitoring and soil remediation at the site.

Waste Rock Water Quality Assessment Open Pit Gold Mine Expansions, Nevada—Performed data validation associated with ongoing humidity cell test results of existing waste rock, alluvium, and drill cores of expansion material. Assisted with the QA report associated with the twenty-week results of the first round of humidity cell tests.

Former DDT Manufacturing Facility, Portland, Oregon—Performed data validation associated with stormwater monitoring at a former pesticide manufacturing facility under the jurisdiction of the Oregon Department of Environmental Quality. Also monitored laboratories' progress on sample analyses and reviewed and validated analytical results.

Blackwell Zinc Site, Blackwell, Oklahoma—Performed data validation associated with mitigation strategies of metals loading to the City's wastewater treatment plant resulting from infiltration of contaminated groundwater to the City's sanitary collection system.

Soil and Groundwater Investigation at Former Allied Engineering Facility, Alameda, California—Performed data validation on historical data and recent data associated with assessment and potential remediation of groundwater and sediment at the site.

Slag and Sewage Site, Past Costs and River Sediment Evaluation, Fox Point Park, Wilmington, Delaware—Performed Stage 2B and Stage 3 data validation associated with the sediment RI/FS in the Delaware River.

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Kevin P. McCarty, P.G.
Principal Geologist

PROFESSIONAL PROFILE

Mr. Kevin McCarty is a principal geologist with more than 25 years of experience providing investigative and remediation technical advice to project managers, coordinating and supervising all section staff, preparing and commenting on work plans and progress, providing guidance on protocols/equipment/specialty contractors, and organizing/coordinating schedules of staff and equipment in the performance of investigations and remediation on a wide variety of projects. Mr. McCarty worked on a wide variety of project sites that have been involved with regulatory programs and oversight of the New York State Department of Environmental Conservation (NYSDEC). These sites have included each division within NYSDEC and have covered nearly every region within New York State. Mr. McCarty has a long and trusted relationship with all levels of NYSDEC management and works with the department regularly on interpreting and implementing program enhancements. He is highly regarded for his knowledge of solid waste management in construction projects, which encompasses material generated from both upland locations and excavations, demolition of existing structures, and material removed from underwater excavation or dredging. He has worked and continues to work with all three regions of NYSDEC in the application of environmental conservation law and the New York's Solid Waste Management Policy in creating sustainable solutions on large construction efforts.

Mr. McCarty also has extensive environmental construction management experience on above and belowground projects. He has historically managed the environmental construction management aspects for the New York City Department of Environmental Protection (NYCDEP) Bureau of Engineering Design and Construction Combined Sewer Overflow Program. He continues to work with NYCDEP and has recently rewritten the NYCDEP environmental and material management specifications for the Departments $2.1 billion dollar annual capital construction program.

CREDENTIALS AND PROFESSIONAL HONORS

B.A., Geology/Earth Science, Western Connecticut State University, Danbury, Connecticut, 1985

Professional Geologist, Pennsylvania (License No. PG0024455G), Delaware (License No. S4-0001302)

Continuing Education and Training

Hazardous Waste Operations and Emergency Response 40-Hour Certification (1985; refreshers 1988-2012)
Hazardous Waste Operations Management and Supervisor 8-hour Certification (2008)
First Aid and CPR Certified (1988-2011)

Professional Affiliations

Board of Directors for the New York City Partnership of Brownfield Practitioners
Board of Directors for New Partners for Community Revitalization
Member of the Downstate Soil Reuse Committee, New York City Department of Environmental Protection
Member of the New York City Brownfields Task Force
Charter Member of the Hudson Valley Brownfields Partnership Steering Committee

Relevant Experience

Emergency Response

Hurricane Sandy Flood Cleanup in New York City Financial District, New York—Managed pumping and dewatering operations following the flooding of the lower section of Manhattan. Coordinated numerous contractors with pumping capacity to clear 53 million gallons of flooded office and parking garage space that contained water and ruptured fuel oil tank contents. Effort included NYCDEP and NYSDEC permits, insurance company coordination, and building health and safety coordination for the overall effort.

Environmental Investigation

Voluntary Cleanup Agreements at a Former Manufactured Gas Plant, New York—Coordinated with city and state agencies for review and approval of documents related to 13 voluntary cleanup agreements for a former manufactured gas plant site between New York City and the State of New York under Voluntary Cleanup and Brownfields programs.

Environmental Impact Study for a Planned New York City Jail, New York, New York—Managed portions of an environmental impact study to locate a New York City jail on a then currently unclosed construction and demolition landfill.

Environmental Impact Study for a Mixed Use Development, Queens, New York—Managed portions of an environmental impact study for a mixed use commercial, residential, and open space development on more than 60 acres in Willets Point, Queens, New York. Managed all aspects of redevelopment internal to the project, including costs, subsurface geotechnical conditions, mitigation, remediation, FEMA and floodplain issues, and importation and settlement of fill and energy.

Environmental Impact Study for a Multiuse Waterfront Port, New York—Managed portions of an environmental impact study for proposed commercial, residential, and educational facilities at waterfront port and shipping terminal.

Yankee Stadium Pocket Parks Project, New York—Conducted an environmental site assessment for two new replacement parks slated to be constructed as part of the much larger Yankee Stadium rebuild. Both sites had petroleum spills that need to be addressed.

Anheuser Busch/Greenway Remediation and Redevelopment, Bronx, New York—Managed a project involving the classification and reuse of more than 43,000 cubic yards of material generated on adjacent construction project to raise the development site out of the 100-year floodplain. Successful project completion saved the City of New York more than $6 million in disposal costs and the developer more than $0.5 million toward the purchase of new fill. The project was awarded the 2010 Diamond Award for environmental projects in New York State and was a national finalist.

Development of Fulton Fish Market, New York—Evaluated most efficient method of beneficial reuse for excavated material taken from an area historically used to dispose of coal tar. Final selection was incineration in a NYSDEC-permitted waste-to-energy facility where the material would be used for fuel. In the end, a total of 7.6 megawatts of electricity was generated and placed into the local electrical grid as well as a significant amount of steam energy that was supplied via underground piping to local industrial facilities. The electrical generation equivalent was enough to supply 10,000 homes with power for 3.5 months. Project received an ACEC Diamond Award, an EPA Region 2 Phoenix Award, and 2011 New York City Sustainable Remediation Award.

Large Design/Construction Management

Corona Vortex Chamber, Queens, New York—Evaluated the predesign and design of installation of an underground wastewater treatment plant facility within a city street. Prepared a full range of construction specifications, and managed all aspects of material handling, classification, and disposal of more than 70,000 cubic yards of material during construction.

Combined Sewer Overflow Tank, Flushing, New York—Assessed pilot locations for a 28 million gallon underground combined sewer tank. Performed soil and geotechnical assessment of chosen locations, prepared construction specifications for entire construction effort. Effort included excavation to depths 45 ft below water table and *in situ* classification of more than 470,000 cubic yards of material. Construction management included oversight of entire excavation, staging, and approval for disposal. Additional effort included working with NYSDEC to create management efforts for fill material and deposition/testimony for construction change order lawsuit.

PUBLICATIONS

McCarty, K. 2006. Market fresh. *Civil Engineering ASCE.* 76(6):60-65.

APPENDIX D
SITE HEALTH AND SAFETY PLAN

U-Haul Site
555 West 22nd Street
New York, New York 10011
NYSDEC BCP No. C231101

Submitted to:
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau B
625 Broadway, 12th Floor
Albany, NY 12233-7020

Prepared for
23rd and 11th Associates LLC
c/o The Related Companies
60 Columbus Circle
New York, NY 10023

Prepared by

integral engineering p.c.

61 Broadway
Suite 1601
New York, NY 10006

Final
October 2016

CONTENTS

LIST OF ATTACHMENTS

ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
CHSM	Corporate Health and Safety Manager
CPR	cardiopulmonary resuscitation
CPT	cone penetration test
HAZWOPER	Hazardous Waste Operations and Emergency Response
HEPA	high-efficiency particulate air
IDLH	immediately dangerous to life and health
Integral	Integral Consulting Inc.
NYSBCP	New York State Brownfield Cleanup Program
OSHA	Occupational Safety and Health Administration
PEL	permissible exposure limit
PFD	personal flotation device
PID	photoionization detector
PPE	personal protective equipment
SHSP	site health and safety plan
SSO	site safety officer
STEL	short-term exposure limit
SVOC	Semivolatile organic compound
VOC	Volatile organic compound

SITE HEALTH AND SAFETY PLAN APPROVAL

This site health and safety plan has been reviewed and approved for Remedial Investigation at 555 West 22nd Street, New York, NY.

October 27, 2016

Project Manager Date

August 1, 2016

Corporate Health and Safety Manager Date

SITE HEALTH AND SAFETY PLAN ACKNOWLEDGMENT

In the absence of an appropriate subcontractor or consultant health and safety plan, and with the written approval of Integral Consulting Inc. (Integral) corporate health and safety manager, the subcontractor or consultant may utilize the Integral site health and safety plan (SHSP), provided there is written concurrence from the subcontractor or consultant that they will directly administer the plan for their employees and assume all risks associated with any possible errors or omissions in the plan. This SHSP does not cover any construction activities. The Integral SHSP is a minimum standard for the site and will be strictly enforced for all Integral personnel, or its subcontractors or consultants where applicable.

I have reviewed the SHSP prepared by Integral, dated October 2016 for the Remedial Investigation fieldwork. I understand the purpose of the plan, and I consent to adhere to its policies, procedures, and guidelines while an employee of Integral, or its subcontractors or consultants. I have had an opportunity to ask questions regarding this plan, which have been answered satisfactorily by Integral.

Employee signature	Company	Date
Employee signature	Company	Date
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1 INTRODUCTION

It is the policy of Integral Consulting Inc. (Integral) to provide a safe and healthful work environment that is compliant with applicable regulations. No aspect of the work is more important than protecting the health and safety of all workers.

This site health and safety plan (SHSP) provides general health and safety provisions to protect workers from potential hazards during field activities performed for the Limited Phase II Subsurface Investigation for the U-Haul facility located at 555 West 22nd Street, New York, NY (hereafter referred to as the site). This SHSP has been prepared in accordance with state and federal Occupational Safety and Health Administration (OSHA) safety regulations (29 CFR [Code of Federal Regulations] 1910 and 29 CFR 1926).

Work performed for the Remedial Investigation will be in full compliance with applicable health and safety laws and regulations, including Site and OSHA worker safety requirements and Hazardous Waste Operations and Emergency Response (HAZWOPER) requirements.

Attachments to the SHSP provide a site-specific map and specific routes to the hospital from the Site (Attachment 1), regulatory notices (Attachment 2), safety procedures (Attachment 3), material safety data sheets (Attachment 4), an employee exposure/injury incident report (Attachment 5), and a near-miss incident report (Attachment 6).

This SHSP has been prepared to identify potential site hazards to the extent possible based on information available to Integral. Integral cannot guarantee the health or safety of any person entering this site. Because of the potentially hazardous nature of this site and the activity occurring thereon, it is not possible to discover, evaluate, and provide protection for all possible hazards that may be encountered. Strict adherence to the health and safety guidelines set forth herein will reduce, but not eliminate, the potential for injury and illness at this site. The health and safety guidelines in this plan were prepared specifically for this site and should not be used on any other site without prior evaluation by trained health and safety personnel.

A copy of this SHSP must be in the custody of the field crew during field activities. All individuals performing fieldwork must read, understand, and comply with this plan before undertaking field activities. Once the information has been read and understood, the individual must sign the Site Health and Safety Plan Acknowledgment form provided as part of this plan. The signed form will become part of the project file.

This plan may be modified at any time based on the judgment of the Integral site safety officer (SSO) in consultation with the project manager and Integral corporate health and safety manager (CHSM) or designee. Any modification will be presented to the onsite team during a safety briefing and will be recorded in the field logbook.

1.1 OBJECTIVES AND METHODS

The primary objective of the Remedial Investigation (RI) is to collect and evaluate data at the Site to define the nature and extent of contamination on and offsite, if present. Field activities for data collection will include:

- Advancement of 18 borings to the anticipated depth of 17 feet below grade (ftbg)), with the collection of two soil samples from each boring;
- Install 3 permanent groundwater monitoring wells and 5 temporary groundwater wells for the collection of five groundwater samples;
- Install 6 soil vapor monitoring points and collect 5 soil vapor samples; and
- Collect 1 indoor air and 1 ambient air sample per day of sampling.

Prior to the advancement of soil borings, all locations will be hand cleared for utilities and subsurface infrastructure. Soil borings will be installed using a track mounted or Bobcat Geoprobe® utilizing direct push technology to the groundwater interface depth, approximately 10 ftbg. Continuous soil samples will be collected using four (4) or five (5) foot macrocore samplers fitted with dedicated acetate liners. The soil/fill retrieved from each sampler will be field screened with a PID for VOCs and described by Integral field personnel on boring logs.

1.2 ORGANIZATION

This SHSP covers the following field activities: drilling oversight, community air monitoring, and soil, groundwater, soil vapor, and air sampling. Chemical and physical hazard evaluations are presented in Sections 2 and 3, respectively. Specific health and safety guidelines associated with each task, including a brief description of the work, are discussed in Section 11 (Task-Specific Safety Procedures).

1.3 ROLES AND RESPONSIBILITIES

All Integral personnel, subcontractors, or consultants and visitors on this site must comply with the requirements of this SHSP. The specific responsibilities and authority of management, safety and health, and other personnel on this site are detailed in the following paragraphs.

1.3.1 Site Safety Officer

The SSO has full responsibility and authority to implement this SHSP and to verify compliance. The SSO reports to the project manager and is onsite or readily accessible to the site during all work operations. The SSO is responsible for assessing site conditions and directing and controlling emergency response activities. The specific responsibilities of the SSO include:

- Managing the safety and health functions on this site
- Serving as the onsite point of contact for safety and health concerns
- Assessing site conditions for unsafe acts and conditions and ensuring corrective action
- Ensuring that all Integral employees and subcontractors understand and follow the SHSP
- Ensuring that daily work schedules and tasks are reasonable for the required levels of effort and weather conditions
- Confirming local emergency response phone numbers and locations
- Conducting and documenting the initial and daily or periodic health and safety briefings
- Evaluating and modifying the level of protective apparel and safety equipment, based on site conditions
- Ensuring that the field team observes all necessary decontamination procedures.

If the SSO determines that site conditions are unsafe, he or she has the authority to suspend field operations until the problem is corrected. The SSO can modify SHSP procedures in the field. Any changes must be documented in the field logbook, and field staff must be immediately informed of the change. The project manager and Integral's CHSM must be notified by phone or email within 24 hours of any major changes to the SHSP.

1.3.2 Project Manager

The project manager has overall responsibility to ensure that personnel working onsite are safe. The specific responsibilities of the project manager include:

- Ensuring that the SHSP is developed prior to the field work or site visit
- Reviewing and approving the SHSP prior to the field work or site visit
- Ensuring employee understanding of and compliance with the SHSP.

1.3.3 Corporate Health and Safety Manager

The CHSM provides guidance to the project manager and SSO on SHSP preparation and reviews and approves the SHSP. The CHSM also serves as an arbitrator if there is a conflict between the project manager, SSO, and field personnel. In addition, the CHSM[1] conducts periodic unannounced audits of Integral field operations to ensure compliance with the SHSP.

[1] The audit task may be delegated to an office health and safety representative by the CHSM.

1.3.4 Field Personnel

All Integral personnel and subcontractors on this site are responsible for reading and complying with this SHSP, using the proper personal protective equipment (PPE), reporting unsafe acts and conditions, and following the work and safety and health instructions of the project manager and SSO. All Integral personnel, subcontractors, or consultants can and are encouraged to suspend field operations if they feel conditions have become unsafe.

1.4 SITE DESCRIPTION

The site is comprised of four tax lots (approx. 31,820 square feet) containing a one-to-three-story facility used entirely by U-Haul as company storage, public storage, rental vehicle parking, vehicle maintenance and servicing, retail U-Haul store and office. An asphalt paved lot, facing 11th Avenue, is used for truck storage.

Owners/tenants:

- **Site history:** A Phase I Environmental Site Assessment (ESA) performed by Integral in December 2015, indicated that the site has had a long history of commercial use including iron work shops, a wood "factory" and distributer, a machine shop, wood yard, cotton mill, stables, parking garages, and offices.
- **Current site use:** Storage, parking, vehicle maintenance and servicing, and a retail U-Haul store and offices.
- **Hazardous waste site:** No
- **Industrial waste site:** No
- **Topography (if applicable):** Fairly level land, 7 feet above sea level.
- **Site access:** Entrance on 23rd Street and 11th Ave.
- **Nearest drinking water/sanitary facilities:** Onsite
- **Nearest telephone:** Field crew members will have cell phones
- **Size of site:** 31,820 square feet
- **Pathways for hazardous substance dispersion:** Inhalation and dermal

A detailed site map is provided in Attachment 1 to this SHSP.

1.5 PROJECT MANAGER AND OTHER KEY CONTACTS

	Name (Affiliation)	Work Telephone	Cell Phone
Project manager	Alana Carroll (Integral)	(212) 440-6707	(646) 895-1430
Site safety officer	Jordan Junion (Integral)	(212) 440-6705	(414) 315-8977
Corporate health and safety manager	Matt Behum (Integral)	(410) 573-1982 x 512	(443) 454-1615
Facility contact	Ian Brown, General Manager	(212) 620-4177	
Client contact	[Jim Harris] (The Related Companies)	(212) 421-5332	

2 CHEMICAL HAZARD EVALUATION

Potentially hazardous chemicals known to exist at the site are primarily VOCs and SVOCs. The chemicals of concern, applicable chemical properties, and potential exposure routes are presented in the following sections.

The following table lists the historical site maximum constituent concentrations for constituents at 562 W 23rd Street. In addition, the table lists the properties of sample preservatives and decontamination chemicals that may be used at the site (i.e., Alconox/Liquinox and Hydrochloric Acid (HCL)). The table also lists the chemical properties and OSHA permissible exposure limit (PEL), short-term exposure limit (STEL), and immediately dangerous to life and health (IDLH) level. Some chemicals used during equipment decontamination or sample preservation may volatilize and enter the field crew's breathing zone and be inhaled. Breathing zone air can be monitored to ensure that the chemicals do not exceed the PEL. If any of the chemicals exceed the PEL, immediate action is required (e.g., don respirators, leave site) as designated in the "Air Monitoring" section (Section 5) of this SHSP.

Chemical Properties

Chemical of Concern	Concentration (site maximum or range expected)	Medium	OSHA PEL (ppm)	OSHA STEL (ppm)	OSHA IDLH (ppm)	IP(eV)	Carcinogen or Other Hazard
Alconox (Tetrasodium Pyrophosphate)	Concentrated	Decon	--	--	--	--	Flammable
Benzene	585 ppb	Groundwater	1	5	500	9.25	Flammable
Ethylbenzene	585 ppb	Groundwater	100	125	800	8.82	Flammable
Hydrochloric Acid (HCl)	Concentrated	Preservative	5	--	50	12.74	Corrosive, reactive
Isobutylene	Concentrated	Gas	--	--	--	--	Flammable
Methyl tert-butyl ether (MTBE)	53 ppb	Groundwater	--50 (ACGIH TWA)	--	--	--	Flammable
Toluene	585 ppb	Groundwater	200	150	500	8.82	Flammable
Xylenes	585 ppb	Groundwater	100	150	900	8.56	Flammable

Notes: -- = none established
ACGIH = American Conference of Government Industrial Hygienists time-weighted average
BTEX = benzene, toluene, ethylbenzene, and xylenes
Ca = carcinogen
IDLH = immediately dangerous to life and health
IP(eV) = ionization potential (electron volts)
mg/kg = milligrams per kilogram
NA = not available
P = poison
PEL = permissible exposure limit

ppb = parts per billion
ppm = parts per million
STEL = short-term exposure limit

The table below summarizes the chemical characteristics and potential chemical exposure routes at the site.

	Likely	Possible	Unlikely
Potential Chemical Exposure Routes at the Site:			
Inhalation		X[a,b]	
Ingestion			X[a,b]
Skin absorption		X[a,b]	
Skin contact		X[a,b]	
Eye contact		X[a,b]	
Chemical Characteristics:			
Corrosive	X[b]		X[a]
Flammable	X[a,b]		
Ignitable			X[a,b]
Reactive	X[a]		X[b]
Volatile		X[b]	X[a]
Radioactive			X[a,b]
Explosive			X[a,b]
Biological agent			X[a,b]
Particulates or fibers			X[a,b]
If likely, describe:	Hydrochloric acid is corrosive and highly reactive. Always wear nitrile gloves and safety glasses when filling sample containers with this acid. Chemicals of concern include BTEX which are flammable chemicals.		

Notes:

[a] Decontamination chemicals and preservative

[b] Soil and groundwater

3 PHYSICAL HAZARD EVALUATION AND GUIDELINES

The following sections present general physical hazards guidelines.

3.1 GENERAL PHYSICAL HAZARDS

The following table presents possible physical hazards that are expected to be present during field activities.

Possible Hazard	Yes	No	Proposed Safety Procedure
Heavy equipment	X		Stay back from operating equipment; wear safety vests and hard hats; coordinate and maintain eye contact with equipment operator.
Material handling	X		Lift properly; seek assistance if necessary; do not overfill coolers or boxes. Seek assistance if drums must be moved.
Compressed air equipment	X		Equipment must be equipped with pressure release valves, drains, and gauges.
Confined spaces		X	Integral personnel are not trained or authorized to enter confined spaces under any circumstances. Only qualified and properly trained subcontractors are allowed to enter confined spaces.
Adverse weather	X		Seek shelter during electrical storms; work in adverse weather conditions only with proper training and equipment.
Work in remote areas		X	Use buddy system; carry radio and/or cellular/satellite phone; bring sufficient equipment in case of accident or injury (first aid kit, shelter if appropriate).
Biohazard		X	Avoid contact with potential biological or infectious materials; wear impermeable gloves, disposable coveralls, and respirator, as appropriate; wash hands and face as soon as possible after contact and before eating or drinking. Use disinfectants as necessary..
Plant/animal hazards		X	Know local hazards and take appropriate precautions. Use insect repellent if mosquitoes are persistent.
Uneven terrain/tripping	X		Use caution, wear properly fitting shoes or boots, and keep work area orderly.
Heights		X	Integral personnel are not trained or authorized to work at heights greater than 6 ft above ground surface under any circumstances. Qualified subcontractors must use fall protection (harness, lanyard, or proper railings) when working above 6 ft above ground surface. All fall protection equipment needs to be inspected annually and replaced every 5 years.
Noise	X		Wear ear protection when working around heavy equipment and other noise sources.

Possible Hazard	Yes	No	Proposed Safety Procedure
Excavations		X	Do not enter excavations greater than 3 ft in depth without evaluation by a qualified person and implementation of applicable trenching and excavation safeguards as required by law.
Heat stress	X		Follow heat stress information (Attachment 3). *Note:* potential for heat stress will depend on season and location of the site.
Cold/hypothermia	X		Keep warm and dry; bring changes of clothes; do not work in extreme conditions without proper equipment and training. Follow cold stress information (Attachment 3). *Note:* potential for cold/hypothermia will depend on season and location of the site.
Falling objects	X		Wear hard hats near overhead hazards (i.e., winch).
Drill rigs	X		Avoid all pinch points; do not operate or stand near rig during electrical storms; stay a safe distance (25 ft) from power lines; level drill rig.

Summary of potential physical hazards posed by proposed site activities:

Activity	Potential Hazard
Soil sampling	Uneven terrain/tripping, cold/hypothermia, falling objects, heavy equipment, material handling, adverse weather, heat stress
Drilling oversight	Heavy equipment, high traffic areas, uneven terrain/tripping, drill rigs, falling objects, noise, compressed air equipment, adverse weather, water hazard, heat stress, cold/hypothermia.
Sample handling/mobilization	Material handling

4 PERSONAL PROTECTIVE EQUIPMENT AND SAFETY EQUIPMENT

The following sections address PPE and safety equipment required for completing the field activities.

4.1 PERSONAL PROTECTIVE EQUIPMENT

Based on the hazards identified above in Sections 2 and 3, the following table identifies the PPE required for site activities.

	Level of Protection	
Site Activity	Initial	Contingency[a]
Soil sampling	D	Leave site
Sample handling	D	Leave site
Decon	D	Leave site

Notes:
[a] Based on unexpected change in site conditions

Each level of protection will incorporate the following PPE:

Level D	Long pants and work coveralls, hard hat, latex or nitrile gloves under work gloves, eye protection, and steel-toe boots are required. Hearing protection is required as needed.

4.2 SAFETY EQUIPMENT

The following safety equipment will be onsite during the proposed field activities.

Air Monitoring (check the items required for this project)

- [X] PID
- [ ] LEL/O_2 meter
- [ ] H_2S meter
- [ ] Detector pump and tubes (e.g., benzene)
- [ ] Air sampling pumps
- [ ] Miniram (particle monitors)
- [ ] Radiation meter
- [ ] Other:

First Aid Kit Mandatory, including absorbent compress, adhesive bandages, adhesive tape, antiseptic, burn treatment, medical exam gloves, sterile pad, cardiopulmonary resuscitation (CPR) shield, triangle bandage, scissors—for cutting off the PPE from an injured person (check additional items required for the site)

- [X] Emergency blanket
- [ ] Insect repellent
- [X] Sunscreen
- [ ] Other: ____________________ ____________________

Other (check the items required for this project)

- [X] Eyewash
- [X] Drinking water
- [ ] Stopwatch for monitoring heart rate for heat stress monitoring[2]
- [ ] Thermoscan® thermometer for heat stress monitoring
- [ ] Survival kit[3]
- [ ] Personal flotation device
- [ ] Cool vests
- [ ] Fit test supplies
- [X] Fire extinguisher (drill rigs and onboard larger sampling vessels)
- [ ] Windsock
- [X] Cellular phone
- [ ] Radio sets
- [ ] Global positioning system
- [ ] Other: ________________________ ________________________

[2] Heart rate monitoring requires special training.
[3] Consult the CHSM for guidance for site-specific survival kits.

5 AIR MONITORING

Air monitoring will be conducted when entering previously uncharacterized sites, when working in the vicinity of uncontained chemicals or spills, when opening containers and well casings, and prior to opening confined spaces. (Note: Integral personnel are not trained or authorized to enter confined spaces under any circumstances.) Air monitoring must be conducted to identify potentially hazardous environments and determine reference or background concentrations. Air monitoring can sometimes be used to augment judgment in defining exclusion zones.

Air monitoring may be discontinued at sites where there have been multiple sampling events in the same area/media during similar activities with no action level exceedances. In such instances, the air monitoring results must be well documented and there must be approval from the CHSM prior to discontinuing the air monitoring. Air monitoring must be reinstated for fieldwork in different areas of the site or when sampling new media.

5.1 INTRODUCTION

Personal air monitoring involves collection of samples within the breathing zone of the field personnel to better understand exposures, ensure appropriate levels of PPE, and document compliance with regulation. Such samples may be full shift, for comparison to PELs (or other applicable occupational exposure limits), or short term, for comparison to STELs. Some chemicals in soil or aqueous media may volatilize or become aerosolized and be inhaled by field personnel.

Breathing zone air can be monitored to ensure that the chemicals do not exceed a regulatory or project-specific action level (generally 50 percent of the PEL). Integral commonly uses photoionization detectors (PIDs) and dust meters (e.g., MINIRAM) for monitoring volatile organic compounds and particle constituents, respectively. In practice, the air directly in the field personnel's breathing zone is monitored with the PID or dust meter for 10–15 seconds. The highest reading is recorded in the project logbook and checked against the site-specific action level in the table below. If any of the constituents exceed the action level presented in Section 5.4, immediate action is required (e.g., don respirators, leave site, etc.), as designated.[4]

The following sections provide general guidance on the selection and calibration of PIDs and dust meters, which are typically rented for Integral field projects.

[4] Note that neither the PID nor the MINIRAM can identify chemicals. The PID detects total ionizable volatile organic compounds and the MINIRAM detects total particles of sufficient diameter to be detected.

5.2 PHOTOIONIZATION DETECTORS

It is critical to order a PID with a detector lamp with the appropriate ionization energy to detect constituents of interest at the site. The ionization energy of the lamp must be greater than the ionization potential of the constituents of interest (ionization potentials are listed in the National Institute of Occupational Safety and Health pocket guide to chemicals and are presented in Section 2). Be sure that the meter arrives at least a day prior to the start of the fieldwork so field personnel can familiarize themselves with the operation of the meter and confirm that it was not damaged during shipping. Field personnel must also read the operation manual to become familiar with its operation prior to use in the field. Note that moisture may damage the detector lamp and/or provide erroneous readings, so a moisture filter is used on the probe. Also note that the PID will only accurately quantitate the material used in the calibration process. A response factor is used to measure the sensitivity of the PID to a particular chemical present at the site. Response factors are normally presented in the operation manual for the PID.

The PID must be calibrated daily in accordance with the manufacturer's specifications, which are provided in the operation manual. The calibration typically requires the use of a span gas (generally 100 parts per million isobutylene) and zero gas (generally fresh air). Be sure that all the required calibration equipment/supplies are provided with the PID (e.g., span gas cylinder, regulator, tubing, and Tedlar™ bag). Record calibration data in the field logbook.

5.3 DUST METERS

It is critical that the dust meter is capable of measuring the concentrations of airborne dust that are at or below the site-specific action levels presented below. Be sure that the meter arrives at least a day prior to the start of the fieldwork so field personnel can familiarize themselves with the operation of the meter and confirm that it was not damaged during shipping. Field personnel must also read the operation manual to become familiar with its operation prior to use in the field.

The dust meter must be field checked (i.e., zeroed) daily in accordance with the manufacture's specifications, which are provided in the operation manual. The dust meter field check typically involves zeroing the meter with ambient or filtered air. Be sure that all the required zeroing and operational equipment/supplies are provided with the dust meter. Record field-check data in the field logbook.

5.4 ACTION LEVELS

The following action levels have been established to determine appropriate actions to be taken during site investigation activities:

Instrument	Observation	Action	Comments
PID	<2 ppm over background for 1 minute	Continue working	
PID	≥2 ppm over background sustained for 1 minute	Evacuate site	

Note:

ppm = parts per million

Air monitoring will be conducted at least every 30 minutes, or more frequently if odors are observed by the field crew. Maintain, calibrate and field check all air monitoring equipment in accordance with the manufacturer's recommendations.

6 HEALTH AND SAFETY TRAINING AND MEDICAL MONITORING

The following sections present requirements for health and safety training and medical monitoring.

6.1 HEALTH AND SAFETY TRAINING AND MEDICAL MONITORING

State and federal laws establish training requirements for workers at uncontrolled hazardous waste sites (including areas where accumulations of hazardous waste create a threat to the health and safety of an individual, the environment, or both). Integral and subcontractor personnel are required to complete the following training requirements prior to working at the site.

6.1.1 Training Requirements

Task	No Training	24-hour	40-hour[a]	Supervisor[b]	First Aid/CPR[c]	Medical Monitoring
Integral Field Personnel						
Jordan Junion			X	X	X	X
Stacey Ng			X	X	X	X
Leah Werner			X		X	X

Notes:

[a] Must have current OSHA 8-hour refresher if it has been more than a year since the OSHA 40-hour training.

[b] At least one person onsite must be OSHA HAZWOPER supervisor trained if this is a hazardous waste site.

[c] At least one member of each team of two or more people onsite must be first aid/CPR trained.

[d] Integral subcontractors and consultants may have requirements that are more stringent than those listed above. These are minimum training and monitoring requirements required to work on this site.

6.1.2 Site Safety Meetings

Site safety meetings must be held before beginning new tasks or when new staff enter the site. Site safety meetings should be held at a minimum of once a week and should be held daily on complex or high hazard projects. Tailgate safety meetings must occur every morning during review of the day’s work plan, covering specific hazards that may be encountered. Additional meetings will be held at any time health and safety concerns are raised by any of the personnel. Attendance and topics covered are to be documented in the field logbook.

6.2 MEDICAL MONITORING

OSHA requires medical monitoring for personnel potentially exposed to chemical hazards in concentrations in excess of the PEL for more than 30 days per year and for personnel who must use respiratory protection for more than 30 days per year. Integral requires medical monitoring for all employees potentially exposed to chemical hazards.

Will personnel working at this site be enrolled in a medical monitoring program?	Yes	X	No	

7 EMERGENCY RESPONSE PLAN

The following sections discuss emergency recognition and prevention, emergency response and notification, emergency decontamination, site communications, and use of the buddy system.

7.1 EMERGENCY RECOGNITION AND PREVENTION

It is the responsibility of all personnel to monitor work at the site for potential safety hazards. All personnel are required to immediately report any unsafe conditions to the SSO. The SSO is responsible to immediately take steps to remedy any unsafe conditions observed at the work site.

The following are examples of some emergency situations that could occur during the West 23rd field activities:

- Slips, trips, and falls (on sloped areas, steel stairs, etc.)
- Lacerations from scrap metal (in soil, waste piles, etc.)
- The air monitoring action level is exceeded
- Entrainment of clothes or objects in moving equipment or parts
- Serious injury or illness (e.g., physical injury, heart attack)
- Severe thunderstorm with lightning.

Immediate actions will be taken by the field team under the leadership of the SSO in response to these emergencies.

7.2 EMERGENCY RESPONSE AND NOTIFICATION

If an emergency at the site warrants it, all personnel must immediately evacuate the affected work area and report to the SSO at the predetermined emergency assembly location:

Field vehicle

In case of injury, field personnel should take precautions to protect the victim from further harm and notify local or facility emergency services. In remote areas, it will be necessary to have first aid-trained personnel on the field team. The victim may require decontamination prior to treatment if practicable—requirements will vary based on site conditions.

Emergency medical care will be provided by:

- [X] Local emergency medical provider (i.e., fire department)
- [ ] Facility emergency medical provider
- [ ] First aid-trained field staff (for remote areas only)

Local Resources	Name	Telephone	Notified Prior to Work (Yes/No)?
Fire	FDNY	911	No
Police	NYPD	911	No
Ambulance	FDNY	911	No
Hospital	Bellevue Hospital Center	(212) 562-4141	No
Site phone	Sam McTavey	(914) 643-1057	Yes
Directions to the hospital:	Consult attached maps.		

The SSO must confirm that the hospital listed is still in operation and that it has an emergency room. **It is required that the SSO drive to the hospital so that the directions are practiced and understood prior to initiating fieldwork.**

Corporate Resource	Name	Work Telephone	Cell Phone
Integral CHSM [a]	Matt Behum	Office: (410) 573-1982 x 512	(443) 454-1615
Integral President	Bill Locke	Office: (720) 465-3315	(303) 548-1111
Integral Human Resources Manager	Amy Logan	Office: (720) 465-3312	NA
Incident Intervention	WorkCare	Office: (800) 455-6155	NA
Medical consultant	Dr. Peter Greaney, MD (WorkCare)	Office: (800) 455-6155 ext. 2219	NA

Notes:

[a] If the CHSM cannot be reached, call Eron Dodak [Office: (503)943-3614; Cell: (503)407-2933]. If Eron Dodak cannot be reached call Ian Stupakoff [Office: (360)705-3534, ext. 20; Cell: (360)259-2518]. If Ian Stupakoff cannot be reached, call David Livermore [Office: (503)943-3613; Cell: (503)806-4665].

In case of serious injuries, death, or other emergency, the Integral CHSM must be notified immediately at the phone numbers listed above. The Integral CHSM will notify the project manager and Integral's President. The project manager will notify the client.

7.3 EMERGENCY DECONTAMINATION PROCEDURES

In case of an emergency, if possible, gross decontamination procedures will be promptly implemented. If a life-threatening injury occurs and the injured person cannot undergo decontamination procedures onsite, then the medical facility will be informed that the injured person has not been decontaminated and given information regarding the most probable chemicals of concern.

Decontamination procedures will only be used if practical and if they will not further injure the person or delay treatment. Decontamination procedures should not be implemented if there is not a reasonable possibility that the injured party requires such intervention. The SSO will make the determination whether or not to decontaminate the injured person. The following steps will be followed for decontaminating injured personnel while onsite:

- If it will not injure the person further, cut off PPE using scissors or scrub the gross contamination from the injured person's PPE (e.g., Tyvek® coveralls, work boots) with a Liquinox® or Alconox® solution followed by a rinse with tap or deionized/distilled water
- Remove PPE if feasible without further injuring the person.

7.4 SITE COMMUNICATIONS

Each field team will carry a cell phone or satellite phone that is in good working order. If there is any type of emergency that requires the site to be evacuated (e.g., severe thunderstorm with lightening, chemical release), the field team leader will blow the air horn three times. When the horn sounds, all personnel will meet at the predetermined emergency assembly location, provided the muster point is in safe territory. All other emergency notifications that do not require evacuation (e.g., a person falling overboard) will be conducted using a cell or satellite phone. Emergency phone numbers are listed above in Section 7.2.

7.5 BUDDY SYSTEM

The buddy system will be used at the site at all times. The buddy system is a system of organizing employees into field teams in such a manner that each employee of the field team is designated to be observed by at least one other employee in the field team. The purpose of the buddy system is to provide rapid assistance to employees in the event of an emergency.

8 WORK ZONES

Work zones are defined as follows:

Exclusion zone	Any area of the site where hazardous substances are present, or are reasonably suspected to be present, and pose an exposure hazard to personnel
Contamination reduction zone	Area between the exclusion and support zones that provides a transition between contaminated and clean zones
Support zone	Any area of the site, so designated, that is outside the exclusion and contamination reduction zones

Site control measures in work zones are described below for each type of field activities.

8.1 GEOPROBE® BORINGS AND SOIL SAMPLING

Exclusion zone: An approximate 12 ft radius around the Geoprobe drill rig will be marked with orange traffic safety cones or caution tape. Only properly equipped and trained personnel (i.e., wearing modified D protective clothing) will be allowed in this area.

Contamination reduction zone: After sampling is completed at a station, the exclusion zone will become the contamination reduction zone.

Support zone: All areas outside the exclusion and contaminant reduction zones.

Controls to be used to prevent entry by unauthorized persons: No unauthorized personnel will be allowed into the exclusion/contaminant reduction zones.

9 EQUIPMENT DECONTAMINATION AND PERSONAL HYGIENE

9.1 EQUIPMENT DECONTAMINATION PROCEDURES

After sampling is completed, the exclusion zone will be used as the contaminant reduction zone for decontamination activities, provided there is no contamination remaining after the sampling is completed. To minimize or prevent personal exposure to hazardous materials, all personnel working in the exclusion zone and contaminant reduction zone will comply with the following decontamination procedures:

- All personnel will wash sediment and chemicals from their raingear or Tyvek® coveralls before leaving the exclusion zone.
- All gloves, Tyvek®, rain gear, and rubber boots will be removed prior to entering the field vehicle.

Decontamination equipment required at the site includes the following:

- Buckets or tubs
- Laboratory grade distilled/deionized water
- Site water
- Scrub brushes (long-handled)
- Liquinox® or Alconox® detergent
- Plastic bags
- Foil
- Paper towels
- Garbage bags
- Clean garden sprayer

All non-disposable components of the sampling equipment (e.g., stainless steel spoons and bowls used for sample compositing) that contact the sediment will be decontaminated using the following steps:

1. Rinse with site water/tap water
2. Wash with Alconox® or Liquinox® detergent
3. Rinse with site water/tap water
4. Allow to air dry

5. Wrap up compositing equipment in aluminum foil.

9.2 PERSONAL HYGIENE

The following personal hygiene practices will be used at the site to reduce exposure to chemicals.

- Long hair will be secured away from the face so it does not interfere with any activities.
- All personnel leaving potentially contaminated areas will wash their hands, forearms, and faces in the contaminant reduction zone prior to entering any clean areas or eating areas.
- Personnel leaving potentially contaminated areas will shower (including washing hair) and change to clean clothing as soon as possible after leaving the site.
- No person will eat, drink, or chew gum or tobacco in potentially contaminated areas. Single portion drink containers and drinking of replacement fluids for heat stress control will be permitted only in support areas.
- Smoking is prohibited by Integral personnel and subcontractors in all areas of the site because of the potential for contaminating samples and for the health of the field team.

10 VEHICLE SAFETY, SPILL CONTAINMENT, AND SHIPPING INSTRUCTIONS

10.1 VEHICLE SAFETY

Integral's vehicle safety program requires the following:

- Cell phone usage while driving is not allowed, including the use of hands-free devices. If it not feasible to wait to use the cell phone until arriving at the destination, pull off the road and park in a safe location to use the cell phone. Do not pull to the side of the road to use a cell phone because this significantly increases the risk of a rear-end collision.
- All vehicles are to be operated in a safe manner and in compliance with local traffic regulations and ordinances.
- Drivers are to practice defensive driving and drive in a courteous manner.
- Drivers are required to have a valid driver's license and liability insurance (per local state laws).
- Seat belts are to be worn by the driver and all passengers.
- No persons are allowed to ride in the back of any trucks or vans, unless equipped with seatbelts.
- Vehicles are to be driven in conformance with local speed limits.
- Personnel who are impaired by fatigue, illness, alcohol, illegal or prescription drugs, or who are otherwise physically unfit, are not allowed to drive or work on Integral field sites.
- Personnel are to avoid engaging in other distractions such as changing radio stations while driving.
- Motor vehicle accidents are to be reported to the responsible law enforcement agency, the Integral human resources manager, and the Integral CHSM on the same day of occurrence. Documentation of damage should be photographed.
- Personnel who have experienced work-related vehicle accidents or citations may be required to complete a defensive driving program.

10.2 SPILL CONTAINMENT

No bulk chemicals will be used at the site.

10.3 SHIPPING INFORMATION

Federal laws and international guidelines place restrictions on what materials may be shipped by passenger and cargo aircraft. In addition, 49 CFR regulates labeling, manifesting, and shipment of all packages containing potentially hazardous materials. In the course of this field investigation, the following items will be shipped to and from the site as shown below:

Item	Hazardous Constituent	Quantity	Packaging	How Shipped
Samples	None	24 solid matrix samples	Coolers	Lab Courier
Preservatives (HCl)	None		Original package	Lab Courier

A 24-hour emergency response number (on any shipping documents such as a Uniform Hazardous Waste Manifest, Shipper's Declaration of Dangerous Goods, etc.) is required for shipments of all dangerous or hazardous goods. Integral does not have a 24-hour emergency contact number for dangerous or hazardous goods shipment. No dangerous or hazardous goods may be shipped by Integral until an account is set up with a 24-hour emergency response service such as CHEM-TEL (1-813-248-0573). If any hazardous or dangerous goods need to be shipped for a project, they must be shipped directly to the site by the supplier. Any hazardous or dangerous goods that are not used in the course of the field effort must remain at the site.

The samples will be prepared and labeled for shipment in accordance with the sampling and analysis plan developed for the site.

Air shipment of equipment with lithium batteries is required to note the presence of these batteries. Warning labels are available from the equipment rental agency and can be copied.

11 TASK-SPECIFIC SAFETY PROCEDURE SUMMARY

11.1 GEOPROBE® BORINGS

Notify the New York one-call utility locating service 48 hours prior to initiating field work (811) and obtain a utility locating ticket. Confirm the absence of underground and overhead utilities before starting drilling activities. Be sure that all utilities are marked or have a designation that they are not present in the area. The New York one-call utility locating service should have marked all utilities present in the area. Take a few minutes to examine the locations of fire hydrants, gas meters, etc. to make sure that the utility locating marks make sense. If there is any doubt as to the location of underground utilities, call the public or a private utility locator. Finally, check for overhead utilities and obstructions such as trees.

Integral personnel will wear a hard hat, safety glasses, traffic safety vests, and steel-toe boots at all times. The exclusion zone around the drill rig will be marked with orange traffic cones or caution tape and personnel will police the area to make sure no unauthorized personnel enter the exclusion zone. Avoid getting soil and sample preservatives (nitric and hydrochloric acid) on clothes or skin. Exercise care when lifting, assembling, and decontaminating equipment. Always stay clear of the Geoprobe® rig and be aware of its location. Keep in eye contact with the driller. Stay away from pinch points. Know the location of the “kill switch” on the rig. Keep equipment organized.

ATTACHMENT 1

SITE MAP AND
HOSPITAL ROUTE

YOUR TRIP TO:

462 1st Ave

11 MIN | 2.0 MI

Trip time based on traffic conditions as of 12:51 PM on August 18, 2016. Current Traffic: Heavy

Start of next leg of route

1. Start out going **northwest** on W 22nd St toward 11th Ave.

Then 0.03 miles — 0.03 total miles

2. Turn **right** onto 11th Ave.

Then 0.05 miles — 0.08 total miles

3. Take the 1st **right** onto W 23rd St.

If you are on W 24th St and reach 12th Ave you've gone about 0.1 miles too far.

Then 0.17 miles — 0.24 total miles

4. Turn **left** onto 10th Ave.

The Half King is on the left.

If you reach 9th Ave you've gone about 0.1 miles too far.

Then 0.15 miles — 0.40 total miles

5. Turn **right** onto W 26th St.

W 26th St is just past W 25th St.

If you are on 10th Ave and reach W 27th St you've gone a little too far.

Then 1.54 miles — 1.93 total miles

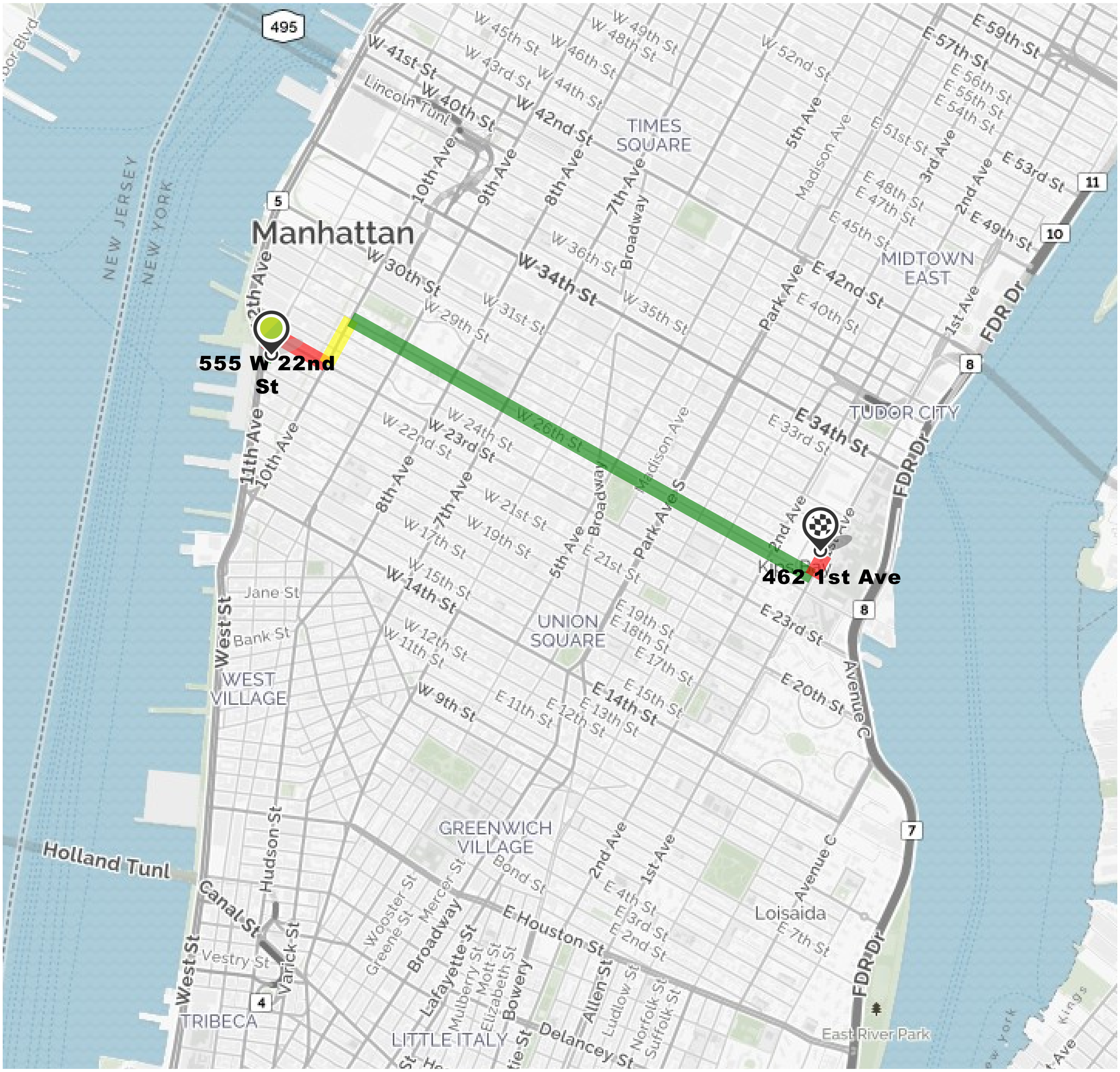
6. Turn **left** onto 1st Ave.

1st Ave is just past Mount Carmel Pl.

Then 0.07 miles — 2.00 total miles

7. 462 1st Ave, New York, NY 10016-9103, 462 1ST AVE.

If you reach E 28th St you've gone a little too far.



555 W 22nd St
462 1st Ave
Manhattan
TIMES SQUARE
MIDTOWN EAST
TUDOR CITY
UNION SQUARE
WEST VILLAGE
GREENWICH VILLAGE
Loisaida
TRIBECA
LITTLE ITALY
East River Park
NEW JERSEY
NEW YORK
Holland Tunl
Lincoln Tunl
W 34th St
E 34th St
W 26th St
W 23rd St
E 23rd St
W 14th St
E 14th St
E 42nd St
E Houston St
Delancey St
Canal St
FDR Dr
West St
11th Ave
10th Ave
9th Ave
8th Ave
7th Ave
5th Ave
Park Ave
Park Ave S
Madison Ave
Broadway
2nd Ave
1st Ave
Avenue C
Hudson St
Varick St
Bowery
Lafayette St
495

ATTACHMENT 2

REGULATORY NOTICES

You Have a Right to a Safe and Healthful Workplace.

IT'S THE LAW!

- You have the right to notify your employer or OSHA about workplace hazards. You may ask OSHA to keep your name confidential.
- You have the right to request an OSHA inspection if you believe that there are unsafe and unhealthful conditions in your workplace. You or your representative may participate in the inspection.
- You can file a complaint with OSHA within 30 days of discrimination by your employer for making safety and health complaints or for exercising your rights under the *OSH Act.*
- You have a right to see OSHA citations issued to your employer. Your employer must post the citations at or near the place of the alleged violation.
- Your employer must correct workplace hazards by the date indicated on the citation and must certify that these hazards have been reduced or eliminated.
- You have the right to copies of your medical records or records of your exposure to toxic and harmful substances or conditions.
- Your employer must post this notice in your workplace.

The *Occupational Safety and Health Act of 1970 (OSH Act),* P.L. 91-596, assures safe and healthful working conditions for working men and women throughout the Nation. The Occupational Safety and Health Administration, in the U.S. Department of Labor, has the primary responsibility for administering the *OSH Act.* The rights listed here may vary depending on the particular circumstances. To file a complaint, report an emergency, or seek OSHA advice, assistance, or products, call 1-800-321-OSHA or your nearest OSHA office: • Atlanta (404) 562-2300 • Boston (617) 565-9860 • Chicago (312) 353-2220 • Dallas (214) 767-4731 • Denver (303) 844-1600 • Kansas City (816) 426-5861 • New York (212) 337-2378 • Philadelphia (215) 861-4900 • San Francisco (415) 975-4310 • Seattle (206) 553-5930. Teletypewriter (TTY) number is 1-877-889-5627. To file a complaint online or obtain more information on OSHA federal and state programs, visit OSHA's website at **www.osha.gov**. If your workplace is in a state operating under an OSHA-approved plan, your employer must post the required state equivalent of this poster.

1-800-321-OSHA

www.osha.gov

U.S. Department of Labor • Occupational Safety and Health Administration • OSHA 3165

Attachment 3

Safety Procedures

FROSTBITE

What happens to the body:

Freezing in deep layers of skin and tissue; pale, waxy-white skin color; skin becomes hard and numb; usually affects fingers, hands, toes, feet, ears, and nose.

What to do: (land temperatures)

- Move the person to a warm, dry area. Don't leave the person alone.
- Remove wet or tight clothing that may cut off blood flow to the affected area.
- **Do not** rub the affected area because rubbing damaged the skin and tissue.
- Gently place the affected area in a warm water bath (105°) and monitor the water temperature to **slowly** warm the tissue. Don't pour warm water directly on the affected area because it will warm the tissue too fast, causing tissue damage. Warming takes 25-40 minutes.
- After the affected area has been warmed, it may become puffy and blister. The affected area may have a burning feeling or numbness. When normal feeling, movement, and skin color have returned, the affected area should be dried and wrapped to keep it warm. **Note:** If there is a chance the affected area may get cold again, do not warm the skin. If the skin is warmed and then becomes cold again, it will cause severe tissue damage.
- Seek medical attention as soon as possible.

How to Protect Workers

- Recognize the environmental and workplace conditions that lead to potential cold-induced illnesses and injuries.
- Learn the signs and symptoms of cold-induced illnesses/injuries and what to do to help the worker.
- Train workers about cold-induced illnesses and injuries.
- Select proper clothing for cold, wet, and windy conditions. Layer clothing to adjust to changing environmental temperatures. Wear a hat and gloves, in addition to underwear that will keep water away from the skin (polypropylene.)
- Take frequent short breaks in warm, dry shelters to allow the body to warm up.
- Perform work during the warmest part of the day.
- Avoid exhaustion or fatigue because energy is needed to keep muscles warm.
- Use the buddy system (work in pairs.)
- Drink warm, sweet beverages (sugar water, sports-type drinks.) **Avoid drinks with caffeine** (coffee, tea, or hot chocolate) **or alcohol**.
- Eat warm, high-calorie foods like hot pasta dishes.

Workers are at increased risk when…

- They have predisposing health conditions such as cardiovascular disease, diabetes, and hypertension.
- They take certain medications. Check with your doctor, nurse, or pharmacy and ask if medicines you take affect you while working in cold environments.
- They are in poor physical condition, have a poor diet, or are older.

HYPOTHERMIA - (Medical Emergency)

What happens to the body:

Normal body temperature (98.6°F/37°C) drops to or below 95°F/35°C; fatigue or drowsiness; uncontrolled shivering; cool, bluish skin; slurred speech; clumsy movements; irritable, irrational, or confused behavior.

What to do: (land temperatures)

- Call for emergency help (i.e., ambulance or 911).
- Move the person to a warm, dry area. Don't leave the person alone.
- Remove wet clothing and replace with warm, dry clothing or wrap the person in blankets.
- Have the person drink warm, sweet drinks (sugar water or sports-type drinks) if he is alert. **Avoid drinks with caffeine** (coffee, tea, or hot chocolate) **or alcohol**.
- Have the person move his arms and legs to create muscle heat. If he is unable to do this, place warm bottles or hot packs in the armpits, groin, neck, and head areas. **Do not** rub the person's body or place him in a warm water bath. This may stop his heart.

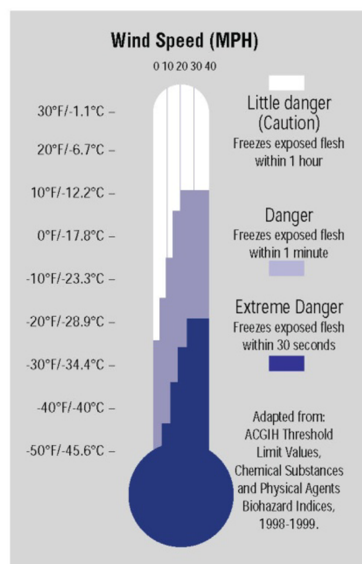
What to do: (water temperatures)

- Call for emergency help (i.e., ambulance or 911). Body heat is lost up to 25 times faster in water.
- **Do not** remove any clothing. Button, buckle, zip, and tighten any collars, cuffs, shoes, and hoods because the layer of trapped water closest to the body provides a layer of insulation that slows the loss of heat. Keep the head out of the water and put on a hat or hood.
- Get out of the water as quickly as possible or climb on anything floating. **Do not** attempt to swim unless a floating object or another person can be reached because swimming or other physical activity uses body heat and reduces survival time by about 50 percent.
- If getting out of the water is not possible, wait quietly and conserve body heat by folding arms across the chest, keeping thighs together, bending knees, and crossing ankles. If another person is in the water, huddle together with chests held closely.

THE COLD STRESS EQUATION

LOW TEMPERATURE + WIND SPEED + WETNESS = INJURIES & ILLNESS

When the body is unable to warm itself, serious cold-related illnesses and injuries may occur, and permanent tissue damage and death may result. **Hypothermia** can occur when *land temperatures* are **above** freezing or *water temperatures* are below 98.6°F/37°C. Cold-related illnesses can slowly overcome a person who has been chilled by low temperatures, brisk winds, or wet clothing.



Oregon Occupational Safety & Health Division
440-3336E-S (9/03)

HEAT EXHAUSTION

What happens to the body:

Headaches, dizziness, or light-headedness, weakness, mood changes, irritability or confusion, feeling sick to your stomach, vomiting, fainting, decreased and dark-colored urine, and pale, clammy skin.

What should be done:

- Move the person to a cool shaded area. Don't leave the person alone. If the person is dizzy or light-headed, lay him on his back and raise his legs about 6-8 inches. If the person is sick to his stomach, lay him on his side.
- Loosen and remove heavy clothing.
- Have the person drink some cool water (a small cup every 15 minutes) if he is not feeling sick to his stomach.
- Try to cool the person by fanning him. Cool the skin with a cool spray mist of water or wet cloth.
- If the person does not feel better in a few minutes call for emergency help (ambulance or call 911.)

(If heat exhaustion is not treated, the illness may advance to heat stroke.)

How to Protect Workers

- Learn the signs and symptoms of heat-induced illnesses and what to do to help the worker.
- Train workers about heat-induced illnesses.
- Perform the heaviest work during the coolest part of the day.
- Slowly build up tolerance to the heat and the work activity (usually takes up to 2 weeks.)
- Use the buddy system (work in pairs.)
- Drink plenty of cool water (one small cup every 15-20 minutes.)
- Wear light, loose-fitting, breathable (like cotton) clothing.
- Take frequent short breaks in cool, shaded areas (allow your body to cool down.)
- Avoid eating large meals before working in hot environments.
- Avoid caffeine and alcoholic beverages (these beverages make the body lose water and increase the risk of heat illnesses.)

Workers are at increased risk when…

- They take certain medications. Check with your doctor, nurse, or pharmacy to see if medicines you take affect you when working in hot environments.
- They have had a heat-induced illness in the past.
- They wear personal protective equipment.

HEAT STROKE - A Medical Emergency

What happens to the body:

Dry, pale skin (no sweating); hot red skin (looks like a sunburn); mood changes; irritability, confusion, and not making any sense; seizures or fits, and collapse (will not respond).

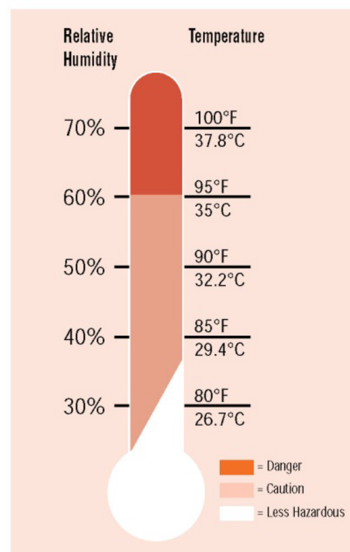
What should be done:

- Call for emergency help (i.e., ambulance or 911.)
- Move the person to a cool, shaded area. Don't leave the person alone. Lay him on his back and if the person is having seizures, remove objects close to him so he won't hit them. If the person is sick to his stomach, lay him on his side.
- Remove heavy and outer clothing.
- Have the person drink some cool water (a small cup every 15 minutes) if he is alert enough to drink anything and not feeling sick to his stomach.
- Try to cool the person by fanning him or her. Cool the skin with a cool spray mist of water, wet cloth, or wet sheet.
- If ice is available, place ice packs in armpits and groin area.

THE HEAT EQUATION

HIGH TEMPERATURE + HIGH HUMIDITY + PHYSICAL WORK = HEAT ILLNESS

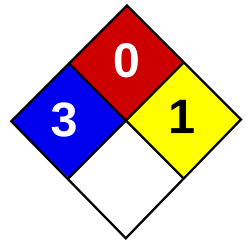
When the body is unable to cool itself through sweating, **serious** heat illnesses may occur. The most severe heat-induced illnesses are **heat exhaustion** and **heat stroke**. If actions are not taken to treat heat exhaustion, the illness could progress to heat stroke and **death**.



Oregon Occupational Safety & Health Division
440-3333E-S(9/03)

ATTACHMENT 4

MATERIAL SAFETY DATA SHEETS



Health	3
Fire	0
Reactivity	1
Personal Protection	

Material Safety Data Sheet
Hydrochloric acid MSDS

Section 1: Chemical Product and Company Identification

Product Name: Hydrochloric acid

Catalog Codes: SLH1462, SLH3154

CAS#: Mixture.

RTECS: MW4025000

TSCA: TSCA 8(b) inventory: Hydrochloric acid

CI#: Not applicable.

Synonym: Hydrochloric Acid; Muriatic Acid

Chemical Name: Not applicable.

Chemical Formula: Not applicable.

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Hydrogen chloride	7647-01-0	20-38
Water	7732-18-5	62-80

Toxicological Data on Ingredients: Hydrogen chloride: GAS (LC50): Acute: 4701 ppm 0.5 hours [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, . Slightly hazardous in case of inhalation (lung sensitizer). Non-corrosive for lungs. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (sensitizer). CARCINOGENIC EFFECTS: Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid]. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth. Repeated or prolonged exposure to the substance can produce target

organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: of metals

Explosion Hazards in Presence of Various Substances: Non-explosive in presence of open flames and sparks, of shocks.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards:
Non combustible. Calcium carbide reacts with hydrogen chloride gas with incandescence. Uranium phosphide reacts with hydrochloric acid to release spontaneously flammable phosphine. Rubidium acetylene carbides burns with slightly warm hydrochloric acid. Lithium silicide in contact with hydrogen chloride becomes incandescent. When dilute hydrochloric acid is used, gas spontaneously flammable in air is evolved. Magnesium boride treated with concentrated hydrochloric acid produces spontaneously flammble gas. Cesium acetylene carbide burns hydrogen chloride gas. Cesium carbide ignites in contact with hydrochloric acid unless acid is dilute. Reacts with most metals to produce flammable Hydrodgen gas.

Special Remarks on Explosion Hazards:

Hydrogen chloride in contact with the following can cause an explosion, ignition on contact, or other violent/vigorous reaction: Acetic anhydride AgClO + CCl4 Alcohols + hydrogen cyanide, Aluminum Aluminum-titanium alloys (with HCl vapor), 2-Amino ethanol, Ammonium hydroxide, Calcium carbide Ca3P2 Chlorine + dinitroanilines (evolves gas), Chlorosulfonic acid Cesium carbide Cesium acetylene carbide, 1,1-Difluoroethylene Ethylene diamine Ethylene imine, Fluorine, HClO4 Hexalithium disilicide H2SO4 Metal acetylides or carbides, Magnesium boride, Mercuric sulfate, Oleum, Potassium permanganate, beta-Propiolactone Propylene oxide Rubidium carbide, Rubidium, acetylene carbide Sodium (with aqueous HCl), Sodium hydroxide Sodium tetraselenium, Sulfonic acid, Tetraselenium tetranitride, U3P4 , Vinyl acetate. Silver perchlorate with carbon tetrachloride in the presence of hydrochloric acid produces trichloromethyl perchlorate which detonates at 40 deg. C.

Section 6: Accidental Release Measures

Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

Large Spill:
Corrosive liquid. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, organic materials, metals, alkalis, moisture. May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
CEIL: 5 (ppm) from OSHA (PEL) [United States] CEIL: 7 (mg/m3) from OSHA (PEL) [United States] CEIL: 5 from NIOSH CEIL: 7 (mg/m3) from NIOSH TWA: 1 STEL: 5 (ppm) [United Kingdom (UK)] TWA: 2 STEL: 8 (mg/m3) [United Kingdom (UK)]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Pungent. Irritating (Strong.)

Taste: Not available.

Molecular Weight: Not applicable.

Color: Colorless to light yellow.

pH (1% soln/water): Acidic.

Boiling Point:
108.58 C @ 760 mm Hg (for 20.22% HCl in water) 83 C @ 760 mm Hg (for 31% HCl in water) 50.5 C (for 37% HCl in water)

Melting Point:
-62.25°C (-80°F) (20.69% HCl in water) -46.2 C (31.24% HCl in water) -25.4 C (39.17% HCl in water)

Critical Temperature: Not available.

Specific Gravity:
1.1- 1.19 (Water = 1) 1.10 (20%and 22% HCl solutions) 1.12 (24% HCl solution) 1.15 (29.57% HCl solution) 1.16 (32% HCl solution) 1.19 (37% and 38%HCl solutions)

Vapor Pressure: 16 kPa (@ 20°C) average

Vapor Density: 1.267 (Air = 1)

Volatility: Not available.

Odor Threshold: 0.25 to 10 ppm

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether.

Solubility: Soluble in cold water, hot water, diethyl ether.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, water

Incompatibility with various substances:
Highly reactive with metals. Reactive with oxidizing agents, organic materials, alkalis, water.

Corrosivity:
Extremely corrosive in presence of aluminum, of copper, of stainless steel(304), of stainless steel(316). Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Reacts with water especially when water is added to the product. Absorption of gaseous hydrogen chloride on mercuric sulfate becomes violent @ 125 deg. C. Sodium reacts very violently with gaseous hydrogen chloride. Calcium phosphide and hydrochloric acid undergo very energetic reaction. It reacts with oxidizers releasing chlorine gas. Incompatible with, alkali metals, carbides, borides, metal oxides, vinyl acetate, acetylides, sulphides, phosphides, cyanides, carbonates. Reacts with most metals to produce flammable Hydrogen gas. Reacts violently (moderate reaction with heat of evolution) with water especially when water is added to the product. Isolate hydrogen chloride from heat, direct sunlight, alkalies (reacts vigorously), organic materials, and oxidizers (especially nitric acid and chlorates), amines, metals, copper and alloys (e.g. brass), hydroxides, zinc (galvanized materials), lithium silicide (incandescence), sulfuric acid(increase in temperature and pressure) Hydrogen chloride gas is emitted when this product is in contact with sulfuric acid. Adsorption of Hydrochloric Acid onto silicon dioxide results in exothmeric reaction. Hydrogen chloride causes aldehydes and epoxides to violently polymerize. Hydrogen chloride or Hydrochloric Acid in contact with the folloiwng can cause explosion or ignition on contact or

Special Remarks on Corrosivity:

Highly corrosive. Incompatible with copper and copper alloys. It attacks nearly all metals (mercury, gold, platinium, tantalum, silver, and certain alloys are exceptions). It is one of the most corrosive of the nonoxidizing acids in contact with copper alloys. No corrosivity data on zinc, steel. Severe Corrosive effect on brass and bronze

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation.

Toxicity to Animals:
Acute oral toxicity (LD50): 900 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 1108 ppm, 1 hours [Mouse]. Acute toxicity of the vapor (LC50): 3124 ppm, 1 hours [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid]. May cause damage to the following organs: kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth.

Other Toxic Effects on Humans:
Very hazardous in case of skin contact (corrosive, irritant, permeator), of ingestion, . Hazardous in case of eye contact (corrosive), of inhalation (lung corrosive).

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Doses (LDL/LCL) LDL [Man] -Route: Oral; 2857 ug/kg LCL [Human] - Route: Inhalation; Dose: 1300 ppm/30M LCL [Rabbit] - Route: Inhalation; Dose: 4413 ppm/30M

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects (fetoxicity). May affect genetic material.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Corrosive. Causes severe skin irritation and burns. Eyes: Corrosive. Causes severe eye irritation/conjuntivitis, burns, corneal necrosis. Inhalation: May be fatal if inhaled. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract. Inhalation of hydrochloric acid fumes produces nose, throat, and larryngeal burning, and irritation, pain and inflammation, coughing, sneezing, choking sensation, hoarseness, laryngeal spasms, upper respiratory tract edema, chest pains, as well has headache, and palpitations. Inhalation of high concentrations can result in corrosive burns, necrosis of bronchial epithelium, constriction of the larynx and bronchi, nasospetal perforation, glottal closure, occur, particularly if exposure is prolonged. May affect the liver. Ingestion: May be fatal if swallowed. Causes irritation and burning, ulceration, or perforation of the gastrointestinal tract and resultant peritonitis, gastric hemorrhage and infection. Can also cause nausea, vomitting (with "coffee ground" emesis), diarrhea, thirst, difficulty swallowing, salivation, chills, fever, uneasiness, shock, strictures and stenosis (esophogeal, gastric, pyloric). May affect behavior (excitement), the cardiovascular system (weak rapid pulse, tachycardia), respiration (shallow respiration), and urinary system (kidneys- renal failure, nephritis). Acute exposure via inhalation or ingestion can also cause erosion of tooth enamel. Chronic Potential Health Effects: dyspnea, bronchitis. Chemical pneumonitis and pulmonary edema can also

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Hydrochloric acid, solution UNNA: 1789 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Hydrochloric acid Illinois toxic substances disclosure to employee act: Hydrochloric acid Illinois chemical safety act: Hydrochloric acid New York release reporting list: Hydrochloric acid Rhode Island RTK hazardous substances: Hydrochloric acid Pennsylvania RTK: Hydrochloric acid Minnesota: Hydrochloric acid Massachusetts RTK: Hydrochloric acid Massachusetts spill list: Hydrochloric acid New Jersey: Hydrochloric acid New Jersey spill list: Hydrochloric acid Louisiana RTK reporting list: Hydrochloric acid Louisiana spill reporting: Hydrochloric acid California Director's List of Hazardous Substances: Hydrochloric acid TSCA 8(b) inventory: Hydrochloric acid TSCA 4(a) proposed test rules: Hydrochloric acid SARA 302/304/311/312 extremely hazardous substances: Hydrochloric acid SARA 313 toxic chemical notification and release reporting: Hydrochloric acid CERCLA: Hazardous substances.: Hydrochloric acid: 5000 lbs. (2268 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

DSCL (EEC):
R34- Causes burns. R37- Irritating to respiratory system. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 1

Personal Protection:

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 0

Reactivity: 1

Specific hazard:

Protective Equipment:
Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

Section 16: Other Information

References:
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du règlement sur le transport des marchandises dangeureuses au canada. Centre de conformité internatinal Ltée. 1986.

Other Special Considerations: Not available.

Created: 10/09/2005 05:45 PM

Last Updated: 05/21/2013 12:00 PM

Isobutylene

Safety Data Sheet P-4614

according to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1979 Revision date: 02/27/2015 Supersedes: 12/01/2009

SECTION: 1. Product and company identification

1.1. Product identifier

Product form	:	Substance
Name	:	Isobutylene
CAS No	:	115-11-7
Formula	:	C4H8 / CH2=C(CH3)2
Other means of identification	:	Isobutene

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture	:	Industrial use. Use as directed.

1.3. Details of the supplier of the safety data sheet

Praxair, Inc.
39 Old Ridgebury Road
Danbury, CT 06810-5113 - USA
T 1-800-772-9247 (1-800-PRAXAIR) - F 1-716-879-2146
www.praxair.com

1.4. Emergency telephone number

Emergency number	:	Onsite Emergency: 1-800-645-4633 CHEMTREC, 24hr/day 7days/week — Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887 (collect calls accepted, Contract 17729)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (GHS-US)

Flam. Gas 1 H220
Liquefied gas H280

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :

GHS02 GHS04

Signal word (GHS-US)	:	DANGER
Hazard statements (GHS-US)	:	H220 - EXTREMELY FLAMMABLE GAS H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED OSHA-H01 - MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION. CGA-HG04 - MAY FORM EXPLOSIVE MIXTURES WITH AIR CGA-HG01 - MAY CAUSE FROSTBITE.
Precautionary statements (GHS-US)	:	P202 - Do not handle until all safety precautions have been read and understood P210 - Keep away from Heat, Open flames, Sparks, Hot surfaces. - No smoking P271+P403 - Use and store only outdoors or in a well-ventilated place. P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely P381 - Eliminate all ignition sources if safe to do so CGA-PG05 - Use a back flow preventive device in the piping. CGA-PG12 - Do not open valve until connected to equipment prepared for use. CGA-PG06 - Close valve after each use and when empty. CGA-PG11 - Never put cylinders into unventilated areas of passenger vehicles. CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F).

2.3. Other hazards

Other hazards not contributing to the classification : None.

2.4. Unknown acute toxicity (GHS-US)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substance

Name	Product identifier	%
Isobutylene (Main constituent)	(CAS No) 115-11-7	100

3.2. Mixture

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Immediately remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, qualified personnel may give oxygen. Call a physician.

First-aid measures after skin contact : For exposure to liquid, immediately warm frostbite area with warm water not to exceed 105°F (41°C). Water temperature should be tolerable to normal skin. Maintain skin warming for at least 15 minutes or until normal coloring and sensation have returned to the affected area. In case of massive exposure, remove clothing while showering with warm water. Seek medical evaluation and treatment as soon as possible.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

No additional information available

4.3. Indication of any immediate medical attention and special treatment needed

None.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Carbon dioxide, Dry chemical, Water spray or fog.

5.2. Special hazards arising from the substance or mixture

Fire hazard : EXTREMELY FLAMMABLE GAS. If venting or leaking gas catches fire, do not extinguish flames. Flammable vapors may spread from leak, creating an explosive reignition hazard. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering an area, especially a confined area, check the atmosphere with an appropriate device.

Explosion hazard : EXTREMELY FLAMMABLE GAS. Forms explosive mixtures with air and oxidizing agents.

Reactivity : No reactivity hazard other than the effects described in sub-sections below.

5.3. Advice for firefighters

Firefighting instructions : **DANGER: FLAMMABLE LIQUID AND VAPOR.** Evacuate all personnel from danger area. Use self-contained breathing apparatus. Immediately cool surrounding containers with water spray from maximum distance, taking care not to extinguish flames. Avoid spreading burning liquid with water. Remove ignition sources if safe to do so. If flames are accidentally extinguished, explosive reignition may occur. Reduce vapors with water spray or fog. Stop flow of liquid if safe to do so, while continuing cooling water spray. Remove all containers from area of fire if safe to do so. Allow fire to burn out. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1919 Subpart L - Fire Protection.

Special protective equipment for fire fighters : Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.

Other information : Containers are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.).

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : **DANGER: Flammable liquid and gas under pressure.** Forms explosive mixtures with air. Immediately evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Remove all sources of ignition if safe to do so. Reduce vapors with fog or fine water spray, taking care not to spread liquid with water. Shut off flow if safe to do so. Ventilate area or move container to a well-ventilated area. Flammable vapors may spread from leak and could explode if reignited by sparks or flames. Explosive atmospheres may linger. Before entering area, especially confined areas, check atmosphere with an appropriate device.

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Try to stop release. Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

6.3. Methods and material for containment and cleaning up

No additional information available

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only non-sparking tools. Use only explosion-proof equipment.

Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store only where temperature will not exceed 125°F (52°C). Post “No Smoking or Open Flames” signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g., NFPA 30, NFPA 55, NFPA 70, and/or NFPA 221 in the U.S.) or according to requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. For other precautions in using this product, see section 16.

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Isobutylene (115-11-7)		
ACGIH	ACGIH TLV-TWA (ppm)	250 ppm

8.2. Exposure controls

Appropriate engineering controls : Use an explosion-proof local exhaust system. Local exhaust and general ventilation must be adequate to meet exposure standards. MECHANICAL (GENERAL): Inadequate - Use only in a closed system. Use explosion proof equipment and lighting.

Eye protection : Wear safety glasses when handling cylinders; vapor-proof goggles and a face shield during cylinder changeout or whenever contact with product is possible. Select eye protection in accordance with OSHA 29 CFR 1910.133.

Skin and body protection : Wear metatarsal shoes and work gloves for cylinder handling, and protective clothing where needed. Wear neoprene gloves during cylinder changeout or wherever contact with product is possible. Select per OSHA 29 CFR 1910.132, 1910.136, and 1910.138.

Respiratory protection : When workplace conditions warrant respirator use, follow a respiratory protection program that meets OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable). Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure (e.g., an organic vapor cartridge). For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

Thermal hazard protection : Wear cold insulating gloves when transfilling or breaking transfer connections.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Gas

Molecular mass : 56 g/mol

Color : Colorless.

Odor : Sweetish.

Odor threshold : Odor threshold is subjective and inadequate to warn for overexposure.

pH : Not applicable.

Relative evaporation rate (butyl acetate=1) : No data available

Relative evaporation rate (ether=1) : Not applicable.

Melting point : -140.3 °C

Freezing point : No data available

Boiling point	:	-6.9 °C
Flash point	:	-80 °C (closed cup)
Critical temperature	:	144 °C
Auto-ignition temperature	:	465 °C
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	1.8 - 8.8 vol %
Vapor pressure	:	260 kPa
Critical pressure	:	4000 kPa
Relative vapor density at 20 °C	:	No data available
Relative density	:	0.63
Specific gravity / density	:	0.599 g/cm³ (at 20 °C)
Relative gas density	:	2
Solubility	:	Water: 388 mg/l
Log Pow	:	2.35
Log Kow	:	Not applicable.
Viscosity, kinematic	:	Not applicable.
Viscosity, dynamic	:	Not applicable.
Explosive properties	:	Not applicable.
Oxidizing properties	:	None.
Explosive limits	:	No data available

9.2. Other information

Gas group	:	Liquefied gas
Additional information	:	Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level.

SECTION 10: Stability and reactivity

10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

May occur.

10.4. Conditions to avoid

High temperature. Catalyst.

10.5. Incompatible materials

Halogens. Oxidizing agents. Acids.

10.6. Hazardous decomposition products

Thermal decomposition may produce : Carbon monoxide. Carbon dioxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Isobutylene (\f)115-11-7	
LC50 inhalation rat (mg/l)	620 mg/l/4h
LC50 inhalation rat (ppm)	≥ 10000
ATE US (gases)	10000.000 ppmV/4h
ATE US (vapors)	620.000 mg/l/4h
ATE US (dust, mist)	620.000 mg/l/4h

Skin corrosion/irritation : Not classified

pH: Not applicable.

Serious eye damage/irritation : Not classified

pH: Not applicable.

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Isobutylene (115-11-7)	
National Toxicology Program (NTP) Status	1 - Evidence of Carcinogenicity

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No known ecological damage caused by this product.

12.2. Persistence and degradability

Isobutylene (115-11-7)	
Persistence and degradability	The substance is biodegradable. Unlikely to persist.

12.3. Bioaccumulative potential

Isobutylene (115-11-7)	
Log Pow	2.35
Log Kow	Not applicable.
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.

12.4. Mobility in soil

Isobutylene (115-11-7)	
Mobility in soil	No data available.
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.

12.5. Other adverse effects

Effect on ozone layer : None.

Effect on the global warming : No known effects from this product.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations : Do not attempt to dispose of residual or unused quantities. Return container to supplier.

SECTION 14: Transport information

In accordance with DOT

Transport document description : UN1055 Isobutylene, 2.1

UN-No.(DOT) : UN1055

Proper Shipping Name (DOT) : Isobutylene

Department of Transportation (DOT) Hazard Classes : 2.1 - Class 2.1 - Flammable gas 49 CFR 173.115

Hazard labels (DOT) : 2.1 - Flammable gas

DOT Special Provisions (49 CFR 172.102) : 19 - For domestic transportation only, the identification number UN1075 may be used in place of the identification number specified in column (4) of the 172.101 table. The identification number used must be consistent on package markings, shipping papers and emergency response information.
T50 - When portable tank instruction T50 is referenced in Column (7) of the 172.101 Table, the applicable liquefied compressed gases are authorized to be transported in portable tanks in accordance with the requirements of 173.313 of this subchapter.

Additional information

Emergency Response Guide (ERG) Number : 115 (UN1055)

Other information : No supplementary information available.

Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

Transport by sea

UN-No. (IMDG) : 1055
Proper Shipping Name (IMDG) : ISOBUTYLENE
Class (IMDG) : 2 - Gases
MFAG-No : 115

Air transport

UN-No.(IATA) : 1055
Proper Shipping Name (IATA) : Isobutylene
Class (IATA) : 2
Civil Aeronautics Law : Gases under pressure/Gases flammable under pressure

SECTION 15: Regulatory information

15.1. US Federal regulations

Isobutylene (115-11-7)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard Delayed (chronic) health hazard Sudden release of pressure hazard Fire hazard

15.2. International regulations

CANADA

Isobutylene (115-11-7)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

Isobutylene (115-11-7)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

15.2.2. National regulations

Isobutylene (115-11-7)
Listed on the AICS (Australian Inventory of Chemical Substances) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory Listed on the Korean ECL (Existing Chemicals List) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

15.3. US State regulations

Isobutylene(115-11-7)	
U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Revision date : 2/27/2015 12:00:00 AM

Other information : When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product.

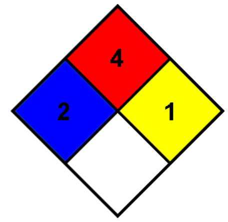
Praxair asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Praxair, Inc., it is the user's obligation to determine the conditions of safe use of the product.

Praxair SDSs are furnished on sale or delivery by Praxair or the independent distributors and suppliers who package and sell our products. To obtain current SDSs for these products, contact your Praxair sales representative, local distributor, or supplier, or download from www.praxair.com. If you have questions regarding Praxair SDSs, would like the document number and date of the latest SDS, or would like the names of the Praxair suppliers in your area, phone or write the Praxair Call Center (Phone: 1-800-PRAXAIR/1-800-772-9247; Address: Praxair Call Center, Praxair, Inc., P.O. Box 44, Tonawanda, NY 14151-0044).

PRAXAIR and the Flowing Airstream design are trademarks or registered trademarks of Praxair Technology, Inc. in the United States and/or other countries.

NFPA health hazard	:	2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.
NFPA fire hazard	:	4 - Will rapidly or completely vaporize at normal pressure and temperature, or is readily dispersed in air and will burn readily.
NFPA reactivity	:	1 - Normally stable, but can become unstable at elevated temperatures and pressures or may react with water with some release of energy, but not violently.



HMIS III Rating

Health	:	1 Slight Hazard - Irritation or minor reversible injury possible
Flammability	:	4 Severe Hazard
Physical	:	2 Moderate Hazard

SDS US (GHS HazCom 2012) - Praxair

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

MATERIAL SAFETY DATA SHEET

ALCONOX®

Prepared to U.S. OSHA, CMA, ANSI, Canadian WHMIS, Australian WorkSafe, Japanese Industrial Standard JIS Z 7250:2000, and European Union REACH Regulations

ALCONOX

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:	**ALCONOX®**
CHEMICAL FAMILY NAME:	Detergent.
PRODUCT USE:	Critical-cleaning detergent for laboratory, healthcare and industrial applications
U.N. NUMBER:	Not Applicable
U.N. DANGEROUS GOODS CLASS:	Non-Regulated Material
SUPPLIER/MANUFACTURER'S NAME:	Alconox, Inc.
ADDRESS:	30 Glenn St., Suite 309, White Plains, NY 10603. USA
EMERGENCY PHONE:	**TOLL-FREE in USA/Canada** 800-255-3924
	International calls 813-248-0585
BUSINESS PHONE:	914-948-4040
DATE OF PREPARATION:	May 2011
DATE OF LAST REVISION:	February 2008

SECTION 2 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: This product is a white granular powder with little or no odor. Exposure can be irritating to eyes, respiratory system and skin. It is a non-flammable solid. The Environmental effects of this product have not been investigated.

US DOT SYMBOLS

Non-Regulated

CANADA (WHMIS) SYMBOLS

EUROPEAN and (GHS) Hazard Symbols

Signal Word: **Warning!**

EU LABELING AND CLASSIFICATION:

Classification of the substance or mixture according to Regulation (EC) No1272/2008 Annex 1
EC# 205-633-8 This substance is not classified in the Annex I of Directive 67/548/EEC
EC# 268-356-1 This substance is not classified in the Annex I of Directive 67/548/EEC
EC# 231-838-7 This substance is not classified in the Annex I of Directive 67/548/EEC
EC# 231-767-1 This substance is not classified in the Annex I of Directive 67/548/EEC
EC# 207-638-8 Index# 011-005-00-2
EC# 205-788-1 This substance is not classified in the Annex I of Directive 67/548/EEC

GHS Hazard Classification(s):
Eye Irritant Category 2A

Hazard Statement(s):
H319: Causes serious eye irritation

Precautionary Statement(s):
P260: Do not breath dust/fume/gas/mist/vapors/spray
P264: Wash hands thoroughly after handling
P271: Use only in well ventilated area.
P280: Wear protective gloves/protective clothing/eye protection/face protection/

Hazard Symbol(s):
[Xi] Irritant

Risk Phrases:
R20: Harmful by inhalation
R36/37/38: Irritating to eyes, respiratory system and skin

Safety Phrases:
S8: Keep container dry
S22: Do not breath dust
S24/25: Avoid contact with skin and eyes

HEALTH HAZARDS OR RISKS FROM EXPOSURE:

ACUTE: Exposure to this product may cause irritation of the eyes, respiratory system and skin. Ingestion may cause gastrointestinal irritation including pain, vomiting or diarrhea.

CHRONIC: This product contains an ingredient which may be corrosive.

TARGET ORGANS: ACUTE: Eye, respiratory System, Skin CHRONIC: None Known

SECTION 3 - COMPOSITION and INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENTS:	CAS #	EINECS #	ICSC #	WT %	HAZARD CLASSIFICATION; RISK PHRASES
Sodium Bicarbonate	144-55-8	205-633-8	1044	33 - 43%	HAZARD CLASSIFICATION: None RISK PHRASES: None
Sodium (C10 – C16) Alkylbenzene Sulfonate	68081-81-2	268-356-1	Not Listed	10 – 20%	HAZARD CLASSIFICATION: None RISK PHRASES: None
Sodium Tripolyphosphate	7758-29-4	231-838-7	1469	5 - 15%	HAZARD CLASSIFICATION: None RISK PHRASES: None
Tetrasodium Pyrophosphate	7722-88-5	231-767-1	1140	5 - 15%	HAZARD CLASSIFICATION: None RISK PHRASES: None
Sodium Carbonate	497-19-8	207-638-8	1135	1 - 10%	HAZARD CLASSIFICATION: [Xi] Irritant RISK PHRASES: R36
Sodium Alcohol Sulfate	151-21-3	205-788-1	0502	1 – 5%	HAZARD CLASSIFICATION: None RISK PHRASES: None
Balance of other ingredients are non-hazardous or less than 1% in concentration (or 0.1% for carcinogens, reproductive toxins, or respiratory sensitizers).					

NOTE: ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-2004 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR, EU Directives and the Japanese Industrial Standard *JIS Z 7250: 2000*.

SECTION 4 - FIRST-AID MEASURES

Contaminated individuals of chemical exposure must be taken for medical attention if any adverse effect occurs. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to health professional with contaminated individual.

EYE CONTACT: If product enters the eyes, open eyes while under gentle running water for at least 15 minutes. Seek medical attention if irritation persists.

SKIN CONTACT: Wash skin thoroughly after handling. Seek medical attention if irritation develops and persists. Remove contaminated clothing. Launder before re-use.

INHALATION: If breathing becomes difficult, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Seek medical attention if breathing dificulty continues.

INGESTION: If product is swallowed, call physician or poison control center for most current information. If professional advice is not available, do not induce vomiting. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or who cannot swallow. Seek medical advice. Take a copy of the label and/or MSDS with the victim to the health professional.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing skin, or eye problems may be aggravated by prolonged contact.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and reduce over-exposure.

MATERIAL SAFETY DATA SHEET

SECTION 5 - FIRE-FIGHTING MEASURES

FLASH POINT: Not Flammable

AUTOIGNITION TEMPERATURE: Not Applicable

FLAMMABLE LIMITS (in air by volume, %): Lower (LEL): NA Upper (UEL): NA

FIRE EXTINGUISHING MATERIALS: As appropriate for surrounding fire. Carbon dioxide, foam, dry chemical, halon, or water spray.

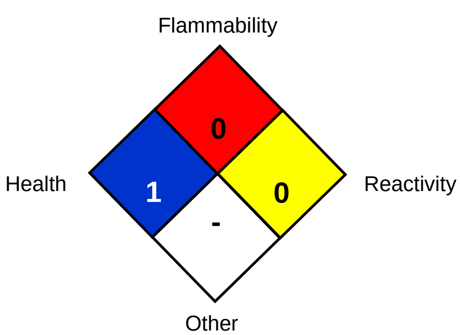
UNUSUAL FIRE AND EXPLOSION HAZARDS: This product is non-flammable and has no known explosion hazards.

Explosion Sensitivity to Mechanical Impact: Not Sensitive.

Explosion Sensitivity to Static Discharge: Not Sensitive

SPECIAL FIRE-FIGHTING PROCEDURES: Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Isolate materials not yet involved in the fire and protect personnel. Move containers from fire area if this can be done without risk; otherwise, cool with carefully applied water spray. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.

NFPA RATING SYSTEM



HMIS RATING SYSTEM

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH HAZARD (BLUE)	**1**
FLAMMABILITY HAZARD (RED)	**0**
PHYSICAL HAZARD (YELLOW)	**0**

PROTECTIVE EQUIPMENT

EYES	RESPIRATORY	HANDS	BODY
	See Sect 8		See Sect 8

For Routine Industrial Use and Handling Applications

Hazard Scale: 0 = Minimal **1** = Slight **2** = Moderate **3** = Serious **4** = Severe * = Chronic hazard

SECTION 6 - ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Personnel should be trained for spill response operations.

SPILLS: Contain spill if safe to do so. Prevent entry into drains, sewers, and other waterways. Sweep, shovel or vacuum spilled material and place in an appropriate container for re-use or disposal. Avoid dust generation if possible. Dispose of in accordance with applicable Federal, State, and local procedures (see Section 13, Disposal Considerations).

SECTION 7 - HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat, drink, smoke, or apply cosmetics while handling this product. Avoid breathing dusts generated by this product. Use in a well-ventilated location. Remove contaminated clothing immediately.

STORAGE AND HANDLING PRACTICES: Containers of this product must be properly labeled. Store containers in a cool, dry location. Keep container tightly closed when not in use. Store away from strong acids or oxidizers.

SECTION 8 - EXPOSURE CONTROLS - PERSONAL PROTECTION

EXPOSURE LIMITS/GUIDELINES:

Chemical Name	CAS#	ACGIH TWA	OSHA TWA	SWA
Sodium Bicarbonate	144-55-8	10 mg/m³ Total Dust	15 mg/m³ Total Dust	10 mg/m³ Total Dust
Sodium (C10 – C16) Alkylbenzene Sulfonate	68081-81-2	10 mg/m³ Total Dust	15 mg/m³ Total Dust	10 mg/m³ Total Dust
Sodium Tripolyphosphate	7758-29-4	10 mg/m³ Total Dust	15 mg/m³ Total Dust	10 mg/m³ Total Dust
Tetrasodium Pyrophosphate	7722-88-5	5 mg/m³	5 mg/m³	5 mg/m³
Sodium Carbonate	497-19-8	10 mg/m³ Total Dust	15 mg/m³ Total Dust	10 mg/m³ Total Dust
Sodium Alcohol Sulfate	151-21-3	10 mg/m³ Total Dust	15 mg/m³ Total Dust	10 mg/m³ Total Dust

Currently, International exposure limits are not established for the components of this product. Please check with competent authority in each country for the most recent limits in place.

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided below. Use local exhaust ventilation to control airborne dust. Ensure eyewash/safety shower stations are available near areas where this product is used.

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132) or equivalent standard of Canada, or standards of EU member states (including EN 149 for respiratory PPE, and EN 166 for face/eye protection), and those of Japan. Please reference applicable regulations and standards for relevant details.

RESPIRATORY PROTECTION: Based on test data, exposure limits should not be exceeded under normal use conditions when using Alconox Detergent. Maintain airborne contaminant concentrations below guidelines listed above, if applicable. If necessary, use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), equivalent U.S. State standards, Canadian CSA Standard Z94.4-93, the European Standard EN149, or EU member states.

EYE PROTECTION: Safety glasses. If necessary, refer to U.S. OSHA 29 CFR 1910.133 or appropriate Canadian Standards.

HAND PROTECTION: Use chemical resistant gloves to prevent skin contact.. If necessary, refer to U.S. OSHA 29 CFR 1910.138 or appropriate Standards of Canada.

BODY PROTECTION: Use body protection appropriate to prevent contact (e.g. lab coat, overalls). If necessary, refer to appropriate Standards of Canada, or appropriate Standards of the EU, Australian Standards, or relevant Japanese Standards.

SECTION 9 - PHYSICAL and CHEMICAL PROPERTIES

PHYSICAL STATE:	Solid
APPEARANCE & ODOR:	White granular powder with little or no odor.
ODOR THRESHOLD (PPM):	Not Available
VAPOR PRESSURE (mmHg):	Not Applicable
VAPOR DENSITY (AIR=1):	Not Applicable.
BY WEIGHT:	Not Available
EVAPORATION RATE (nBuAc = 1):	Not Applicable.
BOILING POINT (C°):	Not Applicable.
FREEZING POINT (C°):	Not Applicable.
pH:	9.5 (1% aqueous solution)
SPECIFIC GRAVITY 20°C: (WATER =1)	0.85 – 1.1
SOLUBILITY IN WATER (%)	>10% w/w
COEFFICIENT OF WATER/OIL DIST.:	Not Available
VOC:	None
CHEMICAL FAMILY:	Detergent

SECTION 10 - STABILITY and REACTIVITY

STABILITY: Product is stable
DECOMPOSITION PRODUCTS: When heated to decomposition this product produces Oxides of carbon (COx)
MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong acids and strong oxidizing agents.
HAZARDOUS POLYMERIZATION: Will not occur.
CONDITIONS TO AVOID: Contact with incompatible materials and dust generation.

SECTION 11 - TOXICOLOGICAL INFORMATION

TOXICITY DATA: Toxicity data is available for mixture:

CAS# 497-19-8 LD50 Oral (Rat)	4090 mg/kg
CAS# 497-19-8 LD50 Oral (Mouse)	6600 mg/kg
CAS# 497-19-8 LC50 Inhalation (Rat)	2300 mg/m³ 2H
CAS# 497-19-8 LC50 Inhalation (Mouse)	1200 mg/m³ 2H
CAS# 7758-29-4 LD50 Oral (Rat)	3120 mg/kg
CAS# 7758-29-4 LD50 Oral (Mouse)	3100 mg/kg
CAS# 7722-88-5 LD50 Oral (Rat)	4000 mg/kg

SUSPECTED CANCER AGENT: None of the ingredients are found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, IARC and therefore is not considered to be, nor suspected to be a cancer-causing agent by these agencies.
IRRITANCY OF PRODUCT: Contact with this product can be irritating to exposed skin, eyes and respiratory system.
SENSITIZATION OF PRODUCT: This product is not considered a sensitizer.
REPRODUCTIVE TOXICITY INFORMATION: No information concerning the effects of this product and its components on the human reproductive system.

SECTION 12 - ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.
ENVIRONMENTAL STABILITY: No Data available at this time.
EFFECT OF MATERIAL ON PLANTS or ANIMALS: No evidence is currently available on this product's effects on plants or animals.

EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence is currently available on this product's effects on aquatic life.

SECTION 13 - DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations, those of Canada, Australia, EU Member States and Japan.

SECTION 14 - TRANSPORTATION INFORMATION

<u>US DOT; IATA; IMO; ADR:</u>
THIS PRODUCT IS NOT HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.
PROPER SHIPPING NAME: Non-Regulated Material
HAZARD CLASS NUMBER and DESCRIPTION: Not Applicable
UN IDENTIFICATION NUMBER: Not Applicable
PACKING GROUP: Not Applicable.
DOT LABEL(S) REQUIRED: Not Applicable
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2004): Not Applicable
MARINE POLLUTANT: None of the ingredients are classified by the DOT as a Marine Pollutant (as defined by 49 CFR 172.101, Appendix B)

U.S. DEPARTMENT OF TRANSPORTATION (DOT) SHIPPING REGULATIONS:
This product is not classified as dangerous goods, per U.S. DOT regulations, under 49 CFR 172.101.
TRANSPORT CANADA, TRANSPORTATION OF DANGEROUS GOODS REGULATIONS:
This product is not classified as Dangerous Goods, per regulations of Transport Canada.
INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA):
This product is not classified as Dangerous Goods, by rules of IATA:
INTERNATIONAL MARITIME ORGANIZATION (IMO) DESIGNATION:
This product is not classified as Dangerous Goods by the International Maritime Organization.
EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR):

This product is not classified by the United Nations Economic Commission for Europe to be dangerous goods.

SECTION 15 - REGULATORY INFORMATION

UNITED STATES REGULATIONS

SARA REPORTING REQUIREMENTS: This product is not subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act., as follows: None

TSCA: All components in this product are listed on the US Toxic Substances Control Act (TSCA) inventory of chemicals.

SARA 311/312:

Acute Health:	Yes	Chronic Health:	No	Fire:	No	Reactivity:	No

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for this product. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lb (4,540 kg) may apply, per 40 CFR 370.20.

U.S. CERCLA REPORTABLE QUANTITY (RQ): None

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): None of the ingredients are on the California Proposition 65 lists.

CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: All of the components of this product are on the DSL Inventory

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: No component of this product is on the CEPA First Priorities Substance Lists.

CANADIAN WHMIS CLASSIFICATION and SYMBOLS: This product is categorized as a Controlled Product, Hazard Class D2B as per the Controlled Product Regulations

EUROPEAN ECONOMIC COMMUNITY INFORMATION:

EU LABELING AND CLASSIFICATION:

Classification of the mixture according to Regulation (EC) No1272/2008. See section 2 for details.

AUSTRALIAN INFORMATION FOR PRODUCT:

AUSTRALIAN INVENTORY OF CHEMICAL SUBSTANCES (AICS) STATUS: All components of this product are listed on the AICS.

STANDARD FOR THE UNIFORM SCHEDULING OF DRUGS AND POISONS: Not applicable.

JAPANESE INFORMATION FOR PRODUCT:

JAPANESE MINISTER OF INTERNATIONAL TRADE AND INDUSTRY (MITI) STATUS: The components of this product are not listed as Class I Specified Chemical Substances, Class II Specified Chemical Substances, or Designated Chemical Substances by the Japanese MITI.

INTERNATIONAL CHEMICAL INVENTORIES:

Listing of the components on individual country Chemical Inventories is as follows:

Asia-Pac:	Listed
Australian Inventory of Chemical Substances (AICS):	Listed
Korean Existing Chemicals List (ECL):	Listed
Japanese Existing National Inventory of Chemical Substances (ENCS):	Listed
Philippines Inventory if Chemicals and Chemical Substances (PICCS):	Listed
Swiss Giftliste List of Toxic Substances:	Listed
U.S. TSCA:	Listed

SECTION 16 - OTHER INFORMATION

PREPARED BY: Paul Eigbrett Global Safety Management, 10006 Cross Creek Blvd. Suite 440, Tampa, FL 33647

ANNEX:

IDENTIFIED USES OF ALCONOX® AND DIRECTIONS FOR USE

Used to clean: Healthcare instruments, laboratory ware, vacuum equipment, tissue culture ware, personal protective equipment, sampling apparatus, catheters, tubing, pipes, radioactive contaminated articles, optical parts, electronic components, pharmaceutical apparatus, cosmetics manufacturing equipment, metal castings, forgings and stampings, industrial parts, tanks and reactors. Authorized by USDA for use in federally inspected meat and poultry plants. Passes inhibitory residue test for water analysis. FDA certified.

Used to remove: Soil, grit, grime, buffing compound, slime, grease, oils, blood, tissue, salts, deposits, particulates, solvents, chemicals, radioisotopes, radioactive contaminations, silicon oils, mold release agents.

Surfaces cleaned: Corrosion inhibited formulation recommended for glass, metal, stainless steel, porcelain, ceramic, plastic, rubber and fiberglass. Can be used on soft metals such as copper, aluminum, zinc and magnesium if rinsed promptly. Corrosion testing may be advisable.

Cleaning method: Soak, brush, sponge, cloth, ultrasonic, flow through clean-inplace. Will foam—not for spray or machine use.

Directions: Make a fresh 1% solution (2 1/2 Tbsp. per gal., 1 1/4 oz. per gal. or 10 grams per liter) in cold, warm, or hot water. If available use warm water. Use cold water for blood stains. For difficult soils, raise water temperature and use more detergent. Clean by soak, circulate, wipe, or ultrasonic method. Not for spray machines, will foam. For nonabrasive scouring, make paste. Use 2% solution to soak frozen stopcocks. To remove silver tarnish, soak in 1% solution in aluminum container. RINSE THOROUGHLY—preferably with running water. For critical cleaning, do final or all rinsing in distilled, deionized, or purified water. For food contact surfaces, rinse with potable water. Used on a wide range of glass, ceramic, plastic, and metal surfaces. Corrosion testing may be advisable.

Safety Data Sheet
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and GHS

Effective date: 05/12/2015 **Revision:** 05/12/2015

LIQUINOX

1 Identification of the Substance/mixture and of the Company/Undertaking

1.1 Product identifier
Trade name: LIQUINOX
Application of the substance / the preparation: Hand detergent.

1.2 Relevant identified uses of the substance or mixture and uses advised against:
No additional information available.

1.3 Details of the supplier of the Safety Data Sheet
Manufacturer/Supplier:
Alconox, Inc.
30 Glenn St., Suite 309
White Plains, NY 10603
Phone: 914-948-4040

Further information obtainable from: Product Safety Department.

1.4 Emergency telephone number:
ChemTel Inc.: (800)255-3924, +1 (813)248-0585

2 Hazards Identification

2.1 Classification of the substance or mixture
Classification according to Regulation (EC) No 1272/2008:
Classification according to Directive 67/548/EEC or Directive 1999/45/EC:

GHS07
Skin Irrit. 2, H315: Causes skin irritation.

Information concerning particular hazards for human and environment:
The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
Classification system:
The classification is according to the latest editions of the EU-lists, and extended by company and literature data

2.2 Label elements
Labelling according to Regulation (EC) No 1272/2008:
The product is classified and labelled according to the CLP regulation.

Hazard pictograms:

GHS07

Signal word: Warning

Hazard-determining components of labelling:
Alkyl benzene sulfonic acid, sodium salt.

Hazard statements:
H315: Causes skin irritation.

Precautionary statements:

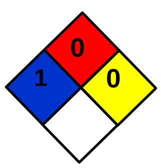
P332+P313: If skin irritation occurs: Get medical advice/attention.

P302+P352: IF ON SKIN: Wash with plenty of soap and water.

P501: Dispose of contents/container in accordance with local/regional/national/international regulations.

Other Hazard description:
WHMIS-classification and symbols:
D2B - Toxic material causing other toxic effects

NFPA ratings (scale 0 - 4)



Health = 1
Fire = 0
Reactivity = 0

HMIS-ratings (scale 0 - 4)

HEALTH	1	Health = 1
FIRE	0	Fire = 0
REACTIVITY	0	Reactivity = 0

2.3 Other hazards
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

3 Composition/Information on Ingredients

3.2 Chemical characterization: Mixture
Description: Hazardous ingredients of mixture listed below.

Identifying Nos.	Description	Wt. %
CAS: 68081-81-2	Alkyl benzene sulfonic acid, sodium salt	10 - 25%
CAS: 1300-72-7 EINECS: 215-090-9	Sodium xylene sulphonate	2.5 - 10%
CAS: 84133-50-6	Alcohol Ethoxylate	2.5 - 10%
CAS: 68603-42-9 EINECS: 271-657-0	Coconut diethanolamide	2.5 - 10%
CAS: 17572-97-3 EINECS: 241-543-5	Ethylenediaminetetraacetic acid, tripotassium salt	2.5 - 10%

Additional information: For the wording of the listed risk phrases refer to section 16.

Safety Data Sheet
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and GHS

Effective date: 05/12/2015 **Revision:** 05/12/2015

LIQUINOX

4 First Aid Measures

4.1 Description of first aid measures

General information:
Take affected persons out into the fresh air.

After inhalation:
Supply fresh air; consult doctor in case of complaints.

After skin contact:
Immediately wash with water and soap and rinse thoroughly for 30 minutes. If skin irritation continues, consult a doctor.

After eye contact:
Remove contact lenses if worn.
Rinse opened eye for at least 30 minutes under running water, lifting upper and lower lids occasionally. Immediately consult a doctor.

After swallowing:
Do not induce vomiting; call for medical help immediately. Rinse out mouth and then drink plenty of water.
A person vomiting while laying on their back should be turned onto their side.

4.2 Most important symptoms and effects, both acute and delayed:
Irritating, all routes of exposure.

4.3 Indication of any immediate medical attention and special treatment needed:
No additional information available.

5 Firefighting Measures

5.1 Extinguishing media:

Suitable extinguishing agents:
CO_2, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

5.2 Special hazards arising from the substance or mixture:
No additional information available.

5.3 Advice for firefighters:

Protective equipment:
Wear self-contained respiratory protective device.
Wear fully protective suit.

6 Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures:
Ensure adequate ventilation.
Particular danger of slipping on leaked/spilled product.

6.2 Environmental precautions:
Dilute with plenty of water.
Do not allow to enter sewers/ surface or ground water.

6.3 Methods and material for containment and cleaning up:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Clean the affected area carefully; suitable cleaners are: Warm water
Dispose contaminated material as waste according to item 13. Ensure adequate ventilation.

6.4 Reference to other sections:
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information

7 Handling and Storage

7.1 Precautions for safe handling:
No special precautions are necessary if used correctly.

Information about fire - and explosion protection:
No special measures required.

7.2 Conditions for safe storage, including any incompatibilities:

Storage:

Requirements to be met by storerooms and receptacles: No special requirements.

Information about storage in one common storage facility: No special requirements.

Further information about storage conditions: None

7.3 Specific end use(s): No additional information available.

8 Exposure Controls/Personal Protection

8.1 Control parameters

Ingredients with limit values that require monitoring at the workplace:

The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

Additional information: The lists valid during the making were used as basis.

8.2 Exposure controls:

Personal protective equipment:

General protective and hygienic measures:

Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.

Respiratory protection:

Not required under normal conditions of use.

Protection of hands:

Protective gloves

The glove material has to be impermeable and resistant to the product. Selection of the glove material should be based on the penetration time, rates of diffusion and the degradation of the glove material.

Material of gloves:

The selection of a suitable gloves does not only depend on the material, but also on the quality, and varies from manufacturer to manufacturer.

Penetration time of glove material:

The exact break through time has to be determined by the manufacturer of the protective gloves. DO NOT exceed the breakthrough time set by the Manufacturer.

For long term contact, gloves made of the following materials are considered suitable:

Butyl rubber, BR
Nitrile rubber, NBR
Natural rubber (NR)
Neoprene gloves

Eye protection:

Safety glasses
Goggles recommended during refilling.

Body protection: Protective work clothing

Safety Data Sheet
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and GHS

Effective date: 05/12/2015 **Revision:** 05/12/2015

LIQUINOX

9 Physical and Chemical Properties

9.1 Information on basic physical and chemical properties:

General Information:	
Appearance:	
Form:	Liquid
Color:	Light Yellow
Odor:	Odorless
Odor threshold:	Not determined.
pH-value:	8.5
Change in condition:	
Melting point/Melting range:	Not determined.
Boiling point/Boiling range:	100°C
Flash point:	Not applicable.
Flammability (solid, gaseous):	Not applicable.
Ignition temperature:	Not applicable.
Decomposition temperature:	Not determined.
Self-igniting:	Product is not selfigniting.
Danger of explosion:	Product does not present an explosion hazard.
Explosion limits:	
Lower:	Not determined.
Upper:	Not determined.
Vapor pressure at 20°C:	23 hPa
Density:	1.08 g/cm³
Relative density:	Not determined.
Vapor density:	Not determined.
Evaporation rate:	Not determined.
Solubility in / Miscibility with water:	Fully miscible.
Segregation coefficient (n-octanol/water):	Not determined.
Viscosity:	
Dynamic:	Not determined.
Kinematic:	Not determined.
Solvent content:	
Organic solvents:	Not determined.
Solids content:	Not determined.
9.2 Other information:	No additional information available.

10 Stability and Reactivity

10.1 Reactivity:

10.2 Chemical stability:

Thermal decomposition / conditions to be avoided:

No decomposition if used according to specifications.

10.3 Possibility of hazardous reactions:

Reacts with strong oxidizing agents. Reacts with strong acids.

10.4 Conditions to avoid:

No additional information available.

10.5 Incompatible materials:

No additional information available.

10.6 Hazardous decomposition products:
Carbon monoxide and carbon dioxide
Sulphur oxides (SOx)
Nitrogen oxides

11 Toxicological Information

11.1 Information on toxicological effects:
Toxicity data: Toxicity data is available for mixture:
Primary irritant effect:
On the skin: Irritating to skin and mucous membranes.
On the eye: Strong irritant with the danger of severe eye injury.
Sensitization: No sensitizing effects known.
Additional toxicological information:
The product shows the following dangers according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version: Irritant

12 Ecological Information

12.1 Toxicity:
Aquatic toxicity: No additional information available.
12.2 Persistence and degradability: Biodegradable.
12.3 Bioaccumulative potential: Does not accumulate in organisms.
12.4 Mobility in soil: No additional information available.
Additional ecological information:
General notes:
Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water.
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Must not reach sewage water or drainage ditch undiluted or un-neutralized.
12.5 Results of PBT and vPvB assessment:
PBT: Not applicable.
vPvB: Not applicable.
12.6 Other adverse effects: No additional information available.

13 Disposal Considerations

13.1 Waste treatment methods:
Recommendation:
Smaller quantities can be disposed of with household waste.
Small amounts may be diluted with plenty of water and washed away. Dispose of bigger amounts in accordance with Local Authority requirements.
The surfactant used in this product complies with the biodegradability criteria as laid down in Regulation (EC) No. 648/2004 on detergents. Data to support this assertion are held at the disposal of the competent authorities of the Member States and will be made available to them, at their direct request or at the request of a detergent manufacturer.
Uncleaned packaging:
Recommendation: Disposal must be made according to official regulations.
Recommended cleansing agents: Water, together with cleansing agents, if necessary.

14 Transport Information

14.1 UN-Number:
DOT, ADR, ADN, IMDG, IATA: Not Regulated

14.2 UN proper shipping name:
DOT, ADR, IMDG, IATA: Not Regulated

14.3 Transport hazard class(es):
DOT, ADR, IMDG, IATA:
Class: Not Regulated
Label: -

14.4 Packing group:
DOT, ADR, IMDG, IATA: Not Regulated

14.5 Environmental hazards:
Marine pollutant: No

14.6 Special precautions for user: Not applicable.

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable.

UN "Model Regulation": Not Regulated

15 Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture:
United States (USA):
SARA:
Section 355 (extremely hazardous substances): None of the ingredient is listed.
Section 313 (Specific toxic chemical listings): None of the ingredient is listed.
TSCA (Toxic Substances Control Act): All ingredients are listed.

Proposition 65 (California):
Chemicals known to cause cancer: None of the ingredient is listed.
Chemicals known to cause reproductive toxicity for females: None of the ingredient is listed.
Chemicals known to cause reproductive toxicity for males: None of the ingredient is listed.
Chemicals known to cause developmental toxicity: None of the ingredient is listed.

Carcinogenic Categories:
EPA (Environmental Protection Agency): None of the ingredient is listed.
TLV (Threshold Limit Value established by ACGIH): None of the ingredient is listed.
NIOSH-Ca (National Institute for Occupational Safety and Health): None of the ingredient is listed.
OSHA-Ca (Occupational Safety & Health Administration): None of the ingredient is listed.
Canadá:
Canadian Domestic Substances List (DSL): All ingredients are listed.
Canadian Ingredient Disclosure list (limit 0.1%): None of the ingredient is listed.
Canadian Ingredient Disclosure list (limit 1%): None of the ingredient is listed.

15.2 Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other Information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Relevant phrases:
H315: Causes skin irritation.

Safety Data Sheet
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and GHS

Effective date: 05/12/2015 **Revision:** 05/12/2015

LIQUINOX

Abbreviations and Acronyms:

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.
IMDG: International Maritime Code for Dangerous Goods.
DOT: US Department of Transportation.
IATA: International Air Transport Association.
GHS: Globally Harmonized System of Classification and Labelling of Chemicals.
ACGIH: American Conference of Governmental Industrial Hygienists.
NFPA: National Fire Protection Association (USA).
HMIS: Hazardous Materials Identification System (USA).
WHMIS: Workplace Hazardous Materials Information System (Canada).
VOC: Volatile Organic Compounds (USA, EU).
LC50: Lethal concentration, 50 percent.
LD50: Lethal dose, 50 percent.

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ATTACHMENT 5

EMPLOYEE EXPOSURE/INJURY INCIDENT REPORT

Employee Exposure/Injury Incident Report

(completed by the CHSM or designee)

Employee:			
Office or field location:			
Incident:			
Potential or known exposure (describe):			
Physical injury or illness (describe):			
Location (city and state):		Project and Contract No.	
Date of incident:		Time of incident:	
Date incident reported:		Person to whom incident was reported:	
Weather condition during incident:	Temperature:		Precipitation:	
Wind speed and direction:		Cloud cover:	
Name of materials potentially encountered (chemical exposure):			
Chemical and phase (i.e., liquid, solid, gas, vapor, fume, mist), radiological, etc.:			
Describe the exposure/injury in detail and the parts of the body affected (attach extra sheets if necessary):			
Describe exact onsite or offsite location where the incident occurred:			
What was the employee doing when the exposure/injury occurred? (Describe briefly as site reconnaissance, soil sampling, etc.):			

How did the incident occur? Describe fully the factors that led to or contributed to the incident:						
Was medical treatment given? ☐ Yes ☐ No If yes, when?						
By whom?		Name of paramedic:				
		Name of physician:				
		Other:				
Where?	Onsite		Offsite			
If offsite, name of hospital or clinic:						
Length of inpatient stay (dates):						
Was Integral Consulting management notified? ☐ Yes ☐ No If yes, when?						
Name and title of manager(s) notified:						
Did the exposure/injury result in permanent disability or death? ☐ Yes ☐ No						
If yes, explain:						
Number of days away from work		Number of days of restricted work activity:				
Has the employee returned to work? (Yes / No) If yes, date:						
Names of other persons affected during the incident:						
Names of persons who witnessed the incident:						
Name and title of field team leader or immediate supervisor at the site:						
Was the operation being conducted under an established safety plan? ☐ Yes ☐ No						

If yes, attach a copy. If no, explain:	

Was personal protective equipment (PPE) used by the employee? ☐ Yes ☐ No

If yes, list items:	

Did any limitations in safety equipment or PPE affect or contribute to exposure? ☐ Yes ☐ No

If yes, explain:	

Attachments to this report:		Medical report(s) (if not confidential)		Site safety plan
		Other relevant information		

Employee's signature		Date
Site safety officer's signature		Date
Project manager's signature		Date

Corporate health and safety manager review and comments

Corrective action/procedure changes carried out on the project:
Corrective actions to be taken to prevent similar incidents at other sites:

Corporate Health and Safety Manager's signature		Date

ATTACHMENT 6

NEAR-MISS INCIDENT REPORT

Near-Miss Incident Report

(completed by field staff)

Employee:	
Office or site location:	

Near-Miss Incident (check one or more): Exposure ☐ Physical injury ☐ Property damage ☐

Location (city and state):		Project and Contract No.	
Date of incident:		Time of incident:	

Fully describe the incident, including how it happened, persons involved, if chemicals were involved in the incident, etc.:

Was the operation being conducted under an established safety plan? ☐ Yes ☐ No

If yes, attach a copy. If no, explain:

Employee's signature	Date
Project Manager's signature	Date
Site safety officer's signature	Date

Corporate health and safety manager review and comments

Corrective action/procedure changes carried out at the site:		
Corrective actions to be taken to prevent similar incidents at other sites:		
Corporate Health and Safety Manager's signature		Date