Hillside Maintenance Complex 93-59 183 Street Hollis, NY 11423 James J. Dermody President



March 3, 2006

Tara Diaz, Project Manager New York State Department of Environmental Conservation Division of Environmental Remediation 625 Broadway, 11th Floor Albany, NY 12233-7015

Re: Voluntary Cleanup Agreement, Long Island Rail Road Manhasset, Massapequa and Island Park Substations Draft Delineation Phase 2 Site Assessment Investigation Report

Dear Ms. Diaz:

Enclosed for your review and comment please find three (3) copies of the following final report:

"Delineation Phase 2 Site Assessment for Manhasset, Massapequa and Island Park Substations Investigation Report April 2005"

The enclosed final report has been revised in accordance with the New York State Department of Environmental Conservation (NYSDEC) comment report dated December 14, 2005, and our discussions during the February 10, 2006 conference call. Please note that in accordance with our discussions on February 10, 2006, the information requested to be added to Figure 1-2 for the Manhasset Substation site has been included on Drawing 1 due to the fact that Figure 1-2 is at a scale that would not allow the addition of this information.

If you have any questions or comments, please contact me at (718) 558-3620.

Very truly yours,

Andrew M. Wilson, P.E. Project Manager

AMW/SET/tp Enclosure cc/encl.: N. Walz, NYSDOH (1 copy) D. D'Ambrosio, NYSDEC (1 copy) C. Channer, Esq., MTA (1 copy) cc: L. Wunderlich (LIRR) T. Fox (D&B) • 2015WISC06LTR-02

## METROPOLITAN TRANSPORTATION AUTHORITY LONG ISLAND RAIL ROAD

# DELINEATION PHASE 2 SITE ASSESSMENT for MANHASSET, MASSAPEQUA AND ISLAND PARK SUBSTATIONS

#### **INVESTIGATION REPORT**

Prepared for:

## METROPOLITAN TRANSPORTATION AUTHORITY LONG ISLAND RAIL ROAD

Prepared by:

## DVIRKA AND BARTILUCCI CONSULTING ENGINEERS WOODBURY, NEW YORK 11797

FEBRUARY 2006

#### LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT FOR MANHASSET, MASSAPEQUA AND ISLAND PARK SUBSTATIONS INVESTIGATION REPORT

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Section 1

#### 1.0 INTRODUCTION

This Investigation Report presents the results of the Delineation Phase 2 Site Assessments, which were conducted at the Long Island Rail Road (LIRR) Manhasset, Massapequa, and Island Park substations and were completed in accordance with fully executed Voluntary Cleanup Agreement Nos. V-00396-1, V-00397-1 and V-00392-1, respectively. The New York State Department of Environmental Conservation (NYSDEC) index numbers for these substations are WI-0908-02-02, WI-0909-02-02 and W1-0910-02-02, respectively.

The objectives of the Delineation Phase 2 Site Assessments included the following:

- Define the nature and extent of impacts to surface and subsurface soil;
- Determine if site-related contaminants have impacted groundwater quality;
- Identify potential impacts to human health and/or the environment associated with site-related contaminants; and
- Obtain sufficient data to determine the need for Interim Remedial Measures (IRMs) and to evaluate remedial alternatives that may be implemented as a final long-term remedy for the sites.

Field activities and sampling procedures associated with the Delineation Phase 2 Site Assessments at each of the three substations were completed in accordance with the NYSDECapproved "Investigation Work Plan," dated September 2002. It should be noted that as part of the Delineation Phase 2 Site Assessments, drainage structures that were identified as requiring closure pursuant to the United States Environmental Protection Agency (USEPA) Underground Injection Control (UIC) program were also investigated at each of the three substation sites. Analytical results associated with the investigation of these structures are, therefore, also discussed in this report. However, remediation and post-remediation endpoint sampling activities conducted subsequent to this investigation are documented in a separate report entitled, "Underground Injection Control Closure Report for Manhasset, Massapequa and Island Park Substations," dated September 2004. All field activities and sampling procedures utilized for the investigation of UIC structures were performed in accordance with the USEPA-approved "Underground Injection Control Closure Plan," dated November 2002.

The LIRR has undertaken a long-term capital improvement project in which it is upgrading several electric substations to accommodate the new "M-7" electric train cars. In support of this project, the LIRR has been renovating the Manhasset and Massapequa substations and plans to reconstruct an entirely new substation to the east of the existing Island Park substation. As a result, the LIRR has undertaken additional environmental investigations at each of the three substations to identify any potentially impacted soil at locations where construction excavation activities are planned. These activities are collectively referred to as the Construction Excavation Investigations. Therefore, this report also documents the findings of these additional investigations conducted at the three substations. All associated field activities and sampling procedures conducted as part of the Construction Excavation Investigations were performed in accordance with the NYSDEC-approved "Construction Excavation Work Plan", dated September 2002. Excavation activities, which were subsequently conducted at the three sites, in support of substation renovation/construction, are documented in a separate report entitled, "Construction Excavation Completion Report for Manhasset, Massapequa and Island Park Substations."

The following subsections provide relevant project background information, including detailed descriptions of each of the three substation sites, as well as a summary of the findings of prior investigations.

#### 1.1 **Project Background**

The LIRR built and operated substations from the early 1930s through 1951 that utilized mercury rectifiers. These rectifiers allowed the LIRR to receive 60-cycle, alternating current (AC) from local utilities and convert it to direct current (DC) for use as a source of electric power for its locomotives and electric passenger car fleet. The LIRR identified 20 substations located throughout Queens, Nassau and Suffolk Counties that once utilized mercury containing rectifiers.

It is believed that during the early 1980s, the mercury rectifiers were taken out of service and physically removed from these LIRR substations and replaced with non-mercury containing solid state equipment. However, due to uncertainties surrounding the work practices that may have been employed when managing the operation and maintenance of these mercury rectifiers, the LIRR believed it necessary to conduct environmental assessments at these 20 electric substations to determine the potential effects that may have occurred to the surrounding environment.

In 1999, the LIRR conducted environmental assessments at 20 of their electric substations, which previously utilized mercury-containing rectifiers. The results of these assessments were documented in a report prepared by Dvirka and Bartilucci Consulting Engineers (D&B), entitled, "Site Assessment of 20 Substations for Mercury Contamination," dated December 2000. Based on the findings of that report, mercury was identified in soil at all 20 substations at concentrations above NYSDEC recommended cleanup objectives. In order to further delineate and remediate impacted soil at the 20 substations, the LIRR has agreed to undertake and complete Delineation Phase 2 Site Assessments under the New York State Department of Environmental Conservation's (NYSDEC) Voluntary Cleanup Program (VCP).

Based on the findings of the 1999 site assessments, several substations were found to contain elevated levels of mercury in soil that had the potential to pose a human exposure pathway. As a result, an Interim Remedial Measures (IRM) program was conducted to eliminate the potential human exposure pathway by excavating mercury-impacted soil for proper off-site transportation and disposal. IRM activities were performed in the Spring of 2000 at 11 substations including Valley Stream, Lindenhurst, Far Rockaway, Floral Park, Shea, Bayside, Port Washington, Massapequa, Hempstead, Kew Gardens, and Island Park. The IRM program is documented in the report entitled, "Site Assessment of 20 Substations for Mercury Contamination - Interim Remedial Measures Oversight Report," dated January 2001, which was prepared by D&B. It should be noted that elevated levels of mercury still exist in subsurface soil at these 11 substations.

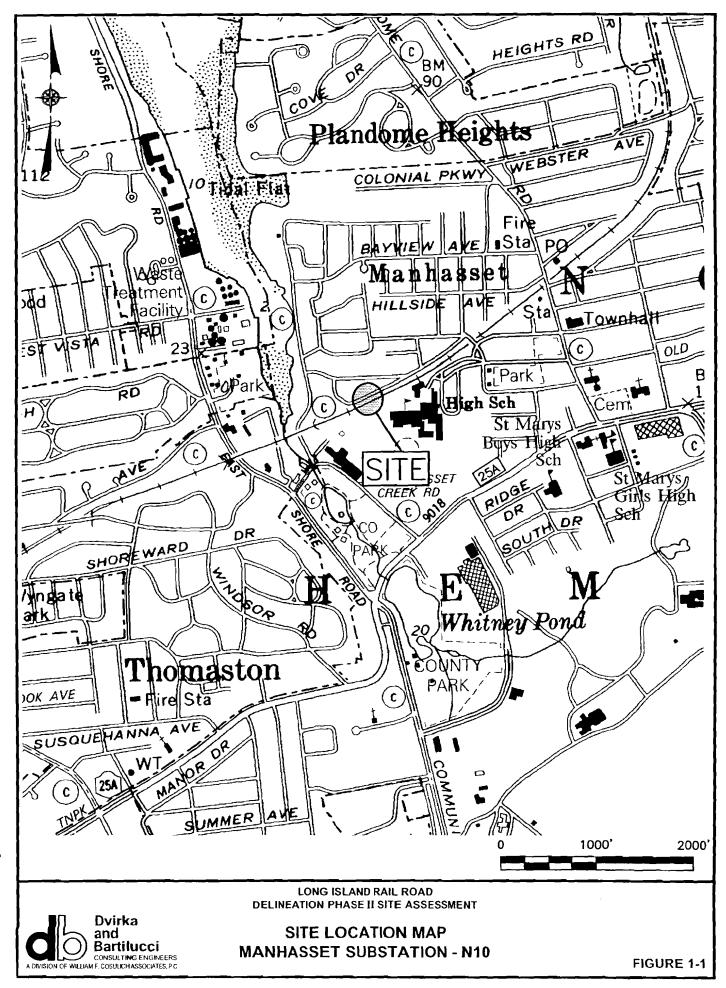
In support of a long-term capital improvement project in which it is upgrading several electric substations, the LIRR elected to initially conduct Delineation Phase 2 Site Assessments at 3 of the 20 substations, including the Manhasset, Massapequa and Island Park Substations. The field investigation for this work was completed in the Winter of 2003. However, based on the sample results, it was determined that additional data was needed to fully characterize the extent of mercury in soil at the Manhasset and Massapequa substations. Therefore, the LIRR developed a Supplemental Investigation Work Plan for this additional investigation that was approved by the NYSDEC in April 2004. The supplemental sampling activities were completed at the Manhasset and Massapequa substations in August 2004. The LIRR intends to further investigate the remaining 17 substations in the near future.

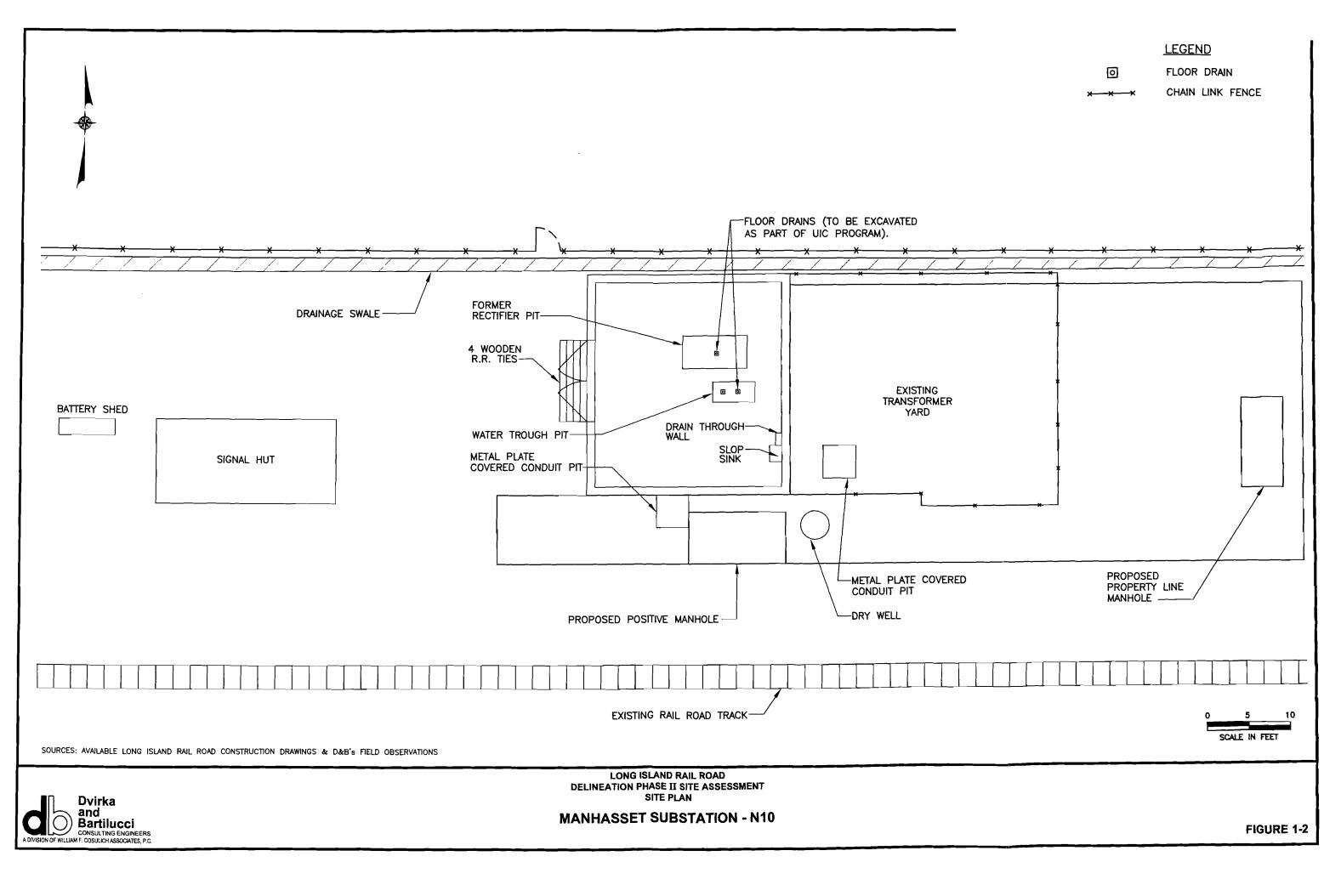
#### **1.2** Site Description

Provided below is a brief description of each substation.

#### 1.2.1 Manhasset Substation

The Manhasset substation site is located in Manhasset, Nassau County, New York (see Figure 1-1). The site consists of a 25-foot by 30-foot one-story brick building located within the LIRR right-of-way, 12 feet north of the train tracks as shown on Figure 1-2. A 30-foot by 30-foot transformer yard is located immediately east of the substation building. It should be noted that all transformers and associated equipment had been removed prior to the Delineation Phase 2 Site Assessment Program in support of above-mentioned Capital Improvement Project. The remaining portion of the site is a rectangular-shaped, partially developed, parcel of land. The Manhasset substation does not have a basement or a utility trench system. It should also be noted that the Manhasset substation formerly contained a bank of active lead-acid batteries located in the northwest corner of the substation to provide back-up electricity for the substation switch equipment in the event of a power failure. However, these batteries were also removed prior to the Delineation Phase 2 Site Assessment Program. The Manhasset substation does not house any sanitary or office facilities but is served by public water.





The substation complex is utilized to convert alternating current to direct current for the LIRR-Port Washington line. However, at the time of the Phase 2 Site Assessment, the complex was de-energized for renovations. The areas surrounding the substation and the former transformer yard are used for storage of equipment and supplies by the LIRR.

During the initial site assessment in 1999, the interior of the substation consisted of an active solid-state rectifier located over a pit that once supported a mercury-containing rectifier. However, as of a site inspection conducted by D&B on February 13, 2002, the solid-state rectifier had been removed in support of the ongoing overall capital improvement project for the Manhasset substation. The substation is also equipped with a second pit, referred to as a water trough on LIRR construction drawings, which is covered by a metal utility plate. During the initial site investigation conducted in 1999, D&B observed that the rectifier pit contained one floor drain and the water trough contained two floor drains. Also noted during the initial 1999 site investigation, the Manhasset substation was equipped with a slop sink along the eastern substation wall that discharged to the transformer yard located to the east of the substation. However, this slop sink was subsequently removed and was not present during the Delineation Phase 2 Site Assessment Program. Based on available information, the approximate groundwater flow direction is to the northwest and the approximate depth to groundwater is 75 feet below grade.

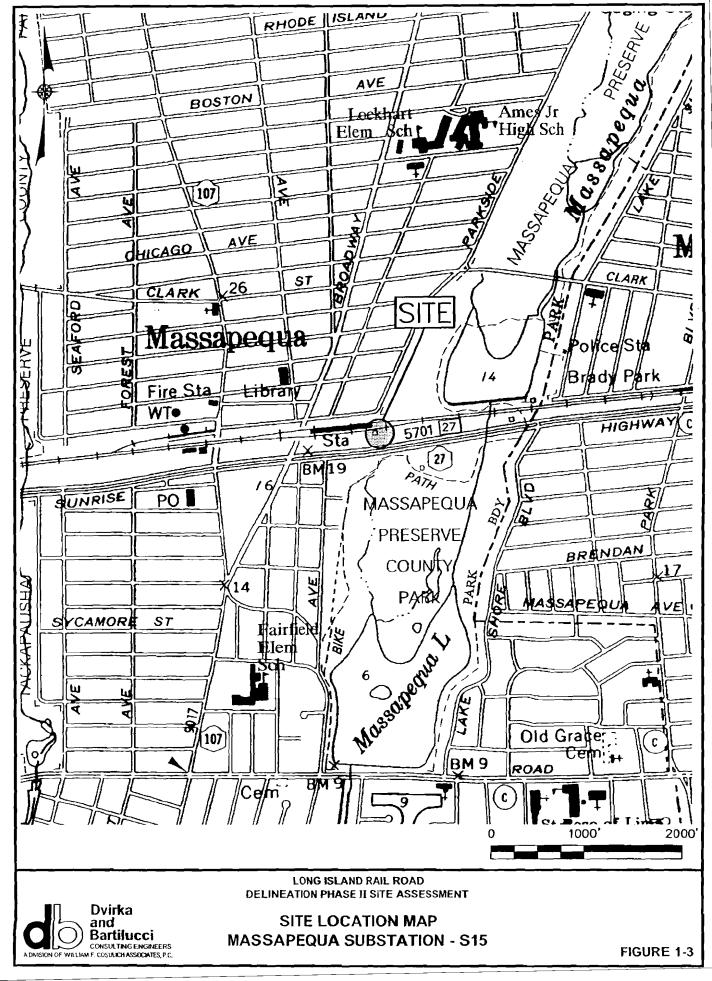
D&B observed that storm water drainage from the substation property is conveyed to an existing storm water drainage system. The storm water drainage system originates from an elevated area to the south of the substation and the LIRR right-of-way and is conveyed via a concrete pipe, which extends to the north running under the tracks. The concrete pipe discharges to a corrugated pipe, approximately 80 feet to the east of the substation. The corrugated pipe conveys storm water in a westerly direction and discharges to a drainage swale located immediately to the west of the substation. Storm water continues to flow west along the northern boundary of the substation approximately 800 feet, down an embankment to the headwaters of Manhasset Bay.

#### 1.2.2 Massapequa Substation

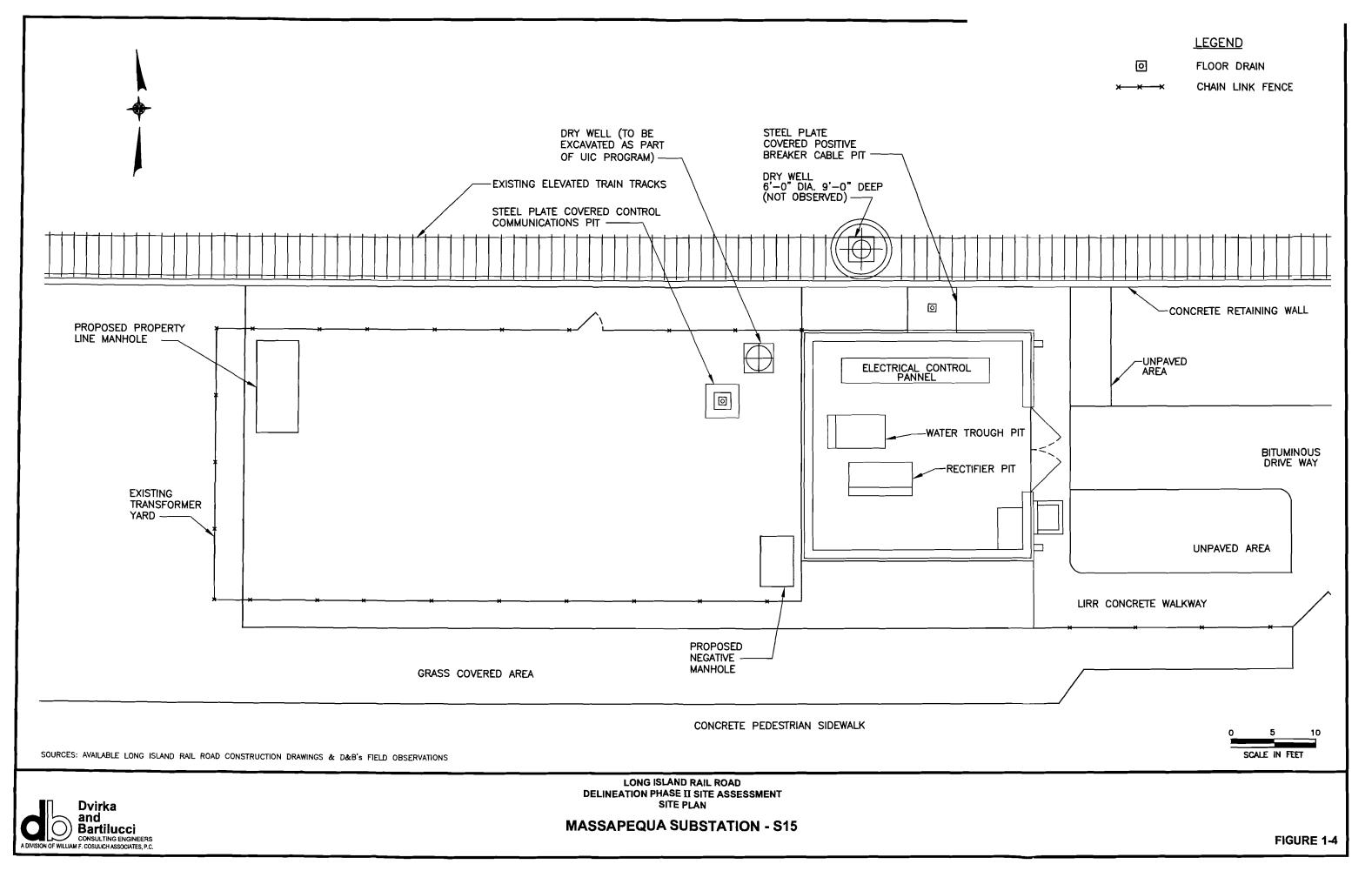
The Massapequa substation site is located in Massapequa, Nassau County, New York (see Figure 1-3). The site consists of an approximately 625 square foot one-story brick building as shown in Figure 1-4. An approximately 2,500 square foot transformer yard is located adjacent to the substation to the west and is secured by a perimeter chain-linked fence. The substation complex is utilized to convert alternating current to direct current for the LIRR-Montauk line. The areas surrounding the substation and the transformer yard are currently utilized as vehicular parking and pedestrian traffic areas.

The Massapequa substation is not equipped with a basement or any sanitary or office facilities. During the Delineation Phase 2 field program, the interior of the substation consisted of an active solid-state rectifier located over a pit that once supported a mercury-containing rectifier. The substation is also equipped with a second pit, referred to as a water trough on LIRR construction drawings. In addition, the substation contains a water pipe trench with a concrete bottom located in the southeast corner of the substation.

A water service pit with an earthen bottom is located along the outside of the eastern wall of the substation. In addition, a dry well with a solid cover exists off the northwest corner of the substation located within the transformer yard. Based on flush tests conducted during the initial site assessment, it was determined that the drain in the rectifier pit discharges to the dry well located in the transformer yard. A steel plate covered control communications pit, containing a floor drain, is located within the transformer yard, and a steel plate covered positive breaker cable pit containing a floor drain exists along the north side of the substation. Available LIRR construction drawings indicate that a dry well is located approximately 10 feet north of the substation. However, this dry well, if present, would currently be located beneath the existing railroad tracks. Based on available information, the approximate groundwater flow direction is to the south and the approximate depth to groundwater is 15 feet below grade.



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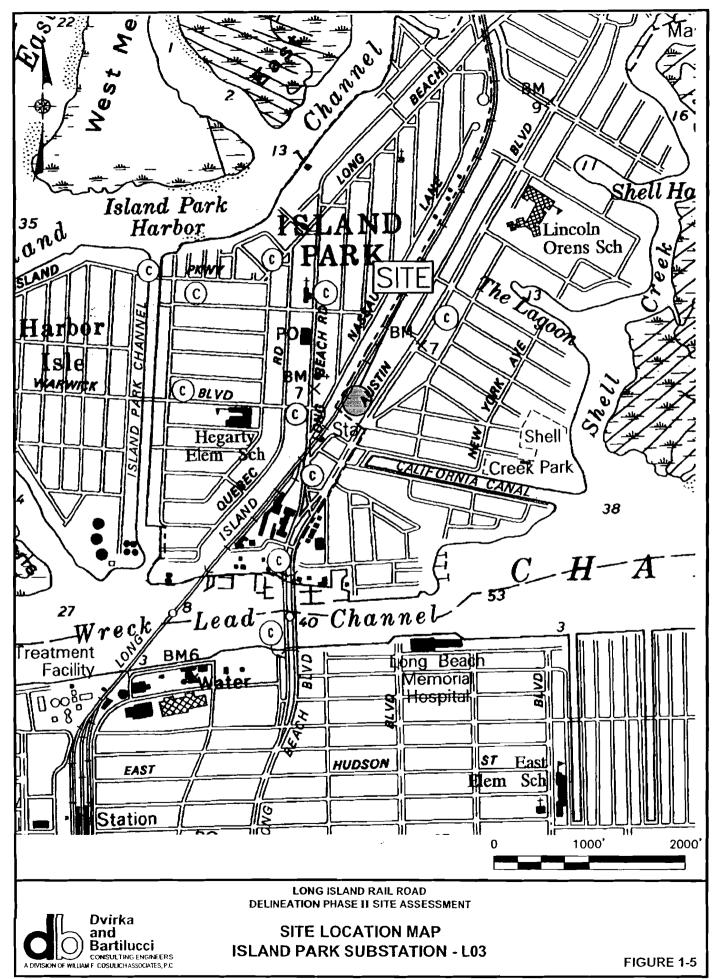
#### 1.2.3 Island Park Substation

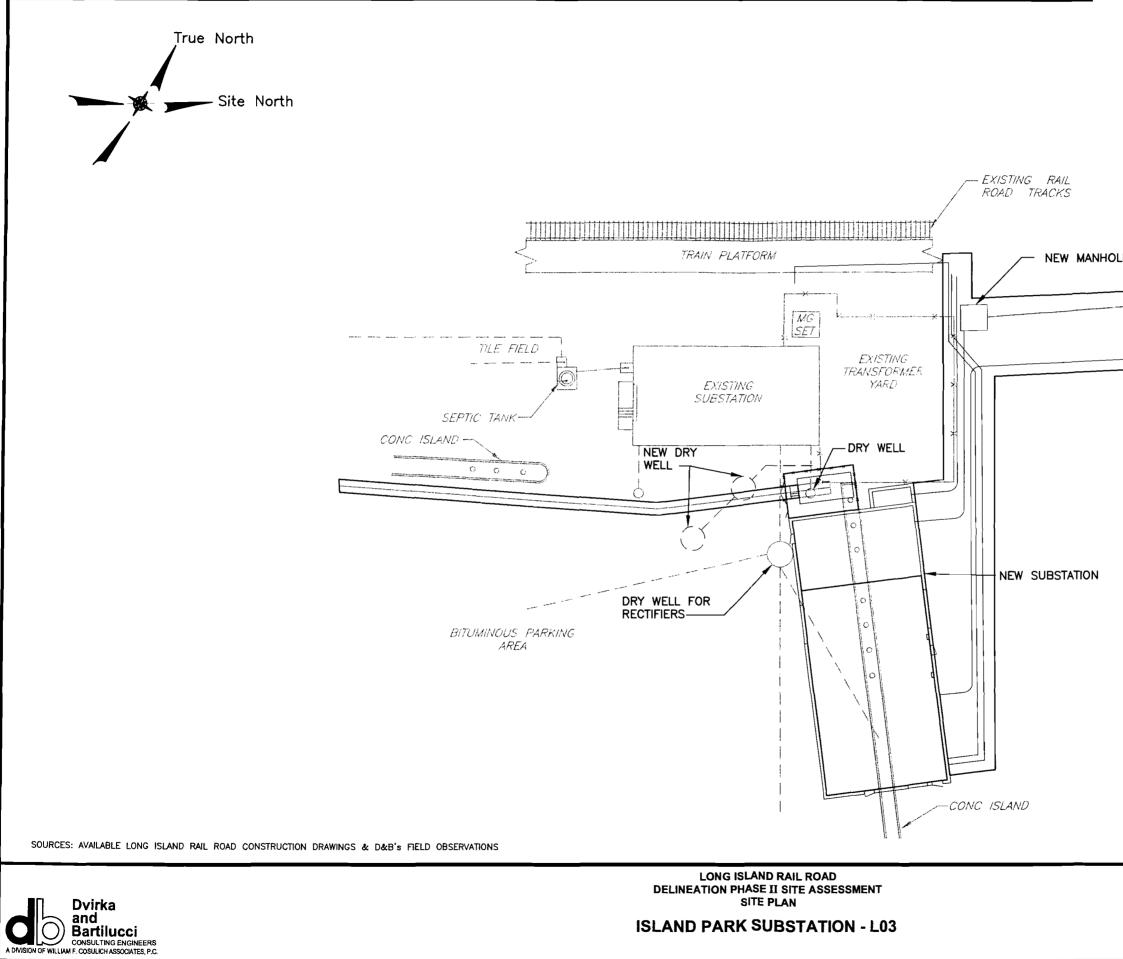
The Island Park substation site is located in Island Park, Nassau County, New York (see Figure 1-5). The site consists of an approximately 1,800 square foot one-story brick building as shown on Figure 1-6. An approximately 3,000 square foot transformer yard is located adjacent to the substation to the northeast and is secured by a perimeter chain-linked fence. The substation complex is presently utilized to convert alternating current to direct current for the LIRR-Long Beach line. The areas surrounding the substation and the transformer yard are currently utilized for vehicular parking.

The Island Park substation contains a basement, sanitary facilities, water service and a utility trench system. The sanitary facilities are active and discharge to a septic tank located to the south of the substation. A tile field, which extends further to the south, is connected to the septic tank. The interior of the substation consists of two active solid-state rectifiers located over two separate pits leading to the basement. These pits once supported the mercury-containing rectifiers. In addition, there is a water meter pit with an earthen bottom that is covered with a steel plate located off the northwest corner of the substation as shown in Figure 1-6. Based on available information, the approximate groundwater flow direction is to the southwest and the approximate depth to groundwater is 10 feet below grade.

#### **1.3 Summary of Prior Investigations**

As discussed in Section 1.1, the LIRR completed initial environmental assessments at each of the three substations in 1999 as documented in the report entitled, "Site Assessment of 20 Substations for Mercury Contamination," dated December 2000. Investigation methods utilized at the sites during the initial site assessments included site inspections, mercury vapor measurements, drainage determinations and geophysical surveys. In addition, samples of various environmental media were collected at each of the sites for laboratory analysis. These media included surface soil, subsurface soil, surface water sediment, groundwater and concrete. Analytical data from the initial assessment of the three substations is presented in Appendix A. Through these assessments, several areas of concern (AOC) were identified at each substation,





	LEGEND
	PIPE CONNECTION BASED ON LIRR CONSTRUCTION DRAWINGS
<del>x x </del>	CHAIN LINK FENCE

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	1
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30 15 SCALE IN FEET

FIGURE 1-6

which were found to warrant additional investigation. As discussed above, the LIRR elected to further investigate the Manhasset, Massapequa and Island Park substations first, in support of a long-term Capital Improvement Project. Below is a summary of the findings and recommendations that are based on the initial assessment of the three substations. Note that the recommendations presented below were used as the basis for developing the investigation scope of work for the Delineation Phase 2 Site Assessment of the three substations. This summary has been organized by each AOC identified at the three substations.

#### 1.3.1 Manhasset Substation

#### Exterior Railroad Ties

Surface and subsurface soil samples were collected from the west side of the substation within the location of the Exterior Railroad Ties. Analytical sampling results identified mercury-impacted soil to a depth of 6 feet below grade at this location. As a result, additional soil sampling and analysis was recommended to delineate the horizontal and vertical extent of mercury-impacted soil in the vicinity of soil borings MHSBB-06 and MHSBB-07.

#### Drainage Swale

A drainage swale was identified just inside the northern border of the site. The swale traversed the site from the east to the west and terminated off-site at an outfall along the east shore of Manhasset Bay. A significant portion of the drainage swale extending to the west of the substation was identified to have been impacted by mercury to a depth of approximately 1-foot below grade with mercury concentrations ranging from nondetect to 9,880 mg/kg in this area.

It was also recommended to further investigate the drainage swale "upgradient" to the substation (to the east) to identify any potential off-site sources.

#### Outfall to Manhasset Bay

As discussed above, the on-site drainage swale was identified to discharge off-site at an outfall located on the eastern shore of Manhasset Bay. Mercury was detected in sediment sample MHSS-08 at the mouth of the outfall at a concentration of 1.3 mg/kg. The NYSDEC guidance values for mercury in surface water sediments ranges from 0.15 mg/kg to 1.3 mg/kg. In order to determine if the mercury identified in the sediment sample was associated with the discharge of storm water from the drainage swale, it was recommended that additional samples be collected from the drainage swale west of the substation, and that additional sediment samples be collected beyond the mouth of the outfall.

#### <u>Slop Sink</u>

A slop sink was identified inside the substation along the eastern wall. The sink was found to discharge to the ground on the west side of the transformer yard, and was therefore found to be in violation of the State Pollutant Discharge Elimination System (SPDES). A surface soil sample (MHSS-01) collected at the discharge point identified the soil to be impacted by mercury. As a result, it was recommended that the slop sink be removed and additional sampling be conducted adjacent to MHSS-01 to determine the horizontal and vertical extent of impacted soil within the vicinity of the slop sink discharge point.

#### Underground Injection Control

A dry well located off the southeast corner of the substation was found to receive drainage from an interior floor drain. As a result, its closure was noted to be regulated by the United States Environmental Protection Agency (USEPA) Underground Injection Control (UIC) program. Based on the initial site assessment field activities, soil within the dry well from at least 12.5 to 16.5 feet below grade was found to be impacted. Based on these results, additional sampling and analysis for UIC constituents was recommended to determine the vertical extent of impacted soil within the dry well.

A floor drain was discovered in both the rectifier and water trough pits that discharge directly to the subsurface soil immediately beneath the substation floor. As a result, the closure of these units was also noted to be regulated by the USEPA UIC program. Further investigation activities, including sampling and analysis, were recommended to determine the vertical extent of the impacted soil at both locations.

Lastly, it was recommended that all closure activities at the dry well, rectifier pit and water trough pit be conducted in accordance with the USEPA UIC program.

#### Potential Miscellaneous Releases

Due to the unknown historic use of the mercury containing rectifiers, it was determined that inadvertent, non-specific releases may have occurred in the areas immediately surrounding the substation. Analytical results indicated that, exterior areas not necessarily associated with known areas of concern (i.e., loading docks, entrance ways, dry wells, trenches, etc.) may have been impacted. Therefore, it was recommended that two soil borings be advanced along the south side of the substation to address potential releases not previously investigated.

#### Groundwater

Groundwater sampling results presented in the initial site assessment indicated that groundwater had not been impacted by mercury at the Manhasset substation. As a result, further investigation and/or remediation activities with respect to groundwater were not recommended.

#### 1.3.2 Massapequa Substation

#### Substation Interior

Mercury was detected above NYSDEC soil cleanup objectives in soil at borings and concrete corings advanced within the former rectifier and water trough pits and water pipe trench located within the substation building. However, further sampling and/or remediation was not recommended at that time. LIRR representatives had indicated that the Massapequa substation was scheduled for renovation, whereby the rectifier and water trough pits would be permanently backfilled to grade with concrete. It was anticipated that the structurally sound concrete cap will minimize, if not eliminate, any mercury migration through the subsurface soil immediately beneath these structures. It was noted that if the LIRR plans to remove the concrete cap or demolish this substation in the future, that would represent the best opportunity to delineate and remediate any mercury contaminated soil as necessary.

The initial site assessment report also noted that during a mercury vapor survey, elevated levels of mercury vapor were detected inside the conduit pipes located within the water trough pit. As a result, it was also recommended that these conduit pipes be permanently sealed with concrete.

#### East Side of Substation

Based on the analytical results from the initial site assessment, as well as the endpoint sample results from the IRM program, surface and subsurface soil was found to have been impacted by mercury in the area to the east of the substation. Additional sampling and analysis was therefore recommended to determine the horizontal and vertical extent of mercury contamination in this area; specifically, in the vicinity of soil boring MSSB-06 and surface soil samples MSSS-02 through MSSS-04.

#### West Side of Substation

The initial site assessment also identified mercury impacted surface soil along the western side of the substation within the transformer yard. Additional sampling and analysis was recommended to determine the horizontal and vertical extent of mercury contamination in this area; specifically, in the vicinity of surface soil sample MSSS-06 and MSSS-07.

#### Former Dry Well

LIRR construction drawings indicated the presence of a dry well located approximately 10 feet to the north of the substation. However, this dry well was not visible from grade during the initial site assessment since we believe that the unit may be located directly beneath the existing railroad tracks. Since this former dry well was inaccessible, further investigation activities were determined not to be feasible.

#### <u>Miscellaneous Pits</u>

A communications pit was identified to the west of the substation within the transformer yard that contained a floor drain that discharges directly to subsurface soil. Soil boring MSSB-05 was advanced through this structure and soil samples were collected. Mercury-impacted soil was identified to a depth of 11 feet below grade, but the vertical extent of contamination was not determined. Therefore, it was recommended that a soil boring be advanced through the floor drain (immediately adjacent to MSSB-05) to collect and analyze samples from a depth of 11 to 15 feet below grade.

A water service pit with an earthen bottom was identified adjacent to the east side of the substation. Soil boring MSSB-07 was advanced at this location and samples were collected. Mercury-impacted soil was identified to a depth of 7.5 feet below grade; however, the vertical extent of contamination was not determined. Therefore, it was recommended that a soil boring be advanced through the floor drain (immediately adjacent to MSSB-07) and samples be collected for analysis from a depth of 7.5 to 11.5 feet below grade.

Lastly, a positive breaker cable pit with an earthen bottom was discovered adjacent to the north side of the substation. Analytical results indicated that soil at a depth of 7 feet below grade had been impacted by mercury. A sample collected from 9 to 11 feet below grade did not exhibit any mercury exceedance. Therefore, no additional investigation was recommended at this structure. Instead, it was recommended that the mercury-impacted soil be excavated to a depth of 9 feet below grade for proper off-site transportation and disposal.

#### Underground Injection Control

A dry well was identified approximately 5 feet to the west of the substation, which receives drainage from an interior pit drain. As a result, the closure of this unit was determined to be regulated by the USEPA UIC program. Soil boring MSSB-04 was advanced to a depth of 12 feet below grade within this structure. The vertical extent of mercury contamination, however, was not determined during the initial site assessment program. Therefore, it was recommended that a soil boring be advanced immediately adjacent to soil boring MSSB-04 from a depth of 17 to 22 feet below grade. In addition, it was recommended that the interior drain pipe located in the rectifier pit that discharges to the dry well be permanently capped with concrete as part of the UIC closure program.

#### Potential Miscellaneous Releases

Due to the unknown historic use of the mercury containing rectifiers, it was determined that inadvertent, non-specific releases may have occurred in the areas immediately surrounding the substation, and that exterior areas not necessarily associated with known areas of concern (i.e., loading docks, entrance ways, dry wells, trenches, etc.) may have been impacted. Therefore, it was recommended that two soil borings be advanced along the south side and northeast corner of the substation to address potential releases not previously investigated.

#### 1.3.3 Island Park Substation

#### Substation Interior

Mercury-impacted soil was identified beneath a sump pump pit located within the substation building. As a result, further investigation activities were recommended to determine the horizontal and vertical extent of the impacted soil. However, at the time of the initial site assessment, LIRR representatives indicated that the Island Park substation was scheduled to be

demolished. Consequently, it was recommended that delineation activities be performed in coordination with the demolition of the building, planned for the year 2005.

#### South Side of Substation

Mercury-impacted soil was identified to a depth of 6 feet below grade along the south side of the substation. As a result, it was recommended that additional subsurface soil sampling be conducted in the vicinity of IPSB-04 and IPSB-05 to delineate the horizontal and vertical extent of impacted soil.

#### Northwest Corner of Substation

Based on the results of endpoint samples that were collected and analyzed during the IRM program, mercury-impacted surface soil was noted to exist along the northwest corner of the substation. As a result, it was recommended that surface and subsurface soil sampling be conducted in the vicinity of surface soil samples IPSS-01 and IPSS-04 to further delineate the horizontal and vertical extent of impacted soil.

#### Western Drainage Line

D&B traced a drain pipe originating from within the substation basement and determined that it terminated approximately 21 feet from the west wall of the building beneath an unpaved area between the substation and the train tracks. However, this area could not be excavated to determine if a discharge feature existed due to the presence of numerous electric utilities. Consequently, it was recommended by D&B that this area be excavated at the time of building demolition (planned for the year 2005) when electric utilities in the area would normally be de-energized.

#### Rectifier Dry Well

D&B traced a drain pipe originating from within the substation basement that lead from the eastern wall of the substation and appeared to terminate under the parking lot approximately 30 feet east of the eastern wall of the building. This location roughly corresponded to the "dry well for rectifiers" identified on LIRR construction drawings. D&B subsequently conducted a geophysical survey to further investigate this area. This survey identified a magnetic anomaly in the vicinity of the rectifier dry well suggesting that a metal manhole cover was still present. Therefore, D&B advanced soil boring IPSB-08 to determine if this dry well area has been impacted. The soil sample results indicate that the rectifier dry well has not been impacted by mercury. It should be noted that D&B elected to advance soil boring IPSB-08 immediately down-gradient (from a groundwater perspective) of the rectifier dry well in order to minimize damage to the asphalt parking lot and to ensure that the soil boring would not meet refusal. Because soil boring IPSB-08 was not advanced through the rectifier dry well for the reasons described above, it was recommended that excavation activities be conducted in an attempt to locate this dry well. Once located, it was further recommended that a soil boring be advanced to a depth of at least 10 feet below the bottom of the dry well. It was also noted that if, upon excavation, the rectifier dry well is determined to be active, it would require proper closure pursuant to the USEPA UIC program.

#### <u>Water Meter Pit</u>

A water meter pit, located along the south side of the substation, was found to contain mercury-impacted soil from the bottom of the pit (2.5 feet below grade) to a depth of 6.5 feet below grade. Successful delineation of impacted soil was accomplished at this pit. As a result, no additional investigation activities were recommended. Instead, it was recommended that soil be excavated to a depth of 6.5 feet below grade from within the water meter pit for proper off-site transportation and disposal.

#### Underground Injection Control

Due to the fact that the Island Park substation had been scheduled for demolition, the active septic tank was recommended for closure pursuant to the USEPA UIC program. In addition, the rectifier dry well and tile field were recommended for UIC closure pending future successful identification of these features.

#### Potential Miscellaneous Releases

Due to the unknown historic use of the mercury containing rectifiers, it was determined that inadvertent, non-specific releases may have occurred in the areas immediately surrounding the substation. It appeared that exterior areas, not necessarily associated with known areas of concern (i.e., loading docks, entrance ways, dry wells, trenches, etc.), may have been impacted. As a result, it was recommended that two soil borings be advanced along the east and west sides of the substation to address potential releases not previously investigated.

Section 2

#### 2.0 INVESTIGATION METHODS

#### 2.1 Introduction

This section provides a description of the field activities conducted at the three substation sites. As discussed in Section 1.0, this investigation report summarizes the results of a number of related investigation phases, including:

- Field work performed during January and February of 2003, as part of the Delineation Phase 2 Site Assessment, that was conducted in accordance with the NYSDEC-approved "Investigation Work Plan," dated September 2002.
- Field sampling performed during January and February 2003 as part of the UIC Investigation. This work was conducted in accordance with the USEPA-approved Underground Injection Control Closure Plan, dated November 2002.
- Field activities conducted as part of the Construction Excavation Investigation that was completed by D&B during January and February 2003 in accordance with the NYSDEC-approved Construction Excavation Work Plan, dated October 2002.
- Field work performed during August of 2004, as part of the Supplemental Sampling Program, that was conducted in accordance with the NYSDEC-approved Supplemental Delineation Phase 2 Sampling Program, Final Sampling Plan, dated April 2004.

Sample locations associated with this investigation are shown on Drawing 1 (Manhasset), Drawing 2 (Massapequa) and Drawing 3 (Island Park), provided in map pockets at the end of this section. In addition, sampling and analysis summaries for the above listed investigation phases (which include AOC designation, number of borings, and samples collected at each AOC) are provided in Tables 2-1 through 2-6.

#### 2.2 Surface Soil Sampling

In general, surface soil samples were collected from a depth of 0 to 2 inches below ground surface (bgs). However, in some locations at the Manhasset Substation, the NYSDEC specified that additional samples be collected from 2 to 12 inches bgs. All samples were

#### TABLE 2-1 Long Island Rail Road DELINEATION PHASE 2 SITE ASSESSMENT Sampling and Analysis Summary Manhasset Substation - N10

			SOIL PR	OBES.		MON W	ITORING BLLS		<b>***</b> ***	generation State	Analyse	2	2		<b>6</b> 0 (1)						
Location	Sample Point ID.	No. of Probes	Geoprobe Samples	Soli Sampling	No. of Sampler	Ne. of	Approx. Depth	Mercury	TAL	RCRA Metals	VOCI	SVOCI	PCB	TPHI	TOC	Purpose for Sampling	Comments				
	MHSB-13(0-2") Through MHSB- 16(0-2")			0-2" bgs				4							•		_				
	MHSB-06A	ł	2	6'-10' bgs Cont.				2									-				
Exterior Railroad Ties	MHSB-13 & 14	2	8	2-10' bgs Cont.				8								Delineate extent of Hg	-				
	MHSB-15 & 16	2	6	2-8' bgs Cont.				6													-
Exterior Railroad Ties Supplemental	MHSS-32 through 43			0-2" bgs				12													
Sampüng*	MHSB-24 Through 35	12	47	0-8' bgs Cont. except for MHSB-29 at 0-6' bgs Cont.				47									A hand-auger was utilized to aquire samples from MHSB-29 due to overhead utility lines.				
	MHSS-14 Through 16 & MHSS-27 Through MHSS-31 & MHSB-17(0-2") Through MHSB- 19(0-2")			0-2" bgs				11								Delineate the extent of Hg contamination associated with the Drainage Swale.					
Drainage Swale	MHSS-17 Through 26			0-2" bsb				10									-				
	MHSB-17, 18 & 19	3	9	2-8' bgs Cont.				9													
Drainage Swaie	MHSS-44 Through 74			0-2" and 2-12" bgs				62									-				
Drainage Swaie Supplemental Sampling*	MHSS-75 Through 80			0-2" bsb				6									-				

#### TABLE 2-1 Long Island Rail Road DELINEATION PHASE 2 SITE ASSESSMENT Sampling and Analysis Summary Manhasset Substation - N10

Location	Sample Point ID		SOIL PR	OBES 12	SURFACE WATER SEDIMENT	MONI	TORING				Analyse						
	i e Tri	No. of Probes	Geoprobe Samples	Soli Sampling & Interval	No. of Samples	No. of y Wells	Approx. Depth	Mercury	Metals	Metals	VOC	SVOC	PCBs	TPHY	TOC	···· Purpose for Sampling	Comments
Underground Injection Control	MHSB-20						[									Determine vertical extent of	Dry well appeared to have a solid bottom. Probe could not pentrate bottom.
	MHSB-21	1	4	0-12' bgs Cont.						4	4	4		4		Determine vertical extent of impacted soil in rectifier pit (UIC).	Probe initially supposed to be advanced to 10' bgs. However high MVA readings at depth warranted additional, deeper sampling.
	MHSB-22	1	3	6-30' Cont.						3	3	3		3		Determine vertical extent of impacted soil in water trough pit (UIC).	Probe initially supposed to be advanced to 10' bgs. However high MVA readings at depth warranted additional, deeper sampling.
Outfail to Manhasset Bay	MHSD-01A, 01, 02A, and 03A			0-2" bgs	4			4								4 sediment samples located at 5' intervals extending to the north from soil sample MHSS-08.	-
Groundwater	MHMW-01, MHMW-02 and MHMW-03					1	90		6**		3	3	3			Install one additional monitoring well. Collected and analyzed samples from three wells.	

NOTES;

bgs: below ground surface,

bsb: below swale bottom

Cont.: Continuous 2-foot soil sampling

\* Sample(s) collected during the Supplemental Sampling Program conducted in August of 2004.

\*\* Filtered and unfiltered samples collected.

# TABLE 2-2Long Island Rail RoadCONSTRUCTION EXCAVATION SAMPLING PROGRAMSampling and Analysis SummaryManhasset Substation - N10

		SOIL	PROBES			Analyses			
	Sample Point ID		No. of Geoprobe Samples	Soll Sampling	RCRA	PCB	A STATE OF A STATE OF	Comments:	
	MHSBX-01	1	8	4'-20' bgs Cont.	6	6	6	No recovery from 6-8' and 10-12' bgs.	
	MHSBX-02	1	8	4'-20' bgs Cont.	8	8	8		
Existing Transformer	MHSBX-03	1	8	4'-20' bgs Cont.	8	8	8		
Yard	MHSBX-04	1	8	4'-20' bgs Cont.	6	6	6	No recovery from 16-20' bgs.	
	MHSBX-05	1	8	4'-20' bgs Cont.	8	8	8		
	MHSBX-06	1	3	4'-10' bgs Cont.	3	3	3		
Property Line Manhole	MHSBX-07	1	5	10'-20' bgs Cont.	5	5	5		
South of Existing Substation	MHSBX-08	1	8	4'-20' bgs Cont.	8	8	8		
Positive Manhole	MHSBX-09	1	7	6'-20' bgs Cont.	7	7	7		
Future Light Pole	MHSB-23	1	2	0'-8' bgs	2*			Soil samples collected from 0-4' and 4- 8' bgs for mercury analysis at request of LIRR.	

#### NOTES:

bgs: below ground surface.

Cont.: Continuous 2-foot soil sampling

\*: Mercury analysis only

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#### TABLE 2-3 Long Island Rail Road DELINEATION PHASE 2 SITE ASSESSMENT Sempling and Analysis Summary Massapequa Substation - S15

Location Con	Grant Princip	-SOIL	PROBES No. of Since rates Samples	Configuration	CROUNDY	VATER PROBES		RCRA Métale		INVIA ILCOX	VOC:	BVOC1-	and a second	a marcifors staplare	Conuntation
	MSSB-06A(0-2") and MSSB-09(0-2") Through MSSB-34(0-2")			0-2" bgs			27								-
	MSSB-06A, 09, 10, 11, 12, 13, 14, & 15	8	15	2-6' bgs. Cont.			15					1			There was no recovery of soil from 2-4' bgs at MSSB-15.
East Side of Substation	MSSB-16 Through 29	14	<b>[4</b>	2-4' bgs Cont.			14								Several samples collected utilizing a hand auger.
	MSSB-30 & 31	2	2	2-4' bgz Cont.			2							Delineate extent of Hg contamination associated with MSSS-01 through MSSS-05 and MSSB-06 and MSSB-08	MSSB-31 was advanced using a hand auger.
	MSSB-32, 33 & 34	3	12	2-10' bgs Cont.			12								-
	MSSS-07 <b>A and MS</b> SS-08 through 20			0-2" bgs			14								
East Side of Substation Supplemental Sampling*	MSSB-40 Through 52 & 54 Through 58	18	55	0-6' bgs Cont. except for MSSB-55 at 0-8' bgs Cont.			55		•						A hand-auger was utilized to acquire samples at soil borings MSSB-45 and MSSB-47 due to sloping topography.
	MS\$8-53	1	3	0-2', 2-4', and 6-8' bgs			3								
	MSSB-35													Boring in floor drain of communications pit. Determine vertical extent of contamination associated with MSSB-05.	This probe could not be advanced due to access constraints associated with the pit, and a solid concrete bottom.
Underground Injection Control	MSSB-36	1	2	7.5-11.5' bgs Cont.				2			2	2	2	Determine vertical extent of impacted soil associated with MSSB-07 advanced withing the water service pit (UIC).	This probe was added to UIC program after field inspection by NCDH.
	MSSB-37	1	4	12-22' bgs Cont.				4			4	4	4	Determine vertical extent of impacted soil in dry well (UIC).	No recovery from 20-22' bgs.
Groundwater	MSGP-01, 02, & 03				j	15			6*	3	3	3		Determine if groundwater has been impacted at the site.	-

#### TABLE 2-3 Long Island Rail Road DELINEATION PHASE 2 SITE ASSESSMENT Sampling and Analysis Summary Massapequa Substation - S15

En	single Point II	SOIU Ne de Prober	PROBES No. of Generation Samples		GROUND Ne. action	WATER PROBES	Netale	Métais	International International	VOCI	SVOCI	стная	Se surpote for a simpling energy	Churrent
	MSSB-38(0-2") and MSSB-39(0-2")			0-2*			2		2		2			
Potential Releases	MSSB-38 & 39	2	2	2-4' bgr		·	2		2		2		Address potential releases not previously investigated.	MSSB-38 and MSSB-39 were advanced using a hand auger.

#### NOTES:

bgs: below ground surface.

bpb: below pit bottom.

Cont.: Continuous 2-foot soil sampling.

\* Sample(s) collected during the Supplemental Sampling Program conducted in August of 2004.

\*\* Unfiltered and filtered samples collected.

# TABLE 2-4Long Island Rail RoadCONSTRUCTION EXCAVATION SAMPLING PROGRAMSampling and Analysis SummaryMassapequa Substation - S15

		SOIL	PROBES			Analyses		
Discation Parts	Sample Point ID	Not of Probes	Geoprobe Samples	Soft Sampling	NGRA	POB	SWORT	Comments
	MSSBX-01	1	8	4'-20' bgs Cont.	5	5		No recovery from 14'-20' bgs.
	MSSBX-02	1	8	4'-20' bgs Cont.	6	6	6	No recovery from 16'-20' bgs.
	MSSBX-03	1	8	4'-20' bgs Cont.	8	8	8	
Existing Transformer Yard	MSSBX-04	1	8	4'-20' bgs Cont.	8	8	8	
	MSSBX-05	1	8	4'-20' bgs Cont.	8	8	8	
	MSSBX-06	1	2	4'-8' bgs Cont.	2	2		Due to physical access constraints these samples were collected using a hand auger. As a result, soil could only be sampled to a depth of 8' bgs.
Property Line Manhole	MSSBX-07	1	8	4'-20' bgs Cont.	5	5	5	No recovery from 14'-20' bgs.
North of Existing Substation	MSSBX-08							This soil probe was removed from the program due to physical access constraints associated with the Transformer Area.
Negative Manhole	MSSBX-09	1	8	4'-20' bgs Cont.	5	5		No recovery from 12'-16' bgs and 18'- 20' bgs.
South of Existing Substation	MSSBX-10	1	8	4'-20' bgs Cont.	7	7	7	No recovery from 14'-16' bgs.

#### NOTES:

bgs: below ground surface.

Cont.: Continuous 2-foot soil sampling

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#### TABLE 2-5 Long Island Rail Road DELINEATION PHASE 2 SITE ASSESSMENT Sampling and Analysis Summary Island Park Substation - L03

and the second	1. Same		PROBES		GROUNDWATER PROBES					Analyses			- 1. je	etter all des	a Minister and Antonio and
Location	Sample Point ID	- Na. of Probes	No. of . Geoprobe Samples	Sell Sampling	Np. of Probes	* Depth of Groupdwater Probes	Mercury	RCRA Metals	TAL Metals	РСВя	VOC	SVDC1	ТРН	Purpose for Sampling	Comment
Substation Interior	₽SB-01A													Delineate extent of Hg contamination associated with IPSE 01. Probe to be located adjacent to IPSB-01. Soil Samples will be collected after building demolition.	Soil boring postponed until after building demolition.
	IPSB-10 & 11													Delineate extent of Hg contamination associated with IPSE 01. Probes to be located 10' east and routh of IPSB-01. Soil samples will be collected after building demolition.	Sail boring notmoned until after building demolition
West Side of Substation	IPSS-05 & 06			0-2" bgs			2							Surface soil samples to delineate extent of Hg contamination in the vicinity of the IRM work.	
	IPSB-12(0-2") Through IPSB-15(0- 2")			0-2-			4								
South Side of	IPSB-04A	1	2	6'-10' bgs. Cont.			I	1		1	1	1		Delineate extent of Hg contamination associated with IPSE 04. Probe located adjacent to IPSB 04.	The 8-10' interval was analyzed for RCRA metals, PCBs, VOCs and SVOCs due to observed PID readings, odors and other characteristics.
Substation	IPSB-12 & 13	2	7	2-10' bga. Com.			5	2		2	2	2		Delineate extent of Hg contamination associated with IPSE 04. Probes located 10' south and west of IPSB-04.	At IPSB-13, the 6-8', and 8-10' intervals were analyzed for RCRA metals, PCBs, VOCs and SVOCs due to observed PID readings, odors and other characteristics.
	IPSB-14 & 15	2	8	2-10' bgs. Cont.			8							Delineate extent of Hg contamination associated with IPSE 05. Probes located 10' south and east of IPSB-05.	
	₽\$B-18(0-2")		I	0-2*											
Northwest Corner of	IPSB-16 & 17	2	4	0-4' bgs. Cont.			4							Delinente extent of Hg contamination associated with IPSS 04. Probes located adjacent to IPSS 04 and 10' north, east and west of IPSS-04.	
Substation	IPSB-18	1	I	2-4' bgs. Cont.			I				,			Delineate extent of Hg contamination associated with IPSS 04. Probes located adjacent to IPSS 04 and 10' north, east and west of IPSS-04.	
	IPSB-20	1	2	0-4' bgs. Cont.			1	1						Delineate extent of Hg contamination associated with IPSS 01. Probes located adjacent to IPSS 01	
Rectifier Dry Well	IPSB-21	1	5	10-20' bgs Cont.				5			5	5	5	Probe advanced after test pit excavated (UIC).	
The Field	IPSB-22(0-2") Through IPSB-25(0- 2")			0-2"				4			4	4	4	Investigate Tile Field (UIC).	
	IPSB-22, 23, 24, 25	4	4	2-4° bga Cont.				4			4	4	4		
Groundwater	IPGP-01, 02 & 03 and IPTP-03				3	10		2*	6•	4	4	4		Determine if groundwater has been impacted at the site.	PCB and SVOC analyses added to program.

#### TAISLE 2-3 Long Island Rall Road DELINEATION PHASE 2 SITE ASSESSMENT Sampling and Analysis Summary Island Park Substation - L03

The second states and	Sample Point ID	SOIL Na. af	PROBES No. of Geoprobe Samples	Soli Samplian Interval	GROUNDY Na. of Probes	SE BESS	RCRA	TAL	Analysee PCBs	Sur and	Acres	Purpers for Sampling	Соплеми
	PSB-19 (0-2"), PSB 26(0-2") and PSB- 27(0-2")			0-2"		 1	2		2	2		c	
Transformers	IPSB-19	1	1	2-4' bgs. Cont.		1						Investigate stained areas in the vicinity of transformers.	
	IPSB-26 & 27	2	4	0-4' bgs. Cont.			4		4	 4			
	IPSB-28(0-2") and IPSB-29(0-2")			0-2-			2		2	2		Address potential releases not	
Polenilaj Refeases	IPSB-28 & 29	2	2	2-4' bgs. Cont.			2		2	2		previously investigated. Probes located on the east and west sides of the substation.	-

NOTES: bgs: below ground surface. Cont.: Continuous 2-foot soil sampling

\* Unfiltered and filtered samples collected.

# TABLE 2-6Long Island Rail RoadCONSTRUCTION EXCAVATION SAMPLING PROGRAMSampling and Analysis SummaryIsland Park Substation - L03

and the second se		SOIL:	PROBES	****************		Analyses	an an Sha	STEP In the Series
Jocation	Sample Point ID	iNo. of	No. of Geoprobe Samples	A CONTRACT OF	RORA	PCB		Comman(r
South Trench	IPSBX-01	l	8	4'-20' bgs Cont.	8	8	8	
South Dry Well	IPSBX-02	1	7	6'-20' bgs Cont.	7	7	7	
North Dry Well	IPSBX-03	1	7	6'-20' bgs Cont.	7	7	7	
New Substation - Cable Vault	IPSBX-04	1	8	4'-20' bgs Cont.	8	8	8	-
New Substation - Cable Vault	IPSBX-05	1	5	10'-20' bgs Cont.	5	5	5	
New Substation	IPSBX-06	1	8	4'-20' bgs Cont.	7	7	7	No recovery from 10-12' bgs.
New Substation	IPSBX-07	1	8	4'-20' bgs Cont.	8	8	8	
East Trench	IPSBX-08	1	8	4'-20' bgs Cont.	8	8	8	
East Trench	IPSBX-09	1	8	4'-20' bgs Cont.	8	8	8	
New Manhole	IPSBX-10	1	6	8'-20' bgs Cont.	5	5	5	No recovery from 18-20' bgs.
North Trench	IPSBX-11	1	8	4'-20' bgs Cont.	8	8	8	
North Trench	IPSBX-12	1	8	4'-20' bgs Cont.	8	8	8	

## NOTES:

bgs: below ground surface. Cont.: Continuous 2-foot soil sampling collected utilizing a dedicated polyethylene scoop and placed into laboratory-supplied glass bottles. All samples were screened utilizing a mercury vapor analyzer (MVA) for the presence of mercury vapor and a photoionization detector (PID) for the presence of volatile organic compounds (VOCs). In areas of the substations where the ground surface was covered with crushed stone or railroad ballast, this material was removed prior to collecting the surface soil sample.

# 2.3 Sediment Sampling

Sediment samples were only collected during the investigation of the Manhasset substation. Sediment samples were collected at the discharge point of the drainage swale outfall (to Manhasset Bay) (off-site). Each sample was collected from 0 to 2 inches below the surface of the sediment utilizing a long-handle polyethylene scoop.

# 2.4 Subsurface Soil Sampling

Subsurface soil samples were collected using a direct push (Geoprobe<sup>®</sup>) sampling technique with a decontaminated probe sampler. The samples were screened for mercury, utilizing an MVA, and for VOCs, utilizing a PID; inspected for staining, discoloration; checked for odors; and logged by a geologist in a dedicated field book. Boring logs are included in Appendix B.

Before commencement of soil probing, all "down-hole" probing equipment (i.e., macrocore samplers, probe rods, etc.) was decontaminated using a steam cleaner/pressure washer and/or Alconox and water daily at the decontamination pad. Soil probe samplers were also decontaminated between each use by thoroughly washing with Alconox and water, using a brush to remove particulate matter or surface film, followed by a thorough rinsing with tap water.

During soil probe installation, an MVA and a PID was used to monitor mercury vapor and VOCs, respectively, in the breathing zone and at the probe holes and boreholes. The PID was calibrated on at least a daily basis, using isobutylene gas at a concentration of 100 parts per million (ppm) in air.

Upon completion of soil probes, recovered sample material that was not retained for laboratory analysis was returned to the borehole from which it came. The remainder of the borehole was filled with clean sand and/or bentonite pellets. All probe holes were restored at grade with the same material that was originally in place. For example, asphalt areas were replaced with asphalt, concrete areas were replaced with concrete and grass and soil areas were restored with grass and soil.

# 2.5 Test Pit Excavation and Sampling

Two test pits were excavated to a depth of 5 feet below ground surface at the Island Park Site in order to locate suspected drywells. The locations of these test pits are depicted on Drawing 3. At each location, asphalt was removed over a 10-foot by 10-foot area with a jackhammer and soil was excavated utilizing a mini-excavator. During excavation, an MVA and a PID was used to monitor mercury vapor and VOCs, respectively, in the breathing zone and in the excavation. Groundwater was observed at a depth of approximately 4 feet below ground surface at both locations. Any evidence of odors, sheens or the presence of free product was noted. All observations and results were logged in the project field books. A groundwater sample was collected from test pit IPTP-03 for laboratory analysis. Test pit logs are included in Appendix C.

#### 2.6 Groundwater Monitoring Well Installation and Sampling

One groundwater monitoring well (MHMW-03) was installed at the Manhasset substation to assess the potential impact to groundwater downgradient of the site. The approximate location of the groundwater monitoring well is shown on Drawing 1. No other monitoring wells were installed as part of the Delineation Phase 2 Site Assessment.

MHMW-03 was installed to a depth of 86 feet utilizing a CME-55 rotary drill rig equipped with 4 1/4-inch hollow stem augers. All equipment, including the 4 1/4-inch hollow stem augers, was decontaminated utilizing a high-pressure steam cleaner. All decontamination water was contained in 55-gallon DOT drums for proper disposal. Fifteen feet of 2-inch diameter 0.010 slot schedule 40 flush joint threaded PVC screen and 70-feet of 2-inch diameter Schedule 40 flush joint thread PVC riser pipe was utilized for the well construction. A well construction log for MHMW-03 is presented in Appendix D.

All drill cuttings and well development water were contained in 55-gallon DOT drums for proper off-site transportation and disposal by LIRR. Number 1 Morie well gravel was utilized for the well screen annulus. The remainder of the annular void was filled with hydrated bentonite pellets and a cement and bentonite grout mix was installed as a seal. Subsequent well development activities reduced the turbidity of the well water to less than 50 NTU's. Nevertheless, the laboratory conducted filtered and unfiltered metals analyses for groundwater samples collected from this monitoring well.

One week subsequent to well development, groundwater samples were collected utilizing dedicated plastic bailers. Samples were not taken until pH, temperature and conductivity measurements were stabilized, and not before at least three well volumes were purged and well recovery was completed. Purge water was containerized in 55-gallon DOT drums for proper off-site disposal.

#### 2.7 Groundwater Probe Installation and Sampling

Groundwater probe samples were collected only at the Massapequa and Island Park substations. These samples were collected by driving probe rods to the designated sample depth and retracting 4 feet to expose a decontaminated stainless steel screen. Dedicated polyethylene tubing and a decontaminated stainless steel check valve were inserted into the rod assembly and manually oscillated to purge approximately three casing volumes of groundwater from the screen and rod assembly. The check valve was decontaminated and new tubing was used between each interval. Any evidence of odors, sheens or the presence of free product was noted. All observations and results were logged in the project field books. Groundwater samples were then collected from the tubing/check valve assembly into laboratory-supplied glass bottles.

Upon completion, each probe hole was backfilled with clean sand and/or bentonite pellets. All probe holes were restored at grade with the same material that was originally in place, as described previously.

# 2.8 Air Sampling

As discussed above, a Jerome Mercury Vapor analyzer was used to scan all surface and subsurface soil samples for the presence of mercury vapor. The mercury vapor results for subsurface soil are summarized on the boring logs provided in Appendix B. In addition, summary tables have been provided in Appendix H for all mercury vapor results measured at each surface soil sample location.

Section 3

# 3.0 FINDINGS

This section presents a discussion of the analytical data associated with the investigation phases conducted at the Manhasset, Massapequa and Island Park Substations, including:

- Field work performed during January and February of 2003, as part of the Delineation Phase 2 Site Assessment, that was conducted in accordance with the NYSDEC-approved "Investigation Work Plan," dated September 2002.
- Field sampling performed during January and February 2003 as part of the UIC Investigation. This work was conducted in accordance with the USEPA-approved Underground Injection Control Closure Plan, dated November 2002.
- Field activities conducted as part of the Construction Excavation Investigation that were completed by D&B during January and February 2003 in accordance with the NYSDEC-approved Construction Excavation Work Plan, dated October 2002.
- Field work performed during August of 2004, as part of the Supplemental Sampling Program, that was conducted in accordance with the NYSDEC-approved Supplemental Delineation Phase 2 Sampling Program, Final Sampling Plan, dated April 2004.

Soil sample results are compared to the criteria included in Appendix A of the New York State Department of Environmental Conservation (NYSDEC) Technical and Administrative Guidance Memorandum (TAGM) 4046 (referred to in this document as "NYSDEC TAGM Criteria"). Groundwater sampling results are compared to the Class GA Groundwater Standards/ Guidance Values listed in NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1. Analytical results are summarized on Tables 1 through 49 located in Appendix E.

The analytical results are organized by each of the three substations with the discussion further organized by each area of concern (AOC) identified at each substation during the initial 1999 Site Assessment.

#### 3.1 Manhasset Substation – Investigation Report

Surface soil, subsurface soil, groundwater and sediment samples were collected in support of the Delineation Phase 2 Site Assessment at the Manhasset Substation. The following presents a summary of the analytical results by AOC. All sample locations are shown on Drawing 1.

# 3.1.1 Exterior Railroad Ties

Sixteen surface soil samples (MHSB-13 [0 to 2 inches] through MHSB-16 [0 to 2 inches]) and MHSS-32 (0 to 2 inches) through MHSS-43 (0 to 2 inches) were collected below 6 to 8 inches of crushed stone in the location of the Exterior Railroad Ties. Table 1 summarizes the mercury data for the surface soil samples. In addition, 17 soil probes (MHSB-06A, MHSB-13 through MHSB-16, and MHSB-24 through MHSB-35) were advanced to varying depths of up to 10 feet bgs at this AOC. A total of 63 subsurface soil samples were collected from the 17 soil probes. All subsurface soil samples were analyzed for mercury, the results of which are summarized on Table 2.

#### Surface Soil

All 16 surface soil samples collected below 6 to 8 inches of crushed stone exhibited detectable levels of mercury, ranging from 0.34 mg/kg to a maximum of 332 mg/kg at MHSS-38, located in the central portion of this AOC. The second highest mercury concentration was 193 mg/kg, detected at MHSB-14 (0 to 2 inches). In addition, all 16 samples exceeded the NYSDEC TAGM criterion for mercury of 0.1 mg/kg. In general, the highest mercury concentrations in this AOC were observed immediately south of the drainage swale hot spot (see Section 3.1.2) and east of the signal hut.

#### Subsurface Soil

Detectable levels of mercury were exhibited by 60 out of the 63 subsurface soil samples with concentrations ranging from 0.015 mg/kg to a maximum of 1,700 mg/kg at MHSB-30 (2 to 4 feet). A total of 36 samples exhibited concentrations of mercury exceeding the NYSDEC TAGM criterion of 0.1 mg/kg. Note that the highest mercury concentrations in subsurface soil were detected at MHSB-29 through MHSB-34 within the central portion of this AOC and directly south of the drainage swale hot spot (see Section 3.1.2). In general, the highest concentrations of mercury were detected in subsurface soil shallower than 4 feet bgs with concentrations greater closer to the surface.

# 3.1.2 Drainage Swale

A total of 89 surface soil samples were collected within and in the vicinity of the drainage swale as part of the Delineation Phase 2 Site Assessment and the associated Supplemental Investigation conducted in August of 2004, and analyzed for mercury, including:

- MHSB-17 (0 to 2 inches) through MHSB-19 (0 to 2 inches);
- MHSS-14 (0 to 2 inches) through MHSS-31 (0 to 2 inches);
- MHSS-44 (0 to 2 inches) through MHSS-80 (0 to 2 inches); and
- MHSS-44 (2 to 12 inches) through MHSS-74 (2 to 12 inches).

As shown on Drawing 1, samples were collected from within and in the vicinity of the drainage swale, a total distance of approximately 105 feet east of the northwest corner of the substation to approximately 870 feet west (downstream) of this point. The samples collected from within the drainage swale were collected below the stone blocks that line the swale. In addition, a number of surface soil samples were collected immediately to the north of the drainage swale and on adjacent off-site properties. The analytical data for the surface soil samples collected from the drainage swale is presented on Table 1.

In addition, three soil probes (MHSB-17, MHSB-18 and MHSB-19) were advanced in the vicinity of this AOC to a depth of 8 feet bgs. A total of nine subsurface soil samples were collected from these soil probes. All samples were analyzed for mercury. The analytical data for the subsurface soil samples is presented on Table 2.

#### Surface Soil

Surface soil samples collected from the drainage swale in 1999, as part of the initial Site Assessment, identified elevated levels of mercury within a portion of the swale from approximately 10 to 30 feet west of the northwest corner of the substation. Surface soil samples MHSS-11 (0 to 2 inches) and MHSS-13 (0 to 2 inches) collected within this hot spot area exhibited the highest detected mercury concentrations within the Manhasset Substation site at 9,800 mg/kg and 1,890 mg/kg, respectively. However, additional sampling performed as part of the Delineation Phase 2 Site Assessment indicate mercury concentrations are significantly lower to the west (downstream) and east (upstream) of this hot spot area. Surface soil samples to the west of the hot spot area exhibited mercury concentrations from a minimum of 0.093 mg/kg detected at MHSS-76 (0 to 2 inches) located approximately 820 feet west of this area to a maximum of 15.5 mg/kg detected at MHSS-19 (0 to 2 inches) located approximately 190 feet west of this area. Surface soil samples collected from within the drainage swale and east of the hot spot were also found to exhibit mercury concentrations at relatively low concentrations, but above the NYSDEC TAGM criterion of 0.1 mg/kg, with concentrations ranging from 0.05 mg/kg detected at MHSB-18 (0 to 2 inches) to a maximum of 6.4 mg/kg detected at MHSS-29 (0 to 2 inches). As discussed previously, all surface soil samples collected from the drainage swale were actually collected from below or underneath the stone blocks that line the swale.

Surface soil samples collected off-site immediately to the north of the drainage swale were found to exhibit relatively low mercury concentrations, but generally above the NYSDEC TAGM criterion of 0.1 mg/kg, with the majority of concentrations ranging from 0.1 mg/kg to less than 6.0 mg/kg. One exception to this general trend was the detection of mercury at 35.8 mg/kg at MHSS-54 (0 to 2 inches) located immediately in front of the substation fence gate.

While not completed as part of the Delineation Phase 2 Investigation, a total of 48 surface soil samples were collected immediately south of the drainage swale as part of the Post-Removal of Staged Soil Investigation conducted at the Manhasset Substation in June of 2004. All samples were analyzed for mercury. The October 4, 2004 letter report entitled, "Removal of Staged Soil at the Long Island Rail Road Manhasset Substation" is provided in Appendix F and includes the results of the analyses. The location of each of the post-soil removal surface soil samples is shown on Drawing 1. The review of the mercury data for the 48 surface soil samples indicates that the vast majority of the samples (45 of 48) exhibited mercury concentrations of less than 2.0 mg/kg. The exceptions include: SRSS-08 (0 to 2 inches) at 3.9 mg/kg, SRSS-31 (0 to 2 inches) at 3.3 mg/kg, and SRSS-32 (0 to 2 inches) at 7.5 mg/kg.

# Subsurface Soil

Mercury was detected in only 2 out of the 9 subsurface soil samples collected from the drainage swale with concentrations of 0.018 mg/kg at MHSB-19 (2 to 4 feet) and 0.023 mg/kg at MHSB-17 (2 to 4 feet), both well below the NYSDEC TAGM criterion for mercury of 0.1 mg/kg.

#### 3.1.3 <u>Slop Sink</u>

As discussed in Section 1.3, a Slop Sink was formerly located inside the substation, along the east wall. The sink discharged to grade outside the east wall of the substation, within the Existing Transformer Yard. One boring (MHSBX-06) was advanced from a depth of 4 to 10 feet below grade at this location as part of the Construction Excavation Investigation. Three subsurface soil samples were collected from this boring and analyzed for semivolatile organic compounds (SVOCs), Resource Conservation and Recovery Act (RCRA) metals and polychlorinated biphenyls (PCBs). Results of this analysis are presented on Table 12 for RCRA metals, Table 13 for SVOCs and Table 14 for PCBs.

Mercury was not detected in any of the three samples collected from MHSBX-06. MHSBX-06 (6 to 8 feet) exhibited a chromium concentration of 144 mg/kg, exceeding the NYSDEC TAGM criterion for chromium of 50 mg/kg. However, a deeper sample collected from 8 to 10 feet at this boring exhibited a chromium concentration of only 7.6 mg/kg. No other exceedances of NYSDEC TAGM criteria for RCRA metals were detected.

All SVOCs were found to be nondetectable in all three soil samples with the exception of di-n-butylphthalate detected at an estimated concentration of 48 ug/kg in MHSBX-06 (8 to 10 feet). The NYSDEC TAGM criterion for this compound is 8,100 ug/kg.

PCBs were not detected in any of the three subsurface soil samples.

# 3.1.4 Outfall to Manhasset Bay

Four surface water sediment samples (MHSD-01, MHSD-01A, MHSD-02A and MHSD-03A) were collected off-site at 5-foot intervals in front of the drainage swale outfall in Manhasset Bay at low tide. The outfall, which is located approximately 1,000 feet west of the substation, discharges storm water to Manhasset Bay conveyed by the on-site drainage swale. Samples were collected from 0 to 3 inches from the tidal flat portion of the bay directly downstream of the outfall. The samples were analyzed for mercury and total organic carbon (TOC).

The analytical data for the four sediment samples are presented on Table 3. All four sediment samples exhibited detectable levels of mercury, ranging from 0.077 mg/kg to a maximum of 0.19 mg/kg at MHSD-02A. Only MHSD-02A exceeded the "lowest effect level" of 0.15 mg/kg established for mercury for surface water sediment by the NYSDEC pursuant to the NYSDEC Technical Guidance for Screening Contaminated Sediment, dated November 22, 1993. All mercury concentrations were found to be well below the "severe effect level" of 1.3 mg/kg which is also included in the above-referenced NYSDEC guidance document.

#### 3.1.5 <u>Underground Injection Control (UIC) Drainage Structures</u>

A total of three drainage structures were identified within the Manhasset substation that were considered UIC structures including the Rectifier Pit, the Water Trough Pit and a dry well located south of the substation building. With the exception of the dry well, soil samples were collected from each structure and analyzed for volatile organic compounds (VOCs), SVOCs, RCRA metals and total petroleum hydrocarbons (TPHs). Results of this analysis are presented on Table 4 for RCRA metals, Table 5 for volatile organic compounds (VOCs), Table 6 for semivolatile organic compounds (SVOCs), and Table 7 for TPHs.

#### Dry Well

During the field investigation, the sampling of a drywell located to the south of the substation was attempted with the advancement of MHSB-20; however, debris at the bottom of the drywell prevented the successful recovery of soil below the bottom. However, in June of 2003, this dry well was closed in accordance with USEPA and NCDH requirements by backfilling the structure with clean soil and capping the structure with the placement of a 1-foot thick concrete slab on top of the backfilled soil.

# Rectifier Pit

Soil probe MHSB-21 was advanced within this structure to a depth of 12 feet bgs. Four subsurface soil samples were collected for analysis.

Two of the four subsurface soil samples analyzed for RCRA metals exhibited detectable levels of mercury, with concentrations of 9.1 mg/kg at MHSB-21 (2 to 4 feet) and 473 mg/kg at MHSB-21 (4 to 6 feet), exceeding the NYSDEC TAGM criterion for mercury of 0.1 mg/kg. MHSB-21 (4 to 6 feet) exhibited a lead concentration of 1,010 mg/kg, exceeding the NYSDEC TAGM criterion for lead of 500 mg/kg. No other exceedances of NYSDEC TAGM criteria for RCRA metals were detected.

VOCs were not detected in the four subsurface soil samples.

Two of the four subsurface soil samples exhibited detectable concentrations of SVOCs, with total SVOC concentrations of 34,678 ug/kg at MHSB-21 (4 to 6 feet) and 55,988 ug/kg at MHSB-21 (2 to 4 feet), both below the NYSDEC TAGM criterion for total SVOCs of 500,000 ug/kg. However, polycyclic aromatic hydrocarbons (PAHs) were the most prevalent SVOCs detected, and both samples exceeded the NYSDEC TAGM criterion for total carcinogenic PAHs (CaPAHs) of 10,000 ug/kg. In addition, soil sample MHSB-21 (4 to 6 feet) exhibited a phenol concentration of 81 ug/kg, which exceeds the NYSDEC TAGM criterion for phenol of 30 ug/kg.

Total petroleum hydrocarbons were detected in two of the four subsurface soil samples, with TPH concentrations of 450 mg/kg at MHSB-21 (2 to 4 feet) and 1,500 mg/kg at MHSB-21 (4 to 6 feet). A NYSDEC TAGM 4046 criteria for TPHs does not exist.

Based on these findings, the rectifier pit was remediated in June of 2003 in accordance with the USEPA-approved Underground Injection Control (UIC) Closure Plan, dated November 2002.

## Water Trough Pit

Soil probe MHSB-22 was advanced within this structure to a depth of 26 feet bgs. Three subsurface soil samples were collected from this probe for chemical analysis.

All three subsurface soil samples analyzed for RCRA metals exhibited detectable levels of mercury, ranging from 0.045 mg/kg to a maximum of 553 mg/kg at MHSB-22 (18 to 20 feet). Two of the three samples that exhibited detectable concentrations of mercury also exceeded the NYSDEC TAGM criterion for mercury of 0.1 mg/kg. No other exceedances of NYSDEC TAGM criteria for RCRA metals were detected.

One out of the three subsurface soil samples exhibited detectable concentrations of VOCs, with a total VOC concentration of 16 ug/kg at MHSB-22 (18 to 20 feet). None of the VOC compounds detected exceeded NYSDEC TAGM criteria.

One out of the three subsurface soil samples exhibited detectable concentrations of SVOCs, with a total SVOC concentration of 42,732 ug/kg at MHSB-22 (18 to 20 feet). The sample did not exceed the NYSDEC TAGM criterion for total SVOCs of 500,000 ug/kg. However, the sample did exceed the NYSDEC TAGM criterion for CaPAHs of 10,000 ug/kg, with a total CaPAH concentration of 21,390 ug/kg.

Total petroleum hydrocarbons were detected in one of the three subsurface soil samples, with a TPH concentration of 480 mg/kg at MHSB-22 (18 to 20 feet).

Based on these findings, UIC closure activities were completed in accordance with the USEPA-approved UIC Closure Plan, dated November 2002. Approximately 6 feet of soil was excavated from the bottom of the Water Trough Pit in June of 2003 and then backfilled with clean soil. A 6-inch concrete slab was then placed on top of the clean soil completing the remediation and closure of this UIC structure.

# 3.1.6 Potential Miscellaneous Releases

Two soil probes (MHSBX-08 and MHSBX-09) were advanced during the Construction Excavation Investigation to investigate potential releases along the south side of the existing substation. Each probe was advanced to a depth of 20 feet bgs. A total of 15 subsurface soil samples were collected from the two soil probes and analyzed for SVOCs, RCRA metals and PCBs. Results of this analysis are presented on Table 12 for RCRA metals, Table 13 for SVOCs, and Table 14 for PCBs.

Two of the 15 subsurface soil samples analyzed for RCRA metals exhibited detectable levels of mercury, with concentrations of 0.081 mg/kg at MHSBX-08 (8 to 10 feet) and 0.33 mg/kg at MHSBX-09 (14 to 16 feet). Of these two samples, only MHSBX-09 (14 to

16 feet) exceeded the NYSDEC TAGM criterion for mercury of 0.1 mg/kg. No other exceedances of NYSDEC TAGM criteria for RCRA metals were detected.

SVOCs were not detected in the 15 subsurface soil samples.

PCBs were not detected in any of the 15 subsurface soil samples.

# 3.1.7 Groundwater

Groundwater samples were collected from existing monitoring wells MHMW-01 and MHMW-02 as well as from monitoring well MHMW-03 installed as part of the Delineation Phase 2 Investigation. As shown on Drawing 1, MHMW-01 is located in the vicinity of the Exterior Railroad Ties and MHMW-02 is located in the Existing Transformer Yard. MHMW-03 is located off-site, on the north side of Virginia Drive. Each sample was analyzed for target analyte list (TAL) metals (see Table 8), VOCs (see Table 9), SVOCs (see Table 10), and PCBs (see Table 11).

Mercury was detected in the unfiltered samples from MHMW-01 and MHMW-02 at concentrations of 0.59 ug/l and 0.17 ug/l, respectively. The NYSDEC Class GA Groundwater standard for mercury is 0.7 ug/l. All three wells exceeded the NYSDEC Class GA Groundwater standard for iron in the unfiltered samples and for sodium in both the filtered and unfiltered samples. MHMW-01 and MHMW-03 exceeded the standard for manganese in both the filtered and unfiltered and unfiltered samples. In addition, the unfiltered sample from MHMW-01 exhibited an arsenic concentration of 25.4 ug/l, above the 25 ug/l standard. Arsenic was not detected in the filtered sample.

Two out of the three groundwater samples exhibited detectable concentrations of VOCs. MHMW-01 exhibited methyl tertiary-butyl ether (MTBE) at a concentration of 4 ug/l. MHMW-03 exhibited MTBE at a concentration of 2 ug/l and chloroform at 1 ug/l. There were no exceedances of NYSDEC Class GA Groundwater criteria.

One out of the three groundwater samples exhibited detectable concentrations of SVOCs, with a total SVOC concentration of only 9 ug/l at MHMW-01. There were no exceedances of NYSDEC Class GA Groundwater criteria.

PCBs were not detected in any of the groundwater samples.

# 3.2 Manhasset Substation – Construction Excavation Investigation

As a result of ongoing and/or future substation renovation/construction projects, a Construction Excavation Investigation was conducted at the Manhasset substation to identify any potentially impacted soil within locations to be utilized for construction. Nine soil probes (MHSBX-01 through MHSBX-09) were advanced as part of the Construction Excavation Investigation to varying depths up to 20 feet bgs to the south and east of the existing substation. However, soil probe MHSBX-06 was advanced to investigate the former Slop Sink and is discussed in Section 3.1.5. Soil probes MHSBX-08 and MHSBX-09 were advanced to investigate potential releases along the south side of the existing substation and are discussed in Section 3.1.7. A total of 41 samples were collected from the six remaining soil probes (MHSBX-01 through MHSBX-05 and MHSBX-07). All samples were analyzed for RCRA metals (see Table 12), SVOCs (see Table 13), and PCBs (see Table 14).

In addition, soil probe MHSB-23 was advanced within the Existing Transformer Yard and is considered a part of the Construction Excavation Investigation. Two samples were collected from this soil probe and were sampled only for mercury (see Table 12).

Nine of the 41 subsurface soil samples analyzed for RCRA metals exhibited detectable levels of mercury, ranging from 0.035 mg/kg to a maximum of 1.4 mg/kg at MHSBX-02 (12 to 14 feet). The nine samples exhibiting detectable levels of mercury were collected from soil probes located in the western portion of the Existing Transformer Yard at depths ranging from 8 to 18 feet bgs. Six of the nine samples also exceeded the NYSDEC TAGM criterion for mercury of 0.1 mg/kg. No other exceedances of NYSDEC TAGM criteria for RCRA metals were detected. Of the two samples collected from MHSB-23, only MHSB-23 (0 to 4 feet) exhibited a

detectable concentration of mercury at 0.027 mg/kg. The sample did not exceed the NYSDEC TAGM criterion for mercury of 0.1 mg/kg

Three of the 41 subsurface soil samples exhibited detectable concentrations of SVOCs, with total SVOC concentrations ranging from 290 ug/kg to a maximum of 1,931 ug/kg at MHSBX-01 (8 to 10 feet). None of the three samples exceeded the NYSDEC TAGM criterion for total SVOCs of 500,000 ug/kg. PAHs were the most prevalent SVOCs detected in the three samples. Soil sample MHSBX-01 (8 to 10 feet) exhibited benzo(a)pyrene at a concentration of 80 ug/kg, which exceeds the NYSDEC TAGM criterion of 61 ug/kg. All three samples where SVOCs were detected were collected from soil probes located in the western portion of the Existing Transformer Yard.

PCBs were not detected in any of the 41 subsurface soil samples.

### 3.3 Massapequa Substation – Investigation Report

Surface soil, subsurface soil and groundwater samples were collected in support of the Delineation Phase 2 Site Assessment at the Massapequa Substation. The following presents a summary of the analytical results by AOC. All sample locations are shown on Drawing 2.

## 3.3.1 Substation Interior

During the Site Assessment of 20 Substations conducted in 1999, elevated levels of mercury were detected in soil borings and concrete corings advanced within the former Rectifier, water trough pits and water pipe trench located within the substation building. LIRR representatives indicated that the Rectifier and water trough pits would be permanently backfilled to grade with concrete during a future renovation. It was recommended that delineation and remediation of this AOC be conducted at a time when the concrete caps are removed or the substation demolished. Therefore, no work was completed at this AOC during the Delineation Phase 2 Site Assessment.

## 3.3.2 East Side of Substation

Forty-one surface soil samples (MSSB-06A [0 to 2 inches] and MSSB-09 [0 to 2 inches] through MSSB-34 [0 to 2 inches], MSSS-07A [0 to 2 inches] and MSSS-08 [0 to 2 inches] through MSSS-20 [0 to 2 inches]) were collected to the east of the existing substation and analyzed for mercury (see Table 15). The majority of the surface soil samples were collected below the asphalt pavement and below the crushed stone area, both located immediately east of the substation. However, a number of surface soil samples were also collected from grass-covered areas immediately outside the substation fenced area. In addition, 46 soil probes (MSSB-06A, MSSB-09 through MSSB-34, and MSSB-40 through MSSB-58) were advanced within this AOC. A total of 101 subsurface soil samples were collected from these locations. All subsurface soil samples were analyzed for mercury (see Table 18).

#### Surface Soil

All 41 surface soil samples exhibited detectable levels of mercury, ranging from 0.12 mg/kg to a maximum of 58.8 mg/kg at MSSB-12 (0 to 2 inches). In general, the highest mercury concentrations were detected in surface soil samples collected beneath the asphalt-paved driveway and the adjacent crushed stone area located immediately east of the substation , as indicated by the following sample results:

- MSSB- 09 (0 to 2 inches), 57.6 mg/kg
- MSSB-10 (0 to 2 inches), 54.6 mg/kg
- MSSB-12 (0 to 2 inches), 58.8 mg/kg
- MSSB-30 (0 to 2 inches), 30.5 mg/kg

The surface soil samples collected to the north and east of the asphalt driveway within the grass-covered area and inside the substation fence exhibited mercury concentrations ranging from a minimum of 0.23 mg/kg at MSSS-10 (0 to 2 inches) to a maximum of 6.7 mg/kg, detected at MSSS-07A (0 to 2 inches). The surface soil samples collected outside the substation

fence within grass-covered areas exhibited mercury concentrations ranging from a minimum of 0.40 mg/kg detected at MSSS-08 (0 to 2 inches) to a maximum of 13.6 mg/kg detected at MSSS-12 (0 to 2 inches).

#### Subsurface Soil

Ninety-five out of the 101 subsurface soil samples exhibited detectable levels of mercury, ranging from 0.015 mg/kg to a maximum of 154 mg/kg at MSSB-44 (4 to 6 feet). In addition, 68 of the 101 samples that exhibited detectable levels of mercury exceeded the NYSDEC TAGM criterion for mercury of 0.1 mg/kg. However, the majority of subsurface samples (87 out of 101 samples) exhibited mercury at less than 5.0 mg/kg. Furthermore, the soil samples exhibiting mercury at concentrations above 5.0 mg/kg are randomly distributed within this AOC and do not indicate a defined area of significantly elevated mercury concentrations or hot spots within a specific subsurface soil horizon.

# 3.3.3 West Side of Substation

Three soil probes (MSSBX-04, MSSBX-06 and MHSBX-09) were advanced during the Construction Excavation Investigation to determine the horizontal and vertical extent of mercury contamination identified along the western side of the substation during the initial site assessment. MSSBX-04 was advanced to 20 feet, MSSBX-06 to 8 feet and MSSBX-09 to 20 feet. A total of 15 subsurface soil samples were collected from the three soil probes and analyzed for RCRA metals (see Table 29), SVOCs (see Table 30), and PCBs (see Table 31).

Two of the 15 subsurface soil samples analyzed for RCRA metals exhibited detectable levels of mercury, with concentrations of 0.025 mg/kg at MSSBX-04 (4 to 6 feet) and 0.13 mg/kg at MSSBX-06 (6 to 8 feet). Soil sample MSSBX-06 (6 to 8 feet) exceeded the NYSDEC TAGM criterion for mercury of 0.1 mg/kg. No other exceedances of NYSDEC TAGM criteria for RCRA metals were detected.

All SVOCs were found to be nondetectable in all three soil borings with the exception of di-n-butylphthalate detected at an estimated concentration of 54 ug/kg in MSSBX-06 (6 to 8 feet). The NYSDEC TAGM criterion for this compound is 8,100 ug/kg.

PCBs were not detected in any of the 15 subsurface soil samples.

# 3.3.4 <u>Underground Injection Control (UIC) Drainage Structures</u>

A total of three drainage structures were identified within the Massapequa substation that were considered UIC structures including the dry well, Communications Pit and the Water Service Pit. With the exception of the Communications Pit, soil samples were collected from each structure and analyzed for VOCs, SVOCs, RCRA metals and total petroleum hydrocarbons (TPHs). Results of this analysis are presented on Table 21 for RCRA metals, Table 22 for VOCs, Table 23 for SVOCs, and Table 24 for TPHs.

Note that the Positive Breaker Cable Pit and the north and south Roof Drains have previously been investigated and remediated. Details are provided in the September 2004 Underground Injection Control Closure Report.

## Communications Pit

The sampling of the Communications Pit located within the transformer yard was attempted, however, physical constraints associated with adjacent transformers prevented successful recovery of soil beneath this structure. However, in July of 2003, this UIC structure was remediated by the excavation of soil up to 10 feet below grade and then backfilled with clean soil to grade with an asphalt cap placed on top of the clean soil.

# Water Service Pit

It should be noted that the Water Service Pit was not considered a UIC structure during preparation of the Investigation Work Plan but rather was added to the program at the request of

the Nassau County Department of Health (NCDH). Soil probe MSSB-36 was advanced beneath this structure to a depth of 11.5 feet bgs. Two samples were collected from the soil probe for chemical analysis.

Both subsurface soil samples were analyzed for RCRA metals and exhibited detectable levels of mercury, with concentrations of 0.74 mg/kg at MSSB-36 (7.5 to 9.5 feet) and 0.074 mg/kg at MSSB-36 (9.5 to 11.5 feet). Soil sample MSSB-36 (7.5 to 9.5 feet) exceeded the NYSDEC TAGM criterion for mercury of 0.1 mg/kg. No other exceedances of NYSDEC TAGM criteria for RCRA metals were detected.

Both subsurface soil samples exhibited detectable concentrations of VOCs. MSSB-36 (7.5 to 9.5 feet) exhibited acetone at a concentration of 4 ug/kg. MSSB-36 (9.5 to 11.5 feet) exhibited acetone at a concentration of 10 ug/kg and naphthalene at 4 ug/kg. However, none of the constituents exceeded their respective NYSDEC TAGM criteria.

The two subsurface soil samples did not exhibit detectable concentrations of SVOCs.

TPHs were not detected in the two subsurface soil samples.

Based on these findings, this UIC structure was remediated in August of 2003, in accordance with USEPA and NCDH requirements, by the excavation of soil to a depth of approximately 6 feet below grade. This structure was then backfilled with clean soil and capped with asphalt.

#### Dry Well

Soil probe MSSB-37 was advanced beneath this structure to a depth of 20 feet bgs and four samples selected for analysis.

The four subsurface soil samples analyzed for RCRA metals exhibited detectable levels of all targeted metals with the exception of mercury and selenium. However, all metals were detected at concentrations below respective NYSDEC TAGM criteria. All four subsurface soil samples exhibited detectable concentrations of VOCs, with total VOC concentrations ranging from 4 ug/kg to a maximum of 41 ug/kg at MSSB-37 (18 to 20 feet). Acetone and methylene chloride were present in all four samples; however, none of the detected VOCs exceeded their respective NYSDEC TAGM criteria.

The four subsurface soil samples did not exhibit detectable concentrations of SVOCs.

TPHs were not detected in the four subsurface soil samples.

Based on these findings, this UIC was remediated in August of 2003, in accordance with the requirements of the USEPA and NCDH, by the excavation of soil up to 9 feet below grade. The structure was then backfilled with clean soil and an asphalt cap placed over the backfilled soil.

# 3.3.5 Potential Miscellaneous Releases

Two surface soil samples (MSSB-38 [0 to 2 inches] and MSSB-39 [0 to 2 inches]) were collected to investigate potential historic releases to the northeast and east of the existing substation. The surface soil samples were analyzed for RCRA metals (Table 15), SVOCs (Table 16) and PCBs (Table 17). In addition, two soil probes (MSSB-38 and MSSB-39) were advanced in this area and subsurface samples were collected from 2 to 4 feet bgs. All subsurface soil samples were analyzed for RCRA metals (see Table 18), SVOCs (see Table 19), and PCBs (see Table 20).

# Surface Soil

Both surface soil samples analyzed for RCRA metals exhibited detectable levels of mercury, with concentrations of 3.3 mg/kg at MSSB-38 (0 to 2 inches) and 178 mg/kg at MSSB-39 (0 to 2 inches). Both samples exceeded the NYSDEC TAGM criterion for mercury of

0.1 mg/kg. No other metals were detected at concentrations exceeding respective NYSDEC TAGM criteria.

One of the two surface soil samples exhibited detectable concentrations of SVOCs, with a total SVOC concentration of 4,374 ug/kg at MSSB-38 (0 to 2 inches). The sample did not exceed the NYSDEC TAGM criterion for total SVOCs of 500,000 ug/kg. However, PAHs were the predominant SVOCs detected in the sample with the individual NYSDEC TAGM criterion for benzo(a)anthracene, chrysene, benzo(a)pyrene and dibenzo(a,h)anthracene being exceeded.

PCBs were not detected in the two surface soil samples.

# Subsurface Soil

Both subsurface soil samples analyzed for RCRA metals exhibited detectable levels of mercury, with concentrations of 1.1 mg/kg at MSSB-38 (2 to 4 feet) and 5.6 mg/kg at MSSB-39 (2 to 4 feet). Both samples exceeded the NYSDEC TAGM criterion for mercury of 0.1 mg/kg. In addition, soil sample MSSB-38 (2 to 4 feet) exhibited an arsenic concentration of 15.9 mg/kg, greater than the NYSDEC TAGM criterion for arsenic of 7.5 mg/kg. No other exceedances of NYSDEC TAGM criteria for RCRA metals were detected.

One of the two subsurface soil samples exhibited detectable concentrations of SVOCs, with a total SVOC concentration of 330 ug/kg at MSSB-38 (2 to 4 feet). The sample did not exceed the NYSDEC TAGM criterion for total SVOCs of 500,000 ug/kg. PAHs were the predominant SVOCs detected in this sample; however, all PAH concentrations were below their respective NYSDEC TAGM criteria.

PCBs were not detected in the two subsurface soil samples.

#### 3.3.6 Groundwater

Three groundwater samples (MSGP-01 through MSGP-03) were collected as part of the Delineation Phase 2 Site Assessment and analyzed for TAL metals (see Table 25), VOCs (see Table 26), SVOCs (see Table 27), and PCBs (see Table 28). As shown on Drawing 2, MSGP-01 was located northeast of the substation, upgradient of the site with respect to groundwater flow. MSGP-02 and MSGP-03 were located to the south of the substation, downgradient of the site with respect to groundwater flow.

Mercury was not detected in any of the groundwater samples. All three samples exceeded the NYSDEC Class GA Groundwater standard for iron and sodium in both the filtered and unfiltered samples and for manganese in the unfiltered samples. MSGP-02 also exceeded the manganese standard in the filtered sample. In addition, MSGP-01 exhibited antimony at a concentration of 3.7 ug/l in the unfiltered sample, above the standard of 3 ug/l. Antimony was not detected in the filtered sample.

Two of the three groundwater samples exhibited detectable concentrations of VOCs. MSGP-01 exhibited methylene chloride at a concentration of 1 ug/l and naphthalene at 3 ug/l. MSGP-02 exhibited methylene chloride at a concentration of 2 ug/l and tetrachloroethene at 1 ug/l. There were no exceedances of NYSDEC Class GA Groundwater criteria.

None of the three groundwater samples exhibited detectable concentrations of SVOCs.

PCBs were not detected in any of the groundwater samples.

# **3.4** Massapequa Substation – Construction Excavation Investigation

As a result of ongoing and/or future substation renovation/construction projects, a Construction Excavation Investigation has been conducted at the Massapequa substation to identify any potentially impacted soil within locations to be utilized for construction. Nine soil probes (MSSBX-01 through MSSBX-07, MSSBX-09 and MSSBX-10) were advanced as part of

the Construction Excavation Investigation. However, three soil probes (MSSBX-04, MSSBX-06 and MHSBX-09) were advanced to determine the horizontal and vertical extent of mercury contamination identified along the western side of the substation during the initial site assessment and are discussed in Section 3.3.3.

The six remaining probes were advanced within the Existing Transformer Yard to the west of the substation with the exception of MSSBX-10, which was advanced immediately to the south of the substation. All probes were advanced from 4 to 20 feet bgs. A total of 39 subsurface soil samples were collected from the six soil probes and were analyzed for RCRA metals (see Table 29), SVOCs (see Table 30), and PCBs (see Table 31).

One of the 39 subsurface soil samples analyzed for RCRA metals exhibited detectable levels of mercury, with a concentration of 0.3 mg/kg at MSSBX-10 (8 to 10 feet), exceeding the NYSDEC TAGM criterion for mercury of 0.1 mg/kg. No other exceedances of NYSDEC TAGM criteria for RCRA metals were detected.

Three of the 39 subsurface soil samples exhibited detectable concentrations of SVOCs, ranging from 38 ug/kg to a maximum of 55 ug/kg at MSSBX-05 (8 to 10 feet). None of the three samples exceeded the NYSDEC TAGM criterion for total SVOCs of 500,000 ug/kg. In all three samples where SVOCs were detected, the total SVOCs were composed entirely of bis(2-ethylhexyl)phthalate. The NYSDEC TAGM criterion for bis(2-ethylhexyl)phthalate is 50,000 ug/kg.

PCBs were not detected in any of the 39 subsurface soil samples.

#### 3.5 Island Park Substation - Investigation Report

Surface soil, subsurface soil and groundwater samples were collected in support of the Delineation Phase 2 Site Assessment at the Island Park Substation. The following presents a summary of the analytical results by AOC. All sample locations are provided on Drawing 3.

# 3.5.1 Substation Interior

Mercury-impacted soil was previously identified beneath a sump pump pit located within the substation building. Delineation activities were recommended to determine the horizontal and vertical extent of the impacted soil in coordination with the scheduled demolition of the building. The building has not yet been demolished but is scheduled for demolition in 2005. Therefore, no investigation activities were performed in this AOC during the Delineation Phase 2 Site Assessment.

#### 3.5.2 South Side of Substation

Four surface soil samples (IPSB-12 [0 to 2 inches] through IPSB-15 [0 to 2 inches]) were collected below the asphalt pavement on the south side of the substation and analyzed for mercury (see Table 32). Five soil probes (IPSB-04A and IPSB-12 through IPSB-15) were also advanced in this area. A total of 17 subsurface soil samples were collected from the five soil probes. All samples were analyzed for mercury (see Table 35) except for IPSB-04A (8 to 10 feet), IPSB-13 (6 to 8 feet) and IPSB-13 (8 to 10 feet), which also were analyzed for RCRA metals (see Table 35), VOCs (see Table 36), SVOCs (see Table 37), and PCBs (see Table 38).

# Surface Soil

All four surface soil samples exhibited detectable concentrations of mercury, ranging from 0.21 mg/kg to a maximum of 12.9 mg/kg at IPSB-13 (0 to 2 inches). All four samples exceeded the NYSDEC TAGM criterion for mercury of 0.1 mg/kg.

#### Subsurface Soil

Twelve of the 17 subsurface soil samples exhibited detectable levels of mercury, ranging from 0.028 mg/kg to a maximum of 11.3 mg/kg at IPSB-04A (6 to 8 feet). Eight of the 12 samples that exhibited detectable concentrations of mercury also exceeded the NYSDEC TAGM

criterion for mercury of 0.1 mg/kg. No other exceedances of NYSDEC TAGM criteria for RCRA metals were detected.

The three samples analyzed for VOCs exhibited detectable concentrations of methylene chloride and naphthalene, with total VOCs ranging from 1,860 ug/kg to a maximum of 50,260 ug/kg at IPSB-13 (6 to 8 feet). All three samples exceeded the NYSDEC TAGM criterion for methylene chloride of 100 ug/kg. In addition IPSB-13 (6 to 8 feet) and IPSB-13 (8 to 10 feet) exceeded the NYSDEC TAGM criterion for naphthalene of 13,000 ug/kg.

The three samples analyzed for SVOCs exhibited detectable concentrations of a number of PAHs, with total SVOCs ranging from 4,864 ug/kg to a maximum of 91,690 ug/kg at IPSB-13 (6 to 8 feet). The samples did not exceed the NYSDEC TAGM criterion for total SVOCs of 500,000 ug/kg. However, a number of PAHs were found to exceed their respective NYSDEC TAGM criteria. including: naphthalene, benzo(a)anthracene, chrysene and benzo(a)pyrene.

PCBs were not detected in any of the subsurface soil samples.

# 3.5.3 Northwest Corner of Substation

One surface soil sample (IPSB-18 [0 to 2 inches]) was collected off the northwest corner of the substation and analyzed for mercury (see Table 32). In addition, four soil probes (IPSB-16 through IPSB-18 and IPSB-20) were advanced to 4 feet bgs. A total of seven subsurface soil samples were collected from the four soil probes. All samples were analyzed for mercury (see Table 35) except for IPSB-20 (2 to 4 feet), which was analyzed for RCRA metals (see Table 35).

# Surface Soil

Mercury was detected at IPSB-18 (0 to 2 inches) at a concentration of 0.12 mg/kg, slightly exceeding the NYSDEC TAGM criterion for mercury of 0.1 mg/kg.

#### Subsurface Soil

Mercury was detected in all seven subsurface soil samples, ranging from 0.038 mg/kg to a maximum of 0.34 mg/kg at IPSB-20 (2 to 4 feet). Three of the seven samples also exceeded the NYSDEC TAGM criterion for mercury of 0.1 mg/kg. Only IPSB-20 (2 to 4 feet) was analyzed for the full set of RCRA metals and no other exceedances of NYSDEC TAGM criteria were detected in the sample.

#### 3.5.4 Western Drainage Line

During the Site Assessment of 20 Substations conducted in 1999, D&B traced a drain pipe originating from within the substation basement, which was found to terminate beneath an unpaved area between the substation and the train tracks, approximately 21 feet from the west wall of the building. It was recommended the area be excavated in an attempt to locate a possible drainage feature and that the excavation be coordinated with the demolition of the building so that electric utilities in that area can be de-energized. The building has not yet been demolished, but is scheduled for demolition in 2005. Therefore, no investigation activities were performed in this AOC during the Delineation Phase 2 Site Assessment.

## 3.5.5 <u>Water Meter Pit</u>

During the Site Assessment of 20 Substations conducted in 1999, a water meter pit, located along the south side of the substation, was found to contain mercury-impacted soil from the bottom of the pit (2.5 feet below grade) to a depth of 6.5 feet below grade. Successful delineation of impacted soil was accomplished at the pit. The recommended excavation and remediation will be performed after the rest of the substation is delineated. It should be noted that the Water Meter Pit was not considered a UIC structure upon NCDH inspection.

# 3.5.6 West Side of Substation

Two surface soil samples (IPSS-05 [0 to 2 inches] and IPSS-06 [0 to 2 inches]) were collected on the west side of the substation and were analyzed for mercury (see Table 32). Both surface soil samples exhibited detectable concentrations of mercury, with IPSS-05 (0 to 2 inches) at 0.52 mg/kg and IPSS-06 (0 to 2 inches) at 0.49 mg/kg. Both samples exceeded the NYSDEC TAGM criterion for mercury of 0.1 mg/kg

# 3.5.7 Transformers

Surface and subsurface soil samples were collected within the Transformer Yard to investigate staining found in the soil during the Site Assessment of 20 Substations conducted in 1999. Three surface soil samples (IPSB-19 [0 to 2 inches], IPSB-26 [0 to 2 inches] and IPSB-27 [0 to 2 inches]) were collected. IPSB-26 (0 to 2 inches) and IPSB-27 (0 to 2 inches) were analyzed for RCRA metals (see Table 32), SVOCs (see Table 33), and PCBs (see Table 34). IPSB-19 (0 to 2 inches) was analyzed only for mercury (see Table 32). In addition, three soil probes were advanced in these locations to 4 feet bgs, including IPSB-19, IPSB-26 and IPSB-27. A total of five subsurface soil samples were collected from the three soil probes. All samples were analyzed for RCRA metals (see Table 35), SVOCs (see Table 37), and PCBs (see Table 38) except for the subsurface soil sample collected from IPSB-19, which was analyzed only for mercury.

# Surface Soil

Mercury was detected in 2 out of the 3 surface soil samples, with concentrations of 0.031 mg/kg at IPSB-27 (0 to 2 inches) and 1.3 mg/kg at IPSB-19 (0 to 2 inches). IPSB-19 (0 to 2 inches) exceeded the NYSDEC TAGM criterion for mercury of 0.1 mg/kg. No other exceedances of NYSDEC TAGM criteria for RCRA metals were detected.

One of the two surface soil samples analyzed for SVOCs exhibited detectable concentrations, with a total SVOC concentration of 42,567 ug/kg at IPSB-27 (0 to 2 inches).

The sample did not exceed the NYSDEC TAGM criterion for total SVOCs of 500,000 ug/kg. PAHs were the most prevalent SVOCs detected in the sample and the total CaPAH concentration of 23,150 ug/kg exceeded the NYSDEC TAGM criterion for total CaPAHs of 10,000 ug/kg. A number of PAHs also exceeded their respective NYSDEC TAGM criteria, including: benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene and dibenzo(a,h)anthracene.

PCBs were not detected in any of the surface soil samples.

# Subsurface Soil

Mercury was detected in two out of the five subsurface soil samples, with concentrations of 0.051 mg/kg at IPSB-26 (0 to 2 feet) and 0.05 mg/kg at IPSB-27 (0 to 2 feet). Neither sample exceeded the NYSDEC TAGM criterion for mercury of 0.1 mg/kg. No other exceedances of NYSDEC TAGM criteria for RCRA metals were detected.

Three out of the four samples that were analyzed for SVOCs exhibited detectable concentrations, with total SVOCs ranging from 1,597 ug/kg to a maximum of 9,590 ug/kg at IPSB-27 (0 to 2 feet). The samples did not exceed the NYSDEC TAGM criterion for total SVOCs of 500,000 ug/kg. PAHs were the most prevalent SVOCs detected in the samples and a number of PAHs exceeded their respective NYSDEC TAGM criteria, including: benzo(a)anthracene, chrysene, benzo(a)pyrene and dibenzo(a,h)anthracene.

PCBs were not detected in any of the subsurface soil samples.

# 3.5.8 Underground Injection Control (UIC) Drainage Structures

Two drainage structures were identified within the Island Park substation that were considered UIC structures including the dry well and the septic tank/tile field. Soil samples were collected from each structure and analyzed for VOCs, SVOCs, RCRA metals and TPHs. Results

of the analysis are presented on Table 39 for RCRA metals, Table 40 for VOCs, Table 41 for SVOCs, and Table 42 for TPHs.

#### Rectifier Dry Well

Soil probe IPSB-21 was advanced below the Rectifier Dry Well to a depth of 20 feet bgs (10 feet below the bottom). Five subsurface soil samples were collected for analysis.

Three out of the five subsurface soil samples analyzed for RCRA metals exhibited detectable levels of mercury, with concentrations ranging from 0.058 mg/kg to a maximum of 5.4 mg/kg at IPSB-21 (10 to 12 feet). Two of the three subsurface soil samples that exhibited detectable levels of mercury exceeded the NYSDEC TAGM criterion for mercury of 0.1 mg/kg. Mercury concentrations were greater in the shallower soil samples. In fact, the two subsurface soil samples that did not exhibit detectable concentrations of mercury were the two deepest subsurface soil samples collected from 16 to 20 feet bgs. In addition, IPSB-21 (10 to 12 feet), IPSB-21 (12 to 14 feet) and IPSB-21 (14 to 16 feet) exceeded the NYSDEC TAGM criteria for RCRA metals were detected.

All five subsurface soil samples exhibited detectable concentrations of VOCs, with total VOC concentrations ranging from 44 ug/kg to a maximum of 446 ug/kg at IPSB-21 (14 to 16 feet). The most prevalent compounds were acetone, carbon disulfide and methylene chloride. IPSB-21 (12 to 14 feet) and IPSB-21 (14 to 16 feet) exceeded the NYSDEC TAGM criteria for acetone and methylene chloride.

Three out of the five subsurface soil samples exhibited detectable concentrations of SVOCs, with total SVOC concentrations ranging from 174 ug/kg to a maximum of 104,950 ug/kg at IPSB-21 (10 to 12 feet). PAHs were the most prevalent SVOCs detected in the three samples. IPSB-21 (10 to 12 feet) exceeded the NYSDEC TAGM criteria for total PAHs and CaPAHs. Soil samples IPSB-21 (10 to 12 feet) and IPSB-21 (12 to 14 feet) exhibited a number of PAHs exceeding their respective NYSDEC TAGM criteria including: benzo(a)anthracene,

chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, and dibenzo(a,h)anthracene. However, the samples collected from the Rectifier Dry Well indicate that the PAH contamination does not extend below 18 feet bgs at this location.

TPHs were detected in three of the five subsurface soil samples ranging from 23 mg/kg to a maximum concentration of 330 mg/kg at IPSB-21 (10 to 12 feet). The shallower soil samples exhibited significantly greater concentrations of TPHs than the deeper soil samples.

In June of 2003, this UIC structure was remediated in accordance with the requirements of the USEPA and NCDH, by the excavation of soil to a depth of 10.5 feet below grade. In addition, the dry well leaching rings were removed. The excavation was then backfilled with clean soil and capped with asphalt.

# Septic Tank/Tile Field

Soil probes IPSB-22 through IPSB-25 were each advanced to a depth of 4 feet bgs at the location of the Septic Tank/Tile Field. Four surface soil samples were collected, one from each of IPSB-22 through IPSB-25. One subsurface soil sample was collected from each of the four soil probes from a depth of 2 to 4 feet bgs for chemical analysis.

## Surface Soil

All four surface soil samples analyzed for RCRA metals exhibited detectable levels of mercury, with concentrations ranging from 0.028 mg/kg to a maximum of 0.99 mg/kg at IPSB-23 (0 to 2 inches). Soil samples IPSB-23 (0 to 2 inches) and IPSB-25 (0 to 2 inches) exceeded the NYSDEC TAGM criterion for mercury of 0.1 mg/kg. In addition, arsenic was detected at a concentration of 8.5 mg/kg in surface soil sample IPSB-23 (0 to 2 inches), slightly above the NYSDEC TAGM criterion on 7.5 mg/kg. No other exceedances of NYSDEC TAGM criteria for RCRA metals were detected.

All four surface soil samples exhibited detectable concentrations of VOCs, with total VOC concentrations ranging from 67 ug/kg to a maximum of 118 ug/kg at IPSB-23 (0 to 2 inches). The most prevalent VOCs included acetone, methylene chloride, toluene and naphthalene. None of the VOC compounds detected exceeded their respective NYSDEC TAGM criteria.

All four surface soil samples exhibited detectable concentrations of SVOCs, with total SVOC concentrations ranging from 775 ug/kg to a maximum of 10,337 ug/kg at IPSB-23 (0 to 2 inches). The PAHs were the most prevalent SVOCs detected. All four samples exceeded the NYSDEC TAGM criterion for benzo(a)pyrene. In addition, soil sample IPSB-23 (0 to 2 inches) exceeded the NYSDEC TAGM criterion for benzo(a)anthracene, chrysene and dibenzo(a,h) anthracene.

TPHs were detected in all four surface soil samples ranging from 69 mg/kg to a maximum concentration of 810 mg/kg at IPSB-24 (0 to 2 inches).

#### Subsurface Soil

All four subsurface soil samples analyzed for RCRA metals exhibited detectable levels of mercury, with concentrations ranging from 0.047 mg/kg to a maximum of 0.79 mg/kg at IPSB-24 (2 to 4 feet). Three of the four subsurface soil samples that exhibited detectable levels of mercury exceeded the NYSDEC TAGM criterion for mercury of 0.1 mg/kg. In addition, IPSB-25 (2 to 4 feet) exceeded the NYSDEC TAGM criterion for arsenic of 7.5 mg/kg. No other exceedances of NYSDEC TAGM criteria for RCRA metals were detected.

All four subsurface soil samples exhibited detectable concentrations of VOCs, with total VOC concentrations ranging from 35 ug/kg to a maximum of 268 ug/kg at IPSB-23 (2 to 4 feet). The most prevalent VOCs were acetone, carbon disulfide and methylene chloride. IPSB-23 (2 to 4 feet) exceeded the NYSDEC TAGM criteria for methylene chloride.

All four subsurface soil samples exhibited detectable concentrations of SVOCs, with total SVOC concentrations ranging from 5,260 ug/kg to a maximum of 310,540 ug/kg at IPSB-24 (2 to 4 feet). The most prevalent SVOCs were PAHs. IPSB-24 (2 to 4 feet) exceeded the NYSDEC TAGM criteria for total PAHs and CaPAHs. In addition, a number of PAHs exceeded their respective NYSDEC TAGM criteria at IPSB-24 (2 to 4 feet) including pyrene.

TPHs were detected in all four subsurface soil samples ranging from 40 mg/kg to a maximum concentration of 1,600 mg/kg at IPSB-24 (2 to 4 feet).

As part of the UIC closure program conducted in June of 2003, the LIRR attempted to locate the tile field which was reportedly located south of the associated septic tank. However, after completing two separate exploratory trenches in this area, no evidence of the tile field could be found. Currently, the septic tank is actively being used for the discharge of sanitary wastes from the substation building. The LIRR intends to close the septic tank upon demolition of the substation building in 2005.

## 3.5.9 Potential Miscellaneous Releases

Two surface soil samples (IPSB-28 [0 to 2 inches] and IPSB-29 [0 to 2 inches]) were collected along the east and west sides of the substation to address potential releases at the Island Park Substation that previously have not be investigated. The surface soil samples were analyzed for RCRA metals (see Table 32), SVOCs (see Table 33), and PCBs (see Table 34). In addition, two soil probes (IPSB-28 and IPSB-29) were advanced to a depth of 4 feet bgs at each of these locations. One sample was collected at each boring at a depth of 2 to 4 feet bgs. All samples were analyzed for RCRA metals (see Table 35), SVOCs (see Table 37), and PCBs (see Table 38).

## Surface Soil

Both surface soil samples exhibited detectable levels of mercury, with concentrations of 0.16 mg/kg at IPSB-29 (0 to 2 inches) and 0.087 mg/kg at IPSB-28 (0 to 2 inches). Soil sample

IPSB-29 (0 to 2 inches) exceeded the NYSDEC TAGM criterion for mercury of 0.1 mg/kg. No other exceedances of NYSDEC TAGM criteria for RCRA metals were detected.

Both surface soil samples exhibited detectable concentrations of SVOCs, with total SVOC concentrations of 1,726 ug/kg at IPSB-29 (0 to 2 inches) and 177 ug/kg at IPSB-28 (0 to 2 inches). Neither sample exceeded the NYSDEC TAGM criterion for total SVOCs of 500,000 ug/kg. PAHs were the most prevalent SVOCs detected in both samples and soil sample IPSB-29 (0 to 2 inches) exceeded the NYSDEC TAGM criterion for benzo(a)pyrene.

PCBs were not detected in the two surface soil samples.

## Subsurface Soil

Both subsurface soil samples analyzed for RCRA metals exhibited detectable levels of mercury, with concentrations of 0.11 mg/kg at IPSB-29 (2 to 4 feet) and 0.14 mg/kg at IPSB-28 (2 to 4 feet). Both samples exceeded the NYSDEC TAGM criterion for mercury of 0.1 mg/kg. No other exceedances of NYSDEC TAGM criteria for RCRA metals were detected.

Both subsurface soil samples exhibited detectable concentrations of SVOCs, with total SVOC concentrations of 10,063 ug/kg at IPSB-29 (2 to 4 feet) and 2,979 ug/kg at IPSB-28 (2 to 4 feet). Neither sample exceeded the NYSDEC TAGM criterion for total SVOCs of 500,000 ug/kg. PAHs were the most predominant SVOCs detected and both samples exceeded the NYSDEC TAGM criterion for benzo(a)anthracene and benzo(a)pyrene. In addition, IPSB-29 (2 to 4 feet) exceeded the NYSDEC TAGM criterion for chrysene and dibenzo(a,h)anthracene.

PCBs were not detected in the two subsurface soil samples.

# 3.5.10 Groundwater

Three groundwater probes, IPGP-01 through IPGP-03, were advanced as part of the Delineation Phase II Site Assessment. As shown in Drawing 3, IPGP-01 was advanced north of

the Transformer Yard, upgradient of the site with respect to groundwater flow. IPGP-02 and IPGP-03 were advanced south of the substation, downgradient of the site with respect to groundwater flow. A groundwater sample was also collected from test pit IPTP-03, located at the Rectifier Dry Well east of the substation. All samples were analyzed for TAL metals (see Table 43), VOCs (see Table 44), SVOCs (see Table 45), and PCBs (see Table 46). However, IPTP-03 was analyzed for RCRA metals instead of TAL metals (see Table 43).

Mercury was detected in the unfiltered samples from all four locations, ranging from 0.16 ug/l to a maximum concentration of 0.64 ug/l at IPGP-03. The NYSDEC Class GA Groundwater standard for mercury is 0.7 ug/l. A number of metals were found at concentrations above their respective NYSDEC Class GA Groundwater Standard including antimony, arsenic, beryllium, cadmium, chromium, copper, iron, lead, manganese, nickel, sodium, thallium and zinc. However, the majority of these exceedances were detected in the unfiltered samples and, therefore, likely are biased high due to the turbidity of the samples.

Three of the four groundwater samples exhibited detectable concentrations of VOCs. MTBE was detected in the three samples with a maximum concentration of 6 ug/l in IPGP-03. The NYSDEC Class GA Groundwater standard for MTBE is 10 ug/l. IPGP-02 exhibited a naphthalene concentration of 18 ug/l, above the NYSDEC standard of 10 ug/l. There were no other exceedances of NYSDEC Class GA Groundwater criteria.

Two of the four groundwater samples, IPGP-02 and IPGP-03, exhibited detectable concentrations of SVOCs. PAHs were the most common SVOCs detected. There were no exceedances of NYSDEC Class GA Groundwater criteria in IPGP-03; however, IPGP-02 exceeded the NYSDEC standards for naphthalene, acenaphthene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene and indeno(1,2,3-cd)pyrene.

PCBs were not detected in any of the groundwater samples.

#### **3.6** Island Park Substation – Construction Excavation Investigation

As a result of ongoing and/or future substation renovation/construction projects, a Construction Excavation Investigation has been conducted at the Island Park substation to identify any potentially impacted soil within locations to be utilized for construction. Twelve soil probes (IPSBX-01 through IPSBX-12) were advanced as part of the Construction Excavation Investigation. IPSBX-01 was located to the southeast of the substation. IPSBX-02 through IPSBX-09 were located on the east side of the substation while IPSBX-10 through IPSBX-12 were located north of the Transformer Yard. All probes were advanced no greater than 20 feet bgs. A total of 87 subsurface soil samples were collected from the twelve soil probes. All samples were analyzed for RCRA metals (see Table 47), SVOCs (see Table 48), and PCBs (see Table 49).

Twelve of the 87 subsurface soil samples analyzed for RCRA metals exhibited detectable levels of mercury, ranging from 0.019 mg/kg to a maximum of 0.25 mg/kg at IPSBX-03 (16 to 18 feet). Of the 12 samples that exhibited detectable concentrations of mercury, three exceeded the NYSDEC TAGM criterion of 0.1 mg/kg. In addition, 15 of the 87 subsurface soil samples exceeded the NYSDEC TAGM criterion for arsenic of 7.5 mg/kg, with a maximum concentration of 25.7 mg/kg at IPSBX-12 (4 to 6 feet). No other exceedances of NYSDEC TAGM criteria for RCRA metals were detected.

Sixty of the 87 subsurface soil samples exhibited detectable concentrations of SVOCs, ranging from 44 ug/kg to a maximum of 56,300 ug/kg at IPSBX-01 (12 to 14 feet). However, none of the samples exceeded the NYSDEC TAGM criterion for total SVOCs of 500,000 ug/kg. PAHs and to a lesser extent phenols were the most prevalent SVOCs detected in the samples. The PAHs most commonly found to exceed their respective NYSDEC TAGM criteria included: naphthalene, benzo(a)anthracene, chrysene, and benzo(a)pyrene. In addition, 18 of the 87 subsurface soil samples exceeded the NYSDEC TAGM criteria for phenol or 2-methyl phenol. Based on the extensive nature of fill material identified throughout subsurface soil within the vicinity of the substation, it is suspected that the source of the PAHs and phenols detected in subsurface is the

fill material and these contaminants are not directly related to past or present substation activities.

PCBs were not detected in any of the subsurface soil samples collected as part of the Construction Excavation Investigation.

# 3.7 Data Usability Summary Report (DUSR)

Investigations were conducted at three substations: Manhasset, Massapequa and Island Park.

Mitkem Corporation, a subcontractor to Dvirka and Bartilucci Consulting Engineers, analyzed all samples in accordance with the USEPA SW-846 methods as stipulated in the work plan. The data packages submitted by Mitkem have been reviewed by Ms. Robbin Petrella, D&B's Quality Assurance/Quality Control Officer. Ms. Petrella meets the NYSDEC requirements of a data validator as listed in the Draft DER-10 Technical Guidance for Site Investigation and Remediation, and her resume is included in Appendix I.

The data packages have been reviewed for completeness and compliance with NYSDEC QA/QC requirements, as well as the requirements for development of Data Usability Summary Reports as listed in Appendix 2B of the Draft DER-10 Technical Guidance for Site Investigations and Remediation dated December 2002. Each data package was reviewed for the following:

- Was a NYSDEC Category B deliverable data package submitted?
- Have all holding times been met?
- Does all QA/QC data fall within QA/QC limits and specifications?
- Were appropriate methods followed?
- Does the raw data conform to that reported on the data summary sheets?
- Have the correct data qualifiers been utilized?

The findings of the data review process are summarized below by site.

#### 3.7.1 Manhasset Substation

NYSDEC ASP Category B deliverable data packages have been submitted for all sample delivery groups (SDG).

#### Manhasset\_Delineation\_Program

Subsurface soil, surface soil, sediment and groundwater samples were collected as part of the January 2003 delineation investigation of the LIRR Manhasset Substation. The soil and sediment samples were analyzed for mercury, with the sediment samples also being analyzed for total organic carbon (TOC). Seven of the subsurface soil samples were analyzed for VOCs, SVOCs, RCRA metals and TPHs. The groundwater samples were analyzed for VOCs, SVOCs, PCBs and RCRA metals. In August 2004, additional soil samples were collected as part of the delineation program and analyzed for mercury only.

All samples were analyzed within the method-specified holding times, with the exception of the mercury analysis for sample MHSS-72 (2 to 12 inches), that was run two days out of hold. Qualification of this sample result is not required.

All surrogate recoveries, internal standard area counts and spike recoveries were within QC limits. Initial and continuing calibrations were analyzed at the method specified frequency.

Methylene chloride has been qualified as nondetect in all of the subsurface soil samples due to laboratory contamination. That is, the method blank associated with the samples also contained methylene chloride, and the sample concentrations were less than ten times the concentration found in the blank. Qualified data summary sheets are contained in Appendix J. Three samples, MHSB-21 (2 to 4 feet), MHSB-21 (4 to 6 feet) and MHSB-22 (18 to 20 feet), required reanalysis of the semivolatile fraction due to compound concentrations exceeding the instrument calibration range in the initial undiluted analysis. The results for the affected compounds were taken from the diluted analysis and have been flagged 'D' on the data summary tables. Corrected data summary sheets are contained in Appendix J.

Sample MHSS-72 had percent solids of 43%; therefore; the mercury result of 4.6 mg/kg is deemed estimated possibly biased high.

# Manhasset Construction Excavation Investigation

Subsurface soil samples were collected during the January 2003 field program for the construction excavation investigation at the LIRR Manhasset Substation. The samples were analyzed for SVOCs, PCBs and RCRA metals.

All samples were analyzed within the method specified holding times.

All surrogate recoveries, internal standard area counts and spike recoveries were within QC limits. Initial and continuing calibrations were analyzed at the method specified frequency.

## 3.7.2. Massapequa Substation

NYSDEC ASP Category B deliverable data packages have been submitted for all SDGs.

## Massapequa Delineation Program

Subsurface soil, surface soil and groundwater samples were collected as part of the February 2003 delineation investigation of the LIRR Massapequa Substation. The soil samples were primarily analyzed for SVOCs, PCBs and mercury. Several of the soil samples were also analyzed for VOCs and RCRA metals. The groundwater samples were analyzed for VOCs,

SVOCs, PCBs and RCRA metals. In August 2004, additional soil samples were collected as part of the delineation program and analyzed for mercury only.

All samples were analyzed within the method specified holding times.

All surrogate recoveries, internal standard area counts and spike recoveries were within QC limits. Initial and continuing calibrations were analyzed at the method specified frequency.

# Massapequa Construction Excavation Investigation

Subsurface soil samples were collected during the February 2003 field program for the construction excavation investigation at the LIRR Massapequa Substation. The samples were analyzed for SVOCs, PCBs and RCRA metals.

All samples were analyzed within the method specified holding times.

All surrogate recoveries, internal standard area counts and spike recoveries were within QC limits. Initial and continuing calibrations were analyzed at the method specified frequency.

Three samples; MSSBX-01 (12 to 14 feet), MSSBX-06 (6 to 8 feet) and MSSBX-02 (6 to 8 feet) were re-extracted outside of holding time due to surrogate recoveries being outside QC limits in the initial extract. The data from the re-extract is considered the most compliant and has been included on the data summary tables. Copies of the data summary sheets have been included in Appendix J.

## 3.7.3 Island Park Substation

NYSDEC ASP Category B deliverable data packages have been submitted for all SDGs.

#### Island Park Delineation Program

Subsurface soil, surface soil, and groundwater samples were collected as part of the January 2003 delineation investigation of the LIRR Manhasset Substation. The soil samples were primarily analyzed for mercury, with several of the samples also being analyzed for VOCs, SVOCs, RCRA metals and TPHs. The groundwater samples were analyzed for VOCs, SVOCs, PCBs and RCRA metals.

All samples were analyzed within the method specified holding times.

All surrogate recoveries, internal standard area counts and spike recoveries were within QC limits. Initial and continuing calibrations were analyzed at the method specified frequency.

# Island Park Construction Excavation Investigation

Subsurface soil samples were collected during the January 2003 field program for the construction excavation investigation at the LIRR Island Park Substation. The samples were analyzed for SVOCs, PCBs and RCRA metals.

All samples were analyzed within the method specified holding times.

All surrogate recoveries, internal standard area counts and spike recoveries were within QC limits. Initial and continuing calibrations were analyzed at the method specified frequency.

Several samples required re-extraction of the semivolatile fraction due to surrogate recoveries being outside QC limits, and the re-extraction was performed outside of the method specified holding times. The data from both the initial analysis and analysis of the re-extracts

were comparable; therefore, the data from the initial runs are considered the 'best set' and has been summarized on the analytical data tables.

No other problems were found with the sample results for all three sites. All of the results have been deemed valid and usable, as qualified above, for environmental assessment purposes.

Section 4

# 4.0 MANHASSET SUBSTATION - FISH AND WILDLIFE RESOURCES IMPACT ANALYSIS

## 4.1 Ecology

This section provides an overall habitat-based assessment of the LIRR Manhasset Substation. This assessment conforms to the guidelines contained in Step IIA of the NYSDEC Technical and Administrative Guidance Memorandum entitled, "A Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites (October, 1994)." The purpose of this section is to provide a description of the existing ecology of the site, including a site specific description of major habitat types with associated wildlife populations, the identification of other significant on-site wildlife resources and evaluate potential impacts to these resources. The information contained in this section was obtained during the Phase I remedial investigation field investigation and supplemented with data from outside sources, including the NYSDEC, U.S. Fish and Wildlife Service, and New York State Historic Preservation Officer. The field survey for this assessment was conducted during March and June of 2003.

#### 4.1.1 Major Habitat Types

The Manhasset Substation is an upland area located near the high point of a geologic moraine above Manhasset Bay. The site is bordered on the north by residential housing and to the south by paved parking for the rail station. A drainage swale exists on the north side of the property which collects overland storm water runoff and conveys it to a culvert which discharges into the extreme southern end of Manhasset Bay. The upland portion of the site is largely disturbed and consists of the railway, an electric substation and the associated railway right-of-way. The railway right-of-way area consists of low growth vegetation to facilitate rail operations, which extends approximately 40 feet north of the tracks to a cyclone fence that serves to protect against unauthorized access to the railway. Overland storm water flow enters the drainage swale at the northern edge of the property adjacent to the fence that feeds into a closed pipe. This underground pipe conveys flow from the railroad right-of-way area down an embankment with the ultimate discharge to Manhasset Bay. This embankment is approximately 50 feet above the Bay with a slope of approximately 60 degrees. The on-site major habitat types

associated with the site are limited to developed land (building, railway) and disturbed low grasslands along the track right-of-way. Beyond the site is residential and commercial development immediately north, south and east, with the headwaters of Manhasset Bay to the west. This area of Manhasset Bay is largely disturbed along the banks by encroachment of businesses and maintained lawn. This area has undergone extensive historic filling and many of the wetland values in this area have been lost.

A list of vegetative species observed on the Manhasset Substation Site is provided in Table 4-1.

# 4.1.2 Wetlands

There are no wetlands located on the Manhasset Substation property. Storm water discharges from the property are conveyed to Manhasset Bay. The area near the discharge point is an unvegetated tidal flat that rapidly transitions into a small stand of common reed (Phragmites communis) along the east and west banks. This growth band is typically less than 10 feet wide leading to upland areas, which are maintained as lawn area. The base of the railway bridge supports freshwater wetland vegetation such as skunk cabbage which is supported by apparent freshwater seeps emanating from beneath the adjacent roadway, which is likely related to the drainage of the moraine. These wetlands, associated with Manhasset Bay, are mapped and regulated by both New York State and the federal government. Further to the south, additional wetlands are present which are associated with Whitney Pond, but are outside the potential zone of influence of the Manhasset Substation.

# 4.1.3 <u>Mammals</u>

The isolated nature of the Manhasset Substation site relative to Manhasset Bay to the west, residential development to the north and east, and paved parking to the south limit the mammals that would inhabit the site to those that are tolerant of human presence and with limited home ranges. It is likely that only small mammals inhabit the area because of the numerous manmade barriers as well as topographic changes, which would act as deterrent

# VEGETATIVE SPECIES OBSERVED ON THE MANHASSET SUBSTATION SITE

#### Common Name

Scientific Name

#### Herbaceous Plants

Common ragweed Common lambsquarters Daisy Chickory Crown vetch Crabgrass Butter and eggs Yellow woodsorrel Fall panicum Common reed grass Ground cherry Pokeweed Broadleaf plantain Smartweed, Knotweed Nightshade Common goldenrod Early flowering goldenrod Stiff goldenrod Common mullein Vetch

Shrubs and Vines

Forsythia Japanese honeysuckle Virginia creeper Poison ivy Multiflora rose Catbrier

#### Trees

Red maple Flowering dogwood White pine Black cherry White oak Black oak Black locust

Ambrosia artemisiifolia Chenopodium album Chrysanthemum sp. Cichorium intybus Coronilla varia Digitaria sp. Linaria vulgaris Oxalis stricta Panicum dichotomiflorum Phragmites communis Physalis heterophylla Phytolacca americana Plantago major Polygonum sp. Solanum dulcamara Solidago juncea Solidago nemoralis Solidago rigida Verbascum thapsus Vicia sp.

Forsythia sp. Lonicera japonica Parthenocissus quinquefolia Rhus radicans Rosa multiflora Smilax rotundifolia

Acer rubrum Cornus florida Pinus strobus

Quercus alba Quercus velutina Robinia pseudoacacia barriers and likely prohibit movement. The only mammal observed during the site walkover was the Norway rat (<u>Rattus norvegicus</u>). In addition, runways and scats were observed that would indicate the presence of white footed mice (<u>Peromyscus leucopus</u>), house mouse (<u>Mus musculus</u>), cottontail rabbits (<u>Sylvilagus floridanus</u>), and raccoons (<u>Procyon lotor</u>). Probable mammal inhabitants are listed in Table 4-2.

#### Table 4-2

#### MAMMALS LIKELY TO INHABIT THE MANHASSET SUBSTATION SITE

Common Name	Scientific Name
Eastern chipmunk	Tamias striatus
Gray Squirrel	Sciurus carolinensis
Cottontail rabbit	Sylvilagus floridanus
White-footed mouse	Peromyscus leucopus
House mouse	Mus musculus
Norway rat	Rattus norvegicus
Raccoon	Procyon lotor

#### 4.1.4 <u>Birds</u>

Birds were present and actively feeding in the railway right-of-way and a number of small trees outside the cyclone fence. Mourning doves (Zenaida macroura) were especially prominent and frequently moved along the railway area, as well as other ground foraging birds, including finches (Carpodacus sp.), mockingbirds (Mimus polyglottus), starlings (Sturnus vulgaris) and American robins (Turdus migratorius). Although no hawk species were observed, the opportunities for several species to rest and feed at this location along the Atlantic Flyway were present.

Waterfowl were observed within the open water areas of Manhasset Bay near the substation discharge area. Mallards and Canadian geese were common to the area. No breeding was observed, although breeding indications would be limited at the time of the site field survey. Although no concentrated vegetation stands were present that would afford feeding opportunities to wintering waterfowl, it is likely that the vegetative screening and high embankments provide

shielding for wintering waterfowl in this area. A subset of the New York State Bird Atlas listing for Suffolk County, New York is presented in Table 4-3, providing species observed or expected to utilize this area of Manhasset Bay.

# 4.1.5 <u>Fish</u>

There is no standing water at the Manhasset Substation site; therefore, the site is not suitable to support any fish species. The area where storm water is discharged to Manhasset Bay likely provides a protective feeding and nursery area to a variety of saltwater finfish and crustaceans. Common species present include the Atlantic silverside (Menidia menidia) and mummichog (Fundulus heteroclitus). Seasonal species of commercial/recreational importance that routinely inhabit this habitat include striped bass (Morone saxatilis), bluefish (Pomatomus saltatrix), and winter flounder (Pseudopleuronectes americana). A list of finfish species, which likely frequent this area on a seasonal basis, are provided in Table 4-4.

## 4.1.6 Reptiles and Amphibians

Reptiles or amphibians were not observed on the Manhasset Substation site. The property includes discarded construction materials that would offer cover to snakes common to the area. Low vegetation likely provides habitat for common toad species. Table 4-5 contains a list of reptiles and amphibians common to the area that could likely inhabit the site and/or surrounding areas.

## 4.1.7 Rare Species and Critical Habitats

Based on a review of the New York Natural Heritage files maintained at the NYSDEC Wildlife Resources Center, there are no rare species or critical habitats known to occur on or adjacent to the Manhasset Substation site. In addition, except for occasional transient individuals, no federally listed or proposed endangered, or threatened species exist within a 2-mile radius of the site according to the U.S. Department of the Interior, Fish and Wildlife

### AVIFAUNA LIKELY TO INHABIT THE MANHASSET SUBSTATION/MANHASSET BAY AREA

#### Common Name

Canada goose Mallard Black duck Red-tailed hawk Kestrel Killdeer Herring gull Great black-backed gull Mourning dove Eastern kingbird American crow Blue jay Black-capped chickadee Tufted titmouse White-breasted nuthatch Red-breasted nuthatch Brown creeper House wren Winter wren Carolina wren Gray catbird Northern mockingbird Eastern bluebird American robin Wood thrush Cedar waxwing Solitary vireo Yellow warbler Ovenbird Common yellowthroat Common grackle European starling House sparrow Northern cardinal Brown-headed cowbird House finch Purple finch American goldfinch Chipping sparrow Field sparrow Song sparrow White-throated sparrow

#### Scientific Name

Branta canadensis Anas platyrhynchos Anas rubripes Buteo jamaicensis Falco sparverius Charadrius vociferus Larus argentatus Larus marinus Zenaida macroura Tyrannus tyrannus Corvus brachyrhynchos Cyanocitta cristata Parus atricapillus Parus bicolor Sitta carolinensis Sitta canadensis Certhia americana Troglodytes aedon Troglodytes troglodytes Thryothorus ludovicianus Dumetella carolinensis Mimus polyglottos Stalia sialis Turdus migratorius Hyocichla mustelina Bonbycilla cedrorum Vireo solitarius Dendroica petechia Seirus aurocapillus Geothlypis trichas Ouiscalus quiscula Sturnus vulgaris Passer domesticus Cardinalis cardinalis Molothrus ater Carpodacus mexicanus Carpodacus purpureus Carduelis tristis Spizella passerina Spizella pusilla Melospiza melodia Zonotrichia albicollis

## FINFISH LIKELY TO SEASONALLY INHABIT MANHASSET BAY

#### Common Name

American eel Blueback herring Atlantic menhaden Bay anchovy Oyster toadfish Mummichog Striped killifish Atlantic silverside Tidewater silverside Northern pipefish Striped bass Bluefish Scup Weakfish Northern kingfish Northern searobin Striped searobin Sea raven Winter flounder Summer flounder Windowpane Northern puffer

#### Scientific Name

Anguilla rostrata Alosa aestivalis Brevoortia tyrannus Anchoa mitchilli Opsanus tao Fundulus heteroclitus Fundulus majalis Menidia menidia Menidia beryllina Syngnathus fuscus Morone saxatilis Pomatomus saltatrix Stenotomus chrysops Cynoscion regalis Menticirrhus saxatilis Prionotus carolinus Prionotus evolans Hemitripterus americanus Pseudopleronectes americanus Paralichthys oblongus Lophopsetta maculata Sphoeroides maculatus

# **REPTILES AND AMPHIBIANS LIKELY TO INHABIT THE MANHASSET SUBSTATION SITE**

Common Name

Scientific Name

Box turtle Eastern garter snake Eastern ribbon snake Fowler's toad Terrapene carolina Thamnophis sirtalis Thamnophis sauritis Bufo woodhousei fowleri Service. Table 4-6 provides a list of all federally listed and proposed threatened or endangered species in New York State.

## 4.1.8 Biological Associations Found in the Project Vicinity

The areas within a 2.5-mile radius surrounding the Manhasset Substation vary greatly. Manhasset Bay lies to the west of the site and exerts a major influence on the aquatic species of the area. South of the site beyond the parking field is Whitney Pond Park, which is a suburban park with fresh water ponds, forested edge area and open recreational areas. Residential development is present north and east of the area. Small commercial establishments line the west bank of Manhasset Bay and intersperse with open areas along the east bank. An association of cover types with common dominant species is presented in Table 4-7. The biological associations observed are common for this general area.

## 4.1.9 Observations of Stress Potentially Related to Site Contaminants

Other than physically disturbed areas, there were no indications of visibly stressed vegetation that could be attributed to contaminants. Past disturbance and multiple contamination sources, including overland storm water runoff from commercial development and storm water runoff discharges from roadways, has impacted water quality in lower Manhasset Bay. As discussed under Section 3.1.4, four surface water sediment samples were collected at low tide adjacent to the drainage swale outfall in Manhasset Bay. All four sediment samples exhibited detectable levels of mercury, ranging from 0.077 mg/kg to a maximum of 0.19 mg/kg at MHSD-02A. Only MHSD-02A exceeded the "lowest effect level" of 0.15 mg/kg established for mercury for surface water sediment by the NYSDEC pursuant to the NYSDEC Technical Guidance for Screening Contaminated Sediment, dated November 22, 1993. All mercury concentrations were found to be well below the "severe effect level" of 1.3 mg/kg, which is also included in the above-referenced NYSDEC guidance document.

# FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED SPECIES IN NEW YORK STATE

Common Name	Scientific Name	<u>Status</u>	Distribution	
Fishes				
Sturgeon, shortnose	Asipenser brevirostrum	Е	Hudson River and other Atlantic coastal rivers	
Reptiles				
Turtle, bog	Clemmys muhlenbergii	РТ	Albany, Columbia, Dutchess, Genesee, Orange, Oswego, Putnam, Seneca, Ulster, Wayne, and Westchester Counties	
Turtle, green	Chelonia mydas	Т	Oceanic summer visitor coastal waters	
Turtle, hawksbill	Eretmochelys imbricata	E	Oceanic summer visitor coastal waters	
Turtle, leatherback	Dermochelys coriacea	E	Oceanic summer visitor coastal waters	
Turtle, loggerhead	Caretta caretta	Т	Oceanic summer visitor coastal waters	
Turtle, Atlantic ridley	Lepidochelys kempii	E	Oceanic summer visitor coastal waters	
Birds				
Eagle, bald	Haliaeetus lcucocephalus	Т	Entire state	
Falcon, peregrine	Falco peregrinus	Е	Entire state - re- establishment to former breeding range in progress	
Plover, piping	Charadrius melodus	Е	Great Lakes Watershed	
		Т	Remainder of coastal New York	
Tern, roseate	Sterna dougallii dougallii	E	Southeastern coastal portions of state	

# Table 4-6 (continued)

# FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED SPECIES IN NEW YORK STATE

Common Name	Scientific Name	<u>Status</u>	<b>Distribution</b>
Mammals			
Bat, Indiana Cougar, eastern	Myotis sodalis Felis concolor cougar	E E	Entire State Entire State - probably extinct
Whale, blue	Balaenoptera musculus	Е	Oceanic
Whale, finback	Balaenoptera physalus	Е	Oceanic
Whale, humpback	Megaptera novaeangliae	Е	Oceanic
Whale, right	Eubalaena glacialis	Е	Oceanic
Whale, sei	Balaenoptera borealis	Oceanic	
Whale, sperm	Physeter catodon	Е	Oceanic
Mollusks			
Snail, Chittenango ovate amber	Succinea chittenangoensis	Т	Madison County
Mussel, dwarf wedge	Alasmidonta heterodon	Е	Orange County - lower Neversink River
Butterflies			
Butterfly, Karner blue	Lycaeides melissa samuelis	Е	Albany, Saratoga, Warren, and Schenectady Counties
Plants			
Monkshood, northern wild	Aconitum noveboracense	Т	Ulster, Sullivan, and Delaware Counties
Pogonia, small whorled	Isotria medeoloides	Т	Entire State
Swamp pink	Helonias bullata	Т	Staten Island - presumed extirpated
Gerardia, sandplain	Agalinis acuta	E	Nassau and Suffolk Counties
Fern, American hart's-tongue	Asplenium scolopendrium var. Americana	Т	Onondaga and Madison Counties
Orchid, estern prairie fringed	Platanthera leucophea	Т	Not relocated in New York
Bulrush, northeastern	Scirpus ancistrochaetus	E	Not relocated in New York
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# Table 4-6 (continued)

# FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED SPECIES IN NEW YORK STATE

Common Name	Scientific Name	<u>Status</u>	Distribution
Roseroot, Leedy's	Sedum integrifolium ssp. Leedyi	Т	West shore of Seneca Lake
Amaranth, seabeach	Amaranthus pumilus	Т	Atlantic coastal plain beaches
Goldenrod, Houghton's	Solidago houghtonii	Т	Genesee County

# FLORAL AND FAUNAL ASSOCIATIONS OBSERVED WITHIN 2.5 MILES OF THE MANHASSET SUBSTATION SITE

	Creasland/	Forested/		Freshwater Wetlands/	Estre vin e	Culturated
<u>Species</u>	Grassland/ <u>Field</u>	Grassland/ <u>Field</u>	Forested	Wetlands/ <u>Ponds</u>	Estuarine <u>Wetlands</u>	Cultivated <u>Lawn</u>
Plants						
Common ragweed	Х	Х				
Daisy	Х	Х				
Crown vetch	Х	Х		Х		
Fescue						Х
Goldenrod	Х	Х		Х		
Virginia creeper		Х	Х			Х
Multiflora rose	Х	Х		Х		
Red maple			Х			Х
Flowering Dogwood		Х	Х			Х
Black locust		Х	Х			Х
Animals						
Striped bass					Х	
Gray Squirrel		Х	Х			Х
Mice/voles/shrews	Х	Х	Х	Х		Х
Black Duck					Х	
Hawks	Х	Х	Х	Х		
Finches		Х	Х			Х
Sparrows	Х	Х	Х			Х
Northern spring peeper				Х		
Eastern garter snake	Х	Х		Х		

# 4.1.10 Habitat Values of Vegetative Zones Within the Project Site

The assessment of habitat value provides for assessments of primary functions, such as food chain production, specialized habitat and hydrologic interactions. As part of the analysis, cultural values concerning recreation, aesthetics or other special features must be taken into consideration.

The information gathered during the initial site assessment conducted in 1999 can provide for a hierarchy of habitat values for the cover types found at the Manhasset Substation. It should be noted that this approach is highly subjective. Those functions assumed to be valuable in relative efficiency or importance are ranked as 3 (high), 2 (moderate), 1 (low) or 0 (non-existent). Specific factors and brief descriptions, which were utilized in the habitat value analysis of the site's qualitative evaluation, are as follows:

- <u>Nutrient Transport Function</u> Transport of nutrients in detrital-based food chains is strongly dependent on the hydrologic characteristics of the particular ecosystem. For example, wetlands located in lower lying areas export more detrital material than do the higher marsh areas infrequently affected by creek/river overflow. Similarly, detrital transport in the riverine systems is dependent on the river flow regime, especially during periods of peak discharge. In contrast, very little detrital material is exported from isolated ponds and marshes, except during periods of episodic overflow resulting from exceptionally high precipitation.
- <u>Food Chain Support</u> This function refers to the secondary productivity values of consumer species that a particular ecosystem can support. Secondary productivity is an overall measure of the efficiency of the habitat in terms of nutrient to transfer higher trophic levels.
- <u>Hydroperiod</u> This factor refers to the frequency of inundation either by river flow runoff or direct precipitation. Areas of good hydrologic linkage help maintain a regular interchange of nutrients and other materials necessary to support diverse flora and fauna.
- <u>Elevational\_Location</u> From the above, it is apparent that hydrologic relationships will progressively deteriorate as the depth of flooding decreases. The weakest hydrologic linkages exist in those areas physically isolated from other areas in the system.

- <u>Cultural Evaluation</u> This particular factor is difficult to assess in detail because of the number of socio-economic considerations, which may be involved. Hence, the evaluation in relation to local residential, commercial, or industrial development is largely left to the professional judgement of the project personnel on a specific case-by-case basis.
- <u>Recreation</u> Recreation is a vital personal and social need, which provides opportunity for self-expression, physical exercise, and a change of pace from normal or routine activities. Outdoor recreation is a major leisure activity and is growing in national importance with a trend towards a higher standard of living. A significant portion of the total recreational output is water based or water related. As such, greater weight is given to those types of habitats.
- <u>Socio-Economic</u> This factor pertains to benefits, which can be attributed directly to renewable resources, recreational enjoyment, or other features associated with a particular habitat.
- <u>Aesthetics</u> Selected types of habitats are distinctive landscape features which can please the aesthetic sense through the intrinsic appreciation of natural beauty. Wetlands, or any other type of natural landscape, can also be offensive if their features have been adversely modified by incompatible human activities. Aesthetic value can be largely determined by the degree of visual diversity and contrast between the physical elements, such as landforms, water bodies, vegetation types and land use types.
- <u>Food Chain Production</u> This factor determines the growth of vegetation in a habitat and influences the populations and secondary productivity of animals that feed on the plants, or that feed at high trophic levels in the community.
- <u>Primary Productivity</u> Primary productivity is a measure of the stored food potential of the vegetation in excess of that used by the plants in metabolism. This determination provides an overall measure of the energy input directly available to the consumer species. It should be noted that the possible range of productivity values, both within and between particular environments, is extremely variable and dependent on a number of local conditions. For the present analysis, literature values for primary productivity as a function of biomass were utilized.
- <u>Water Purification Factor</u> Through a variety of physical, biological, and chemical processes, some habitats function to naturally purify water by removing organic and mineral particulate matter from runoff and/or rivers and streams. For example, wetlands may be significant in minimizing some of the harmful effects of pollutants introduced into natural ecological systems by the activities of man. Thus, wetlands, especially when part of riverine or estuarine systems, can be an integral part of water quality and pollution control objectives.

Based upon the above factors, a qualitative analysis of the habitat value of the vegetative and aquatic communities at the Manhasset Substation are presented in Table 4-8. Based upon these results, the wetlands habitats associated with Manhasset Bay are moderately high value habitats. These wetlands function as a typical estuarine in primary productivity, nutrient transport and food chain support, while also providing aesthetic and recreational opportunities to the local community that would not likely otherwise be available in this location. The Manhasset Substation is a man-maintained corridor that has an important socio-economic function as a mass transportation corridor. As such the property is not managed for and does not present opportunities for ecological diversity or development. Control of contaminants on location is important to minimize impacts to Manhasset Bay. Due to the high tidal amplitude and flushing abilities of Manhasset Bay coupled with the affinity of contaminants under investigation to closely adhere to local sediments, it is unlikely that significant ecological disturbance has resulted from past practices of the Manhasset Substation.

# QUALITATIVE HABITAT VALUE ANALYSIS WITHIN THE MANHASSET SUBSTATION SITE

<b>Evaluation Factor</b>	<u>Disturbed Upland</u>	Manhasset Bay <u>Discharge Site</u>
Food Chain Production	1	2
Primary Productivity	1	2
Nutrient Transport	1	2
Food Chain Support	1	2
Hydroperiod	1	2
Elevational Location	1	2
Cultural Location	3	2
Recreation	0	2
Socio-Economic	3	1
Aesthetics	1	2
Water Purification Factor	1	2
Totals	14	21

Section 5

# 5.0 QUALITATIVE EXPOSURE ASSESSMENT

#### 5.1 Introduction

The purpose of this exposure assessment is to determine how and when an individual might be exposed to contaminants of potential concern associated with the LIRR Manhasset, Massapequa and Island Park substations. A contaminant of potential concern (COPC) is any chemical detected above the NYSDEC cleanup guidelines in a medium, which could produce adverse health effects under the right conditions of dose and exposure. For exposure to occur, there must be a complete "pathway of exposure" where a person can come into contact with contaminants of potential concern. For a pathway to be complete, there must be: 1) a source or medium containing the COPC; 2) a location where human contact could take place (i.e., an exposure point); and 3) a feasible means for the COPC to enter into the person's body. The person who could come into contact with the COPC at an exposure point is called a "receptor." The ways in which the COPC can enter the body are called "routes of exposure." Ingestion (by mouth), dermal (contact with skin) and inhalation (breathing into the lungs) are the routes of exposure considered in this and other human health risk assessments. Consistent with the New York State Department of Health (NYSDOH) and other regulatory agencies, this assessment considers both current and potential future exposures.

As with any exposure assessment, it is not intended to predict disease outcome, but rather, is meant to be used as a tool to make decisions regarding the need for remediation or the institution of precautionary measures, such as limiting the affected area to nonresidential land uses. Given the available information for each site, and keeping the purpose of the assessment in mind, the following evaluation for the three LIRR substations and surrounding off-site areas is qualitative in nature.

#### 5.2 **Properties, Fate and Transport of Mercury**

The following is a summary of the properties, fate and transport of mercury (Hg) in surface and shallow subsurface soil. The mercury found at Long Island Rail Road substations is assumed to have entered in the soil in the form of liquid elemental mercury that was utilized in mercury-containing rectifiers. Elemental mercury  $(Hg^0)$  is a heavy, silver-white metal with a specific gravity approximately 13.5 times that of water and is the only metal to exist in the liquid phase at room temperature.  $Hg^0$  has a relatively high vapor pressure and is the most volatile of all metals. Overall, however, it is considered only slightly volatile when compared to most liquids.  $Hg^0$  volatilizes into a colorless, odorless and tasteless gas.

Mercury is a naturally occurring element that has been distributed throughout the environment by natural processes. Mercury exists in three possible oxidation states: elemental mercury (Hg<sup>0</sup>), mercurous (Hg<sup>1+</sup>), and mercuric (Hg<sup>2+</sup> or Hg[II]). Atmospheric deposition to the surface from anthropogenic and natural air emissions is considered a major source of mercury in the environment and is primarily in the form of Hg(II), either during precipitation events or adsorbed onto airborne particulates. The mercurous and mercuric forms of mercury will complex and form numerous organic and inorganic compounds. Hg(II) is commonly found as mercuric sulfide (HgS), a stable inorganic species that is essentially insoluble in water and is therefore considered a major long term sink for mercury in soils. Moderately soluble forms of Hg(II), such as mercuric forms of mercury will adsorb to clay minerals, oxides and organic matter and tend not to leach. Methylmercury (MeHg) is the most widespread organic form of mercury in the environment and is formed from the methylation of inorganic mercury by bacteria in aquatic environments. Methylation is generally negligible in terrestrial soils.

Liquid elemental mercury has a tendency to form globules or beads and therefore is generally not uniformly distributed among soil particles. It will sink under the force of gravity and split up into available pore spaces. Despite this fact,  $Hg^0$  is only slightly soluble in water and, therefore, is unlikely to leach into groundwater via infiltrating precipitation. In fact, spills of liquid mercury to shallow subsurface soil have been found to be persistent in this environment. Elemental mercury is assumed to be removed from unsaturated soil primarily through its potential to volatilize to the soil vapor and the outside air. Although liquid mercury is volatile, the process is not rapid and globules of  $Hg^0$  may persist for a long time before completely volatilizing. In addition, mercury globules can become coated with a stable layer of insoluble

HgS, especially in anaerobic conditions, and can remain inert for a long time. Mercury vapor released to the outdoor air will dissipate rapidly into the atmosphere.

#### 5.3 General Findings and Conditions

As indicated by the chemical data presented in Section 3.0, mercury is the primary COPC detected in surface and subsurface soil associated with the three substation sites. However, groundwater at each substation does not appear to be impacted by mercury. In addition, a number of PAH compounds have been detected in surface and subsurface soil. Relatively low concentrations of several VOCs have been detected in several UIC structures; however, these structures have been remediated as part of the UIC closure program. Several VOCs were detected in groundwater, including MTBE in groundwater samples collected from the three substations at trace to low concentrations not exceeding 18 ug/l. However, these groundwater contaminants appear to be from upgradient, off-site sources and are not associated with activities conducted at the three substations.

All three substations are actively used by the LIRR to convert alternating current (AC) obtained from the local electrical provider, the Long Island Power Authority (LIPA), to direct current (DC) for use in powering the LIRR's electric train fleet. As discussed in Section 1.1, the substations have been used for this purpose since the early 1930's and the LIRR intends to continue to use these facilities for this purpose in the foreseeable future.

The substations are only accessible by authorized LIRR personnel and their subcontractors. In addition, the substations are not occupied by LIRR personnel on a continuous or full-time basis. Under normal operating conditions, access to the substation properties only occurs when equipment requires monitoring, maintenance or repair. Each substation building is locked at all times and all associated outside electrical equipment (i.e., transformers) are secured by a locked fence. In addition, the property surrounding the Manhasset and Massapequa substations is fenced, preventing public access to these properties.

5-3

All three substations are serviced by public water and on-site groundwater is not used for any purpose.

While soil contamination has been documented within certain areas of each substation, the LIRR maintains strict control over conducting soil excavation activities within LIRR properties known to contain contaminants in order to avoid the excavation and handling of contaminated soil without undertaking appropriate health and safety measures. Provided as Appendix G is the LIRR Procedure/Instruction EE03-001 which defines the procedures that must be undertaken prior to conducting excavation activities at LIRR properties.

The following sections discuss the exposure assessment for each of the three substations.

#### 5.4 Manhasset Substation

## Surface and Subsurface Soil

Elevated concentrations of mercury were detected within surface soil and subsurface soil within the Manhasset substation. The highest mercury concentrations were detected in surface soil within the drainage swale, and in surface soil and shallow subsurface soil within the Exterior Railroad Tie AOC located south of the drainage swale and west of the substation building. However, surface soil within the drainage swale is covered by stone blocks that line the swale and the Exterior Railroad Tie AOC, as well as the surrounding area, is covered with 6 to 8 inches of crushed stone. Therefore, direct exposure to mercury contamination of LIRR workers (on-site receptors) who are required to periodically enter the site for equipment maintenance and repair is highly unlikely. LIRR workers and subcontractors could be potentially exposed to this contaminant source during excavation activities as the result of dermal contact and inhalation of windblown dust. However, as discussed above, the LIRR has in place procedures to avoid the excavation and handling of contaminated soil without undertaking appropriate health and safety measures. In addition, the Manhasset substation is secured with a fence eliminating the potential of trespassers entering the site.

Surface soil samples collected from off-site locations immediately north of the drainage swale exhibited relatively low concentrations of mercury with the majority of surface soil samples exhibiting mercury concentrations ranging from 0.1 mg/kg to less than 6.0 mg/kg. While the majority of these concentrations were found to be low, they are located in an area that has unrestricted access by the public. Therefore, exposure of off-site receptors to this contaminant source could occur through dermal contact, ingestion and inhalation of windblown dust. However, due to the low volatility of mercury and the relatively low concentrations, inhalation of mercury vapor is not expected. This is supported by the fact that all mercury vapor readings were nondetectable for all surface soil samples collected from this area.

#### Groundwater

As discussed in Section 1.3.7, groundwater has not been adversely impacted by the presence of mercury in on-site soil. In addition, on-site groundwater is not used as a potable water source or for any other uses. Therefore, groundwater is not considered a potential exposure pathway.

#### <u>Air</u>

VOCs were only detected at trace concentrations of less than 10 ug/kg within a former UIC structure that was remediated in 2003. As a result, inhalation of contaminants released to the air through volatilization of contaminants from surface soil and subsurface soil does not represent a potential exposure pathway for on-site or off-site receptors. However, as discussed above, inhalation of windblown dust of surface soil does represent a potential for exposure to off-site receptors. While the volatilization of mercury present in the subsurface can occur, this process occurs at a very slow rate and inhalation of mercury vapor from on-site sources is not expected to be a significant exposure pathway.

#### Future Use of Manhasset Substation

The Manhasset substation is an integral component of the LIRR rail system and will remain as an electric substation for the foreseeable future.

#### 5.5 Massapequa Substation

Elevated levels of mercury were detected in surface and subsurface soil within the Massapequa substation. The highest mercury concentrations were detected in surface soil located immediately east of the substation building, and below an asphalt driveway as well as an area covered by 6 to 8 inches of crushed stone. Therefore, direct exposure of LIRR workers (on-site receptors) to this contaminant source who need to periodically enter the site for equipment monitoring, maintenance and repair is highly unlikely. LIRR workers and subcontractors could be potentially exposed to this contaminant source during excavation activities as the result of dermal contact and inhalation of windblown dust. However, as discussed above, the LIRR has in place procedures to avoid the excavation and handling of contaminated soil without undertaking appropriate health and safety measures. In addition, the Massapequa substation is secured with a fence eliminating the potential of trespassers entering the site.

Surface soil samples collected outside the substation fence within nearby grass-covered areas also exhibited mercury at concentrations ranging from 0.40 mg/kg to a maximum of 13.6 mg/kg. These grass-covered areas are accessible to the public, therefore, exposure of off-site receptors to this contaminant source could occur through dermal contact, ingestion and inhalation of windblown dust. Therefore, the LIRR has erected temporary fencing to restrict the public from access to these areas.

#### Groundwater

As discussed in Section 3.3.6, groundwater has not been adversely impacted by the presence of mercury in on-site soil. Furthermore, on-site groundwater is not used as a potable

water source or for any other uses. Therefore, groundwater is not considered a potential exposure pathway.

### 5.6 Island Park Substation

#### Surface and Subsurface Soil

The highest mercury concentrations detected in surface and subsurface soil within the Island Park substation were observed in samples collected from an area adjacent to the south side of the substation building. However, mercury concentrations did not exceed 13 mg/kg in this area and it is currently covered by asphalt pavement. Therefore, direct exposure of LIRR workers (on-site receptors) to this contaminant source who need to periodically enter the site for equipment maintenance and repair is highly unlikely. LIRR workers and subcontractors could be potentially exposed to this contamination during excavation activities as the result of dermal contact and inhalation of windblown dust. However, as discussed above, the LIRR has in place procedures to avoid the excavation and handling of contaminated soil without undertaking appropriate health and safety measures.

Subsurface soil samples collected throughout the Island Park substation site exhibited elevated concentrations of a number of PAHs and, to a lesser extent, arsenic and phenols. However, based on soil conditions observed during the advancement of borings, much of the site soil appears to be comprised of non-native fill. In addition, while undertaking excavation activities in accordance with the construction excavation program, subsurface soil was found to be comprised of fill material and debris, including automobile parts, mattresses, bottles, tools and related material. Based on these findings, it is apparent that the PAHs, arsenic and phenols identified in subsurface soil is associated with this fill material and is not associated with LIRR operations, past or present. Regardless of their origin, the areas where these contaminants have been observed are covered with asphalt pavement and, therefore, exposure of LIRR workers who periodically access the site is highly unlikely. LIRR workers and subcontractors could be potentially exposed to this contamination during excavation activities as the result of dermal contact and inhalation of windblown dust. However, as discussed above, the LIRR has instituted

procedures to prevent the excavation of contaminated soil without undertaking appropriate health and safety measures.

### Groundwater

As discussed in Section 3.5.10, mercury was not detected above NYSDEC Class GA groundwater standards in groundwater samples collected from the site. A number of metals were detected above their respective NYSDEC Class GA groundwater standard; however, the majority of these exceedances was detected in unfiltered groundwater samples and, therefore, does not represent true dissolved-phase concentrations. In addition, groundwater samples exhibited low concentrations of several VOCs including MTBE, a common gasoline additive. Finally, groundwater samples exhibited a number of PAHs exceeding NYSDEC standards which would be expected given the concentrations observed in subsurface soil as the result of the fill material. Furthermore, on-site groundwater is not used as a potable water source or for any other uses. Therefore, groundwater is not considered a potential exposure pathway.

Section 6

#### 6.0 CONCLUSIONS AND RECOMMENDATIONS

This section presents a discussion of the conclusions and recommendations associated with the investigation of the presence of any chemical constituents of concern at the Manhasset, Massapequa and Island Park substations and surrounding off-site properties. It is important to note that the conclusions and recommendations presented take into consideration the completed Fish and Wildlife Resources Impact Analysis presented in Section 4.0, the findings of the Qualitative Human Health Exposure Assessment presented in Section 5.0, as well as the intended future use of the substation sites.

Note that, upon approval of this investigation report by the NYSDEC, the LIRR intends to proceed with development of a Remedial Action Selection report that will identify the selected remedial technologies that will be used to successfully remediate each substation site in accordance with the recommendations presented below.

### 6.1 Manhasset Substation

Mercury was detected in surface and shallow subsurface soil at the Manhasset Substation. The most significant mercury contamination has been identified in soil collected immediately beneath the stone blocks lining the drainage swale at concentrations of up to 9,800 mg/kg. Soil samples collected from the drainage swale indicate a mercury "hot spot" located between 10 and 30 feet west of the northwest corner of the existing substation building. However, mercury concentrations within the drainage swale decrease rapidly to the west (downstream) and east (upstream) of this hot spot area. The drainage swale conveys storm water runoff from the substation property, as well as properties located "upstream" and to the east and south of the substation. The storm water is ultimately discharged to Manhasset Bay via an outfall located approximately 1,000 feet west of the substation. However, surface water sediment samples collected from Manhasset Bay immediately downstream of the outfall indicate that mercury concentrations are only marginally above the "lowest effect level" standard of 0.15 mg/kg and well below the "severe effect level" of 1.3 mg/kg, which has been established by the NYSDEC for mercury in surface water sediments.

Mercury has been identified in surface soil and shallow subsurface soil immediately to the south of the drainage swale hot spot discussed above and immediately west of the substation building at concentrations of up to 1,700 mg/kg.

In addition, surface soil samples collected from the soil median and from off-site properties immediately north of the drainage swale exhibited concentrations of mercury above the NYSDEC TAGM criteria of 0.1 mg/kg with the majority of these samples exhibiting relatively low mercury concentrations ranging from 0.1 mg/kg to less than 6.0 mg/kg.

Groundwater has not been impacted by the presence of mercury in on-site soil.

All UIC structures identified within the Manhasset Substation have been remediated and closed in accordance with USEPA and NCDH requirements.

Exposure of on-site workers to mercury-contaminated soil is not expected due to the fact that the soil comprising the drainage swale is "lined" by stone blocks and soil south of the swale is covered with 6 to 8 inches of crushed stone. Furthermore, the LIRR has instituted procedures to prevent the excavation of contaminated soil at LIRR properties without undertaking appropriate health and safety measures. Off-site receptors could be potentially exposed to surface soil exhibiting mercury above the NYSDEC TAGM criteria of 0.1 mg/kg located off-site and north of the drainage swale.

Based on the above findings, we recommend the following:

#### Drainage Swale

In order to remediate the mercury concentrations in surface soil within the drainage swale, excavate all soil and stone blocks from the drainage swale to a total depth of 3 feet below grade in an area beginning approximately 2 feet west of the northwest corner of the substation and extending to a point approximately 50 feet west. Subsequent to completing this remedial action, the swale should be replaced with a concrete culvert and backfilled with clean fill.

#### Exterior Railroad Ties AOC

Soil south of the drainage swale, north of the signal hut and west of the substation containing elevated levels of mercury should be remediated to a depth of between 2 and 4 feet below grade, depending on the results of the completed surface soil sampling. This area is approximately 1,400 square feet in area and would require the excavation of approximately 130 cubic yards of soil. After removal of the contaminated soil, this area should be backfilled with clean soil and a layer of crushed stone placed on top of the area.

#### Off-site Soil

Due to the potential for exposure to off-site receptors, shallow soil up to 1 foot in depth should be remediated within the soil median located immediately to the north of the drainage swale. This would include the narrow strip of exposed soil located between the drainage swale and the curb of Virginia Drive. The area requiring excavation includes a distance of approximately 440 feet, starting approximately 80 feet east of the substation building and continuing west along Virginia Drive. In addition, a narrow strip of soil approximately 550 feet in length located on the two private properties west of Virginia Drive and adjacent to the drainage swale should be remediated to a depth of up to 1 foot below grade. Assuming a strip 3 feet in width, the area to be remediated consists of approximately 110 cubic yards of soil. After remediation, the excavated area should be backfilled with clean soil and the surface restored to pre-remediation conditions including the restoration of lawns and other landscaped areas.

### 6.2 Massapequa Substation

Mercury has been detected in surface soil and shallow subsurface soil at the Massapequa Substation. The highest mercury concentrations have been identified in surface soil and shallow subsurface soil located immediately east of the eastern side of the substation building with mercury concentrations of up to 178 mg/kg. This portion of the site is covered by asphalt pavement and crushed stone. Exposure of on-site workers to mercury contamination is not expected due to the fact that it is covered by asphalt pavement or crushed stone. Furthermore, the LIRR has instituted procedures to prevent the excavation of contaminated soil at its properties without undertaking appropriate health and safety measures.

In addition, surface soil samples collected outside the substation fence within grass covered areas to the south and east exhibited mercury concentrations ranging from 0.4 to 13.6 mg/kg. In addition, subsurface soil sample MSSB-53 (2 to 4 feet) collected within a grass covered area immediately south of the substation fence exhibited a mercury concentration of 103 mg/kg. These grass-covered areas are accessible to the public and, therefore, exposure of off-site receptors to this contaminant source could occur through dermal contact, ingestion and/or inhalation of windblown dust. Note that, based on these findings, the LIRR has placed temporary fencing around these grass areas in order to prevent access while a permanent remedy is selected to mitigate this potential exposure pathway.

Groundwater has not been impacted by the presence of mercury in on-site soil.

All UIC structures identified within the Massapequa Substation have been remediated and closed in accordance with USEPA and NCDH requirements.

Based on these findings, we recommend the following:

#### **On-site** Locations

Replace the area of crushed stone located immediately east of the substation building with asphalt pavement in order to further isolate any residual mercury-impacted soil from on-site workers and to reduce the degree to which groundwater can infiltrate through this soil.

#### Off-site Locations

Excavate the mercury-impacted soil in grass covered areas to the south and east of the substation fence to a depth of 2 feet below grade. Replace the excavated soil with clean soil and cover with asphalt pavement or concrete to prevent future access by the public.

#### 6.3 Island Park Substation

Mercury was detected in surface and shallow subsurface soil within the Island Park Substation. The highest mercury concentrations were detected in samples collected from an area adjacent to the south side of the substation building. However, mercury concentrations did not exceed 13 mg/kg in this area and is currently covered by asphalt pavement. Therefore, direct exposure of LIRR workers to this area who need to periodically enter the site for equipment maintenance and repair is highly unlikely. LIRR workers and subcontractors could be potentially exposed to this contamination during excavation activities as a result of dermal contact and/or inhalation of windblown dust. However, as discussed above, the LIRR has procedures in place to prevent the excavation of contaminated soil at its properties without undertaking appropriate health and safety measures.

Subsurface soil samples collected throughout the Island Park substation site exhibited elevated concentrations of a number of PAHs and, to a lesser extent, arsenic and phenols. However, during the advancement of borings, much of the site soil appears to be comprised of nonnative fill. In addition, while undertaking excavation activities in accordance with the construction excavation program, subsurface soil was found to be comprised of fill material and debris, including automobile parts, mattresses, bottles, tools and related material. Based on these findings, it is apparent that the PAHs, arsenic and phenols identified in subsurface soil is associated with this fill material and is not associated with LIRR operations, past or present. Regardless of the origin, the areas where these contaminants have been observed are covered with asphalt pavement and, therefore, exposure of LIRR workers who periodically access the site is highly unlikely. LIRR workers and subcontractors could be potentially exposed to this contamination during excavation activities as the result of dermal contact and/or inhalation of

windblown dust. However, as discussed above, the LIRR has instituted procedures to prevent the excavation of contaminated soil at its properties without undertaking appropriate health and safety measures.

Mercury was not detected above NYSDEC Class GA groundwater standards in groundwater samples collected from the site. A number of metals were detected above their respective NYSDEC Class GA groundwater standard; however, the majority of these exceedances were detected in unfiltered groundwater samples that exhibited turbidity values well in excess of 50 NTUs and, therefore, do not represent true dissolved-phase concentrations. Groundwater samples exhibited relatively low concentrations of several VOCs (not exceeding 18 ug/l) including MTBE, a common gasoline additive. In addition, groundwater samples exhibited a number of PAHs exceeding NYSDEC standards which would be expected given the concentrations of PAHs observed in subsurface soil as the result of the fill material.

The rectifier dry well was remediated and closed as part of the Island Park UIC closure program in accordance with the requirements of the USEPA and NCDH.

The existing Island Park electric substation building is scheduled to be demolished in 2005. After demolition is completed, we recommend the following:

#### Sump Pump Pit

During the initial site assessment conducted in 1999, mercury-impacted soil was detected beneath a sump pump pit located within the substation building. Therefore, delineation activities are recommended to determine the horizontal and vertical extent of the impacted soil after demolition of the building.

#### Basement Drain Pipe

During the initial site assessment conducted in 1999, a drain pipe originating from within the substation basement was found to terminate beneath an area between the substation and the train tracks, approximately 21 feet from the west wall of the building. Investigation of this area could not be completed due to the presence of active utilities. Therefore, it is recommended that additional investigations be completed in this area to locate the discharge point associated with the basement drain after the demolition of the building so that electric utilities in that area can be de-energized.

### Septic Tank

After building demolition, the LIRR recommends closing the active septic tank associated with the building by pumping out all material present in the tank and backfilling the tank with clean soil.

Appendix A

# APPENDIX A

# ANALYTICAL DATA FROM INITIAL SITE ASSESSMENT OF THE THREE SUBSTATIONS

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### TABLE D-1A

#### LONG ISLAND RAIL ROAD SUBSTATION INVESTIGATION SOIL BORING SAMPLING RESULTS - MANHASSET-N10 MERCURY

LOCATION	Recti	iier Pit	Water Ti	ough Pit	Southeast Exte	utheast Exterior Conduit Pit		
SAMPLE ID SAMPLE DEPTH (ft.) DATE OF COLLECTION PERCENT SOLIDS	MHSBB-01 0-2 6/24/99 88	MHSBB-01 2-3 6/24/99 91	MHSBB-02 2-4 6/22/99 92	MHSBB-02 4-6 6/22/99 94	MHSBB-03 7-9 6/21/99 92	MHSBB-03 9-11 6/21/99 97	Instrument Detection Limits	Eastern USA Background Levels <sup>(1)</sup>
UNITS	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(ug/L)	(mg/kg)
Mercury	171	392	514	247	0.054 U	0.043 U	0.1	<u>0.001</u> - 0.2

### NOTES:

()) Background level for mercury provided in NYSDEC TAGM 4046 Appendix A.

### QUALIFIERS:

U: Constituent analyzed for but not detected.

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### TABLE D-1A (continued)

#### LONG ISLAND RAIL ROAD SUBSTATION INVESTIGATION SOIL BORING SAMPLING RESULTS - MANHASSET-N10 MERCURY

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LOCATION	West of Substation					
SAMPLE ID SAMPLE DEPTH (ft.) DATE OF COLLECTION	MHSBB-12 0-2 6/22/99	MHSBB-12 4-6 6/22/99			Instrument Detection Limits	Eastern USA Background Levels <sup>(1)</sup>
PERCENT SOLIDS UNITS	92 (mg/kg)	87 (mg/kg)			(ug/L)	(mg/kg)
Mercury	0.057 B	0.063 B			0.1	0.001 - 0.2

### NOTES:

<sup>(1)</sup> Background level for mercury provided in NYSDEC TAGM 4046 Appendix A.

### QUALIFIERS:

B: Constituent concentration is less than the CRDL, but greater than the IDL.

### TABLE D-1A (continued)

### LONG ISLAND RAIL ROAD SUBSTATION INVESTIGATION SOIL BORING SAMPLING RESULTS - MANHASSET-N10 MERCURY

LOCATION	South of West Rail Road Ties		End Rail Road es		Drainage Swale			
SAMPLE ID SAMPLE DEPTH (ft.)	MHSBB-06 4-6	MHSBB-07 2-4	MHSBB-07 4-6	MHSBB-08 0-2	MHSBB-08 4-6	MHSBB-09 0-2	Instrument Detection	Eastern USA Background
DATE OF COLLECTION PERCENT SOLIDS	6/22/99 93	6/22/99 94	6/22/99 91	6/22/99 94	6/22/99 89	6/21/99 60	Limits	Levels <sup>(1)</sup>
UNITS	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(ug/L)	(mg/kg)
Mercury	1.1	38.2	0.050 U	0.046 U	0.066 <b>B</b>	1.3	0.1	0.001 - 0.2

NOTES:

<sup>(1)</sup> Background level for mercury provided in NYSDEC TAGM 4046 Appendix A.

### QUALIFIERS:

U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

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#### TABLE D-1B

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#### LONG ISLAND RAIL ROAD SUBSTATION INVESTIGATION SURFACE SOIL SAMPLING RESULTS - MANHASSET-N10 MERCURY

LOCATION	Slop Sink Discharge Point		Drainag	je Swale	North of West- End Rail Road Ties			
SAMPLE ID SAMPLE DEPTH (in.) DATE OF COLLECTION PERCENT SOLIDS	MHSS-01 0-6 6/21/99 86	MHSS-02 0-6 6/21/99 85	MHSS-03 0-6 6/21/99 94	MHSS-04 0-6 6/21/99 85	<b>0-6 0-6</b> 6/21/99 6/21/9	MHSS-06 0-6 6/21/99 86	Instrument Detection Limits	Eastern USA Background Levels <sup>(1)</sup>
UNITS	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(ug/L)	(mg/kg)
Mercury	25.1	2.1	0.75	3.6	7.4	143	0.1	0.001 - 0.2

### NOTES:

<sup>(1)</sup> Background level for mercury provided in NYSDEC TAGM 4046 Appendix A.

#### TABLE D-7A

#### LONG ISLAND RAIL ROAD SUBSTATION INVESTIGATION SOIL BORING SAMPLING RESULTS - ISLAND PARK-L03 MERCURY

LOCATION	Sump Pump Pit		West C	orner	Utility Tre	nch	Exterior Wa	ter Meter	er Meter Pit			
SAMPLE ID SAMPLE DEPTH (ft.)	IPSB- 0-2		IPSB-01 2-4	IPSB- 0-2		IPSB- 4-6		IPSB-03 2.5-4.5	IPSB- 6.5-8		Instrument Detection	Eastern USA Background
DATE OF COLLECTION PERCENT SOLIDS	1 <b>0/4/</b> 9 80	99	10/4/99 78	10/4/	99	10/4/9 85	9	8/10/99 82	8/10/95	99	Limits	Levels <sup>(1)</sup>
UNITS	(mg/k	g)	(mg/kg)	(mg/k	g)	(mg/k	g)	(mg/kg)	(mg/k	(g)	(ug/L)	(mg/kg)
Mercury	0.10	В	0.24	0.056	U	0.074	в	0.44	0.047	U	0.1	0.001-0.2

### NOTES:

<sup>(1)</sup> Background level for mercury provided in NYSDEC TAGM 4046 Appendix A.

### QUALIFIERS:

U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

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#### LONG ISLAND RAIL ROAD SUBSTATION INVESTIGATION SOIL BORING SAMPLING RESULTS - ISLAND PARK-L03 MERCURY

LOCATION	South I	Dry Well		ry Well For ifiers	East of We	st Dry Well		
SAMPLE ID SAMPLE DEPTH (ft.)	IPSB-07 5-7	IPSB-07 9-11	IPSB-08 5-7	IPSB-08 9-11	IPSB-09 5-7	IPSB-09 9-11	Instrument Detection	Eastern USA Background
DATE OF COLLECTION PERCENT SOLIDS	10/5/99 82	10/5/99 68	10/5/99 83	10/5/99 36	10/5/99 80	10/5/99 51	Limits	Levels <sup>(1)</sup>
UNITS	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(ug/L)	(mg/kg)
Mercury	0.049 U	0.070 U	0.060 U	0.14 U	0.060 U	0.085 U	0.1	0.001 - 0.2

### NOTES:

(1) Background level for mercury provided in NYSDEC TAGM 4046 Appendix A.

### QUALIFIERS:

U: Constituent analyzed for but not detected.

### TABLE D-7B

#### LONG ISLAND RAIL ROAD SUBSTATION INVESTIGATION SURFACE SOIL SAMPLING RESULTS - ISLAND PARK-L03 MERCURY

LOCATION	South of Rear Concrete Platform	West of Rear Concrete Steps\Pad	North of Rear Concrete Steps\Pad	East of Rear Concrete Steps\Pad			
SAMPLE ID SAMPLE DEPTH (ft.)	IPSS-01 0-6	IPSS-02 0-6	IPSS-03 0-6	IPSS-04 0-6		Instrument Detection	Eastern USA Background
DATE OF COLLECTION PERCENT SOLIDS	8/10/99 88	8/10/99 84	8/10/99 87	8/10/99 85		Limits	Levels <sup>(1)</sup>
UNITS	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	· · · · · · · · · · · · · · · · · · ·	(ug/L)	(mg/kg)
Mercury	12.2	35.4	10.8	27		0.1	0.001-0.2

NOTES:

<sup>(1)</sup> Background level for mercury provided in NYSDEC TAGM 4046 Appendix A.

### TABLE D-12A

### LONG ISLAND RAIL ROAD SUBSTATION INVESTIGATION SOIL BORING SAMPLING RESULTS - MASSAPEQUA-S15 MERCURY

LOCATION	Interior Water Trough Pit	Rectifier Pit		sitive Breaker le Pit	Northwes	t Dry Weil		
SAMPLE ID SAMPLE DEPTH (ft.)	MSSB-01 0-2	MSSB-02 0-2	MSSB-03 5-7	MSSB-03 9-11	MSSB-04 6-8	MSSB-04 10-12	Instrument Detection	Eastern USA Background
DATE OF COLLECTION PERCENT SOLIDS	11/23/99 90	11/23/99 99	11/23/99 94	11/23/99 97	11/23/99 87	11/23/99 85	Limits	Levels <sup>(1)</sup>
UNITS	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(ug/L)	(mg/kg)
Mercury	4.4	10	1.8	0.072 B	42.3	0.20	0.1	0.001-0.2

#### NOTES:

<sup>(1)</sup> Background level for mercury provided in NYSDEC TAGM 4046 Appendix A.

### QUALIFIERS:

B: Constituent concentration is less than the CRDL, but greater than the IDL.

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### TABLE D-12A (continued)

#### LONG ISLAND RAIL ROAD SUBSTATION INVESTIGATION SOIL BORING SAMPLING RESULTS - MASSAPEQUA-S15 MERCURY

LOCATION		East-Side s Entrance			
SAMPLE ID SAMPLE DEPTH (ft.)	MSSB-08 0-2	MSSB-08 4-6	MSFB-01	Instrument Detection	Eastern USA Background
DATE OF COLLECTION PERCENT SOLIDS	11/23/99 96	11/23/99 91	11/23/99 	Limits	Levels <sup>(1)</sup>
UNITS	(mg/kg)	(mg/kg)	_(ug/L)	 (ug/L)	(mg/kg)
Mercury	11.3	0.072 B	0.17 U	0.1	0.001-0.2

### NOTES:

<sup>(1)</sup> Background level for mercury provided in NYSDEC TAGM 4046 Appendix A. ----: Not applicable.

#### **QUALIFIERS:**

U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

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### TABLE D-12B

#### LONG ISLAND RAIL ROAD SUBSTATION INVESTIGATION SURFACE SOIL SAMPLING RESULTS - MASSAPEQUA-S15 MERCURY

LOCATION	Northeast of Exterior Water Service Pit	Far East of Southeast Substation Corner	East-Side Wood Plank	East of Southeast Chain Link Double Swing Doors	South off Southeast Exterior Substation Corner	Northwest Exterior Corner of Substation		
SAMPLE ID SAMPLE DEPTH (in.)	MSSS-01 0-6	MSSS-02 0-6	MSSS-03 0-6	MSSS-04 0-6	MSSS-05 0-6	MSSS-06 0-6	Instrument Detection	Eastern USA Background
DATE OF COLLECTION PERCENT SOLIDS UNITS	11/23/99 92 (mg/kg)	11/23/99 93 (mg/kg)	11/23/99 93 (mg/kg)	11/23/99 93 (mg/kg)	11/23/99 90 (mg/kg)	11/23/99 92 (mg/kg)	Limits (ug/L)	Levels <sup>(1)</sup> (mg/kg)
Mercury	25.3	8	0.86	1.1	169	13.5	0.1	0.001 - 0.2

### NOTES:

<sup>(1)</sup> Background level for mercury provided in NYSDEC TAGM 4046 Appendix A.

### TABLE D-12C

### LONG ISLAND RAIL ROAD SUBSTATION INVESTIGATION CONCRETE CORE SAMPLING RESULTS - MASSAPEQUA-S15 MERCURY

LOCATION	Interior Water Trough Pit	Rectifier Pit	Interior Water Pipe Trench		
SAMPLE ID DATE OF COLLECTION PERCENT SOLIDS UNITS	MSCC-01 11/23/99 94 (mg/kg)	MSCC-02 11/23/99 97 (mg/kg)	MSCC-03 11/23/99 93 (mg/kg)	MSFB-02 11/23/99  (ug/L)	Instrument Detection Limits (ug/L)
Mercury	68	682	12.5	0.16 U	0.1

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### NOTES:

----: Not applicable.

### **QUALIFIERS:**

U: Constituent analyzed for but not detected.

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Appendix B

# **APPENDIX B**

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## **BORING LOGS**

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	]		virka		Project No	.: 2015 me: Long Island RailRoad	Boring No.: MHSB-06A Sheet <u>1</u> of <u>1</u> .	
C	Ć	) an Ba	rtiluco	;i	riojectiva	Manhasset Substation Virginia Drive	By: Albert Albano	
Drilling	Contu		ULTING ENG	NEERS	Geologist:	Albert Albano	Boring Completion Depth: 1	0'
Driller:					-	thod: Direct Push	Ground Surface Elevation:	
Drill Rig					-	mer Weight: NA	Boring Diameter: 1"	
Date Sta	rted:	01/15/	03		Date Comp	leted: 01/15/03	Samples were collected in 2' in	tervals.
[		Soil Sa	ample	Mercury	Photo-			
				Vapor	ionization	0		
Depth (ft.)	No	Туре	Rec. (inches)	(mg/m <sup>3</sup> )	Detector (ppm)	Sample	Description	USCS
6' - 8'	1	GP	24	.000	0.0	Tan very fine silty sand, mo	pist to wet (not saturated)	
8' - 10'	2	GP	24	.006	0.0	Tan fine to medium sand w	vith some orange (oxidation),	
SS = Spli HA = Har GP = Geo	Sample Types:NOTES:SS = Split SpoonBoth sampled intervals collected for analysis of mercury.HA = Hand AugerGP = Geoprobe SamplerCC = Concrete CoreCC = Concrete Core							

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						me: Long Island RailRoad Manhasset Substation Virginia Drive	Boring No.: MHSB-13 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Driller: J			LAVVES		-	Albert Albano thod: Direct Push	Boring Completion Depth: 1 Ground Surface Elevation: -	
Drill Rig:					-	mer Weight: NA	Boring Diameter: 1"	-
Date Sta		-	03			bleted: 01/15/03	Samples were collected in 2' in	tervals.
		Soil Sa		Mercury				
				Vapor	ionization			
Depth		_	Rec.		Detector	Sample	Description	USCS
(ft.)	No.		(inches)	(mg/m <sup>3</sup> )	(ppm)	<b>T B 11 11</b>		
0' - 2'	1	GP	24	.01 <b>0</b>	0.0	l an/brown medium silty sa 1' bgs.	and with some black staining at	
2' - 4'	2	GP	24	.017	0.0	Gray/tan very fine silty san	d, moist	
4' - 6'	3	GP	24	.000	0.0	Tan very fine silty sand		
6' - 8'	4	GP	24	.000	0.0	Tan very fine silty sand, we condition)	et (perched water table	
8' - 10'	5	GP	24	.000	0.0	Tan medium sand, less sill	t, loos <b>e, m</b> oist	
SS = Split HA = Han GP = Geo	Sample Types: SS = Split Spoon HA = Hand Auger GP = Geoprobe Sampler CC = Concrete Core						s collected for analysis of merce -2" section collected from the 0-	

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d		an	virka d Irtilucc	NEERS	Project No.: 2015 Project Name: Long Island RailRoa Manhasset Substatio Virginia Drive		By: Albert Albano	
<b>3</b> .					Drilling Me Drive Ham	Albert Albano thod: Direct Push mer Weight: NA	Boring Completion Depth: 10 Ground Surface Elevation: Boring Diameter: 1" Samples were collected in 2' in	
Date Sta Depth		Soil Sa		Mercury Vapor	Photo- ionization Detector	leted: 01/15/03 Sample	Description	USCS
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)			
0' - 2'	1	GP	24	.000	0.0	Brown medium sand with a rocky	a 3" layer of black-stained sand,	
2' - 4'	2	GP	24	.004	0.0	Brown/tan medium sand b	ecoming more silty with depth	
4' - 6'	3	GP	18	.000	0.0	Tan medium silty sand, mo	pist to wet	
6' - 8'	4	GP	18	.000	0.0	Same, but less moist		
8' - 10'	5	GP	24	.000	0.0	Same, wet from 8-9'		
				-				
Sample						NOTES:		
S <b>S =</b> Spli HA = Har GP = Geo	Sample Types: SS = Split Spoon HA = Hand Auger GP = Geoprobe Sampler CC = Concrete Core					All sample intervals	were analyzed for mercury. In sample was collected and analyzed	zed for

Drilling C Driller: J Drill Rig:	.w.	an Ba cons actor: Palmer	I <b>rtiluco</b> Sulting Engi LAWES	NEERS	Geologist: Drilling Me	: 2015 me: Long Island RailRoad Manhasset Substation Virginia Drive Albert Albano thod: Direct Push mer Weight: NA	Boring No.: MHSB-15 Sheet <u>1</u> of <u>1</u> . By: Albert Albano Boring Completion Depth: 8' Ground Surface Elevation: — Boring Diameter: 1"	
Date Sta					· · · · · · · · · · · · · · · · · · ·	leted: 01/15/03	Samples were collected in 2' in	tervals.
Death		Soil Sa	ample Rec.	Mercury Vapor	Photo- ionization Detector			
Depth (ft.)	No.	Туре	(inches)	(mg/m³)	(ppm)	Sample	Description	USCS
0' - 2'	1	GP	24	.000	0.0	0-6" – Black/brown coarse diameter) 6"-2' – Brown medium san	•	
2'-4'	2	GP	24	.000	0.0	2-3' – Reddish brown medi pebbles 3-4' – Tan/white very fine s		
4' - 6'	3	GP	24	.000	0.0	Light tan very fine sand, m	edium stiffness	
6' - 8'	4	GP	24	.000	0.0	Same, but moist		
Sample T SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	on ger e Samj	ble <b>r</b>				were analyzed for mercury. In sample was collected and analy	zed for

and Bartilucci CONSULTING ENGINEERS								
	Drilling Contractor: LAWES					Albert Albano	Boring Completion Depth: 8	
Driller: J	.W. F	Palmer			-	thod: Direct Push	Ground Surface Elevation:	-
Drill Rig:	Geo	probe			)	mer Weight: NA	Boring Diameter: 1"	
Date Sta	rted:	01/15/	03			leted: 01/15/03	Samples were collected in 2' in	tervals.
		Soil Sa	ample	Mercury Vapor	Photo- ionization			
Depth			Rec.		Detector	Sample	Description	USCS
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )				
0' - 2'	1	GP	24	.000	0.0	Brown/gray fine to coarse	sand with quartz pebbles	
2' - 4'	2	GP	24	.000	0.0	2-2.5' – Black stained med 2.5-4' – Tan fine to mediur pebbles		
4' - 6'	3	GP	24	.000	0.0	Tan fine to medium slity sa	and rather stiff from 5-6' bgs	
6' - 8'	4	GP	24	.000	0.0	6-7' Reddish brown med 7-8' Tan/white fine sand,		
Sample Types: SS = Split Spoon HA = Hand Auger GP = Geoprobe Sampler CC = Concrete Core							were analyzed for mercury. In sample was collected and analy	zed for

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d		) an Ba	ITTILUCC	i Neers		me: Long Island RailRoad Manhasset Substation Virginia Drive	Boring No.: MHSB-17 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling ( Driller: (					-	Albert Albano thod: Direct Push	Boring Completion Depth: 8 Ground Surface Elevation: -	
Drill Rig:		-			-	mer Weight: NA	Boring Diameter: 1"	
Date Sta	rted:	01/17/	03			oleted: 01/17/03	Samples were collected in 2' in	tervals.
		Soil Sa	ample	Mercury				
Depth			Rec.	Vapor	ionization Detector	Sampla	Description	uscs
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )		Jampie	Description	0303
0' - 2'	1	GP	24	.006	0.0	0-1' - Brown/black medium	n sand, loose	
						1-2' - Brown/black medium	n sand, a little stiff	
2' - 4'	2	GP	24	.005	<b>0</b> .0	Tan fine to medium sand, r	noist, a little stiff	
4' - 6'	3	GP	24	.006	0.0	Tan fine to medium sand, s	stiff, moist	
1								
6' - 8'	4	GP	24	.005	0.0	Same (slightly lighter color	ed tan)	r I
			1					
{		{						
Sample T					L	NOTES:		L
SS = Split							were analyzed for mercury. In	
HA = Han GP = Geo			ler			addition, a surface s mercury from 0"-2".	ample was collected and analy	zea ior
CC = Con								

d		an	irka d rtilucc	i NEERS	Project No.: 2015 Project Name: Long Island RailRoad Manhasset Substation Virginia Drive		Boring No.: MHSB-18 Sheet _1_ of _1 By: Albert Albano	
Drilling Contractor: LAWES Driller: Carl Pederson Drill Rig: Geoprobe					Drilling Me Drive Hami	Albert Albano thod: Direct Push mer Weight: NA	Boring Completion Depth: 8' Ground Surface Elevation: Boring Diameter: 1"	-
Date Sta	_	Soil Sa		Mercury Vapor				
Depth (ft.)	No.	the second s	Rec. (inches)	(mg/m³)	Detector (ppm)	·	Description	USCS
0' - 2'	1	GP	24	.004	0.0	0-2" – Black "topsoil" 2"-2' – Brown medium san gravel, sand getting finer a	d with sporadic quartz pea nd stiffer with depth	
2' - 4'	2	GP	24	.009	0.0	Brown fine sand, medium	stiffness and packed	
4' - 6'	3	GP	18	.007	0.0	Tan/brown fine to medium moist to wet	sand with some pea gravel,	
6' - 8'	4	GP	18	.007	0.0	Same, with a slight orange	coloring	
<b>Sample</b> <b>SS</b> = Spli <b>HA</b> = Har <b>GP</b> = Ger <b>CC</b> = Cor	it Spo nd Au oprot	ion Iger De Sam	pler				s were analyzed for mercury. In sample was collected and analy .	zed for

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Drilling C Driller:		) an Ba	TTILLCC	NEERS	Geologist:	: 2015 me: Long Island RailRoad Manhasset Substation Virginia Drive Albert Albano thod: Direct Push	Boring No.: MHSB-19 Sheet <u>1</u> of <u>1</u> . By: Albert Albano Boring Completion Depth: 8' Ground Surface Elevation:	
Drill Rig: Date Sta		-	03			mer Weight: NA Jeted: 01/17/03	Boring Diameter: 1" Samples were collected in 2' in	tervals.
Depth		Soil Sa		Mercury Vapor	Photo- ionization Detector	Photo- onization		
(ft.)	No.	Туре		(mg/m <sup>3</sup> )	(ppm)			USCS
0' - 2'	1	GP	24	.009	0.0	0-6" – Brown/black "topsoil 6"-2' – Brown medium sand bgs	d getting fine and moist at 2'	
2' - 4'	2	GP	24	.006	0. <b>0</b>	Tan fine sand, moist		
4' - 6'	3	GP	24	.006	0.0	Same		
6' - 8'	4	GP	24	.006	0.0	Same, but getting stiffer an	nd more packed with depth	
Sample 1						NOTES:	·	
<b>SS =</b> Split <b>HA =</b> Han <b>GP =</b> Geo <b>CC =</b> Con	i Spo Id Aug prob	on ger e Samp	bler				were analyzed for mercury. In sample was collected and analyzed	zed for

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d			ITTILLCO		Project No.: 2015 Project Name: Long Island RailRoad Manhasset Substation Virginia Drive		Boring No.: MHSB-21 Sheet <u>1</u> of <u>1</u> . By: Albert Albano		
Driller: J.W. Palmer Drill Rig: Geoprobe					Drilling Me Drive Hami	Albert Albano thod: Direct Push mer Weight: NA	Boring Completion Depth: 12 Ground Surface Elevation: Boring Diameter: 1"	Elevation: : 1"	
Date Sta	_	01/15/ Soil Sa	ample	Mercury Vapor	Photo- ionization	nization			
Depth (ft.)	No.	Туре	Rec. (inches)	(mg/m <sup>3</sup> )	Detector (ppm)	Sample	Description	USCS	
0' - 2'	1	GP	24	.473	1.2	Black stained medium san gravel	d, small to medium sized pea		
2' - 4'	2	GP	24	.131	1.0	Tan/Brown fine to medium	silty sand		
4' - 6'	3	GP	18	.003	0.2	Tan fine to medium silty sa	and		
6' - 8'	4	GP	18	.000	0.2	Tan fine to medium silty sa	and, some "clayey" rock		
8' - 10'	5	GP	18	.000	0.0	Tan medium silty sand			
10' - 12'	6	GP	18	.000	0.0	Same			
Sample 1 SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprot	iger iger be Sam	pler			substation (since th was a 6" gap betwee Samples were colle below the top of soi	ated at 1.5' below the floor of the te pit was about 1 foot deep, and een the top of the drain and actua ected from 2-4', 4-6', 6-8', and 10 il (1.5' below substation floor) for istituents (VOCs, SVOCs, RCRA	there al soil). -12'	

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d		) an Ba	TTILLCC	i NEERS	Project No.: 2015 Project Name: Long Island RailRoad Manhasset Substation Virginia Drive		Boring No.: MHSB-22 Sheet <u>1</u> of <u>2</u> . By: Albert Albano			
Drilling ( Driller: J Drill Rig:	J.W. Geo	Palmer oprobē			Geologist: Albert Albano Drilling Method: Direct Push Drive Hammer Weight: NA		Boring Completion Depth: 3 Ground Surface Elevation: - Boring Diameter: 1"	-		
Date Sta Depth	_	01/14/ Soil Sa		Mercury Vapor	Photo- ionization Detector	leted: 01/14/03	Samples were collected in 2' ir Description	USCS		
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)	Oumpic	Description			
6'-8'	1		24		0.0	Tan medium silty sand, so	me quartz rock	1		
8' 10'						Same				
10' 12'	3	GP	24	.400	0.0	Brown and black rocky me diameter)	dium sand (rocks 1" in			
12'-14' 14'-16'	4 5	GP GP	24 18	.450 .300	0.0 0.0	Tan medium silty sand Tan medium silty packed s	sand			
16'-18'	6	GP	18	.358	0.0	Tan medium loose granula	ar sand			
18'-20'	7	GP	12	.700	0.0	Brown and tan medium sa	nd, some quartz rock, moist			
20'-22'	8	GP	18	.700	0.0	Same				
22'-24'	9	GP	18	.532	0.0	Tan medium loose sand o	range (oxidation) sections			
24'-26'	10	GP	24	.500	0.0	Same				
SS = Spli HA = Har GP = Geo	Sample Types:     NOTES:       SS = Split Spoon     Notes summarized at the bottom of the following page.       HA = Hand Auger     SP = Geoprobe Sampler       CC = Concrete Core     SP = Geoprobe Sampler									

d	DVirka and Bartilucci consulting Engineers rilling Contractor: LAWES					.: 2015 me: Long Island RailRoad Manhasset Substation Virginia Drive	Boring No.: MHSB-22 Sheet <u>2</u> of <u>2</u> . By: Albert Albano	
Drilling ( Driller:		actor:			Geologist: Albert Albano Drilling Method: Direct Push		Boring Completion Depth: 3 Ground Surface Elevation: -	
Drill Rig		•				mer Weight: NA	Boring Diameter: 1"	
Date Sta	_	-				oleted: 01/14/03	Samples were collected in 2' in	tervals.
	Soil Sample Mercury Vapor		ionization					
Depth	No	Turne	Rec.	(m m/m <sup>3</sup> )	Detector	Sample	Description	USCS
(ft.) 26'-28'	No. 11	<b>Type</b> GP	(inches) 0	(mg/m <sup>3</sup> ) N/A	(ppm) N/A	No recovery		
28' - 30'	12	GP	0	N/A	N/A		roke, could not sample deeper.	
Sample T SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Aug oprob	on ger e Samj	pler	<u> </u>		where breathing zou .011. Respirators w In addition, levels of higher when soil wa exposed to ambient Sampling was initial substation. The pit was a 2' void from t soil. Samples collected t	ted at 3' below the floor of the was approximately 1' deep, and he top of the pits drain to the un from 8-10', 18-20', and 24-26' fo stituents (VOCs, SVOCs, RCR4	ted at f time. h eing I there derlying r

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Drilling (	Contr				Geologist:	Albert Albano	Boring Completion Depth: 8	
Driller: E	Brian					Drilling Method: Direct Push Ground Surface Elevation:		
Drill Rig:		-				mer Weight: NA	Boring Diameter: 1"	
Date Sta						leted: 01/17/03	l	<del></del>
	Vapor			Mercury Vapor	Photo- ionization			
Depth (ft.)	No.	Туре	Rec. (feet)	(mg/m <sup>3</sup> )	Detector (ppm)	Sample	Description	USCS
0' - 4'	1 GP 4 0.0			.003	Reddish brown coarse to v	ery coarse loose sand		
4' - 8'	1       GP       4       0.0       .003       Reddish brown coarse to very coarse loose sand         2       GP       4       0.0       .003       Tan fine silty sand, moist							
Sample 1 SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	ion ger ie Samj	oler			2 composite soil sa	NOTES: Probe added to program at LIRR request. 2 composite soil samples collected for analysis of mercury 1 composite from 0-4', and another from 4-8' bgs.	

d		an	rirka d Irtilucc	NEERS	Project No. Project Na	me: Long Island RailRoad	Boring No.: MHSB-24 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling ( Driller: L Drill Rig:	₋uke <sup>:</sup> : Geo	Tibbets probe	i		Drilling <b>Me</b> Drive Ham	Albert Albano thod: Direct Push mer Weight: NA	Boring Completion Depth: 8 Ground Surface Elevation: - Boring Diameter: 1"	
Date Sta		08/12/ Soil Sa		Mercury	Date Comp Photo-	bleted: 08/12/04	Samples were collected in 2' in	tervals.
	Vapor				ionization			
Depth		<b>T</b>	Rec.	(	Detector	Sample	Description	USCS
(ft.) 0'-2'		Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)	0' 1' Prown oilty toppoil		
	1	GP	12	.000		0'-1' – Brown silty topsoil. 1'-2' – Reddish tan fine to r		-
2' - 4' 4' - 6'	2' - 4' 2 GP 12 .000 4' - 6' 3 GP 24 .000					Light tan medium silty sand Same as above.	d, moist.	
	3							
6'-8'	4	GP	24	.000		Same as above.		
Sample SS = Spli HA = Har GP = Geo CC = Cor	it Spo nd Au oprob	ion Iger ie Sam	pler			for mercury. : Instrument not	from 0'-2', 2'-4' and 4'-6' were ar used to screen sample. Supplei on delineation of mercury-impact	mental

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d		) an Ba	TTILLCC	NEERS		me: Long Island RailRoad Manhasset Substation Virginia Drive	Boring No.: MHSB-25 Sheet <u>1</u> of <u>1</u> . By: Albert Albano		
Drilling (					-	Albert Albano	Boring Completion Depth: 8		
Driller: L					-	thod: Direct Push	Ground Surface Elevation:	~~	
Drill Rig:		-				mer Weight: NA	Boring Diameter: 1"		
Date Sta						leted: 08/12/04	Samples were collected in 2' in	tervals.	
		Soil Sa	ample	Mercury	Photo-				
				Vapor	ionization	Comula	Description	uscs	
Depth	No. Type (inches) (mg/m <sup>3</sup>				Detector	Sample	Description	0363	
(ft.) 0'-2'	1 GP 18 N/A				(ppm)	Light brown modium cither	and		
0-2 2'-4'	2	GP	18	N/A		Light brown medium silty sand. Reddish brown/ fine silty sand, very light rock.			
4' – 6'	3	GP	24	N/A		Light tan medium silty sand	Light tan medium silty sand.		
6' - 8'	5' - 8' 4 GP 24 N/A					Light tan medium silty sand	d, moist.		
Sample 1 SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	on ger e Sam	bler			NOTES: Samples collected from 0'-2', 2'-4' and 4'-6' were analyzed for mercury. N/A: Not available. Mercury Vapor Analyzer not working properly. : Instrument not used to screen sample. Supplemental sampling focused on delineation of mercury-impacted soil.		rking nental	

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Drilling ( Driller: 1 Drill Rig: Date Sta	uke Geo	Tibbets pprobe			Geologist: Albert Albano Drilling Method: Direct Push Drive Hammer Weight: NA Date Completed: 08/13/04		Boring Completion Depth: 8' Ground Surface Elevation: Boring Diameter: 1" Samples were collected in 2' interval	
Depth		Soil Sa	Rec.	Mercury Vapor	Photo- ionization Detector		Description	USCS
(ft.) 0'-2'	<u>No.</u> 1	<b>Type</b> GP	(inches) 24	(mg/m³) .000	(ppm)	Brown medium silty sand r topsoil, medium to heavy r		
2' – 4'	2	GP	24	.000	-	Tan fine silty sand, light roo	ck.	
4' - 6'	3	GP	24	.000		Tan silty fine sand, moist.		
6' - 8'	4	GP	24	.000		Same as above.		
Sample SS = Spl HA = Har GP = Ger CC = Cor	t Spo nd Au oprob	ion iger ie Samj	pler	<u> </u>		analyzed for mercur : Instrument not	from 0'-2', 2'-4', 4'-6', and 6'-8' w ry. used to screen sample. Suppler in delineation of mercury-impacte	nental

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<b>D</b> rilling			ITTILLCC	NEERS	Geologist:	me: Long Island Rail Road Manhasset Substation Virginia Drive Albert Albano	Boring No.: MHSB-27 Sheet <u>1</u> of <u>1</u> . By: Albert Albano Boring Completion Depth: 8'	
Driller: 1	Luke	Tibbets	,		Drilling Me	thod: Direct Push	Ground Surface Elevation:	
Drill Rig:	: Geo	probe			Drive Ham	mer Weight: NA	Boring Diameter: 1"	
Date Sta	rted:	08/13/	04		Date Comp	oleted: 08/13/04	Samples were collected in 2' in	tervals.
		Soil Sa	ample	Mercury Vapor	ionization			
Depth	{		Rec.		Detector	Sample	Description	USCS
(ft.)	No.		(inches)	(mg/m <sup>3</sup> )	(ppm)		· · · · · · · · · · · · · · · · · · ·	
0'-2' 2'-4'	1 2	GP GP	18 18	.000 .000		Tan medium silty sand. Tan medium silty sand, mo	pist.	
4'-6'	3	GP	12	.000		Tan medium silty sand, wet.		
6' <b>-8</b> '	4	GP	12	.000		Same as above.		
Sample SS = Spli HA = Har	it Spo	on				analyzed for mercur		
GP = Geoprobe Sampler CC = Concrete Core : Instrument not used to screen sample. Suppler sampling focused on delineation of mercury-impacted								

d		an	rtiluco	NEERS	Project No. Project Na	.: 2015 me: Long Island RailRoad Manhasset Substation Virginia Drive	Boring No.: MHSB-28 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling (	Contr	actor:	Zebra		Geologist:	Albert Albano	Boring Completion Depth: 8'	
Driller: l	_uke <sup>·</sup>	Tibbets			-	thod: Direct Push	Ground Surface Elevation: -	
Drill Rig:						mer Weight: NA	Boring Diameter: 1"	
Date Sta						oleted: 08/13/04	Samples were collected in 2' in	tervals.
		Soil Sa	ample	Mercury				
Depth			Rec.	Vapor	ionization Detector	Samplo	Description	uscs
(ft.)	No. Type (inches) (mg/m <sup>3</sup>					Sample	Description	0303
0'-2'	1	GP	18	.024		0'-1.5' Dark brown mediu	im silty sand, medium rock	
						1.5'-2' - White crushed sh	ell-like material.	
2'-4'	2	GP	18	.016		Reddish tan fine to mediun	n sand.	
4' – 6'	3	GP	18	.018		Same as above.		
6' - 8' Sample			18	.000		Light tan fine clayey sand,		
SS = Spli HA = Hai GP = Geo CC = Cor	nd Au oprob	ger e Sam	pler			Samples collected from 0'-2', 2'-4', 4'-6' and 6'-8' were analyzed for mercury. : Instrument not used to screen sample. Supplemental sampling focused on delineation of mercury-impacted soil.		mental

d		an	rtiluco	NEERS		me: Long Island RailRoad Manhasset Substation Virginia Drive	Boring No.: MHSB-29 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling Driller:   Drill Rig Date Sta	Luke : Not	Tibbets Applica	able		Drilling Method:Hand AugerGiDrive Hammer Weight:NABo		Boring Completion Depth: 6' Ground Surface Elevation: Boring Diameter: 1" Samples were collected in 2' interva	
Depth	Vapor		Mercury Vapor	Photo- ionization Detector	Sample	Description	USCS	
(ft.)	ft.) No. Type (inches) (mg/m			(mg/m <sup>3</sup> )	(ppm)	·		
0'-2' 2' - 4'	1 2	HA HA	24 24	.039 .000		Brown/black stained mediu Tan/light brown medium sa		
4' - 6'	3	HA	24	.000		Same as above.		
			-					
Sample SS = Spl HA = Ha GP = Ge CC = Co	it Spo nd Au oprob	on Iger De Samj	bler			for mercury. : Instrument not ι	rom 0'-2', 2'-4', and 4'-6' were an used to screen sample. Supplen n delineation of mercury-impacte	nental

Drilling			ITTILUCO	i Neers		: 2015 me: Long Island RailRoad Manhasset Substation Virginia Drive Albert Albano	Boring No.: MHSB-30 Sheet <u>1</u> of <u>1</u> . By: Albert Albano Boring Completion Depth: 8	
Driller: L	.uke <sup>-</sup>	Tibbets			Drilling Me	thod: Direct Push	Ground Surface Elevation: -	
Drill Rig:		-				me <b>r Wei</b> ght: NA	Boring Diameter: 1"	
Date Sta	_					leted: 08/13/04	Samples were collected in 2' in	tervals.
		Soil Sa	mple	Mercury	Photo-			
Depth	Rec.				ionization Detector	Sampla	Description	uscs
(ft.)				(mg/m <sup>3</sup> )	(ppm)	Sample	Description	0303
0'-2'					<u>(ppin)</u>	Brown medium sitly sand,	coal fragments	
2'-4'						Tan/brown fine to medium		
4' - 6'	4'-6' 3 GP 12 .000					Light tan silty, clayey sand.		
6' - 8'	4	GP	12	.075		Same as above.		
Sample T SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	on ger e Sam	pler			analyzed for mercur : Instrument not u	from 0'-2', 2'-4', 4'-6' and 6'-8' w ry. used to screen sample. Supple n delineation of mercu <b>ry</b> -impact	mental

	d		) an Ba	TTILLCO	NEERS		me: Long Island Rail Road Manhasset Substation Virginia Drive	Boring No.: MHSB-31 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
D	riller: t	_uke <sup>·</sup>	actor: 2 Tibbets			Drilling Me	Albert Albano thod: Direct Push	Boring Completion Depth: 8 Ground Surface Elevation:	
			oprobe 08/13/				mer Weight: NA bleted: 08/13/04	Boring Diameter: 1" Samples were collected in 2' in	tervals.
			Soil Sa		Mercury	Photo- ionization		·	
	Depth					Detector	Sample	Description	uscs
	(ft.)					1			
	0'-2' 1 GP 12 .009						Brown medium silty sand n topsoil.		
2	2' – 4'	2	GP	12	.000		Reddish brown fine to med	lium sand.	
4	4'-6' 3 GP 12 .000						Reddish tan fine sand.		
E	6' 8' 4 GP 12 .000				.000		Tan fine sand.		
SS H/ GI	ample <sup>-</sup> 5 = Spli A = Har P = Ger C = Cor	it Spo nd Au oprob	on Iger Ie Sam	pler	1	1	analyzed for mercur	rom 0'-2', 2'-4', 4'-6', and 6'-8' w y. used to screen sample. Suppler n delineation of mercury-impacte	nental

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Drilling C					-	Albert Albano	Boring Completion Depth: 8	
Driller: L			-			thod: Direct Push	Ground Surface Elevation: -	
Drill Rig:		-				mer Weight: NA	Boring Diameter: 1"	
Date Star	_	08/13/ Soil Sa		Mercury	Photo-	leted: 08/13/04	Samples were collected in 2' in	tervals.
{		3011 36	unhie	Vapor	ionization			
Depth			Rec.		Detector	Sample	Description	USCS
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)	·	· · · · · · · · · · · · · · · · · · ·	
0'-2'						Black stained medium san fragments.	d, heavy rock, asphalt	
2'4'	2	GP	12	.000		Same as above.		
4'6'	3	GP	12	.000		Light brown/Reddish mediu	um sand.	
6'8'	4	GP	12	.000		Tan medium sand, moist.		
Sample						NOTES		
Sample T SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	on ger e Samj	pler			analyzed for mercur	rom 0'-2', 2'-4', 4'-6', and 6'-8' w y. used to screen sample. Suppler n delineation of mercury-impact	nental

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d		an	rirka d Irtilucc	NEERS	Project No Project Na	ame: Long Island Rail Road       Sheet 1 of 1 .         Manhasset Substation       By: Albert Albano         Virginia Drive			
Drilling ( Driller: L Drill Rig:	uke .	Tibbets			Drilling Me	Albert Albano thod: Direct Push mer Weight: NA	Boring Completion Depth: 8 Ground Surface Elevation: - Boring Diameter: 1"		
Date Sta		-				oleted: 08/13/04	Samples were collected in 2' in	tervals.	
		Soil Sa	ample	Mercury					
Depth			Rec.	Vapor	ionization Detector	Sample	Description	USCS	
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)		Description		
0'-2'	1	GP	12	.000		Tan/brown medium silty sa	and, some black staining.		
2'-4'	2	GP	12	.000		Same as above.			
4'6'	3	GP	24	.000		Brown fine silty sand.			
6'8'	4	GP	24	.000		Light tan silty sand.			
Sample T SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	oon Iger De Samj	pier	<u> </u>	I	analyzed for mercur : Instrument not u	from 0'-2', 2'-4', 4'-6', and 6'-8' w ry. used to screen sample. Suppler n delineation of mercury-impact	nental	

Drilling C Driller: L Drill Rig: Date Sta	uke Geo rted:	and Ba cons actor: Tibbets probe 08/13/	rtiluco ULTING ENGI Zebra		Project No.:2015Boring No.:MHSB-34Project Name: Long Island Rail Road Manhasset Substation Virginia DriveSheet 1 of 1 By: Albert AlbanoGeologist: Albert AlbanoBoring Completion Depth: 8°Drilling Method: Direct Push Drive Hammer Weight: NABoring Diameter: 1" Samples were collected in 2' in			
Depth	No.	Soil Sa	Rec.	Mercury Vapor (mg/m <sup>3</sup> )	Photo- ionization Detector	Sample	Description	USCS
(ft.)	_	Type	(inches)		(ppm)	Tan/aroun modium eilhuas	and some black staining	
0'-2' 2'4'	1 2	GP GP	12 12	.012		Tan/brown medium silty sa Black medium sand, mediu		
4'6'	3	GP	12	.000		Tan fine silty sand.		; ,
6'-8'	4	GP	12	.000		Light tan moist silty sand.		
Sample SS = Spli HA = Har GP = Ger CC = Cor	it Spo nd Au oprob	on ger e Sam	bler			analyzed for mercur	from 0'-2', 2'-4', 4'-6', and 6'-8' w ry. used to screen sample. Suppler in delineation of mercury-impacte	nental

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		) an Ba	ITTILLCO	NEERS		2015       Boring No.: MHSB-35         ne: Long Island Rail Road       Sheet 1 of 1         Manhasset Substation       By: Albert Albano         Virginia Drive       Boring Completion Depth: 8'		
Driller:					-	thod: Direct Push	Ground Surface Elevation:	
					-	mer Weight: NA	Boring Diameter: 1"	~
Drill Rig: Date Sta						bleted: 08/13/04	Samples were collected in 2' in	torvale
Date Sta	-	Soil Sa		Mercury			Samples were collected in 2 in	
		5011 52	ampie	Vapor	ionization			
Depth			Rec.	Tupor	Detector	Sample	Description	uscs
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)		· · · · · · · · · · · · · · · · · · ·	
0'-2'	1	GP	12	.000		0'-1' Brown medium sand		
						1'-2' – Light tan fine silty sa		
2'–4'	2	GP	12	.000		Same as above.		
4'6'	3	GP	24	.000		Same as above.		
6'-8'	4	GP	24	.000		Same as above.		
Sample <sup>-</sup> SS = Spl HA = Hai GP = Ge CC = Co	it Spo nd Au oprot	ion Iger De Sam	pler			analyzed for mercur : Instrument not u	rom 0'-2', 2'-4', 4'-6', and 6'-8' w ry. used to screen sample. Suppler n delineation of mercury-impacte	nental

d		an	rirka d Intilucc	CI NEERS	-	roject No.:       2015       Boring No.:       MHSBX-01         roject Name:       Long Island RailRoad       Sheet 1 of 1       Sheet 1 of 1         Manhasset       Substation       By:       Albert       Albert         Virginia       Drive       Drive       Drive			
Drilling C	Contr	actor:	LAWES		Geologist:	eologist: Albert Albano Boring Completion Depth: 20'			
Driller: E	Brian	-			<b>Drilling Me</b>	thod: Direct Push	Ground Surface Elevation: -		
Drill Rig:	Geo	probe			Drive Ham	mmer Weight: NA Boring Diameter: 1"			
Date Sta	rted:	01/13/	03		Date Comp	eted: 01/13/03 Samples were collected in 2' intervals			
		Soil Sa		Mercury Vapor	Photo- Ionization				
Depth		-	Rec.	3	Detector	Sample	Description	USCS	
(ft.)	_	Туре		$(mg/m^3)$	(ppm)				
4' - 6'	1	GP	24	.000	0.0	Brown/Lan tine to medium rocks, loose Some red (oxidation) stain	a sand, sporadic "golf ball-sized" ing		
6' - 8'	2	GP	0	N/A	N/A	No Recovery			
8' - 10'	3	GP	24	.000	0.0		<b>dium sand</b> with red (oxidation) k clay with angular rocks, slight tan very fine sand, moist		
10' - 12'	4	GP	0	N/A	N/A	No Recovery			
12' - 14'	5	GP	24	.000	0.0	12-12.5 - Tan very fine sa wet 12.5-14 – Reddish brown	nd, slight petroleum oil odor, medium loose sand		
14' - 16'	6	GP	24	.000	0.0	Tan medium loose sand			
16' - 18'	7	GP	24	.000	0.0	Brown medium sand, som 16.5 and 17'.	e brown angular rocks between		
18' - 20' 8 GP 24 .000 0.0 Tar						Tan coarse loose sand wi	th small pea gravel throughout.		
Sample T SS = Split HA = Han GP = Geo CC = Con	Spo d Au prob	on ger e Samr	bler		L		rielded recovery were sampled for , PCBs, and RCRA metals. e.	) Dr	

			<u>an</u>		_	Project No Project Na	: 2015     Boring No.: MHSBX-02       me: Long Island RailRoad     Sheet 1 of 1.       Manhasset Substation     By: Albert Albano		
		$\bigcup$	リBa	ITTILUCO			Virginia Drive		
	Drilling ( Driller:				INEEKS	-	Geologist: Albert AlbanoBoring Completion Depth: 20'Drilling Method: Direct PushGround Surface Elevation:		
C	Drill Rig	Ge	oprobe				mer Weight: NA Boring Diameter: 1"		
C	Date Sta	e Started: 01/17/03					leted: 01/17/03 Samples were collected in 2' in	terva	
			Soil Sa	·	Mercury Vapor	Photo- ionization			
	Depth		-	Rec.	3	Detector	Sample Description	USC	
	(ft.) 4' - 6'	<u>No.</u> 1	Type GP		(mg/m <sup>3</sup> ) .004		Brown fine silty sand with layers of orange-stained		
	4 - 0	)	GP	24	.004	0.0	(oxidation) medium grained, loose sand, moist		
	6' - 8'	2	GP	24	.008	0.0	Brown fine silty sand, moist		
ł	8' - 10'	3	GP	18	.007	0.0	Same		
1	10' - 12'	4	GP	18	.006	0.0	Same, with some quartz rock		
1	12' - 14'	5	GP	18	.005	0.0	12-13' — Gray fine clayey sand 13-14' — Tan medium sand with some quartz pea gravel	-	
1	14' - 16'	6	GP	18	.009	0.0	Same		
1	16' - 18'	7	GP	18	.003	0.0	Same		
1	18' - 20'	8	GP	18	.006	0.0	Same		
S H G	Sample S S = Spli IA = Har SP = Ger CC = Cor	t Spo nd Au oprob	ion Iger Ie Samp	bler			NOTES: All sampled intervals collected for analysis of SVOC PCBs, and RCRA metals.	s,	

	}	Dv	<b>rirka</b>		Project No		Boring No.: MHSBX-03	
	5	\ an	-		Project Na	me: Long Island RailRoad	Sheet <u>1</u> of <u>1</u> .	
	$\left( \right)$			i		Manhasset Substation	By: Albert Albano	
	$\sim$	=	ULTING ENGI	NEERS		Virginia Drive		
Drilling C		actor:	LAWES		Geologist:	Albert Albano	Boring Completion Depth: 2	
Driller: E					Drilling Me	g Method: Direct Push Ground Surface Elevation:		
Drill Rig:	Geo	probe			Drive Ham	Prive Hammer Weight: NA Boring Diameter: 1"		
Date Sta				<u> </u>		leted: 01/13/03	Samples were collected in 2' in	tervals.
		Soil Sa	ample	Mercury	Photo-			
Dauth				Vapor	ionization	Como la	Description	uscs
Depth (ft.)	No.	Туре	Rec. (inches)	(malm <sup>3</sup> )	Detector	Sample	Description	0565
4' - 6'	1	GP	24	(mg/m <sup>3</sup> ) .004	(ppm) 0.0	4-5' Black stained medium	to coarse sand/pebble	
4.0	•		24	.004	0.0	5-6' Tan medium to coars		
						interspersed		
			<u>.</u>	000				}
6' - 8'	2	GP	24	.000	0.0	Tan fine to medium silty sa	and, slightly stiff in sections	
8' - 10'	3	GP	18	.000	0.0		dium sand, some quartz rock	
						and pebbles		
								}
10' - 12'	4	GP	18	.000	0.0	Brown medium sand, weat	thered quartz pea gravel	
								}
12' - 14'	5	GP	18	.000	0.0	Tan very fine to fine sand		
						Dark brown stained sand a	at 13' bgs	
	- 1							!
14' - 16'	6	GP	18	.000	0.0	Tan medium "loose" sand	some brown staining (natural	
	Ŭ	0.	10	.000	0.0	rock), some quartz pea gra		1 1
						, , <b>, , , , , , , , , , , , , , , , , </b>		
16' - 18'	7	GP	24	.004	0.0	Proum find to madium some	d mixed with averty reak (4*	
10 - 10	·	GP	24	.004	0.0	diameter)	d mixed with quartz rock (1*	
18' - 20'	8	GP	24	.000	0.0	Tan and brown fine loose :	sand	}
	· {							
Sample T	•••					NOTES:		
SS = Split							continuously for analysis of SVC	)Cs,
HA = Han			. ·			PCBs, and RCRA n	netals.	
GP = Geo CC = Con			нег					
		0010						

d		) an ) Ba	virka d Irtilucc	NEERS	Project No Project Na	.: 2015 me: Long Island RailRoad Manhasset Substation Virginia Drive	Boring No.: MHSBX-04 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling ( Driller: 1 Drill Rig:	Brian : Ge	oprobe			Drilling Me Drive Ham	: Albert Albano       Boring Completion Depth: 16'         ethod: Direct Push       Ground Surface Elevation:         mmer Weight: NA       Boring Diameter: 1"		
Date Sta		01/13/ Soil Sa		Mercury Vapor		bleted: 01/13/03	Samples were collected in 2' in	tervals.
Depth (ft.)	No.		Rec. (inches)	(mg/m <sup>3</sup> )	Detector (ppm)		Description	USCS
4' - 6'	1	GP	18	.000	.0.0	Pebbles, some orange (oxi	dium sand with some quartz idation) staining	
6' - 8'	2	GP	18	.000	0.0	Brown fine to medium sand	d with some quartz pebbles	
8' - 10'	3	GP	24	.000	0.0	Brown/Tan fine to medium gravel	silty sand, some light pea	
10' - 12'	4	GP	24	.000	0.0	Brown fine to medium silty	sand, a little stiff	
12' - 14'	5	GP	24	.000	0.0	Brown fine to medium sand stiff and silty	d with quartz pea gravel, a little	
14' - 16'	6	GP	20	.000	0.0	14-15' 8" - Tan medium sa mica particulate at bottom	nd with some larger rocks, of sample.	
Sample T SS = Split HA = Han GP = Geo CC = Con	Spo d Au prob	on ger e Samp	oler			probe could not phy to apparent rock for	called for advancement to 20' by sically be advanced beyond 15' mation. Samples collected lysis of SVOCs, PCBs, and RCI	8" due

d		) an Ba	ITTILLCO	NEERS	-	Project No.:       2015       Boring No.:       MHSBX-05         Project Name:       Long Island RailRoad       Sheet 1 of 1.         Manhasset       Substation       By:       Albert Albano         Virginia       Drive       Drive       Drive		
Drilling (	Contr	actor:	LAWES		Geologist:	Albert Albano	Boring Completion Depth: 2	0,
Driller: E	Brian					Drilling Method: Direct Push Ground Surface Elevation:		
Drill Rig:		-			Drive Ham	mer Weight: NA	Boring Diameter: 1"	
Date Sta						leted: 01/13/03	Samples were collected in 2' in	tervals.
Death		Soil Sa		Mercury Vapor	Photo- ionization			
Depth (ft.)	No.	Туре	Rec. (inches)	(mg/m <sup>3</sup> )	Detector	Sample	Description	USCS
4' - 6'	1	GP	24	.000	(ppm) 0.0	Brown/tan very fine to fine	silly sand moist	
6' - 8'	2	GP	24	.000	0.0	Tan fine silty sand, some o		
8' - 10'	3	GP	18	.000	0.0	Brown fine to medium san mica fragments, a little stif	d, some quartz pea gravel and f	
10' - 12'	4	GP	24	.000	0.0	Brown very fine to fine silty mica, clay layer at 11.5-12	/ sand, some quartz rock and ' bgs	
12' - 14'	5	GP	24	.000	0.0	Brown fine to medium silty mica fragments	sand, some quartz rock and	
14' - 16'	6	GP	24	.000	0.0	Same		
16' - 18'	7	GP	24	.000	0.0	16-17' Brown fine silty san 17-18' Tan fine to medium	d, a little stiff sand, some loose quartz rock	
18' - 20'	8	GΡ	18	.000	0.0	Tan fine to medium loose :	sand	
Sample T SS = Split HA = Han GP = Geo CC = Con	Spo d Au prob	on ger e Samp	bler			NOTES: Samples collected of PCBs, and RCRA n	continuously for analysis of SVO netals.	Cs,

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	$\sum_{i=1}^{n}$		TTILLCO			Manhasset Substation Virginia Drive	By: Albert Albano		
Drilling (	Conti				Geologist:	Geologist: Albert Albano Boring Completion Depth: 10'			
Driller: E	3 <b>ria</b> n				Drilling Me	thod: Direct Push	Ground Surface Elevation: -		
Drill Rig:	Geo	probe			Drive Ham	Prive Hammer Weight: NA Boring Diameter: 1"			
Date Sta	rted:	01/13/	/03		Date Comp	oleted: 01/13/03	Samples were collected in 2' in	tervals.	
		Soil Sa	ample	Mercury Vapor	Photo- ionization				
Depth			Rec.		Detector	Sample	Description	USCS	
<u>(ft.)</u>	No.		(inches)	(mg/m <sup>3</sup> )			<u> </u>		
4' - 6'	1	GP	24	.000	0.0	Reddish brown coarse to v	ery coarse loose sand		
6' - 8'	2	GP	24	.000	0.0	Tan (with minor brown sec	tions) fine silty sand, moist		
8' - 10'	3	GP	24	.000	0.0	Tan fine silty sand with son	ne quartz pea gravel, moist		
Sample T SS = Split HA = Han GP = Geo CC = Con	Spo d Au prob	on ger e Samp	bler			NOTES: Samples collected of PCBs, and RCRA m	continuously for analysis of SVO netals.	c,	

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		Dv an	rirka d		Project No. Project Na		me: Long Island RailRoad Sheet <u>1</u> of <u>1</u> .		
	$\bigcirc$			•i		Manhasset Substation	By: Albert Albano		
	$\sim$		TTILLCC	NEERS		Virginia Drive			
Drilling C		actor:	LAWES		-	Albert Albano	Boring Completion Depth: 2		
Driller: E					Drilling Method: Direct Push Ground Surface Elevation:				
Drill Rig:		•				mer Weight: NA	Boring Diameter: 1"	_	
Date Sta	_	_				leted: 01/13/03	Samples were collected in 2' in	tervals.	
1		Soil Sa	impie	Mercury Vapor	Photo- ionization				
Depth			Rec.	Tapor	Detector	Sample	Description	USCS	
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)				
4' - 6'	1	GP	24	.000	0.0	Brown/Tan fine to medium	sand, sporadic pebbles, moist		
6' - 8'	2	GP	24	.000	0.0	Yellow/tan fine to medium	sand, some quartz pebbles		
8' - 10'	3	GP	18	.000	0.0	Brown fine to medium silty moist	sand, sporadic quartz pebbles,		
10' - 12'	4	GP	18	.000	<b>0</b> .0		sand with sporadic quartz golf ball"-sized quartz rocks		
12' - 14'	5	GP	24	.000	0.0	Brown fine to medium san and some larger "golf ball"	d with sporadic quartz pebbles -sized quartz rocks		
14' - 16'	6	GP	24	.000	0.0	Same			
16' - 18'	7	GP	24	.000	0.0	Same			
18' - 20'	8	GP	24	.000	0.0	Same			
Sample T SS = Split HA = Han GP = Geo CC = Con	Spo d Au prob	on ger e Samp	bler			NOTES: Samples collected of PCBs, and RCRA n	continuously for analysis of SVO netals.	Cs,	

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d		) an ) Ba	virka d artilucc	NEERS	-	roject No.: 2015 roject Name: Long Island RailRoad Manhasset Substation Virginia Drive Boring No.: MHSBX-08 Sheet <u>1</u> of <u>1</u> . By: Albert Albano		
Drilling	Conti	ractor:	LAWES		Geologist:	Albert Albano	<b>Boring Completion Depth: 2</b>	:0'
Driller:	Brian				Drilling Me	Drilling Method: Direct Push Ground Surface Elevation:		
Drill Rig:	Geo	oprobe			Drive Ham	mer Weight: NA	Boring Diameter: 1"	
Date Sta	rted:	<u>0</u> 1/17/	/03		Date Comp	oleted: 01/17/03	Samples were collected in 2' ir	tervals.
		Soil Sa	ample	Mercury	Photo-			
Depth			Baa	Vapor	ionization Detector	Comple	Description	uscs
(ft.)	No.	Туре	Rec. (inches)	(mg/m <sup>3</sup> )		Sample	Description	0363
4' - 6'	1	GP	24	.003	(ppm) 0.0	Tan fine to medium sand	a little silty, moist to wet (at 6'	
4-0	•	0	24	.005	0.0	bgs)	a hlue shiy, moisi io wei (al o	
6' - 8'	2	GP	24	.005	0.0	Same, but a bit stiffer		
8' - 10'	3	GP	24	.003	0.0	Tan medium to coarse san	nd, saturated from 8-9.5' bgs	
10' - 12'	4	GP	24	.006	0.0	Brown/tan fine to medium s	sand, medium stiffness	
12' - 14'	5	GP	18	.007	0.0	Tan/orange fine to medium pebble, a little stiff	a sand with small quartz	
14' - 16'	6	GP	18	.003	0.0	14-15.5' – Brown/dark brow packed 15.5-16' – Brown coarse sa	wn clayey sand, very stiff and	
16' - 18'	7	GP	18	.003	0.0	gravel, loose Brown fine clayey sand, sti		
18' - 20'	8	GP	18	.006	0.0	Tan medium sand with qua	artz pea gravel, loose	
Sample 1 SS = Split HA = Han GP = Gec CC = Con	t Spo Id Au Iprob	on ger e Samp	bler			NOTES: All sampled intervals PCBs, and RCRA m	s collected for analysis of SVOC netals.	Čs,

d		an	virka d Irtilucc	CI NEERS	Project No Project Na	.: 2015 me: Long Island RailRoad Manhasset Substation Virginia Drive	Boring No.: MHSBX-09 Sheet <u>1</u> of <u>1</u> . By: Albert Albano		
Drilling	Contr	actor:	LAWES		Geologist:	Albert Albano Boring Completion Depth: 20'			
Driller: E	Brian	_			Drilling Me	thod: Direct Push	Ground Surface Elevation: -		
Drill Rig:	Geo	probe			Drive Ham	amer Weight: NA Boring Diameter: 1"			
Date Sta	_					leted: 01/17/03 Samples were collected in 2' interva			
		Soil Sa	ample	Mercury	Photo-				
	Vapor			Vapor	ionization				
Depth	No	Turne	Rec.	1	Detector	Sample	Description	USCS	
(ft.) 6' - 8'	<b>No.</b>	Type GP	(inches) 24	(mg/m <sup>3</sup> ) .008	(ppm) 0.0	Ton fing to modium condu	moist to wet, stiff and silty (like		
0-0		GP	24	.000	0.0	clay) form 6-6.5' bgs.	moist to wet, suit and siny (nee		
8' - 10'	2	GP	24	.008	0.0	Brown medium sand with o at 9' bgs	quartz pea gravel, moist to wet		
10' - 12'	3	GP	24	.011	0.0	Brown fine to coarse silty s bgs	and, moist, a bit "clayey" at 12'		
12' - <b>1</b> 4'	4	GP	24	.007	0.0	Brown fine silty sand, a littl	e stiff		
14' - 16'	5	GP	18	.000	0.0	Brown/gray silty sand, moi	st, a little stiff		
16' - 18'	6	GP	18	.000	0.0	Brown medium to coarse s some red (oxidation) staini	sand, some quartz pea gravel, ing		
18' - 20'	7	GP	12	.005	0.0 Tan/brown medium sand, medium to heavy quartz rock				
Sample T SS = Split HA = Har GP = Geo CC = Cor	t Spo Id Au Sprob	on ger e Samj	bler			<b>NOTES:</b> All sampled interval PCBs, and RCRA n	s collected for analysis of SVOC netals.	Čs,	

d		an	rirka d rtilucc	NEERS	-	me: Long Island Railroad       Sheet _1_ of _1         Issapequa Substation       By: Albert Albano			
Drilling ( Driller: Drill Rig: Date Sta	I.W. I Geo	Palmer oprobe			Drilling Me Drive Ham	Albert Albano thod: Direct Push mer Weight: NA pleted: 02/04/03	Boring Completion Depth: 6 Ground Surface Elevation: - Boring Diameter: 1" Samples were collected in 2' in		
Depth (ft.)	Vapo Rec.			Mercury Vapor (mg/m <sup>3</sup> )	Photo- ionization Detector (ppm)	Sample	Description	uscs	
0' - 2'	1	GP	24	.000	0.0	Brown medium silty sand,	a little stiff, clayey		
2' - 4'	2	GP	24	.000	0.0	2-3' – Same 3-4' – Tan/orange sand, h rock, loose	eavy quartz pea gravel and		
4' - 6'	3	GP	24	.000	0.0	Same			
								}	
	1								
	Ĩ								
	r.								
Sample SS = Spli HA = Hai GP = Ge CC = Coi	it Spo nd Au oprot	oon Iger De Sam	pler			NOTES: 2'-4' and 4'-6' interv addition, a surface analyzed for mercu	als were analyzed for mercury. sample was collected from 0"-2" ry.	In and	

d		h an	rirka d Irtilucc	i NEERS	-	.: 2015 me: Long Island Railroad sapequa Substation	Boring No.: MSSB-09 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling ( Driller: J Drill Rig:	I.W. F	<b>actor:</b> Palmer			Drilling Me	Albert Albano thod: Direct Push mer Weight: NA	Boring Completion Depth: 6 Ground Surface Elevation: - Boring Diameter: 1"	
Date Sta	rted:	02/04/	03		Date Comp	oleted: 02/04/03	Samples were collected in 2' in	tervals.
ļ		Soil Sa	ample	Mercury				
Depth			Rec.	Vapor	ionization Detector	Sample	Description	uscs
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)	Campio		0000
0' - 2'	1	GP	24	.000	0.0	Brown silty sand fine to me black staining	edium, stiff like clay, minor	
2' - 4'	2	GP	24	.000	0.0	2-3.5' - Same 3.5-4' – Tan sand, heavy c	quartz rock, loose	
4' - 6'	3	GP	24	.000	0.0	Same		
Sample 1 SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	on ger e Sam	pler		I		vals were analyzed for mercury. sample was collected from 0"-2" Iry.	

d		an	irka d rtiluco	NEERS	-	: 2015 me: Long Island Railroad sapequa Substation	Boring No.: MSSB-10 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling (	Contr	actor:	LAWES		Geologist:	Albert Albano	Boring Completion Depth: 6	
Driller:	I. W.	Palmer			Drilling Me	thod: Direct Push	Ground Surface Elevation: -	
Drill Rig:	Geo	probe			Drive Ham	mer Weight: NA	Boring Diameter: 1"	
Date Sta	rted:	02/04/	03		Date Comp	leted: 02/04/03	Samples were collected in 2' in	tervals.
		Soil Sa	mple	Mercury				
				Vapor	ionization		<b>—</b> • •	
Depth		_	Rec.	3	Detector	Sample	Description	USCS
(ft.)	No.	Type	(inches)	(mg/m <sup>3</sup> )	(ppm)			
0' - 2'	1	GP	24	.000	<b>0</b> .0	Tan sandy clay with mediu	m quartz rock, stiff	
2' - 4'	2	GP	24	.000	<b>0</b> .0	Same		
4' - 6'	3	GP	24	. <b>0</b> 00	0.0	Tan sand, heavy quartz pe	a gravel and rock, loose	
Sample	Í VDe					NOTES:		
SS = Spli	t Spo	on				2'-4' and 4'-6' interv	als were analyzed for mercury.	
HA = Har							sample was collected from 0"-2"	and
GP = Ge			pler			analyzed for mercu	<b>у</b> .	
CC = Co	ncrete	Core						

d		an	rirka d rtilucc	NEERS	Project Na	ct No.: 2015Boring No.: MSSB-11ct Name: Long Island RailroadSheet 1 of 1Massapequa SubstationBy: Albert Albano			
Drilling ( Driller: Drill Rig: Date Sta	J. W. Geo	<b>actor:</b> Palme <u>r</u> pprobe	LAWES		Drilling Me Drive Ham	Albert Albano thod: Direct Push mer Weight: NA bleted: 02/04/03	Boring Completion Depth: 6' Ground Surface Elevation: Boring Diameter: 1" Samples were collected in 2' interval		
Depth		Soil Sa	Rec.	Mercury Vapor	ionization Detector	Sample	Description	USCS	
(ft.) 0' - 2'	<u>No.</u> 1	<b>Type</b> GP	(inches) 24	(mg/m <sup>3</sup> ) .000	(ppm) 0.4	0-2" – Brown topsoil 2"-2' – Tan sand with med	lium quartz rock, loose		
2' - 4'	2	GP	24	.000	0.4	Same			
4' - 6'	3	GP	24	.000	0.0	Same, but soil getting mor	re orange with depth		
Sample SS = Spli HA = Har GP = Ge CC = Col	it Spo nd Au opr <b>o</b> b	on ger e Sam	pler	I	I	addition, a surface analyzed for mercu There is a 9" layer sampling purposes	vals were analyzed for mercury. sample was collected from 0"-2" iry. of crushed stone just below grad s, grade (or "0") was considered t 9" below the existing grade surfac	and e. For o exist	

d		an	rirka d rtilucc		-	.: 2015 me: Long Island Railroad sapequa Substation	oad Boring No.: MSSB-12 Sheet <u>1</u> of <u>1</u> . By: Albert Albano		
Drilling ( Driller: 、 Drill Rig:	I. W. Geo	Palmer pprobe			Drilling Me Drive Ham	ogist: Albert AlbanoBoring Completion Depth: 6'ng Method: Direct PushGround Surface Elevation:Hammer Weight: NABoring Diameter: 1"			
Date Sta Depth	_	02/04/ Soil Sa	imple	Mercury Vapor	Photo- ionization	Sample	Samples were collected in 2' ir	USCS	
(ft.)	No.	Rec. Detector . Type (inches) (mg/m <sup>3</sup> ) (ppm)		Campie	Description				
0' - 2'	1	GP	24	.000	0.0	0-2" – Brown silty sand 2"-2' – Tan/orange sand, I	neavy quartz rock		
2' - 4'	2	GP	24	.000	0.0	Tan/orange sand, heavy o	juartz rock		
4' - 6'	3	GP	24	.000	0.0	Same			
Sample <sup>-</sup> SS = Spli HA = Har GP = Get CC = Cor	t Spo nd Au oprob	on ger e Samj	bler			addition, a surface analyzed for mercu There is a 9" layer sampling purposes	vals were analyzed for mercury. sample was collected from 0"-2" ry. of crushed stone just below grad , grade (or "0") was considered t )" below the existing grade surfa	'and e. For o exist	

d		an	rirka d rtilucc	NEERS	Project Na	Project No.:       2015       Boring No.:       MSSB-13         Project Name:       Long Island Railroad       Sheet 1 of 1       Group         Massapequa Substation       By:       Albert Albano			
Drilling (	Contr				Geologist:	Albert Albano	Boring Completion Depth: 6	•	
Driller:					Drilling Method: Direct Push Ground Surface Elevation:				
Drill Rig:		-			-	mer Weight: NA	Boring Diameter: 1"		
Date Sta		•	03			oleted: 02/03/03	Samples were collected in 2' in	tonvals	
Date old		Soil Sa		Mercury					
		0011 01	anpic	Vapor	ionization				
Depth			Rec.	Tupor	Detector		Description	USCS	
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)		Desemption		
0' - 2'	1	GP	24	.000	0.0	0-4" - Crushed stone, Bla	ck/grav topsoil		
2' - 4'	2	GP	24	.003	0.0	4"-2' – Tan sand with med			
4' - 6'	4' - 6' 3 GP 24 .000				0.0	Same			
Sample SS = Spli HA = Har GP = Ge CC = Co	it Spo nd Au oprob	ion iger ie Sam	pler				rals were analyzed for mercury. sample was collected from 0"-2" ry.		

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d		an	virka d Irtilucc	NEERS	Project Na	t No.: 2015Boring No.: MSSB-14t Name: Long Island RailroadSheet 1 of 1 .Massapequa SubstationBy: Albert Albano			
Drilling ( Driller:	).W. F	actor: Palmer			Geologist: Albert AlbanoBoring Completion Depth: 6'Drilling Method: Direct PushGround Surface Elevation:Drive Hammer Weight: NABoring Diameter: 1"				
Drill Rig: Date Sta		•	03			bleted: 02/04/03	Boring Diameter: 1" Samples were collected in 2' in	tervals	
Date Sta		Soil Sa		Mercury	Photo-				
				Vapor	ionization				
Depth	pth Rec.			Detector	Sample	Description	USCS		
(ft.)	No.		(inches)	(mg/m <sup>3</sup> )	(ppm)				
0' - 2'	1	GP	24	.000	0.0	pea gravel and quartz rock			
2' - 4'	2	GP	24	.000	0.0	Tan/orange medium to co gravel and quartz rock	arse sand, heavy quartz pea		
4' - 6'	3	GP	24	.000	0.0	Same			
Sample SS = Spli HA = Hai GP = Gei CC = Coi	it Spo nd Au oprob	ion Iger Ie Sam	pler	L		addition, a surface analyzed for mercu There is a 9" layer of sampling purposes	vals were analyzed for mercury. sample was collected from 0"-2" ry. of crushed stone just below grad , grade (or "0") was considered to " below the existing grade surfac	and e. For o exist	

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d		h an	irka d rtilucc	NEERS	-	.: 2015 me: Long Island Railroad sapequa Substation	Boring No.: MSSB-15 Sheet _1_ of _1 By: Albert Albano	
Drilling (	Contr	actor:	LAWES		Geologist:	Albert Albano	Boring Completion Depth: 6	•
Driller:	J. W.	Palmer			Drilling Me	thod: Direct Push	Ground Surface Elevation: -	
Drill Rig:	Geo	probe			-	mer Weight: NA	Boring Diameter: 1"	
Date Sta		-	03			oleted: 02/04/03	Samples were collected in 2' in	tervals
Date Old	_	Soil Sa		Mercury	Photo-			
		0011 01	impic	Vapor	ionization	[		[
Depth			Rec.		Detector	ſ	Description	uscs
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)			
0' - 2'	1	GP	24	.000	0.0	Brown sand with medium	guartz rock	
2' - 4'	2	GP	24	N/A	N/A	No recovery		
4' - 6'	3	GP	24	.000	0.0	Tan/orange sand with me	dium quartz rock	
Sample SS = Spli HA = Har GP = Geo CC = Cor	it Spo nd Au oprob	on ger e Sam	bler	L	I	addition, a surface analyzed for mercu There is a 9" layer sampling purposes	of crushed stone just below grad , grade (or "0") was considered t )" below the existing grade surfa	and e. For o exist

d		an	rirka d rtilucc	NEERS		.: 2015 me: Long Island Railroad sapequa Substation	Boring No.: MSSB-16 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling (	Contr				Geologist:	Albert Albano	Boring Completion Depth: 4	r
Driller:	I.W. F	Palmer			Drilling Me	thod: Direct Push	Ground Surface Elevation:	
Drill Rig:	Geo	probe			Drive Ham	mer Weight: NA	Boring Diameter: 1"	
Date Sta	rted:	02/04/	03		Date Comp	leted: 02/04/03	Samples were collected in 2' in	ntervals.
		Soil Sa	ample	Mercury	Photo-			
				Vарог	ionization			
Depth			Rec.		Detector	Sample	Description	USCS
(ft.)		Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)			Ļ
0' - 2'	1	GP	24	.000	0.0	Brown medium sand with gravel, 2" asphalt layer at	medium quartz rock and pea 1' bgs	
2' - 4'	2	GP	24	.000	0.0	Brown medium sand with gravel	medium quartz rock and pea	
Sample SS = Spli HA = Har GP = Ge CC = Col	it Spo nd Au oprot	ion iger ie Samj	pler				nalyzed for mercury. In addition s collected from 0"-2" and analy	

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Drilling O Driller:	J.W. F	an Ba cons actor: Palmer	ITTILUCC	i NEERS	Mas Geologist: Drilling Me	me: Long Island Railroad sapequa Substation Albert Albano thod: Direct Push	Boring No.: MSSB-17 Sheet <u>1</u> of <u>1</u> . By: Albert Albano Boring Completion Depth: 4 Ground Surface Elevation:	
Drill Rig:		-				mer Weight: NA	Boring Diameter: 1"	
Date Sta						leted: 02/04/03	Samples were collected in 2' in	tervals.
		Soil Sa	ample	Mercury				l l
				Vapor	ionization			[ ]
Depth	Rec.				Detector	Sample	Description	USCS
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)			
0' - 2'	1	GP	24	.000	0.0	Brown/tan medium to coar	se sand	
2' - 4'	2	GP	24	.000	0.0	2-3' – Same 3-3.5' – Dark brown clayey 3.5-4' – Tan medium sand		
Cample						NOTES:		
Sample SS = Spli HA = Har	t Spo	on				2'-4' interval was ar	nalyzed for mercury. In addition, s collected from 0"-2" and analyz	
GP = Ge			nlor			mercury.	S concorcu norr o -2 anu aridiyz	
CC = Cor			hiel					
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Drilling ( Driller: Drill Rig:	J.W. F	Palmer	LAWES		Drilling Me	Albert Albano ethod: Direct Push mer Weight: NA	Boring Completion Depth: 4 Ground Surface Elevation: - Boring Diameter: 1"		
Date Sta		02/04/ Soil Sa		Mercury Vapor		pleted: 02/04/03	Samples were collected in 2' in	itervals.	
Depth (ft.)	No.	Туре	Rec. (inches)	(mg/m <sup>3</sup> )	Detector (ppm)	Sample	Description	USCS	
0' - 2'	1	GP	24	.000	0.0	Brown medium sand Layer of black-stained san	d between 6" and 8" bgs		
2' - 4'	2	GP	24	.000	0.0	2-3' – Tan/brown sand 3-4' – Brown fine silty sand and medium quartz rock	d, s <b>o</b> me dark brown staining		
Sample SS = Spli HA = Har GP = Ger CC = Cor	it Spo nd Au oprob	on ger e Sam	pler				nalyzed for mercury. In addition, s collected from 0"-2" and analyz		

d		an	virka d Irtilucc	NEERS	-	.: 2015 me: Long Island Railroad sapequa Substation	Boring No.: MSSB-19 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling ( Driller:	).W. F	actor: Palmer			Drilling Me	Albert Albano thod: Direct Push	Boring Completion Depth: Ground Surface Elevation:	
Drill Rig		-				mer Weight: NA	Boring Diameter: 1"	n:
Date Sta		_				pleted: 02/04/03	Samples were collected in 2'	intervals.
				Mercury Vapor	Photo- ionization			
Depth			Vapor	Detector	Sample	Description	USCS	
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)		Description	
0' - 2'	1	GP	24	.000	0.0	Brown medium sand with	medium quartz rock	+
0 L				.000	0.0	2" asphalt layer from 1'10'		
2' - 4'	2	GP	24	.000	0.0	2-3' – Tan medium sand 3-4' – Brown silty sand wit	h medium to heavy rock	
Sample SS = Spl HA = Har GP = Ge CC = Cor	it Spo nd Au oprob	on ger e Sam	pler				nalyzed for mercury. In additions collected from 0"-2" and analy	

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Drilling (	Contr	actor:	LAWES		Geologist: Albert Albano		Boring Completion Depth: 4	,
Driller: .	I.W. F	Palmer			Drilling Me	thod: Direct Push	Ground Surface Elevation: -	
Drill Rig:	Geo	probe			Drive Ham	mer Weight: NA	Boring Diameter: 1"	
Date Sta	rted:	02/04/	/03		Date Comp	leted: 02/04/03	Samples were collected in 2' in	tervals.
	1	Soil Sa	ample	Mercury				
	Vapor			Vapor	ionization		<b>D</b>	
Depth		-	Rec.	3	Detector	Sample	Description	USCS
(ft.)	No.	Туре	(inches)	$(mg/m^3)$		Tan/brown modium condu	with minor block staining	
0' - 2' 2' - 4'	1 2	GP GP	24 24	.000	0.0	Tan/brown medium sand v Brown/gray silty sand with clayey	heavy quartz rock, stiff and	
Sample SS = Spli HA = Hai GP = Ge CC = Co	t Spo nd Au oprob	on ger e Sam	pler	I	I		alyzed for mercury. In addition, s collected from 0"-2" and analyz	

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Drilling		Ba CONS actor:	TTILLCO	NEERS	Mas Geologist:	me: Long Island Railroad sapequa Substation Albert Albano	Boring No.: MSSB-21 Sheet <u>1</u> of <u>1</u> By: Albert Albano Boring Completion Depth: 4'	
Driller: 、		Palmer			-	thod: Hand Auger	Ground Surface Elevation:	
Drill Rig:						mer Weight: NA	Boring Diameter: 1"	1
Date Sta						oleted: 02/03/03	Samples were collected in 2' in	ntervals.
		Soil Sa	imple	Mercury	Photo- ionization			
Depth		Vapor Rec.			Detector	Sample	Description	uscs
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)	<b>p</b>	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
0' - 2'	1	HA	24	.000	0.0	Tan/brown fine to medium	sand	
2' - 4'	2	HA	24	.000	0.0	Same		
Sample SS = Spli HA = Har GP = Ge CC = Cor	it Spo nd Au oprob	on ger je Samj	pler	<u> </u>	<u> </u>		alyzed for mercury. In addition s collected from 0"-2" and analy	

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d			TTILLCO	NEERS	Project No.: 2015 Project Name: Long Island Railroad Massapequa Substation		Boring No.: MSSB-22 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling ( Driller: Drill Rig:	I.W. F	Palmer probe			Geologist: Albert Albano Drilling Method: Direct Push Drive Hammer Weight: NA		Boring Completion Depth: 4' Ground Surface Elevation: Boring Diameter: 1"	
Date Sta		02/04/ Soil Sa		Mercury	Date Comp Photo-	leted: 02/04/03	Samples were collected in 2' in	tervals.
Depth			Rec.	Vapor	ionization Detector	Sample	Description	USCS
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)	•	•	
0' - 2'	1	GP	24	.000	0.0	Brown medium sand, heav	vy quartz rock	
2' - 4'	2	GP	24	.000	0.0	Same		
		-						
				z				
Sample <sup>-</sup> SS = Spli HA = Har GP = Ge CC = Cor	t Spo nd Au oprob	on ger e Sam	pler				nalyzed for mercury. In addition, s collected from 0"-2" and analyz	

d		an	irka d rtilucc	NEERS	-	.: 2015 me: Long Island Railroad sapequa Substation	Boring No.: MSSB-23 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling ( Driller: C Drill Rig:	I.W. F	Palmer	LAWES		Geologist: Albert Albano Drilling Method: Direct Push Drive Hammer Weight: NA		Boring Completion Depth: 4' Ground Surface Elevation: Boring Diameter: 1"	
Date Sta	rted:	02/04/	03		Date Comp	oleted: 02/04/03	Samples were collected in 2' in	tervals.
		Soil Sa	mple	Mercury				
Depth	No	Туре	Rec. (inches)	Vapor (mg/m <sup>3</sup> )	ionization Detector	Sample	e Description	USCS
(ft.) 0' - 2'	1	GP	24	.000	(ppm) 0.0	Dark brown medium sand	heavy quartz rock	
2' - 4'	2	GP	24	.000	0.0		and, silty zone between 3.5' and	
Sample SS = Spli HA = Har GP = Ger CC = Cor	t Spo nd Au oprob	on ger e Samj	bler				nalyzed for mercury. In addition, s collected from 0"-2" and analyz	

Drilling		) an Ba	ITTILLCO	NEERS	Mas	: 2015 me: Long Island Railroad sapequa Substation Albert Albano	Boring No.: MSSB-24 Sheet <u>1</u> of <u>1</u> . By: Albert Albano Boring Completion Depth: 4	_ of _ 1 rt Albano	
-					-	thod: Direct Push	Ground Surface Elevation: -		
Driller:					-	mer Weight: NA	Boring Diameter: 1"		
Drill Rig Date Sta		-	10.2			leted: 02/04/03	Samples were collected in 2' in	tonvals	
Date Sta		Soil Sa		Mercury		102/04/05	Samples were collected in 2 in		
		3011 34	ample	Vapor	ionization				
Depth	Rec.			, tupo.	Detector	Sample	Description	USCS	
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)	•	•		
0' - 2'	1	GP	24	.000	0.0	Brown medium sand, light	to medium quartz rock		
2' - 4'	2	GP	24	.000	0.0				
Sample SS = Spl HA = Ha GP = Ge	it Spo nd Au	ion Iger					halyzed for mercury. In addition, s collected from 0"-2" and analyz		

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d		) an Ba	TTILLCC	i NEERS	Mas	me: Long Island Railroad sapequa Substation	Boring No.: MSSB-25 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling C Driller: J Drill Rig:	.W. F		LAWES		Geologist: Albert Albano Drilling Method: Hand Auger Drive Hammer Weight: NA		Boring Completion Depth: 4 Ground Surface Elevation: - Boring Diameter: 1"	
Date Sta		_			Date Comp	tate Completed: 02/03/03 Samples were collected in		
		Soil Sa	ample	Mercury	1			
Depth	th Rec.				ionization Detector	Sample	Description	USCS
(ft.)	No.	Type	(inches)	(mg/m <sup>3</sup> )	(ppm)	Sample	bescription	0303
0' - 2'	1	HA	24	.006	0.0	Brown fine to medium san	d with medium rock coal	
	•		24	.000	0.0	fragments, and clinker	u wurmedum rock, coar	
2' - 4'	2	ΗΑ	24	.003	0.0	Same		
Sample T SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	on ger e Samj	pler	[	L		2'-4' interval was analyzed for mercury. In addition, a surface sample was collected from 0"-2" and analyzed for	

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			Dv	virka		Project No		Boring No.: MSSB-26		
£			an				me: Long Island Railroad	Sheet <u>1</u> of <u>1</u> .		
		$\bigcup_{i=1}^{n}$		SULTING ENGI	NEERS	Mas	sapequa Substation	By: Albert Albano		
	Drilling (	Contr				Geologist:	Albert Albano	Boring Completion Depth:	4'	
	Driller:	J.W. I	Palmer			Drilling Me	thod: Hand Auger	Ground Surface Elevation:		
	Drill Rig			-		Drive Ham	mer Weight: NA	Boring Diameter: 1"		
	Date Sta	rted:	02/03/	/03		Date Comp	oleted: 02/03/03	Samples were collected in 2' i	ntervals.	
1			Soil Sa	ample	Mercury	Photo-				
		Vapor				ionization				
	Depth			Rec.		Detector	Samp	le Description	USCS	
	(ft.)		Туре		(mg/m <sup>3</sup> )	(ppm)				
	0' - 2'	1	HA	24	.000	0.0	0-6" – Black/brown medi			
							6 -2 - Tan/prown mediu	m sand, some rock, loose		
	2' - 4'	2	НА	24	.000	0.0	Same			
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4										
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بر.										
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~3.					[					
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		l								
	Sample	L Tvne	۱ s:	L	L	I	NOTES:			
	SS = Spl							analyzed for mercury. In addition	,а	
	HA = Ha	nd Au	ıger				surface sample w	surface sample was collected from 0"-2" and analyzed for		
	GP = Ge	oprot	be Sam	pler			mercury.			
	CC = Co	ncret	e Core							

Drilling C Driller: J Drill Rig:	.W. F	Ba CONS actor:	<b>TTILLCO</b> SULTING ENGI LAWES	NEERS	Project No.: 2015 Project Name: Long Island Railroad Massapequa Substation Geologist: Albert Albano Drilling Method: Hand Auger Drive Hammer Weight: NA		Boring No.: MSSB-27 Sheet <u>1</u> of <u>1</u> . By: Albert Albano Boring Completion Depth: 4' Ground Surface Elevation: Boring Diameter: 1"		
Date Star	rted:	02/03/	/03		Date Comp	oleted: 02/03/03	Samples were collected in 2' in	tervals.	
Depth	Vapor Rec.			Mercury Vapor	Photo- ionization Detector	Photo- onization			
(ft.)	No.	Туре	(inches)	$(mg/m^3)$	(ppm)		Description	USCS	
0' - 2'	1	HA	24	.000	0.0	Brown/tan sand			
2' - 4'	- 4' 2 HA 24 .000				0.0	2-3' – Same 3-4' – Black/dark brown ro road spike	cky sand with coal, glass, rail		
Sample	[ ypes	5:				NOTES:			
SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	on ger e Sam	pler			2'-4' interval was an	2'-4' interval was analyzed for mercury. In addition, a surface sample was collected from 0"-2" and analyzed for		

d		an	virka d Irtilucc		-	: 2015 me: Long Island Railroad sapequa Substation	Boring No.: MSSB-28 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling ( Driller: \ Drill Rig	J.W. F	actor:	LAWES		Drilling Me Drive Ham	Albert Albano thod: Hand Auger mer Weight: NA	Boring Completion Depth: 4' Ground Surface Elevation: Boring Diameter: 1"	
Date Sta	rted:	02/03/	/03		Date Comp	leted: 02/03/03	Samples were collected in 2' i	ntervals.
		Soil Sa	ample	Mercury				
				Vapor	ionization			
Depth	Rec.				Detector	Sample	e Description	USCS
(ft.)	No.	Type	(inches)	(mg/m <sup>3</sup> )				<u> </u>
0' - 2'	1	HA	24	.004	0.0	Dark brown medium sand (styrofoam cup)	with quartz rock, some trash	
2' - 4'	2	HA	24	.000	0.0	Dark brown/black soil with	i coal fragments	
Sample SS = Spl HA = Hai GP = Ge CC = Coi	it Spo nd Au oprob	on ger e Sam	pler				nalyzed for mercury. In addition s collected from 0"-2" and analy	

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d		) an Ba	ITTILUCC	NEERS	Project No.: 2015 Project Name: Long Island Railroad Massapequa Substation		Boring No.: MSSB-29 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling ( Driller:					-	Albert Albano	Boring Completion Depth: 4 Ground Surface Elevation:	
Drill Rig:		rame				thod: Hand Auger mer Weight: NA	Boring Diameter: 1"	-
Date Sta		02/03/	03			bleted: 02/03/03	Samples were collected in 2' in	tonvals
Dale Sla		Soil Sa		Mercury	Photo-	<u>neteu.</u> 02/03/03	Comples were concelled in 2 m	tervais.
				Vapor	ionization			
Depth			Rec.		Detector	Sample	Description	USCS
<u>(ft.)</u>	No.	Туре	(inches)	(mg/m³)			<u> </u>	
0' - 2' 2' - 4'	1 2	ha Ha	24 24	.003	0.0	some quartz rock		
Sample	ſypes	5:				NOTES:		
SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	on ger e Sam	pler			2'-4' interval was ar	2'-4' interval was analyzed for mercury. In addition, a surface sample was collected from 0"-2" and analyzed for	

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Drilling ( Driller: Drill Rig:	I.W. F	Palmer	LAWES		Drilling Me	Albert Albano thod: Direct Push mer Weight: NA	Boring Completion Depth: 4 Ground Surface Elevation: Boring Diameter: 1"	
Date Sta	rted:	02/04/	/03		Date Comp	leted: 02/04/03	Samples were collected in 2' in	tervals.
		Soil Sa	ample	Mercury				
				Vapor	ionization			
Depth	N.	<b>T</b>	Rec.	1 mm - 1 mm - 31	Detector	Sample	Description	USCS
(ft.)			(mg/m <sup>3</sup> )	(ppm)	0-1' - Brown medium silty			
0' - 2'	1	GP	24	.000	0.0		sand i sand, some quartz pea gravel	
2' - 4'	2	GP	24	.004	0.0	Tan/orange medium sand,	, some quartz pea gravel	
Sample SS = Spl HA = Ha GP = Ge CC = Co	it Spo nd Au oprob	on ger e Sam	pler				nalyzed for mercury. In addition, s collected from 0"-2" and analyz	

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d		an	irka d rtiluco	NEERS	Project No.: 2015 Project Name: Long Island Railroad Massapequa Substation		Boring No.: MSSB-31 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling ( Driller: J Drill Rig: Date Sta	.W. F	actor: Palme <u>r</u>	LAWES		Geologist: Albert Albano Drilling Method: Hand Auger Drive Hammer Weight: NA Date Completed: 02/03/03		Boring Completion Depth: 4' Ground Surface Elevation: Boring Diameter: 1" Samples were collected in 2' intervals	
Depth (ft.)	Soil Sample Mercury Vapor No. Type (inches) (mg/m <sup>3</sup> )			-	Photo- ionization Detector (ppm)	Sample	Description	USCS
0' - 2'	1	HA	24	.003	0.0	0-2" – crushed stone 2"-2' - Tan fine sand		
2' - 4'	2	HA	24	.000	0.0	Dark brown/black sand, m	edium rock	
Sample SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Aug oprob	on ger e Samj	bler				nalyzed for mercury. In addition, s collected from 0"-2" and analy.	

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d		an	rtiluco	NEERS	Project No.: 2015 Project Name: Long Island Railroad Massapequa Substation Geologist: Albert Albano Drilling Method: Direct Push/Hand Auger Drive Hammer Weight: NA Date Completed: 02/04/03		Boring No.: MSSB-32 Sheet 1_ of 1 By: Albert Albano Boring Completion Depth: 10' Ground Surface Elevation: Boring Diameter: 1" Samples were collected in 2' intervals.	
Drilling ( Driller: C Drill Rig: Date Sta	I.W. I	Palmer oprobe						
Depth		Soil Sa	Rec.	Mercury Vapor	ionization Detector	Sample	e Description	uscs
(ft.) 0' - 2'	No. 1	<b>Туре</b> НА	(inches) 24	(mg/m <sup>3</sup> ) .000	(ppm) 0.0	Brown silty sand with med	lium quartz rock, moist	
2' - 4'	2	НА	24	.000	0.0	Brown/tan/orange sand, h		
4' - 6'	3	GP	24	.000	0.0	Tan medium sand with me rock	edium quartz pea gravel and	
6' - 8'	4	GP	24	.000	0.0	Same		
8' - 10'	5	GP	24	.000	0.0	Same		
Sample 1 SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	on ger e Samj	pler	L	1		and 8' - 10' intervals were analyz on, a surface sample was collect for mercury.	

d		an	rirka d rtilucc	<b>i</b> NEERS	-	.: 2015 me: Long Island Railroad sapequa Substation	Boring No.: MSSB-33 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling ( Driller: J Drill Rig: Date Sta	J.W. F	actor: Palmer oprobe	LAWES		Drilling Me Direct Push Drive Ham	r/Hand Auger mer Weight: NA	Boring Completion Depth: 10' Ground Surface Elevation: Boring Diameter: 1" Samples were collected in 2' interval	
Depth (ft.)	No.	Soil Sa	ample Rec. (inches)	Mercury Vapor (mg/m <sup>3</sup> )	Photo- ionization Detector	bleted: 02/04/03 Sample	Description	USCS
0' - 2'	1	HA	24	.000	0.0	Brown medium sand, heav	vy quartz rock	
2' - 4'	2	НА	24	.003	0.0	Same		
4' - 6'	3	GP	24	.000	0.0	Tan medium sand with he	avy quartz pea gravel and rock	
6' - 8'	4	GP	24	.000	0.0	Same, with lighter pea gra	vel and rock	
8' - 10'	5	GP	24	.000	0.0	Same		
		,						
Sample SS = Spli HA = Har GP = Ger CC = Cor	it Spo nd Au oprob	oon Iger De Sam	pler	<u> </u>	<u> </u>		nd 8' - 10' intervals were analyzed n, a surface sample was collected for mercury.	

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Drilling ( Driller: J Drill Rig:	I.W.F Geo	Palmer probe			Geologist: Albert Albano Drilling Method: Direct Push Drive Hammer Weight: NA		Boring Completion Depth: 10 Ground Surface Elevation: Boring Diameter: 1"		
Date Sta					· · · · · · · · · · · · · · · · · · ·	leted: 02/04/03	Samples were collected in 2' in	tervals.	
		Soil Sa	imple	Mercury Vapor	Photo- ionization				
Depth			Rec.		Detector	Sample	Description	USCS	
(ft.)	No.		(inches)	$(mg/m^3)$	(ppm)		·		
0' - 2' 2' - 4'	1 2	GP GP	24 24	.000	0.0	Brown clay with some san pea gravel and rock Same	d in it, medium stiffness, quartz		
4' - 6'	3	GP	24	.000	0.0	Tan medium sand, heavy	quartz pea gravel and rock		
6' - 8'	8' 4 GP 24 .000				0.0	Same			
8' - 10'	5	GP	24	.000	0.0	Same			
Sample Types:NOTES:SS = Split Spoon2'-4', 4' - 6', 6' - 8' and 8' - 10' intervals were analyzed for mercury. In addition, a surface sample was collected from 0"-2" and analyzed for mercury.GP = Geoprobe Sampler CC = Concrete Core0"-2" and analyzed for mercury.									

d	$\bigcirc$		tilucc	EERS	Project No.: 2015 Project Name: Long Island Railroad Massapequa Substation		Boring No.: MSSB-36 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling Co			AWES		-	Albert Albano	Boring Completion Depth: 1	
Driller: J. \		-			-	hod: Direct Push	Ground Surface Elevation: -	-
Drill Rig: 🤇						er Weight: NA	Boring Diameter: 1"	
Date Starte	the second s					eted: 02/04/03	Samples were collected in 2' in	tervals.
	:	Soil Sa	mple	Mercury Vapor	Photo- ionization			
Depth			Rec.	_	Detector	Sampl	e Description	USCS
(ft.)	No.	Туре	(inches)		(ppm)			
7.5' - 9.5'	1	GP	24	.000	0.0		quartz pea gravel and rock d, smooth, no rock, moist	
9.5' - 11.5'	.5' - 11.5' 2 GP 24 .000					9.5-10' – Same 10-11.5 – Tan coarse sa	nd with some quartz pea gravel	
Samula Tu						NOTES:		
Sample Ty SS = Split S HA = Hand GP = Geop CC = Conci	Spoor Auge robe	er Sample	ər				oled for analysis of UIC constitue CRA metals, and TPH).	nts

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Drilling Co Driller: J. Drill Rig: 0 Date Starto	W. Pa Geop	ctor: LA almer robe <sup>-</sup>	<b>tilucc</b> LTING ENGIN AWES	EERS	Project Name: Long Island Railroad Massapequa Substation       Sheet _1_ of _1         By: Albert Albano       By: Albert Albano         Geologist: Albert Albano       Boring Completion         Drilling Method: Direct Push       Ground Surface E         Drive Hammer Weight: NA       Boring Diameter:					
Dute otart		Soil Sa		Mercury	Photo-					
			<b></b>	Vapor	ionization					
Depth		-	Rec.	3.	Detector	Sampl	e Description	USCS		
(ft.)	No.		(inches)	(mg/m <sup>3</sup> )		Tan was divers to an arrow of	and light quarter page group			
12'-14'	1	GP	24	.003	0.0	l an medium to coarse s saturated	and, light quartz pea gravel,			
14'-16'	2	GP	24	.000	0.0	Same				
16'-18'	3	GP	24	.000	0.0	Same				
18'-20'	18'-20' 4 GP 24 .000					Same				
20'-22'	5	GΡ	0	N/A	N/A	No recovery	·			
Sample Types:NOTES:SS = Split SpoonBoth intervals sampled for analysis of UIC constituentsHA = Hand Auger(VOCs, SVOCs, RCRA metals, and TPH).GP = Geoprobe SamplerDry well is 6' deepCC = Concrete CoreN/A: Not applicable.										

Drilling		) an Ba	TTILLCO	NEERS	Mas	.: 2015 me: Long Island Railroad sapequa Substation Albert Albano	Boring No.: MSSB-38 Sheet <u>1</u> of <u>1</u> . By: Albert Albano Boring Completion Depth: 4'	
Driller: J	I.W. F	Palmer			Drilling Me	thod: Hand Auger	Ground Surface Elevation: -	
Drill Rig:		-			-	mer Weight: NA	Boring Diameter: 1"	
Date Star		02/03/	03			leted: 02/03/03	Samples were collected in 2' in	tervals.
		Soil Sa	ample	Mercury	Photo-			
Donth			Baa	Vapor	ionization	Sample	Description	uscs
Depth (ft.)	Rec.           No.         Type           (inches)         (mg/m³)				Detector (ppm)	Sample	Description	0363
0' - 2'	1 HA 24 .000				0.0	Tan fine to medium sand		
2' - 4'	2	HA	24	.000	0.0	Same		
			- - - - -					
							· · · · · · · · · · · · · · · · · · ·	
Sample T SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	on ger e Sam	pler	L	·	NOTES: 0"-2" and 2'-4' inter SVOCs, PCBs, and	vals were sampled and analyzed I RCRA metals.	for

d		∖ an	rirka d rtilucc	NEERS	-	.: 2015 me: Long Island Railroad sapequa Substation	Boring No.: MSSB-39 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling Driller: Drill Rig	J.W. F :	actor: Palmer	LAWES		Geologist: Albert Albano Drilling Method: Hand Auger Drive Hammer Weight: NA		Boring Completion Depth: 4 Ground Surface Elevation: 4 Boring Diameter: 1"	
<u>Date Sta</u>	Started: 02/04/03 Soil Sample Mercury			Mercury Vapor	Photo- ionization	pleted: 02/04/03	Samples were collected in 2' in	intervals.
Depth	Na	Tune	Rec.	(mg/m <sup>3</sup> )	Detector	Sample	Description	USCS
(ft.) 0' - 2'	No. 1	<b>Туре</b> НА	(inches) 24	(mg/m) .000	(ppm) 0.0	Tan/orange sand, heavy o	uartz rock	
2' - 4'	2	НА	24	.000	0.0	Same		
						) ]		
			ľ					
Sample SS = Spl HA = Ha GP = Ge CC = Co	it Spo nd Au oprot	ion iger ie Sam	pler	<u> </u>	<u> </u>	NOTES: 0"-2" and 2'-4' inter SVOCs, PCBs, and	vals were sampled and analyzed I RCRA metals.	t for

d		<u>an</u>	rirka d Irtilucc		-	.: 2015 me: Long Island Railroad sapequa Substation	Boring No.: MSSB-40 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling ( Driller: l Drill Rig: Date Sta	₋uke ∶ <b>Geo</b>	actor: Tibbets oprobe	Zebra		Geologist: Albert Albano Drilling Method: Direct push Drive Hammer Weight: NA Date Completed: 08/09/04		Boring Completion Depth: 8' Ground Surface Elevation: Boring Diameter: 1" Samples were collected in 2' intervals	
Depth	h Rec.			Mercury Vapor	Photo- ionization Detector	Sample	Description	uscs
(ft.) 0' - 2'	No. 1	<b>Type</b> GP	(inches) 24	(mg/m <sup>3</sup> ) .000	(ppm) 	Tan medium silty sand, lig	ht rock.	
2' - 4'	2	GP	24	.000		Tan/brown medium silty sa	and, medium to heavy rock.	
4'6'	3	GP	24	.000		Tan medium to coarse sa	n <b>d, medium quart</b> z rock.	
6' – 8'	4	GP	24	.000		Tan medium sand.		
Sample SS = Spl HA = Har GP = Ge CC = Cor	it Spo nd Au oprob	on ger e Sam	pler	<u> </u>	<u> </u>	for mercury. : Instrument not	' intervals were sampled and an used to screen sample. Supple on delineation of mercury-impact	mental

	 ]	Dv	rirka		Project No		Boring No.: MSSB-43	
	5	an			-	me: Long Island Railroad	Sheet <u>1</u> of <u>1</u> .	
Q	$\sum_{n}$		TTILLCO	NEERS	Mas	sapequa Substation	By: Albert Albano	
Drilling (	Contr	actor:	Zebra		Geologist:	Albert Albano	Boring Completion Depth: 8	
Driller: L					-	thod: Direct Push	Ground Surface Elevation: -	
Drill Rig:		-				mer Weight: NA	Boring Diameter: 1"	
Date Sta	_					oleted:_08/09/04	Samples were collected in 2' in	itervals.
		Soil Sa	ample	Mercury Vapor	Photo- ionization			
Depth			Rec.	Vapor	Detector	Sample	Description	uscs
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)	· ·	•	
0' - 2'	1	GP	24	.000		Brown fine silty sand, som	e clay, asphalt material.	
2' - 4'	2	GP	24	.000	-	2'-3' Brown clay, stiff, me 3'-4' Tan/brown medium		
4'6'	3	GP	24	.000		Tan medium sand.		
6' 8'	4	GP	24	.000	-	Tan/brown medium sand,	light pea gravel.	
			-					
Sample 1 SS = Spli HA = Har GP = Geo CC = Cor	it Spo nd Au oprot	oon Iger De Samj	pler			for mercury. : Instrument not	' intervals were sampled and ana used to screen sample. Suppler on delineation of mercury-impacte	nental

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d		∖ an	rirka d Irtilucc		Project No.: 2015 Project Name: Long Island Railroad Massapequa Substation		Boring No.: MSSB-41 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling C		actor:	Zebra		-	Albert Albano	Boring Completion Depth: 8	
Driller: L		·			-	thod: Direct Push	Ground Surface Elevation: -	
Drill Rig:		-				mer Weight: NA	Boring Diameter: 1"	
Date Sta	_					leted: 08/09/04	Samples were collected in 2' in	tervals.
		Soil Sa	ample	Mercury Vapor	Photo- ionization			
Depth	Rec.				Detector	Sample	Description	uscs
(ft.)	No.	Туре		(mg/m <sup>3</sup> )	(ppm)			
0' - 2'	1 GP 24 .000					0'-1' - Tan/brown medium	silty sand.	
2' - 4'	2	GP	24	.000	-	1'-2' – Tan fine to medium Tan/brown medium sand,		
4' –6'	3	GP	24	.000		Same as above.		
6' - 8'	4	GP	24	.000		Same as above.		
Sample T SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	on ger e Sam	pler			for mercury. : Instrument not	" intervals were sampled and ana used to screen sample. Suppler on delineation of mercury-impact	nental

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d		) ) Ba	irka d rtilucc	NEERS		.: 2015 me: Long Island Railroad sapequa Substation	Boring No.: MSSB-42 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling	Contr	actor:	Zebra		Geologist:	Albert Albano	Boring Completion Depth: 1	0'
Driller:					-	thod: Direct Push	Ground Surface Elevation: -	
Drill Rig					-	mer Weight: NA	Boring Diameter: 1"	
Date Sta						bleted: 08/09/04	Samples were collected in 2' in	tervals
Date Sta	_	Soil Sa		Mercury				
		3011 38	ampie	Vapor	ionization			[
Depth	<u> </u>		Rec.	Tupo:	Detector	Sample	Description	USC
(ft.)	No	Туре	(inches)	(mg/m <sup>3</sup> )	1	p.		
	1	GP	24	.000	<u></u>	Brown silty fine sand, light	rock and coal fragments	╂─────
2' - 4'	2	GP	24	.000			black and gray staining, light	
4'6'	3	GP	24	.000		Brown clay, black staining	, wet at 6'.	
6' – 8'	4	GP	24	.000		Black silty sand, some wo	od and organics, wet.	
8' – 10'	5	GP	24	.000		White medium sand, heav	ry quartz rock.	
			- - - -					
Sample SS = Spl						<b>NOTES:</b> 0'-2', 2'-4', and 4'-6	' intervals were sampled and ana	alyzed
HA = Ha GP = Ge CC = Co	nd Au oprot	iger be Samj	pler			for mercury. : Instrument not	used to screen sample. Suppler on delineation of mercury-impacted	nental

d		an	rirka d rtiluco	NEERS	Project No.: 2015 Project Name: Long Island Railroad Massapequa Substation		Boring No.: MSSB-44 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling ( Driller: L Drill Rig:	uke <sup>-</sup> Geo	actor: 2 Tibbets pprobe	Zebra		Drilling Me Drive Ham	Albert Albano thod: Direct Push mer Weight: NA	Boring Completion Depth: 6' Ground Surface Elevation: Boring Diameter: 1"	
Date Sta		08/10/ Soil Sa		Mercury Vapor	Date Comp Photo- ionization	oleted: 08/10/04	Samples were collected in 2' in	tervals.
Depth (ft.)	No.	Туре	Rec. (inches)	(mg/m <sup>3</sup> )	Detector (ppm)	Sample	Description	USCS
0' - 2'	1	GP	24	.004		Tan medium sand, light ro	ck.	
2' - 4'	2	GP	24	.000		Tan medium sand, mediur	n rock.	
4' –6'	3	GP	24	.000		Same as above.		
Sample 1 SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	on ger e Samj	pler	L		for mercury. : Instrument not	intervals were sampled and and used to screen sample. Supplementation of mercury-impact	mental

d		) an Ba	TTILLCC	NEERS	Mas	me: Long Island Railroad sapequa Substation	Boring No.: MSSB-45 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling ( Driller: L Drill Rig:	.uke <sup>-</sup>				Drilling Me	Albert Albano thod: HA mer Weight: NA	Boring Completion Depth: 5 Ground Surface Elevation: Boring Diameter: 1"	F
Date Sta		08/10/	04			leted: 08/10/04	Samples were collected in 2' in	tervals.
		Soil Sa	mple	Mercury		· · · · · · ·		
Depth			Rec.	Vapor	ionization Detector	Sample	Description	uscs
(ft.)	No.	Туре	(inches)	( <b>mg</b> /m <sup>3</sup> )			Booonplion	
0' - 2'						Light brown fine sand, light	rock.	
2' - 4'	2	HA	24	.000		Same as above.		
4'5'	3	HA	12	.000		Same as above.		
Sample <sup>–</sup> SS = Spli HA = Har GP = Gea CC = Cor	t Spo nd Au oprob	on ger e Sam	pler			for mercury. : Instrument not u	intervals were sampled and ana used to screen sample. Suppler n delineation of mercury-impacte	nental

d		an	virka d Irtilucc	NEERS		.: 2015 me: Long Island Railroad sapequa Substation	Boring No.: MSSB-46 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling ( Driller: l Drill Rig:	.uke <sup>·</sup>	actor: Tibbets	Zebra		Geologist: Albert AlbanoBoring Completion Depth: 8Drilling Method: Direct PushGround Surface Elevation: -Drive Hammer Weight: NABoring Diameter: 1"			
Date Sta				1		leted: 08/09/04	Samples were collected in 2' in	tervals.
		Soil Sa	ample	Mercury Vapor	Photo- ionization			
Depth	h Rec.			Tapol	Detector	Sample	Description	uscs
(ft.)	No.	Туре		(mg/m <sup>3</sup> )	(ppm)	· · · · · · · · · · · · · · · · · · ·		
0' - 2'	2' 1 GP 24 .000			.000		Tan/gray fine silty sand.		
2' - 4' 4' -6'	2	GP	24 24	.000		rock.	n sand, medium to heavy quartz nedium silty sand, some rock, v sand.	
6' – 8'	4	GP	24	.000		Tan medium sand, mediui	m rock.	
Sample SS = Spl HA = Hai GP = Ge CC = Coi	it Spo nd Au oprob	on Iger Ie Sam	pler			for mercury. : Instrument not	" intervals were sampled and ana used to screen sample. Suppler on delineation of mercury-impact	mental

d		an	rirka d rtilucc	NEERS	Project No.:       2015       Boring No.:       MSSB-47         Project Name:       Long Island Railroad       Sheet _1_ of _1         Massapequa Substation       By:       Albert Albano			
Drilling ( Driller: l Drill Rig:	_uke <sup>-</sup>	actor:	Zebra		Drilling Me	Albert Albano thod: HA mer Weight: NA	Boring Completion Depth: 5 Ground Surface Elevation: - Boring Diameter: 1"	
Date Sta	rted:	08/10/	04		Date Comp	oleted: 08/10/04	Samples were collected in 2' in	tervals.
		Soil Sa	mple	Mercury	Photo-			
ļ				Vapor	ionization			
Depth	epth Rec.			3	Detector	Sample	e Description	USCS
(ft.)		Туре		(mg/m <sup>3</sup> )	(ppm)	1 1 1 4 h		
0' - 2' 2' - 4'	1 2	HA HA	24 24	.120		Light brown very fine silty s	sand, light rock.	
2 - 4 4' -5'	2 3	НА	12	.000		Same as above.		
Sample SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	on ger e Sam	pler			for mercury. : Instrument not	' intervals were sampled and ana used to screen sample. Suppler on delineation of mercury-impacto	nental

d		an	rirka d Irtiluco		Project No.:       2015       Boring No.:       MSSB-48         Project Name:       Long Island Railroad       Sheet _1_ of _1         Massapequa       Substation       By:       Albert Albano				
Drilling ( Driller: L Drill Rig:	uke <sup>-</sup>	actor: : Tibbet <u>s</u>	Zebra		Drilling Me	Albert Albano thod: Direct Push mer Weight: NA	ct Push Ground Surface Elevation:		
Date Sta	_	08/09/ Soil Sa		Mercury	Date Comp Photo-	oleted: 08/09/04	Samples were collected in 2' in	tervals.	
Depth	Vapor ior			-	ionization Detector	Sample	e Description	USCS	
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)				
0' - 2'	1	GP	24	.000		Tan/brown fine silty sand.	nd light rook and from outs		
2' - 4' 4'6'	2' - 4' 2 GP 24 .000 4' -6' 3 GP 24 .000					Reddish tan medium sand	nd, light rock, coal fragments. I, light rock.		
6' – 8'						6'-7' – Brown clay, moist, a 7'-8' – Tan/brown medium moist.	a little stiff. ) sand, heavy quartz pea gravel,		
Sample T SS = Spli HA = Har GP = Geo CC = Cor	t Spo Id Au oprob	on ger e Sam	pler			for mercury. : Instrument not	i' intervals were sampled and and used to screen sample. Supple on delineation of mercury-impact	nental	

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d		∖ an	rtiluco	NEERS	1 -	.: 2015 me: Long Island Railroad sapequa Substation	Boring No.: MSSB-49 Sheet <u>1</u> of <u>1</u> . By: Albert Albano		
Drilling ( Driller: L	.uke <sup>-</sup>	Fibbets			Drilling Me	Albert Albano thod: Direct Push	Boring Completion Depth: 8' Ground Surface Elevation:		
Drill Rig: Date Sta						mer Weight: NA bleted: 08/09/04	Boring Diameter: 1" Samples were collected in 2' in	tonvale	
Date Sta	_	Soil Sa		Mercury		neted. 00/03/04	Comples were conceled in 2 in		
				Vapor	ionization			1	
Depth			Rec. Detector Sample Description				USCS		
(ft.)	_	Туре		(mg/m <sup>3</sup> )	(ppm)			ļ	
0' - 2' 2' - 4'	1 2	GP GP	24 24	.000		Brown silty fine sand, loos Tan/brown medium sand,			
4' –6'	4'-6' 3 GP 24 .000					Same as above.			
6' <b>- 8</b> '	4	GP	24	.000		6'-7' – Black stained silty s 7'-8' – Gray/tan medium s	sand, wet. and, heavy pea gravel, wet.		
Sample SS = Spli HA = Har GP = Get CC = Cor	t Spo nd Au oprob	on ger e Samj	pler			for mercury. : Instrument not	' intervals were sampled and ana used to screen sample. Suppler on delineation of mercury-impacte	nental	

d		) an Ba	TTILLCO	NEERS		: 2015 me: Long Island Railroad sapequa Substation	Boring No.: MSSB-50 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling (						Albert Albano	Boring Completion Depth: 8	
Driller: L					-	thod: Direct Push	Ground Surface Elevation: -	-
Drill Rig:		-				mer Weight: NA	Boring Diameter: 1"	·
Date Sta	_	Soil Sa		Mercury		bleted: 08/10/04	Samples were collected in 2' in	tervals.
1			mpic	Vapor	ionization			
Depth	pth Rec.				Detector	Sample	Description	uscs
(ft.)				(mg/m <sup>3</sup> )	(ppm)		`	
0' - 2'	)' - 2'   1   GP   12 .092			.092		Light brown very fine silty	sand, light rock.	
2' - 4'	2	GP	12	.019		2'-3.5' - Same as above. 3.5'-4' – Tan medium sand	d, heavy rock.	
4' 6'	3	GΡ	24	.000		Tan medium sand, mediur	m rock.	
6' - 8'	6' - 8' 4 GP 24 .000					Same as above.		
Sample SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	on ger e Samj	pler			for mercury. : Instrument not	' intervals were sampled and ana used to screen sample. Suppler on delineation of mercury-impact	nental

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d		< an	virka d Irtilucc	NEERS	Project No.:       2015       Boring No.:       MSSB-51         Project Name:       Long Island Railroad       Sheet 1 of 1       By:         Massapequa Substation       By:       Albert Albano			
Drilling	Contr				Geologist:	Albert Albano	Boring Completion Depth: 8	•
Driller: I	uke	Tibbets	;		Drilling Me	thod: Direct Push	Ground Surface Elevation: -	
Drill Rig	Geo	probe	-		Drive Ham	mer Weight: NA	Boring Diameter: 1"	
Date Sta	rted:	08/09/	/04		Date Comp	oleted: 08/09/04	Samples were collected in 2' in	tervals.
[		Soil Sa	ample	Mercury	Photo-			
ł				Vapor	ionization			
Depth			Rec.	}	Detector	Sample	Description	USCS
(ft.)					(ppm)			
0' - 2'	1	GP	18	.000		0'-1' – Tan/brown medium 1'-2' – Black medium silty		
2' - 4'	2	GP	18	.000		Reddish brown medium sa	and.	
4' –6'	3	GP	24	.000		Tan/gray medium sand, liç	ght rock.	
6' - 8'	4	GP	24	.000		Same as above.		
Sample SS = Spl HA = Hai GP = Ge CC = Co	it Spo nd Au oprob	on ger e Sam	pler			for mercury. : Instrument not	' intervals were sampled and ana used to screen sample. Suppler on delineation of mercury-impact	nental

d		an	rtiluco	NEERS	Project Na	t No.: 2015Boring No.: MSSB-52t Name: Long Island RailroadSheet 1 of 1 .Massapequa SubstationBy: Albert Albano			
Drilling ( Driller: L		actor:	Zebra		-	eologist: Albert AlbanoBoring Completion Depth: 10'rilling Method: Direct PushGround Surface Elevation:			
Drill Rig:		-				mer Weight: NA	Boring Diameter: 1"		
Date Sta		<u>08/09/</u> Soil Sa		Mercury	Date Comp Photo-	leted: 08/09/04	Samples were collected in 2' in	tervals.	
			mpie	Vapor	ionization				
Depth	oth Rec.				Detector	Sample	Description	USCS	
(ft.)				(mg/m <sup>3</sup> )	(ppm)		_ <u></u>		
0' - 2' 2' - 4'	1 2	GP GP	24 24	.000 .000	-	Tan/brown medium silty sa Reddish brown medium sa			
4' –6'	3	GP	24	.000		Gray/tan medium sand.			
6' – 8 <b>'</b>	4	GP	24	.000		6'-7' - Black silty fine sand 7'-8' – Gray/white medium	, moist. sand, medium rock, moist.		
8' – 10'	5	GP	24	.00 <b>0</b>		Reddish tan medium sand	l, medium rock.		
SS = Spli HA = Har GP = Geo	Sample Types:NOTES:SS = Split Spoon0'-2', 2'-4', and 4'-6' intervals were sampled and analyzedHA = Hand Auger0'-2', 2'-4', and 4'-6' intervals were sampled and analyzedGP = Geoprobe Sampler- : Instrument not used to screen sample. SupplementaCC = Concrete Coresampling focused on delineation of mercury-impacted soi								

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d		\ an	virka d Irtilucc	NEERS	-	.: 2015 me: Long Island Railroad sapequa Substation	Boring No.: MSSB-53 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling					Geologist: Albert Albano Boring Completion Depth: 10'			
Driller:			_		· ·	thod: Direct Push	Ground Surface Elevation: -	
Drill Rig Date Sta						er Weight: NA Boring Diameter: 1" eted: 08/09/04 Samples were collected in 2' interv		
Date Sta		Soil Sa		Mercury		<b>Neted.</b> 00/09/04	Samples were collected in 2 in	
		001100	in pic	Vapor	ionization			]
Depth			Rec.	]	Detector	Sample	e Description	USCS
(ft.)	No.		(inches)	(mg/m <sup>3</sup> )	(ppm)			
0' - 2'	1	GP	24	.031		0'-6" - Brown silty fine san 6"-2' – Tan medium sand,		
2' - 4'	2	GP	24	.012		Black silty fine sand, medi concrete material, asphalt	um to heavy angular rock and and coal fragments.	
4'6'	3	GP	24	.000		Same as above.		
6' – 8'	4	GP	24	.020		6'-7' – Black silty fine sand 7'-8' – White medium sand 8'.	d. d, medium quartz rock. Wet at	
8' – 10'	5	GP	24	.000		Reddish brown/tan mediu	m sand, very heavy rock <b>, w</b> et.	
Sample SS = Spl HA = Ha GP = Ge CC = Co	it Spo nd Au oprob	ion Iger De Sam	pler			for mercury. : Instrument not	' intervals were sampled and ana used to screen sample. Supplen on delineation of mercury-impacte	nental

Drilling		) an Ba	ULTING ENGI	<b>i</b> NEERS	Mas	: 2015 me: Long Island Railroad sapequa Substation Albert Albano	Boring No.: MSSB-54 Sheet <u>1</u> of <u>1</u> . By: Albert Albano Boring Completion Depth: 6	
-					-			
Driller: L					-	thod: Direct Push	Ground Surface Elevation: -	-
Drill Rig:		-				mer Weight: NA	Boring Diameter: 1"	4 I
Date Sta						leted: 08/09/04	Samples were collected in 2' in	tervais.
		Soil Sa	ampie		Photo- ionization			
Depth	pth Rec.			ναμοι	Detector	Sample	Description	USCS
(ft.)				Campic				
			<u>(pp::)</u>	0'-1' - Brown silty fine to m	edium sand light rock			
	0' - 2' 1 GP 24 .000 2' - 4' 2 GP 21 .000					1'-2' – Tan/brown medium		
	٤		21			3.5'-4' Brown/tan mediu	m sand, medium to heavy rock.	
4'6' Sample 1						Light brown medium sand		
SS = Spli HA = Har GP = Geo CC = Cor	nd Au oprob	ger e Sam	pler			for mercury. : Instrument not	' intervals were sampled and ana used to screen sample. Supple on delineation of mercury-impact	nental

d		an	virka d artilucc	NEERS	-	ne: Long Island Railroad       Sheet _1_ of _1         apequa Substation       By: Albert Albano		
Drilling (					-	Albert Albano	Boring Completion Depth: 1	
Driller: l						thod: Direct Push	Ground Surface Elevation: -	
Drill Rig		-				mer Weight: NA	Boring Diameter: 1"	
Date Sta					,	pleted: 08/09/04	Samples were collected in 2' in	itervals.
	Soil Sample Mercur							
Depth			Rec.	Vapor	ionization Detector	Sample	Description	uscs
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )			besenption	
0' - 2'	1	GP	24	.000	<u>(PP····)</u>	Tan/brown medium sand.		
2' - 4'	2	GP	24	.050		Tan/gray medium sand, so	ome asphalt.	
4' –6'	3	GP	24	.028		Brown/black clay, moist, se	ome wood.	
6' – 8'	4	GP	24	.000		Tan medium sand, some r	rock fill material and asphalt.	
8' – 10'	5	GP	24	.000		8'-9' – Brown/gray clay, mo 9'-10' – Gray medium to co		
Sample SS = Spl HA = Hai GP = Ge CC = Co	it Spo nd Au oprob	on Iger De <u>Sam</u>	pler			analyzed for mercu	d 6'-8' intervals were sampled ar ry. used to screen sample. Suppler n delineation of mercury-impact	nental

d		an	rirka d rtilucc		Project Nai	oject No.:       2015       Boring No.:       MSSB-56         oject Name:       Long Island Railroad       Sheet 1 of 1       Of 1         Massapequa Substation       By:       Albert Albano			
Drilling ( Driller: L Drill Rig: Date Sta	uke Geo	actor: Tibbets oprobe	Zebra		Drilling Me Drive Hami	Albert Albano thod: Direct Push mer Weight: NA lleted: 08/09/04	NA Boring Diameter: 1"		
Depth					Photo- ionization Detector		Description	USCS	
(ft.)	No.		(inches)	$(mg/m^3)$	(ppm)				
0' - 2' 2' - 4'	0'-2' 1 GP 24 .000					Brown silty sand and tops Tan/brown medium sand,			
4'6'	3	GP	24	.000	-	Tan/reddish brown mediu	m sand, very light rock.		
Sample SS = Spli HA = Har GP = Ger CC = Cor	it Spo nd Au oprob	ion iger ie Samj	pler	l		for mercury. : Instrument not	' intervals were sampled and ana used to screen sample. Suppler on delineation of mercury-impact	nental	

d		an	virka d Irtilucc	NEERS	Project No.: 2015 Project Name: Long Island Railroad Massapequa Substation		Boring No.: MSSB-58 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling (	Contr	actor:	Zebra		Geologist: Albert Albano		Boring Completion Depth: 6'	
Driller: l	uke	Tibbets			Drilling Me	thod: Direct Push	Ground Surface Elevation: -	
Drill Rig:	Geo	probe			Drive Ham	mer Weight: NA	Boring Diameter: 1"	
Date Sta	rted:	08/09/	/04		Date Comp	oleted: 08/09/04	Samples were collected in 2' in	ntervals.
		Soil Sa	ample	Mercury				]
				Vapor	ionization	Comple		11000
Depth	Ma	<b>T</b>	Rec.	(m m / <sup>3</sup> )	Detector	Sample	Description	USCS
(ft.)	No.		(inches)	$(mg/m^3)$	(ppm)	Droum ailty fing to madium	and some mederately stiff	
	'-2' 1 GP 24 .000					clay zones, moist.	sand, some moderately stiff	
2' - 4' 4'6'	2 3	GP GP	24	.000		Tan medium sand, mediur Same as above.	m quartz rock and pea gravel.	
Sample	Гурез	s:				NOTES:		
SS = Spli HA = Har GP = Ge CC = Cor	nd Au oprob	iger be Samj	pler			for mercury. : Instrument not	0'-2', 2'-4', and 4'-6' intervals were sampled and analyzed for mercury. : Instrument not used to screen sample. Supplemental sampling focused on delineation of mercury-impacted soil.	

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d		an	rirka d rtilucc	NEERS	Project No.: 2015 Project Name: Long Island Railroad Massapequa Substation		Boring No.: MSSBX-01 Sheet <u>1</u> of <u>1</u> . By: Albert Albano		
Drilling C Driller: J Drill Rig:	I.W. I	Palmer	LAWES		Geologist: Albert Albano Drilling Method: Direct Push Drive Hammer Weight: NA		Boring Completion Depth: 2 Ground Surface Elevation: - Boring Diameter: 1"		
Date Star	rted:	02/06/	03		Date Comp	oleted: 02/06/03	Samples were collected in 2' in	tervals.	
		Soil Sa	mple	Mercury	Photo-				
Depth	h Rec. Vapor				ionization Detector	Sample	Description	uscs	
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)	Janpie	Description	0303	
4' - 6'	1	GP	24	.000	0.0	Tan medium to coarse sar gravel and rock, loose	nd with medium quartz pea		
6' - 8'	2	GP	24	.000	0.0	Tan/brown medium sand v rock	with light quartz pea gravel and		
8'-10'	3	GP	24	.000	0.0	Same			
10'-12'	4	GP	24	.000	0.0	10-10.5' – Same 10.5-11' – Black-stained sand with pebbles and rock (at water table)			
12'-14'	5	GP	24	.000	0.0	saturated Same	and with quartz pea gravel,		
14'-16'	6	GP	0	N/A	N/A	No recovery			
16'-18'	7	GP	0	N/A	N/A	No recovery			
18'-20'	8	GP	0	N/A	N/A	No recovery			
Sample 1 SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	o <b>n</b> ge <b>r</b> e Sam	pler		NOTES: All recovered interv PCBs, and RCRA r N/A: Not applicable		Cs,		

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	d		) an ) Ba	rirka d rtiluco		-	.: 2015 <b>me:</b> Long Island Railroad sapequa Substation	Boring No.: MSSBX-02 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
	Drilling ( Driller:			LAWES		-	Albert Albano thod: Direct Push	Boring Completion Depth: 20' Ground Surface Elevation:	
	Drill Rig						Drive Hammer Weight: NA Boring Diameter: 1"		
ŀ	Date Sta	rted:				Date Comp Photo-	bleted: 02/06/03	Samples were collected in 2' in	itervals.
l		Soil Sample Mercury Photo- Vapor ionization							
ĺ	Depth (ft.)	No.	Туре	Rec. (inches)	(mg/m <sup>3</sup> )	Detector (ppm)		e Description	ບຣດ
	4' - 6'	1	GP	24	.000	0.0	Tan medium to coarse sa rock	nd, heavy quartz pea gravel and	
	6' - 8'	2	GP	24	.000	0.0	Tan reddish brown mediu gravel	m sand, very light quartz pea	
	8'-10'	3	GP	24	.000	0.0	Same		
	10'-12'	4	GP	24	.000	0.0	10-10.5' – Same 10.5-11.5' – Black-stained quartz pea gravel	I medium to coarse sand, heavy	
	12'-14'	5	GP	18	.000	0.0	11.5-12' – Reddish brown Same	medium sand	
	14'-16'	6	GP	18	.000	0.0	Same		
	16'-18'	7	GP	0	N/A	N/A	No recovery		
	18'-20'	8	GP	0	N/A	N/A	No recovery		
	Sample SS = Spli HA = Har GP = Ge CC = Cor	it Spo nd Au oprot	oon iger oe Samj	pler			NOTES: All recovered interv PCBs, and RCRA i N/A: Not applicabl		Cs,

d		an	rirka d Irtilucc	NEERS	Project No.: 2015 Project Name: Long Island Railroad Massapequa Substation		Boring No.: MSSBX-03 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling C Driller: J Drill Rig:	I.W. F Geo	Palme <u>r</u> oprobe			Geologist: Albert Albano Drilling Method: Direct Push Drive Hammer Weight: NA		Boring Completion Depth: 20' Ground Surface Elevation: Boring Diameter: 1"	
Date Sta		02/06/ Soil Sa		Mercury Vapor	Date Comp Photo- ionization Detector	leted: 02/06/03	Samples were collected in 2' int	tervals.
Depth (ft.)	No.	Туре	(inches)	(mg/m³)		Sample	Description	0303
4' - 6'	1	GP	24	.000	0.0	Tan/brown medium to coa quartz pea gravel and rock	rse sand, medium to heavy <	
6' - 8'	2	GP	24	.000	0.0	Same		
8'-10'	3	GP	24	.000	0.0	8-9' – Black medium sand 9-10' – Orange/tan mediur		
10'-12'	4	GP	24	.000	0.0	Tan medium sand with he	avy quartz pea gravel	
12'-14'	5	GP	18	.000	0.0	Same		
14'-16'	6	GP	18	.000	0.0	Same		
16'-18'	7	GP	18	.000	0.0	Tan medium sand with ver	ry light quartz pea gravel	
18'-20'	8	GP	18	.000	0.0	Same		
Sample 1 SS = Spli HA = Har GP = Gec CC = Cor	t Spo nd Au oprob	on ger e Samj	pler	I	L	NOTES: All intervals sample RCRA metals.	ed for analysis of SVOCs, PCBs,	and

d		) Ba	virka d Irtilucc	NEERS	Project No.: 2015 Project Name: Long Island Railroad Massapequa Substation		Boring No.: MSSBX-04 Sheet <u>1</u> of <u>1</u> . By: Albert Albano		
Drilling ( Driller: Drill Rig: Date Sta	J.W. I Geo	Palmer oprobe			Drilling Me Drive Ham	Geologist: Albert AlbanoBoring Completion DepDrilling Method: Direct PushGround Surface ElevatDrive Hammer Weight: NABoring Diameter: 1"Date Completed: 02/07/03Samples were collected		o <b>n:</b>	
Depth		Soil Sa	Rec.	Mercury Vapor	Photo- ionization Detector		Description	USCS	
<u>(ft.)</u> 4' - 6'	No. 1	<b>Type</b> GP	(inches) 24	(mg/m <sup>3</sup> ) .000	<b>(ppm)</b> 0.0	Tan/brown medium sand v and rock	with medium quartz pea gravel		
6' - 8'	2	GP	24	.000	0.0	Same			
8'-10'	3	GP	24	.000	0.0	Same			
10'-12'	4	GP	18	.000	0.0		at top of water table nd with medium quartz pea		
12'-14'	5	GP	24	.000	0.0	gravel and rock Same			
14'-16'	6	GP	18	.000	0.0	Same			
16'-18'	7	GP	18	.000	0.0	Same			
18'-20'	8	GP	12	.000	0.0	Same			
Sample <sup>-</sup> SS = Spli HA = Har GP = Ge CC = Cor	it Spo nd Au oprob	on Iger Ie Samj	pler			NOTES: All recovered interv PCBs, and RCRA n	als sampled for analysis of SVO netals.	Cs,	

d		∖ an	rtiluco	NEERS	Project No.: 2015 Project Name: Long Island Railroad Massapequa Substation		Boring No.: MSSBX-05 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling C Driller: J Drill Rig: Date Stat	I.W. F Geo	actor: Palme <u>r</u> oprobe	LAWES		Geologist: Albert Albano Drilling Method: Direct Push Drive Hammer Weight: NA		Boring Completion Depth: 20' Ground Surface Elevation: Boring Diameter: 1"	
Depth		Soil Sa	Rec.	Mercury Vapor	Photo- ionization Detector	oleted: 02/06/03 Sample	Samples were collected in 2' in Description	USCS
(ft.) 4' - 6'	<u>No.</u> 1	GP	(inches) 24	(mg/m <sup>3</sup> ) .004	(ppm) 0.0	Tan/light brown medium to heavy quartz pea gravel a	o coarse sand with medium to nd rock	
6' - 8'	2	GP	24	.00 <b>3</b>	0.0	6-7' – Same 7-8' – Orange/tan sand wi	th light quartz pea gravel	
8'-10'	0'     3     GP     24     .000     0.0     Orange/tan medium to coarse sand with medium quartz pea gravel						arse sand with medium to heavy	
10'-12'	4	GP	24	.000	0.0	Orange/tan medium sand	with light quartz pea gravel	
12'-14'	5	GP	18	.003	0.0	Tan/light brown medium to medium quartz pea gravel		
14'-16'	6	GP	18	.000	0.0	Same		
16'-18'	7	GP	18	.000	0.0	Same		
18'-20'	8	GP	18	.003	0.0	Same		
Sample 1 SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	on ger e Samj	bler	L		NOTES: All intervals sample RCRA metals.	ed for analysis of SVOCs, PCBs,	and

Drilling ( Driller:			<b>TTILLCO</b> SULTING ENGI LAWES	NEERS	Project No.: 2015 Project Name: Long Island Railroad Massapequa Substation Geologist: Albert Albano Drilling Method: Hand Auger		Boring No.: MSSBX-06 Sheet <u>1</u> of <u>1</u> . By: Albert Albano Boring Completion Depth: 8' Ground Surface Elevation:	
Drill Rig:		-				Drive Hammer Weight: NA Boring Diameter: 1"		
Date Sta		02/06/ Soil Sa		Mercury	Date Comp Photo-	pleted: 02/06/03	Samples were collected in 2' ir	itervals.
Depth	Rec.				ionization Detector	Sample	Description	USCS
(ft.) 4' - 6'	No. 1	Type HA	(inches) 24	(mg/m <sup>3</sup> ) .003	(ppm) 0.0	Ton/brown modium cond u	vith medium quartz pea gravel	
6' - 8'	2	ΗΑ	24	.003	0.0	Same		
Sample T SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	on ger e Samj	pler			NOTES: Both intervals samp RCRA metals.	led for analysis of SVOCs, PCB	is, and

d		) an Ba	ITTILLCO	NEERS	Mas	me: Long Island Railroad sapequa Substation	Boring No.: MSSBX-07 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling C	Contr	actor:	LAWES		Geologist:	Albert Albano	Boring Completion Depth: 2	0'
Driller: J	I.W. F	<sup>o</sup> alme <u>r</u>			Drilling Me	thod: Direct Push	Ground Surface Elevation: -	
Drill Rig:	Geo	probe			Drive Ham	mer Weight: NA	Boring Diameter: 1"	
Date Star	rted:	02/06/	03		Date Comp	leted: 02/06/03	Samples were collected in 2' in	tervals.
		Soil Sa	mple	Mercury	Photo-			
ļ				Vapor	ionization			}
Depth	Rec.				Detector	Sample	e Description	USCS
(ft.)		Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)			ļ
4' - 6'	1	GP	24	.000	0.0	Tan medium sand with me rock	edium quartz pea gravel and	
6' - 8'	2	GP	24	.000	0. <b>0</b>	Tan medium sand with lig	ht quartz pea gravel and rock	
8'-10'	3	GP	24	.000	0.0	Same		
10'-12'	4	GP	18	.000	0. <b>0</b>	Tan medium sand with lig black staining at 10.5-11'	ht quartz pea gravel and rock, bgs (top of water table)	
12'-14'	5	GP	24	.000	0.0	Same, but saturated		
14'-16'	6	GP	0	N/A	N/A	No recovery		
16'-18'	7	GP	0	N/A	N/A	No recovery		
18'-20'	8	GP	0	N/A	N/A	No recovery		
Sample T SS = Split HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	on ger e Samp	bler	NOTES: All recovered interv PCBs, and RCRA N/A: Not applicable		Cs,		

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d		an	rtiluco	NEERS	-	.: 2015 me: Long Island Railroad sapequa Substation	Boring No.: MSSBX-09 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling Driller: Drill Rig: Date Sta	J.W. I Geo	Palmer			Drilling Me Drive Ham	Geologist: Albert AlbanoBoring Completion DepDrilling Method: Direct PushGround Surface ElevatDrive Hammer Weight: NABoring Diameter: 1"Date Completed: 02/06/03Samples were collected		
Depth		Soil Sa	Rec.	Mercury Vapor	Photo- ionization Detector	Sample	e Description	USCS
(ft.) 4' - 6'	No. 1	Type GP	(inches) 24	(mg/m <sup>3</sup> ) .004	(ppm) 0.0	Tan medium sand with m	edium quartz pea gravel, loose	
6' - 8'	2	GP	24	.003	0.0	6-7.5' – Same 7.5-8' – Reddish tan med pea gravel	ium sand with very light quartz	
8'-10'	8'-10' 3 GP 24 .000 0					Tan medium sand with m	edium quartz pea gravel	
10'-12'	4	GP	24	.000	0.0	Reddish tan sand with ligi bgs	ht quartz pea gravel, wet at 11'	
12'-14'	5	GP	0	N/A	N/A	No recovery		
14'-16'	6	GP	0	N/A	N/A	No recovery		
16'-18'	7	GP	18	.000	0.0	Tan medium sand, satura	ited, loose	
18'-20'	8	GP	0	N/A	N/A	No recovery		
Sample T SS = Spli HA = Har GP = Geo CC = Cor	it Spo nd Au oprob	oon iger oe Sa <b>m</b> j	pler		L	NOTES: All recovered inten PCBs, and RCRA N/A: Not applicable		DCs,

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d		an	rtiluco	NEERS		.: 2015 me: Long Island Railroad sapequa Substation	Boring No.: MSSBX-10 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling C	Contr	actor:	LAWES		Geologist:	Albert Albano	Boring Completion Depth: 2	2 <b>0'</b>
Driller: J	.W. F	Palmer			Drilling Me	thod: Direct Push	Ground Surface Elevation:	• ••• •••
Drill Rig:	Geo	probe			Drive Ham	me <mark>r Weight:</mark> NA	Boring Diameter: 1"	
Date Sta	rted:	02/03/	03		Date Comp	oleted: 02/03/03	Samples were collected in 2' ir	itervals.
		Soil Sa		Mercury Vapor	Photo- Ionization		'	
Depth		Turns	Rec.	(	Detector	Sample	e Description	USCS
<u>(ft.)</u> 4' - 6'	<u>NO.</u>	Type GP	(inches)	$(mg/m^3)$		Ten medium te eneme ee	ad day and loops	<b> </b>
4' - 6 6' - 8'	2		24	.003	0.0	Tan medium to coarse sai	na, ary ana ioose	
		GP	24	.003	0.0	6-7' - Same 7-8 – Tan/reddish medium quartz rock, dry and loose	n to coarse sand with medium	
8' - 10'	3	GP	24	. <b>0</b> 00	0.0	Tan/reddish sand, heavy p	bea gravel and quartz rock	
10' - <b>12</b> '	4	GP	24	.000	0.0	Brown silty sand, very hea wet below 10.5' bgs	ivy quartz pea gravel and rock,	
1 <b>2' - 14'</b>	5	GP	18	.000	0.0	Same		
14' - 16'	6	GP	0	N/A	N/A	No recovery		
16' - 18'	7	GP	18	.000	0.0	Brown silty sand, very hea wet below 10.5' bgs	ivy quartz pea gravel and rock,	
18' - 20'	8	GP	18	.000	0.0	Same		
Sample 1 SS = Split HA = Har GP = Geo CC = Cor	t Spo Id Au oprob	on ger e Samj	bler			NOTES: All recovered interv PCBs, and RCRA r N/A: Not applicable		  Cs,

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	7	<b>D</b> v	virka		<b>Project No</b>	.: 2015	Boring No.: IPSB-04A		
			_		Project Name: Long Island Railroad		Sheet <u>1</u> of <u>1</u> .		
		an		. :		Island Park Substation	By: Albert Albano		
	$\mathbf{\nabla}$	クBa	<b>ITTILLCO</b>						
Drilling	Contr				Geoloaist:	Albert Albano	Boring Completion Depth: 1	D'	
Driller:					-	thod: Direct Push	Ground Surface Elevation: -		
Drill Rig				,	-	mer Weight: NA	Boring Diameter: 1"		
Date Sta						bleted: 01/29/03	Samples were collected in 2' in	tervals	
Date Sta	neu.		ample	Mercury					
			ampie	Vapor	ionization				
Depth		1	Rec.		Detector	Sample	Description	USCS	
(ft.)	No.	Туре	(inches)	(mg/m³)	(ppm)	-			
6' - 8'	1	GP	24	.005	2.0	6-7' - Brown silty sand			
			l			7-8' - Sand fill material with	h heav <b>y</b> a <b>ngular</b> rock		
				044		ON Torth his and card	a quarte mat		
8' - 10'	2	GP	24	.014	2.0	8-9' – Tan/white sand, som	material with wood 1/2" thick,		
						light petroleum odors	Inaterial with wood /2 thick,		
								·	
					1				
						[			
			.     .					ſ	
								l	
Sample	Types	s:	L	•	•	NOTES:		•	
SS = Spli	it Spo	on				Both intervals samp	led for analysis of mercury.		
HA = Ha	nd Âu	iger							
GP = Ge	oprob	e Sam	ple <b>r</b>				Mercury readings appear to be false positives due to possible hydrogen sulfide interference from the soil.		
CC = Co	ncrete	e Core				possible hydrogen s	suitide interterence from the soil.		
					-				

d		an	rirka d rtilucc	NEERS	Project No Project Na	Boring No.: IPSB-12 Sheet <u>1</u> of <u>1</u> . By: Albert Albano			
Drilling (	Contr				Geologist:	Albert Albano	Boring Completion Depth: 1	0'	
Driller: (	Carl F	ederso	ก		Drilling Me	thod: Direct Push	Ground Surface Elevation: -	-	
Drill Rig:		_			-	mer Weight: NA	Boring Diameter: 1"		
Date Sta		-	03			bleted: 01/27/03	Samples were collected in 2' in	tervals.	
[]		Soil Sa		Mercury	Photo-	· · · · · · · · · · · · · · · · · · ·			
ļ			•	Vapor	ionization			} 1	
Depth					Detector	Sample	Description	USCS	
(ft.)	No.	Туре	(inches)	$(mg/m^3)$	(ppm)	-	•	[	
0' - 2'	1	GP	24	.008	0.0	Black-stained sand			
2' - 4'	2	GP	24	.008	0.0	Tan sand with some black	staining		
4' - 6'	3	GP	12	.005	0.0	4-5' – Black stiff yet pliable clay 5-6' – No recovery			
6' - 8'	4	GP	0	N/A	N/A	No recovery			
8' - 10'	5	GP	24	.000	0.0	Tan/white sand, heavy qua	rtz rock (up to 1 inch diameter)		
Sample Types:       NOTES:         SS = Split Spoon       2'-4', 4' - 6', 6' - 8' and 8' - 10' intervals were analyzed for         HA = Hand Auger       mercury. In addition, a surface sample was collected from         GP = Geoprobe Sampler       0"-2" and analyzed for mercury.         CC = Concrete Core       Mercury readings appear to be false positives due to possible hydrogen sulfide interference from the soil.         N/A: Not applicable.       N/A: Not applicable.									

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d	Dvirka and Bartilucci consulting Engineers prilling Contractor: LAWES priller: J.W. Palmer					.: 2015 me: Long Island Railroad Island Park Substation		
-			LAWES		-	Albert Albano	Boring Completion Depth: 1 Ground Surface Elevation: -	
Driller: Control Drill Rig:					-	thod: Direct Push mer Weight: NA	Boring Diameter: 1"	-
Date Sta		-	03			bleted: 01/29/03	Samples were collected in 2' in	tervals.
Date Old		Soil Sa		Mercury				
				Vapor	ionization			
Depth		_	Rec.		Detector	Sample	Description	USCS
(ft.)	No.		(inches)	(mg/m <sup>3</sup> )	(ppm)	0 47 A		
0' - 2'	1	GP	24	.025	0.4	clinker	d rock with coal remnants and	
2' - 4'	2	GP	24	.016	0.4	Same		
4' - 6'	3	GP	12	.004	0.4	4-5' – Gray/black silty clay,	, pliable	
6' - 8'	4	GP	24	.004	0.0		y sand, strong petroleum-like -like odors, wooden fragments	
8' - 10'	5	GP	18	.004	37	8-9.5 – Same 9.5-10 – Brown peat mater	rial	
Sample Types:         SS = Split Spoon         HA = Hand Auger         GP = Geoprobe Sampler         CC = Concrete Core             NOTES:         2'-4', 4' - 6', 6' - 8' and 8' - 10' intervals         mercury. In addition, a surface sample         0"-2" and analyzed for mercury.								

d		an	virka d Irtilucc	NEERS	Project No Project Na	: 2015 ne: Long Island Railroad Island Park Substation By: Albert Albano	
Drilling ( Driller: 、		actor:			-	Albert Albano         Boring Completion De           hod: Direct Push         Ground Surface Elevat	
Drill Rig:					-	ner Weight: NA Boring Diameter: 1"	
Date Sta	rted:	01/29	03			leted: 01/29/03 Samples were collected	in 2' intervals.
		Soil Sa	ample	Mercury Vapor	Photo- ionization		
Depth (ft.)	No.	Туре	Rec. (inches)	(mg/m <sup>3</sup> )	Detector (ppm)	Sample Description	USCS
0' - 2'	1	GP	24	.010	0.2	0-4° – Asphalt 4°-12° – Black angular rocky so <b>il</b> 1-2° – Tan sand	
2' - 4'	2	GP	24	.007	0.2	Gray/black silty sand	
4' - 6'	3	GP	24	.005	0.0	Same	
6' - 8'	4	GP	24	.006	0.0	Gray very fine silty sand	
8' - 10'	5	GP	24	.006	0.0	Brown peat material, spongy, organics (grass, roots	)
Sample T SS = Split HA = Han GP = Geo CC = Con	Spo d Au prob	on ger e Samj	bler			NOTES: 2'-4', 4' - 6', 6' - 8' and 8' - 10' intervals were a mercury. In addition, a surface sample was 0"-2" and analyzed for mercury.	
						Mercury readings appear to be false positive possible hydrogen sulfide interference from t	

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d		) an Ba	<b>rtiluc</b>			me: Long Island Railroad Island Park Substation				
Drilling Driller: Drill Rig	J. W. : Geo	Palmer oprobe		Drilling Method:Direct PushGroundDrive Hammer Weight:NABoring I			g Method: Direct PushGround Surface Elevation:Hammer Weight: NABoring Diameter: 1"		Ground Surface Elevation: Boring Diameter: 1"	
Date Sta		Soil Sa		Mercury Vapor	Photo- ionization	oleted: 01/29/03	Samples were collected in 2' in			
Depth (ft.)	No.	Туре	Rec. (inches)	(mg/m <sup>3</sup> )	Detector (ppm)	Sample	Description	USCS		
0' - 2' 2' - 4'	1	GP GP	24 24	.014	0.4	0-4" Asphalt 4"-8" Black rocky soil 8"-1' – Tan clayey stiff san 1-2' – Black sand with ang Black rocky sand and clay	ular rocks			
4' - 6'	3	GP	24	.008	0.4	4-5' – Same 5-6' – Gray clayey/silty sar	nd			
6' - 8'	4	GP	24	N/A	0.4	Gray very fine silty sand				
8' - 10'	5	GP	24	N/A	0.3	Peat material/organics (gra sulfide odor	ass, roots) spongy, hydrogen			
Sample SS = Spl HA = Har GP = Ge CC = Cor	it Spo nd Au oprob	ion iger ie Samj	Der	<u> </u>		mercury. In addition 0"-2" and analyzed Mercury readings a	nd 8' - 10' intervals were analyze n, a surface sample was collecte for mercury. ppear to be false positives due t sulfide interference from the soil	ed from o		

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Drilling		Ba CONS	TTILLCC	NEERS	Geologist:	me: Long Island Railroad Island Park Substation Albert Albano	Boring Completion Depth: 4	
Driller: J		Palmer			-	thod: Hand Auger mer Weight: NA	Ground Surface Elevation: - Boring Diameter: 1"	-
Date Sta	_					leted: 01/30/03	Samples were collected in 2' in	tervals.
		Soil Sa	ample	Mercury Vapor	Photo- ionization			
Depth		_	Rec.	_	Detector	Sample	Description	USCS
(ft.)		Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)			
0' - 2' 2' - 4'	1 2	на	24 24	.005 .005	0.0 0.0	Black/brown sand with coa Same	a tragments	
Sample 7 SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Aug oprob	on ger e Samp	bler			Mercury readings a	oled for analysis of mercury. ppear to be false positives due t sulfide interference from the soil	o

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d		an	virka d Irtilucc	NEERS	Project No.:       2015       Boring No.:       IPSB-17         Project Name:       Long Island Railroad       Sheet 1 of 1       Sheet 1         Island Park Substation       By:       Albert Albano				
Drilling (	Contr				Geologist:	Albert Albano	Boring Completion Depth: 4		
Driller:	J.W. F	Palmer			<b>Drilling</b> Me	thod: Hand Auger	Ground Surface Elevation:	-	
Drill Rig					Drive Ham	mer Weight: NA	Boring Diameter: 1"		
Date Sta		01/28/	/03			leted: 01/28/03	Samples were collected in 2' in	tervals.	
		Soil Sa		Mercury					
				Vapor	ionization			{	
Depth			Rec.		Detector	Sample	Description	USCS	
(ft.)	No.	Туре	(inches)	$(mg/m^3)$	(ppm)				
0' - 2'	1	HA	24	.000	0.0	0-0.5' - Gray gravel fill mate	erial		
				1		0.5-1.5' – Brown and black 1.5-2' – Brown and black n			
2' - 4'	2	HA	24	.000	0.0	Brown and black rocky san	d		
			) }						
		-							
Sample 7 SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	on ger e Samj	pler			NOTES: Both intervals samp	led for analysis of mercury.		

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d		) an Ba	ITTILUCO	NEERS	Project No Project Na	.: 2015 me: Long Island Railroad Island Park Substation			
Drilling Driller: Drill Rig Date Sta	J. W. :	<b>palm<u>e</u>r</b>			Drilling Me Drive Ham	Reologist: Albert AlbanoBoring Completion Depth:rilling Method: Hand AugerGround Surface Elevation:rive Hammer Weight: NABoring Diameter: 1"ate Completed: 01/30/03Samples were collected in 2"			
Depth (ft.)	N Rec.			Mercury Vapor (mg/m <sup>3</sup> )	Photo- ionization Detector (ppm)	Sample	Description	USCS	
0' - 2'	1	HA	24	.008	0.0	Black sand with large amo	unts of coal and clinker		
2' - 4'	2	HA	24	.005	0.0	Same			
•									
	-								
Sample SS = Spli HA = Har GP = Ge CC = Cor	t Spo nd Au oprot	ion iger ie Samj	pler				alyzed for mercury. In addition, s collected from 0"-2" and analyz		
	icre((	e core					ppear to be false positives due t sulfide interference from the soil		

Drilling			ITTILUCO	i NEERS	Project Na	ect No.: 2015       Boring No.: IPSB-19         ect Name: Long Island Railroad       Sheet 1 of 1 .         Island Park Substation       By: Albert Albano         logist: Albert Albano       Boring Completion Depth: 4'			
Driller: (					-	thod: Hand Auger	Ground Surface Elevation: -		
4		euersu	11			mer Weight: NA	Boring Diameter: 1"		
Drill Rig:		04107	00				Samples were collected in 2' in	tonyole	
Date Sta	_					pleted: 01/27/03	Samples were collected in 2 in	lervais.	
1		Soil Sa	ample	Mercury	Photo- ionization				
Depth			Rec.	Vapor	Detector	Sample	Description	uscs	
	No.	Turne	(inches)	(mg/m <sup>3</sup> )		Sample	Description		
(ft.) 0' - 2'	1	Type HA	24	.005	(ppm) 0.0	Tan silty sand			
2' - 4'	2	НА	24	.005	0.0	Same			
Sample T SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	on ger e Sam	pler			surface sample was mercury. Mercury readings a	nalyzed for mercury. In addition, s collected from 0"-2" and analyz oppear to be false positives due t sulfide interference from the soil	zed for o	

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Drilling C Driller: E Drill Rig: Date Sta	Brian	an Ba cons actor:	<b>TTILLCO</b> SULTING ENGI LAWES	NEERS	Geologist: Drilling Me Drive Ham	: 2015 me: Long Island Railroad Island Park Substation Albert Albano thod: Hand Auger mer Weight: NA bleted: 01/27/03	Boring No.: IPSB-20 Sheet <u>1</u> of <u>1</u> . By: Albert Albano Boring Completion Depth: 4 Ground Surface Elevation: Boring Diameter: 1" Samples were collected in 2' in	-
Depth		Soil Sa	Rec.	Mercury Vapor	ionization Detector	Sample	Description	USCS
(ft.)	No.	<u> </u>	(inches)	(mg/m³)	(ppm)			
0' - 2' 2' - 4'	1 2	НА	24 24	.005 .005	0.0 0.0	Reddish brown sand with a Same	ingular rocks and concrete	
Sample 7						NOTES:		
SS = Spli HA = Har GP = Geo CC = Cor	nd Aug oprob	ger e Samj	pler			Mercury readings a	ted for analysis of mercury. ppear to be false positives due t sulfide interference from the soil	

d			ITTILUCO	i NEERS		me: Long Island Railroad Island Park Substation				
Drilling (	Contr	actor:	LAWES		Geologist:	Albert Albano	Boring Completion Depth: 2	0'		
Driller: J	.W. F	Palmer			Drilling Me	thod: Direct Push	Ground Surface Elevation: -			
Drill Rig:	Geo	probe			Drive Ham	mer Weight: NA	er Weight: NA Boring Diameter: 1"			
Date Sta		-	03		•	pleted: 01/29/03	Samples were collected in 2' in	tervals.		
	_	Soil Sa		Mercury						
}				Vapor	ionization			{		
Depth			Rec.		Detector	Sample	Description	USCS		
(ft.)	No.	Туре	(inches)	$(mg/m^3)$	(pp <b>m)</b>		•			
10' - 12' 12' - 14'	1	GP GP	24	.022	3.7	10-11' – Brown peat mater sulfide odor 11-12' – Black soft clay 12-13' – Same	iał (grass, roots), hydrogen			
12 - 14	2 3	GP	24	.008	3.7	12-13 – Same 13-14' – No recovery Brown peat material, spon	gy, hydrogen sulfide odor			
16' - <b>18</b> '	4	GP	24	.005	3.9	Gray very fine silty sand				
18' - 20'	5	GP	24	.005	0.0	Same				
Sample T SS = Split HA = Han GP = Gec CC = Con	Spo d Au prob	on ger e Samp	bler			approximately 10' d All intervals collecte (VOCs, SVOCs, RC Mercury readings approximately set the set of the	ough Rectifier Dry Well. Dry we eep and had 5' of standing wate d for analysis of UIC constituen RA metals, and TPHs). ppear to be false positives due t sulfide interference from the soil	er in it. ts O		

d		<u>an</u>	rirka d rtilucc	i NEERS	Project No Project Na	: 2015 me: Long Island Railroad Island Park Substation	Boring No.: IPSB-22 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling Q	Contr	actor:	LAWES		Geologist:	Albert Albano	Boring Completion Depth: 4	•
Driller:	J. W.	Palmer			Drilling Me	thod: Direct Push	Ground Surface Elevation: -	-
Drill Rig:	Geo	probe			Drive Ham	mer Weight: NA	Boring Diameter: 1"	
Date Sta	rted:	01/29/	03		Date Comp	leted: 01/29/03	Samples were collected in 2' in	tervals.
		Soil Sa	ample	Mercury				
ļ				Vapor	ionization			1
Depth			Rec.		Detector	Sample	Description	USCS
<u>(ft.)</u>	_	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)			
0' - 2'	1	GP	24	.005	0.9	0-4" Asphalt		
2' - 4'	2	GP	24	<b>.005</b> .	0.9	4 -2 - Black/brown sand f Same	ill material with coal fragments	
Sample T SS = Split HA = Han GP = Geo CC = Cor	t Spor d Aug oprob	on jer e Samp	bler				vals were analyzed for UIC cons CRA metals, and TPHs).	tituents

d		<u>an</u>	virka d Irtilucc	-i	Project No Project Na	me: Lor	5 ng Island Railroad Ind Park Substation	Boring No.: IPSB-23 Sheet <u>1</u> of <u>1</u> . By: Albert Albano		
	$\sim$	CONS	ULTING ENG							
Drilling (					Geologist:			Boring Completion Depth: 4		
Driller: 、	J. W.	Palmer	•		Drilling Me			Ground Surface Elevation:	- (	
Drill Rig:	Geo	probe			Drive Ham		-	Boring Diameter: 1"	1	
Date Sta	rted:	01/29/	03		Date Comp	pleted:	01/29/03	Samples were collected in 2' in	tervals.	
		Soil Sa	ample	Mercury	Photo-	}				
ļ			·····	Vapor	ionization	}				
Depth			Rec.	3	Detector	{	Sample	Description	USCS	
(ft.)		Туре	(inches)	$(mg/m^3)$						
0' - 2'	1	GP	24	.021	0.0		stained fill material, i ns of tan sand, with (		1	
Į					1	Section	ns or lan sand, with	20ai mayments		
						{				
2' - 4'	2	GP	24	.021	1.8	Same				
						<b>!</b>				
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Sample							NOTES:			
SS = Spli								vals were analyzed for UIC cons	tituents	
HA = Har			I				(VOUS, SVOUS, RU	RA metals, and TPHs).		
GP = Geo CC = Cor			pier				Mercury readings a	opear to be false positives due to		
00 - 00	icrete	e core						sulfide interference from the soil.		
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d		<u>an</u>	rirka d Irtilucc	NEERS	Project No Project Na	.: 2015 me: Long Island Railroad Island Park Substation	Boring No.: IPSB-24 Sheet <u>1</u> of <u>1</u> . By: Albert Albano			
Drilling (		actor:			-	Albert Albano	Boring Completion Depth: 4			
Driller: J Drill Rig:					-	thod: Direct Push mer Weight: NA	Ground Surface Elevation: • Boring Diameter: 1"	ation:		
Date Sta		•	03			bleted: 01/29/03	Samples were collected in 2' ir	tervals.		
	Soil Sample Mercury Vapor			Mercury Vapor	Photo- ionization					
Depth			Rec.		Detector	Sample	Description	USCS		
(ft.) 0' - 2'	No. 1	<b>Type</b> GP	(inches) 24	(mg/m <sup>3</sup> ) .024	(ppm) 1.8	Tan/brown fine to coarse s				
2' - 4'	2	GP	24	.024	1.8	Same	·			
Sample T SS = Split HA = Han GP = Geo CC = Con	Spo d Au prob	on ger e Samp	bler			(VOCs, SVOCs, RC Mercury readings ap	rals were analyzed for UIC cons RA metals, and TPHs). opear to be false positives due to sulfide interference from the soil	o		

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d		an	rirka d rtilucc	NEERS	Project No.:       2015       Boring No.:       IPSB-25         Project Name:       Long Island Railroad       Sheet 1 of 1 .         Island Park Substation       By:       Albert Albano			
Drilling (	Contr				Geologist: Albert Albano Boring Completion Depth: 4			•
Driller: J	.W. F	Palmer			<b>Drilling Me</b>	thod: Direct Push	Ground Surface Elevation: -	-
Drill Rig:					Drive Ham	mer Weight: NA	Boring Diameter: 1"	
Date Sta		•	03			ate Completed: 01/29/03 Samples were collected in 2' inter		
	_	Soil Sa		Mercury				
				Vapor	ionization			
Depth			Rec.		Detector	Sample	Description	USCS
(ft.)	No.	Туре	(inches)	( <b>mg/</b> m <sup>3</sup> )	(ppm)			
0' - 2'	1	GP	24	.210	1.4	Black/brown/tan medium s agglomerations of tan stiff		
2' - 4'	2	GP	24	.210	1.0	Same		
Sample 1 SS = Spli HA = Har GP = Geo CC = Cor	t Spo Id Au oprob	on ger e Samj	pler			(VOCs, SVOCs, RO Mercury readings a	vals were analyzed for UIC cons CRA metals, and TPHs). ppear to be false positives due to sulfide interference from the soil.	0

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d		an	rirka d rtilucc	NEERS	Project No. Project Na	: 2015 me: Long Island Railroad Island Park Substation	Boring No.: IPSB-26 Sheet <u>1</u> of <u>1</u> . By: Albert Albano		
Drilling (	Contr				Geologist:	Albert Albano	Boring Completion Depth: 4	,	
Driller: J	).W. F	Palmer			<b>Drilling Me</b>	thod: Hand Auger	Ground Surface Elevation: -	~	
Drill Rig:					Drive Ham	mer Weight: NA	Boring Diameter: 1"		
Date Sta	rted:	01/30/	03		Date Comp	leted: 01/30/03	Samples were collected in 2' in	tervals.	
		Soil Sa	ample	Mercury Vapor	Photo- ionization		· · · ·		
Depth	Rec. Detector Sample Description		Description	USCS					
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)		·		
0' - 2' 2' - 4'	1	HA HA	24	.008 .008	0.0	Tan/reddish-brown sand fil Gray/black-stained sand, n			
Sample T SS = Split HA = Han GP = Geo CC = Con	Spo d Au prob	on ger e Sam <sub>l</sub>	bler			SVOCs, PCBs, and Mercury readings a	rom 0-2", 0-2', and 2-4' for analy RCRA metals. opear to be false positives due t sulfide interference from the soil	o	

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d		an	rirka d Irtilucc	;i NEERS	Project No. Project Na	: 2015 me: Long Island Railroad Island Park Substation	Boring No.: IPSB-27 Sheet <u>1</u> of <u>1</u> . By: Albert Albano		
Drilling ( Driller: J Drill Rig:	J.W. F	actor:			Drilling Me	Albert Albano thod: Hand Auger mer Weight: NA			
-		01/20/	10.2			bleted: 01/30/03	Samples were collected in 2' in	tervals	
Date Sta				Mercury			Camples were conceled in 2 in		
}	Soil Sample Mercury Vapor			-	ionization				
Depth			Rec.	Tapor	Detector	   Sample	Description	uscs	
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)				
0' - 2'	1	HA	24	.008	0.0	Brown/tan/red sand			
2' - 4'	2	НА	24	.008	0.0	Gray silty sand, wet			
Sample 1 SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	on ger e Samj	pler			RCRA metals. Mercury readings a	cted for analysis of SVOCs, PCE ppear to be false positives due t sulfide interference from the soil	0	

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d			TTILLCO	NEERS		me: Long Island Railroad Island Park Substation	<u> </u>	
Drilling (					-	Albert Albano	Boring Completion Depth: 4	
Driller: J			•			thod: Direct Push	Ground Surface Elevation: -	
Drill Rig:		-				me <b>r Weight:</b> NA	Boring Diameter: 1"	ľ
Date Sta						leted: 01/30/03	Samples were collected in 2' in	tervals.
		Soil Sa	-	Mercury Vapor	ionization			
Depth		_	Rec.		Detector	Sample	Description	USCS
(ft.)	_	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)		· •	
0' - 2' 2' - 4'	1 2	GP GP	24 24	.013 .012	0.2	<ul> <li>0-1' Black sand, heavy ro</li> <li>1-2' Tan sand with quartz</li> <li>2-3' Same</li> <li>3-4' Tan/brown very fine</li> </ul>	z rock	
<b>Ca</b>								
Sample 1 SS = Spli HA = Har GP = Geo CC = Cor	t Spo Id Au oprob	on ger e Samj	pler			and RCRA metals. Mercury readings a	vals were analyzed for SVOCs, ppear to be false positives due f sulfide interference from the soi	o

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Drilling ( Driller: Drill Rig: Date Sta	J.W. I ; rted:	an Ba cons actor: Palmer	ULTING ENGI LAWES	NEERS Mercury Vapor	Geologist: Drilling Me Drive Hamı Date Comp	: 2015 ne: Long Island Railroad Island Park Substation Albert Albano thod: Hand Auger ner Weight: NA Ileted: 01/28/03	Boring No.: IPSB-29 Sheet <u>1</u> of <u>1</u> . By: Albert Albano Boring Completion Depth: 4 Ground Surface Elevation: - Boring Diameter: 1" Samples were collected in <u>2</u> ' in	
Depth	Rec.			, vapoi	Detector	Sample	Description	uscs
(ft.)	No.	No. Type (inches) (mg/m <sup>3</sup> )			(ppm)			
0' - 2'	1	HA	24	.000	0.0	Tan fine silty sand		
2' - 4' Sample 1	2	HA	24	.000	0.0	Tan medium sand, moist		
Sample SS = Spli HA = Har GP = Geo CC = Cor	t Spo nd Au oprob	on ger e Sam	pler				vals were analyzed for SVOCs, I	PCBs,

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d		<u>an</u>	irka d rtilucc	NEERS	-	Project No.:       2015       Boring No.:       IPSBX-01         Project Name:       Long Island RailRoad       Sheet 1 of 1 .         Island Park Substation       By:       Albert Albano		
Drilling ( Driller: ( Drill Rig:	Carl F	ederso		_	Drilling Me	eologist: Albert AlbanoBoring Completion Depth: 20'rilling Method: Direct PushGround Surface Elevation:rive Hammer Weight: NABoring Diameter: 1"		
Date Sta		•	03			bleted: 01/27/03	Samples were collected in 2' in	tervals
Date ota		Soil Sa		Mercury				
	Vapor				ionization			
Depth		-	Rec.	3	Detector	Sample	Description	USCS
(ft.)	No.	Type	(inches)	$(mg/m^3)$	(ppm)	A.F. Deck and concerts		·
4' - 6'	1	GP	24	.005	0.0	4-5' – Rock and concrete 5-6' – Gray medium sand v	vith shell remnants	
6' - 8'	2	GP	12	.005	0.0	6-7' No recovery 7-8' Gray medium sand v (grass, roots)	with peat material/organics	
8' - 10'	. 3	GP	24	.007	0.0	Black, brown and green pe	at material, spongy, ogranics	
10' - 12'	4	GP	24	.007	0.0	Same, but moist to wet		
12' - 14'	5	GP	18	.006	0.0	Same		
14' - 16'	6	GP	18	.000	0.0	Same		
16' - 18'	7	GP	24	.006	0.0	Same		
18' - 20'	8	GP	24	.003	0.0	18-19' – Same 19-20' – Gray medium to c	oarse sand, wet.	
Sample 1 SS = Split HA = Har GP = Gec CC = Cor	t Spo Id Au oprob	on ger e Samj	bler	L	L	PCBs, and RCRA m Mercury readings a	s collected for analysis of SVOC netals. ppear to be false positives due t sulfide interference from the soil	o

	1	Dν	<b>irka</b>		Project No		Boring No.: IPSBX-02	-		
		an	-		Project Na	me: Long Island Railroad	Sheet <u>1</u> of <u>1</u> .			
	$\sum$	<b>\                                    </b>	u I <b>rtiluco</b> Sulting Engl	NEERS		Island Park Substation	By: Albert Albano			
Drilling C	Contr	actor:			Geologist:	Albert Albano	Boring Completion Depth: 2	0'		
Driller: J	. W.	Palmer			<b>Drilling Me</b>	Drilling Method: Direct Push Ground Surface Elevation:				
Drill Rig:	Geo	probe			Drive Ham	mer Weight: NA	Boring Diameter: 1"			
Date Star		•	03		Date Comr	ate Completed: 01/28/03 Samples were collected in 2' interv				
	_	Soil Sa		Mercury	Photo-		·	1		
	Vapor			-	ionization			ł.		
Depth			Rec.		Detector	Sample	Description	USCS		
(ft.)	No.	Туре	(inches)	$(mg/m^3)$	(ppm)					
4' - 6'	1	GP	24	.000	0.0	4-4.5' - Gray fine to mediu				
						4.5-5' - 3" layer of shell re		}		
} {						5-6' – Black clay mixed wit	h shell remnants	{		
6' - 8'	2	GP	24	.00 <del>9</del>	0.0	Black/brown soft pliable cla	ay, hydrogen sulfide odor			
8' - 10'	3	GP	24	.014	0.0	0.0 <b>8-9.5' - Gray v</b> ery fine silty sand. 9.5-10' – Black/brown peat material/organics (grass, roots)				
10' - 12'	4	GP	24	.005	0.0	Gray very fine silty sand, s	aturated			
12' - 14'	5	GP	24	.005	0.0	12-13' Same 13-14' Black/brown peat	material			
14' - 16'	6	GP	24	.005	0.0	14-15' – Same 15-16' – Gray very fine silt	y sand			
16' - 18'	7	GP	24	.005	0.0	Same				
18' - 20'	8	GΡ	24	.005	0.0	18-19' – Black/brown peat 19-20' – Gray very fine sar				
Sample T SS = Split HA = Han GP = Geo CC = Con	Spo d Au prob	on ger e Samp	bler			PCBs, and RCRA n Mercury readings a	ppear to be false positives due to	D		
·						possible hydrogen s	sulfide interference from the soil.			

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	7	Dv	irka		Project No		Boring No.: IPSBX-03	_
	6	an	-		Project Na	me: Long Island Railroad	Sheet <u>1</u> of <u>1</u> .	
Q	$\sum$	))Ba	TTILLCO	NEERS		Island Park Substation	By: Albert Albano	
Drilling (	Contr	actor:	LAWES		Geologist: Albert Albano Boring Completion Depth: 2			)'
Driller: J	.W. I	Palmer			Drilling Method: Direct Push Ground Surface Elevation:			-
Drill Rig:	Geo	oprobe			Drive Ham	Drive Hammer Weight: NA Boring Diameter: 1"		
Date Sta	rted:	01/28	03			pleted: 01/28/03	Samples were collected in 2' int	ervals.
		Soil Sa	ample	Mercury	Photo-			
	Vapor			Vapor	ionization			
Depth			Rec.		Detector	Sample	Description	USCS
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)			
6' - 8'	1	GP	24	.006	0.0	6-7.5 – Black silty clay, sof 7.5-8 – Gray very fine, very		
8' - 10'	2	GP	24	.005	0.0	8-9' Same 9-10' Brown peat materia spongy, hydrogen sulfide o		
.10' - 12'	3	GP	24	.005	0.0	Gray very fine silty sand, si sulfide odors	upersaturated, hydrogen	
12' - 14'	4	GP	24	.006	0.0	Brown peat material, orgar	nics, hydrogen sulfide odors	
14' - 16'	5	GP	24	.006	0.0	14-14.5' – Peat material 14.5-16' – Gray fine to very	y coarse silty sand	
16' - 18'	6	GP	24	.006	0.0	Same		
18' - 20'	7	GP	24	.006	0.0	18-19' – Peat material with 19-20' – Tan and brown m		
Sample T SS = Split HA = Han GP = Geo	t Spo Id Au Isprob	on ger e Samj	pler	L	<u> </u>	PCBs, and RCRA n		
CC = Cor	crete	e Core					ppear to be false positives due to sulfide interference from the soil.	

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	7	Dv	virka		Project No		1 <del>-</del>		
	·	h an	d		Project Na	me: Long Island Railroad	Sheet <u>1</u> of <u>1</u> .		
Q	$\sum_{n}$	))Ba	<b>TTILUCO</b>			Island Park Substation By: Albert Albano			
Drilling	Contr	actor:	LAWES		Geologist:	Albert Albano	Boring Completion Depth: 2	0'	
Driller:	J.W. 1	Palmer			Drilling Me	thod: Direct Push	Ground Surface Elevation: -		
Drill Rig	: Geo	oprobe			Drive Ham	mer Weight: NA	Boring Diameter: 1"		
Date Sta	rted:	01/28	/03		Date Comp	oleted: 01/28/03	Samples were collected in 2' in	tervals.	
				Mercury Vapor	Photo- ionization				
Depth			Rec.	1	Detector	Sample	Description	USCS	
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)				
4' - 6'	1	GP	24	.006	0.0	Brown medium silty sand,	some clay		
6' - 8'	2	GP	24	.304	0.0	Brown/black silty clay, stiff odors	<b>yet pliable</b> , hydrogen sulfide		
8' - 10'	3	GP	24	.005	0.0	0.0 8-9' – Gray very fine silty sand, hydrogen sulfide odors 9-10' – Black/brown peat material/organics (grass, roots)			
10' - 12'	4	GP	24	.005	0.0	Gray very fine silty sand			
12' - 14'	5	GP	24	.005	0.0	12-12.5' – Same 12.5-14' – Black/brown pea	at material		
14' - 16'	6	GP	24	.005	0.0	Gray medium to very coars	se slity sand		
16' - 18'	7	GP	24	.005	0.0	Same			
18' - 20'	8	GP	24	.006	0.0	Same			
Sample T SS = Split HA = Han GP = Geo	t Spo Id Au	on ger	bler			NOTES: All sampled interval: PCBs, and RCRA m	s collected for analysis of SVOC netals.	s,	
CC = Con							opear to be false positives due to ulfide interference from the soil.		

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d		) an Ba	TTILLCC	NEERS	Project Na	oject No.: 2015 oject Name: Long Island Railroad Island Park Substation Boring No.: IPSBX-05 Sheet <u>1</u> of <u>1</u> . By: Albert Albano				
Drilling ( Driller: E		actor:	LAWES		Drilling Me	Albert Albano thod: Direct Push	Boring Completion Depth: 20 Ground Surface Elevation:			
Drill Rig:		•				mmer Weight: NA Boring Diameter: 1"				
Date Sta					<u>`</u>	leted: 01/23/03	Samples were collected in 2' in	tervals.		
		Soil Sa	ample	Mercury						
Danth			Dee	Vapor	ionization Detector		Description	uscs		
Depth (ft.)				(malm <sup>3</sup> )	(ppm)	Sample	Description	0303		
10' - 12'	1	GP	24	.125	0.0	Black neat material and or	ganics (grass, roots), heavy			
10 - 12		Or	24	. 120	0.0	hydrogen sulfide odors	yanics (yrass, 10013), ficavy			
12' - 14'	2	GP	24	N/A	0.0	Same				
14' - 16'	3	GP	24	N/A	0.0	Gray medium to coarse sa	nd, wet			
16' - 18'	4	GP	24	N/A	0.0	Same				
18' - 20'	5	GP	18	N/A	0.0	Gray fine sand, wet				
Sample T	vpe	s:				NOTES:				
SS = Split HA = Han GP = Geo	t Spo Id Au	on ger	bler				s collected for analysis of SVOC netals.	Ċs,		
<b>CC =</b> Con					,		ppear to be false positives due to sulfide interference from the soil.			
							<sup>st</sup> sample, Mercury meter needed d not use it for remaining, deepe			
	N/A: Not applicable.									

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Drilling	Cont	ractor:	LAWES		Geologist:	Albert Albano	Boring Completion Depth: 2	0'
Driller:	Carl F	Pederso	n		Drilling Me	thod: Direct Push	Ground Surface Elevation: -	
Drill Rig	: Ge	oprobe			Drive Ham	mer Weight: NA	Boring Diameter: 1"	
Date Sta	rted:	01/27/	03		Date Com	oleted: 01/27/03	Samples were collected in 2' in	tervals.
		Soil Sa	ample	Mercury	Photo-	1		
l	Vapor		ionization			[		
Depth			Rec.	{	Detector	Sample	Description	USCS
(ft.)	No.	Type	(inches)	(mg/m <sup>3</sup> )	(ppm)	-	·	}
4' - 6' 6' - 8'	1 2	GP GP	18	.005	0.0 3.7	macro liner		
8' - 10'	3	GP	 18	.006	0.0	8-9.5' – Black/gray soft silt 9.5-10' – Gray fine sand	y clay, a little stiff	
10' - 12'	4	GP	18	.008	0.0	Gray fine very silty sand, s	aturated	
12' - 14'	5	GP	18	.009	0.0	Gray fine to medium sand, (peat material, grass, roots		
14' - 16'	6	GP	18	.005	0.0	14-15' – Peat material, stiff 15-16' – Gray fine to mediu organics throughout		
16' - 18'	7	GP	24	.012	0. <b>0</b>	Gray fine to medium sand, throughout	some peat and organics	
18' - 20'	8	GP	24	.005	0.0	Same		
Sample T SS = Split HA = Han GP = Gec CC = Cor	t Spo Id Au oprob	on ger e Samp	bler			PCBs, and RCRA m Mercury readings ap	s collected for analysis of SVOC netals. opear to be false positives due to sulfide interference from the soil.	0

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Drilling ( Driller: ( Drill Rig:	Carl F	actor: Pederso	LAWES		Drilling Me	Albert AlbanoBoring Completion Depth: 20'ethod: Direct PushGround Surface Elevation:mer Weight: NABoring Diameter: 1"		
Date Sta	_					oleted: 01/27/03	Samples were collected in 2' in	tervals.
		Soil Sa	ample	Mercury	Photo- ionization			
Depth (ft.)	No.	Туре	Rec. (inches)	Vapor (mg/m³)	Detector (ppm)	Sample	Description	USCS
4' - 6'	1	GP	24	.006	0.0	Gray fine sand, some peat sporadic silty clay zones	material and shell remnants,	
6' - 8'	8' 2 GP 24 .005 0.0 Gra					Gray/black very fine silty s	and, <b>shell</b> remnants, loose, wet	
8' - 10'	3	GP	24	.007	0.0	Gray clay, medium stiffnes	s, moist	
10' - 12'	4	GP	24	.024	0.0	Gray very fine silty sand, s	upersaturated	
12' - 14'	5	GP	18	.017	0.0	Gray very fine silty sand wi hydrogen sulfide odors	ith organic/peat material,	
14' - 16'	6	GP	18	.020	0.0	14-15.5' — Same 15.5-16' — Gray medium sa	and	
16' - 18'	7	GP	18	.005	0.0	Gray fine to medium sand throughout	with sporadic peat layers	
18' - 20'	8	GP	18	.005	0.0	Same		
Sample 1 SS = Split HA = Han GP = Gec CC = Cor	i Spo Id Au Isprob	on ger e Samj	bler	<u> </u>		PCBs, and RCRA r Mercury readings a	ls collected for analysis of SVOC netals. ppear to be false positives due t sulfide interference from the soil	0

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Drilling ( Driller: 、 Drill Rig:	). W.	Palmer			Drilling Me	Albert Albano ethod: Direct Push mer Weight: NA	Boring Completion Depth: 20' Ground Surface Elevation: Boring Diameter: 1"		
Date Sta		•	03		<b>k</b>	oleted: 01/28/03	Samples were collected in 2' in	tervals.	
		Soil Sa	ample	Mercury					
Depth		<b></b>	Rec.	Vapor	ionization Detector	Sample	Description	USCS	
(ft.)	No.	Туре	(inches)	(mg/m³)	(ppm)	l ogubie	Description	0000	
4' - 6'	1	GP	24	.007	0.0	4-4.5' – Tan/brown/red fine 4.5-6 – Black fine very silty medium stiffness			
6' - 8'	2	GP	24	.006	0.0	Black/gray soft and pliable	clay		
8' - 10'	3	GP	24	.006	0.0	8-9.5 Same 9.5-10 Gray very fine silly	<b>y sand, some</b> grass/peat		
10' - 12'	4	GP	24	.007	0.0	Gray very fine silly sand, s	upersaturated		
12' - 14'	5	GP	24	.005	0.0	Same			
14' - 16'	6	GP	24	.005	0.0	14-14.5' – Peat material (g 14.5-16 - Gray fine to coars			
16' - 18'	7	GP	24	.003	0.0	Same			
18' - 20'	8	GP	24	.003	0.0	Same			
Sample 1 SS = Split HA = Han GP = Gec CC = Con	t Spo Id Au Iprob	on ger e Samp	bler			PCBs, and RCRA m Mercury readings ap	s collected for analysis of SVOC netals. opear to be false positives due to sulfide interference from the soil.	,	

d		) ) Ba	virka d artilucc	NEERS	Project No Project Na	.: 2015 me: Long Island Railroad Island Park Substation	Boring No.: IPSBX-09 Sheet <u>1</u> of <u>1</u> . By: Albert Albano		
Drilling (	Contr	actor:	LAWES		Geologist:	Albert Albano	Boring Completion Depth: 2	0'	
Driller:					Drilling Me	thod: Direct Push	Ground Surface Elevation:	-	
Drill Rig:					Drive Ham	mer Weight: NA	Boring Diameter: 1"		
Date Sta		•	03			sleted: 01/29/03	Samples were collected in 2' in	tervals.	
		Soil Sa		Mercury	Photo-				
		0011 00	anpic	Vapor	ionization				
Depth			Rec.		Detector		Description	USCS	
(ft.)	No.	Туре		(mg/m <sup>3</sup> )	(ppm)				
4' - 6'	1	GP	12	.007	0.0	4-5' – Tan/red medium silty 5-6' – No recovery	y sand		
6' - 8'	2	GP	12	.008	0.0	6-7' - Gray silty clay, stiff			
8' - 10'	3	GP	12	.005	0.0	8-9.5' - Gray silty clay, stiff 9.5-10' – Gray silty sand	yet pliable		
10' - 12'	4	GP	24	.006	0.0	Gray silty, loose, super-sat	urated sand		
12' - 14'	5	GP	24	.009	0.0	12-12.5' Same 12.5-14' Gray silty clay a	nd peat material/organics		
14' - 16'	6	GP	24	N/A	0.0	14-15' – Gray fine to coars 15-16' – Tan/brown mediui	e sand m to coarse sand		
16' - 18'	7	GP	24	.005	0.0	Brown peat material/organ	ics, hydrogen sulfide odor		
18' - 20'	8	GP	24	.006	0.0	Gray very fine silty sand, lo	ose, supersaturated		
Sample 1 SS = Spli HA = Har GP = Geo CC = Cor	t Spo Id Au oprob	on ger e Samj	bler			PCBs, and RCRA n Mercury readings a	ppear to be false positives due to sulfide interference from the soil.	0	

	d			TTILLCO	NEERS		<b>me:</b> Lor Isla	ng Island RailRoad nd Park Substation	Boring No.: IPSBX-10 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
	Drilling ( Driller: E Drill Rig:	Brian	. –	LAWES		Geologist: Drilling Me Drive Ham	thod:	Direct Push	Boring Completion Depth: 1 Ground Surface Elevation: - Boring Diameter: 1"	
	Date Sta	rted:	01/23/	03		Date Comp	pleted:	01/23/03	Samples were collected in 2' in	tervals.
			Soil Sa	mple	Mercury	Photo-				
ĺ	Danth			Rec.	Vapor	ionization Detector		Sample	Description	USCS
	Depth (ft.)	No.	Type		(mg/m <sup>3</sup> )	(ppm)		Sample	Description	
	8' - 10'	1	GP	24	.300	0.0		soft, pliable clay, a lit en sulfide odor	ttle stiff, wood fragments,	
	10' - 12'	2	GP	24	.375	0.5		grass), getting more	organics (peat material, salt e sandy with depth, hydrogen	
	12' - 14'	3	GP	18	.020	0.2	Gray c sulfide		anics, moist to wet, hydrogen	
	14' - 16'	4	GP	18	.014	0.0	Gray n	nedium to coarse sa	nd, loose, wet	
	16' - 18'	5	GP	18	. <b>01</b> 5	0.0	Fine to	mediu <b>m</b> sand, more	e wet and packed	
	18' - 20'	6	GP	18	N/A	N/A	No rec	overy		
	Sample 1						   	NOTES:		
	SS = Spli HA = Har GP = Geo	t Spo nd Au	on ger	bler					s collected for analysis of SVO0 netals.	Cs,
	CC = Cor								opear to be false positives due t sulfide interference from the soil	
								N/A: Not applicable.		

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d		an	rirka d Irtilucc	NEERS	Project No Project Na	.: 2015 me: Long Island RailRoad Island Park Substation	Boring No.: IPSBX-11 Sheet_1_of_1 By: Albert Albano		
Drilling (	Contr	actor:	LAWES		Geologist:	Albert Albano	Boring Completion Depth: 2	0'	
Driller: (	Carl P	ederso	n		Drilling Me	thod: Direct Push	Ground Surface Elevation: -	-	
Drill Rig:	Geo	probe			Drive Ham	mer Weight: NA	Boring Diameter: 1"	i	
Date Sta	rted:	01/27/	03	· · · · · · · · · · · · · · · · · · ·	Date Comp	oleted: 01/27/03	Samples were collected in 2' in	tervals.	
] ]		Soil Sa	ample	Mercury	1				
				Vapor	ionization		<b>B</b> 14		
Depth (ft.)	No	Туре	Rec.	(mg/m³)	Detector	Sample	Description	USCS	
4' - 6'	1	GP	(inches) 24	.006	(ppm) 0.0	Black very coarse sand wit	h angular racks and shall		
4 - 0		5	27	.000	0.0	remnants	n angular focks and sher		
6' - 8'	2	GP	24	.007	0.0	Tan fine to coarse sand wil diameter, wet	th quartz rock to 1 inch		
8' - 10'	3	GP	24	.008	0.0	Brown/black silty clay, stiff			
10' - 12'	4	GP	24	.008	0.0	Tan medium to coarse san	d, heavy quartz rock, wet		
12' - 14'	5	GP	18	.008	0. <b>0</b>	Brown medium silty sand, s	small rounded quartz rocks		
14' - 16'	6	GP	18	.005	0.0	Same			
16' - 18'	7	GP	18	.000	0.0	Brown/tan medium sand w some quartz rock	ith some finer sand mixed in,		
18' - 20'	8	GP	18	.000	0. <b>0</b>	Brown/tan medium sand, h	omogeneous (no rocks)		
Sample T SS = Split HA = Han GP = Geo CC = Con	t Spo Id Au prob	on ger e Samj	bler		L	PCBs, and RCRA m Mercury readings a	s collected for analysis of SVO netals. opear to be false positives due t sulfide interference from the soil	o	

d			ULTING ENG	i NEERS		me: Long Island Railroad Island Park Substation	• • • • • • • • • • • • • • • • • • •		
Drilling (	Conti	ractor:	LAWES		Geologist:	Albert Albano	Boring Completion Depth: 2	0'	
Driller:	Brian				Drilling Me	ethod: Direct Push	Ground Surface Elevation: -		
Drill Rig:	Ge	oprobe			Drive Ham	mer Weight: NA	Boring Diameter: 1"		
Date Sta		•	03			pleted: 01/23/03	Samples were collected in 2' in	tervals.	
		Soil Sa		Mercury			<b></b>		
				Vapor	Ionization				
Depth			Rec.	1 .	Detector	Sample	Description	USCS	
(ft.)	No.	Туре	(inches)	(mg/m <sup>3</sup> )	(ppm)		•		
4' - 6'	1	GP	24	.014	.2	Brown/gray stiff, yet pliable,	. clav		
6' - 8'	2	GP	24	.006	.2	Black very coarse, loose at hydrogen sulfide odor	ngular fill material, wet,		
8' - 10'	3	GP	18	.013	.3	Gray medium to coarse sa	nd with quartz pea gravel, wet		
10' - 12'	4	GP	18	.015	0.0	Brown/black silty pliable cla grass, peat), spongy	ay, heavy organics (roots,		
12' - 14'	5	GP	18	.357	0.0		oarse sand, some organics oarse sand with quartz pea		
14' - 16'	6	GP	18	.015	0.0	Same			
16' - 18'	7	GP	24	.009	0.0	Same			
18' - 20'	8	GP	18	.005	0.0	Same			
Sample T SS = Split HA = Han GP = Geo CC = Con	t Spo Id Au oprob	on ger e Samp	bler			PCBs, and RCRA m Mercury readings ap	s collected for analysis of SVOC netals. opear to be false positives due to ulfide interference from the soil.	0	

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Appendix C

**APPENDIX C** 

**TEST PIT LOGS** 

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d		) an Ba	rirka d rtiluco		Project No Project Na	.: 2015 me: Long Island Railroad Island Park Substation	Test Pit No.: IPTP-02 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling (	Conti	actor:	LAWES		Geologist:	Albert Albano	Test Pit Completion Depth: 2	2.5'
Driller:					-	thod: Backhoe	Ground Surface Elevation: -	
			Mini-exca	vator	-	mer Weight: NA	Boring Diameter: 1"	
Date Sta						oleted: 01/22/03	Samples were collected in 2' in	tervals
	r –	Soil Sa		Mercury	Photo-			
			•	Vapor	ionization			
Depth			Rec.	1	Detector	Sample	Description	USCS
(ft.)	No.	Туре	(feet)	(mg/m <sup>3</sup> )	(ppm)			
0'-2.5'	NA	NA	2.5'	.000	0.0	of 2.5° at IPTP-02 in an effe was suspected to be locate Rectifier Drywell was identified Groundwater was identified approximately 4.5 feet bgs.	dy fill material area was excavated to a depth ort to identify a drywell which ed in the area. The top of the ified at a depth of 2.5 feet bgs. 4 within the drywell at . The bottom of the drywell ately 7.5 feet bgs. As a result, or VOCs, SVOCs, RCRA	
Sample 1 SS = Spli IA = Har SP = Geo CC = Cor	t Spo nd Au oprob	on ger e Samp	)ler			NOTES: N/A: Not applicable.		<u> </u>

d		) an ) Ba	virka d Irtiluco		Project No Project Na	.: 2015 me: Long Island Railroad Island Park Substation	Test Pit No.: IPTP-03 Sheet <u>1</u> of <u>1</u> . By: Albert Albano	
Drilling (	Contr	ractor:	LAWES		Geologist:	Albert Albano	Test Pit Completion Depth:	3.5'
Driller: (					-	thod: Backhoe	Ground Surface Elevation:	
Excavati	on M	lethod:	Mini-exca	vator	-	mer Weight: NA	Boring Diameter: 1"	
Date Sta						oleted: 01/22/03	Samples were collected in 2' in	tervals.
		Soil Sa		Mercury	• <u> </u>			
				Vapor	ionization			
Depth			Rec.		Detector		<b>Description</b>	uscs
(ft.)	No.	Туре	(feet)	(mg/m <sup>3</sup> )		1		
0'-1.5'	NA	NA	1.5 <sup>°</sup>	.000	0.2	of 3.5' at IPTP-03 in an effe was suspected to be locate identified. Groundwater ide noted to have a sheen. As		
Sample T SS = Split HA = Han GP = Geo CC = Con	Spo d Au prob	on ger e Samp	bler			NOTES: N/A: Not applicable.		

Appendix D

**APPENDIX D** 

## WELL CONSTRUCTION LOG

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d		) an Ba	ITTILUCO	NEERS	Project Na	:: 2015-03 me: Long Island RailRoad Manhasset Substation Virginia Drive		
Drilling ( Driller: ( Drill Rig: Date Sta	Carl F : Aug	Pederse jer Rig	n		Drilling Me Drive Ham	Kristen Panella <b>athod:</b> 6" Rotating Auger <b>mer Weight:</b> NA <b>bleted:</b> 01/17/03	Boring Completion Depth: 8 Ground Surface Elevation: - Boring Diameter: 4" Samples were collected in 5' in	
Depth		Soil Sa	Rec.	Mercury Vapor	Photo- ionization Detector		Description	USCS
(ft.) 5' - 7'	<b>No.</b> 1	Type SS	(inches) 20	( <u>mg/m<sup>3</sup>)</u> 0.003	(ppm) 0.0	Light brown fine sand, soft,	, loose, saturated, no odor.	
10' - 12'	2	SS	. 10	0.003	0.0	Light brown fine sand, soft,	, loose, saturated, no odor.	
15' - 17'	3	SS	12	0.007	0.0	Dark brown medium sand, saturated, no odor.	trace pebbles, loose,	
20' - 22'	4	SS	10	0.005	0.0	Dark brown medium sand,	loose, moist, no odor.	
25' - 27'	5	SS	20	0.007	0.0	Light to dark brown mediur moist, no odor.	n sand, trace pebbles, loose,	
30' - 32'	6	SS	12	0.000	0.0	Brown medium sand, trace odor.	e pebbles, loose, moist, no	
35' - 37'	7	SS	12	0.000	0.0	Dark brown coarse sand, tr no odor.	race pebbles, loose, saturated,	
40' - 42'	8	SS	12	0.000	0.0	Light brown to white fine sa dry, no odor.	and with orange banning, loose,	
45' - 47'	9	SS	20	0.000	0.0	Light brown to white fine sa dry, no odor.	and with orange banning, loose,	
50' - 52'	10	SS	20	0.000	0.0	White fine sand, neatly pac	sked, moist, no odor.	
Sample T SS = Split HA = Han GP = Geo CC = Cor	t Spo Id Au Iprob	on ger e Samp	bler			NOTES: Assumed DTW was	73' bgs.	   

d		<u>)</u> an	virka d Irtiluc		-	.: 2015-03 me: Long Island RailRoad Manhasset Substation Virginia Drive	Boring No.: 1 Sheet <u>2</u> of <u>2</u> . By: Kristen Panella		
Drilling (	Contr	actor:	LAWES		Geologist:	Kristen Panella	Boring Completion Depth: 86		
Driller: (	Carl F	Pederse	en		Drilling Me	thod: 6" Rotating Auger	Ground Surface Elevation:		
Drill Rig:	: Aug	jer Rig			Drive Ham	mer Weight: NA	Boring Diameter: 4"		
Date Sta	rted:	01/17/	/03		Date Comp	oleted: 01/17/03	Samples were collected in 5' inte	ervals.	
		Soil Sa		Mercury Vapor	Photo- ionization				
Depth	N -	<b>T</b>	Rec.	1	Detector	Sample	e Description	USCS	
(ft.) 55' - 57'	No. 11	Type SS		$(mg/m^3)$	(ppm)	6" Light brown fing cond. k			
55 - 57 60' - 62'	12	SS	12 20	0.004	0.0	6" Light brown fine sand, lo 6" Gray clay with trace silt, Gray silt, densely packed,	dense, moist, no odor.		
65' - 67'	13	SS	24	0.006	0.0	12" Gray silt, loose, supers 12" Gray silt to clay, dense	saturated, no odor. Ny packed, saturated, no odor.		
70' - 72'	14	SS	20	0.003	0.0	Gray silt, densely packed,	moist, no odor.		
75' - 77'	15	SS	12	0.003	0.0	6" Gray silt to clay, dense, 6" Gray silt, soupy, supers			
Sample T SS = Split HA = Han GP = Gec CC = Con	Spo d Au prob	on ger e Samj	bler			NOTES: Assumed DTW wa	as 73' bgs.		

Appendix E

## APPENDIX E

## ANALYTICAL DATA

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**1**....

#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT

#### SURFACE SOIL - MERCURY

AREASON CONCERNS OF SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLIDS UNITS	MH88-14 (0-2) 1/15/03 83.0 (mg/kg)	MH\$8-15 (0-2) 1/15/03 88.0 (mg/kg)	MHSS-16 (0-2) 1/15/03 80.0 (mg/kg)	MHSS-17 (0-2) 1/15/03 93.0 (mg/kg)	MHSS-18 (0-2) 1/15/03 88.0 (mg/kg)	MHSS-19 (0-2) 1/15/03 74.0 (mg/kg)	MH8S-20 (0-2) 1/16/03 83.0 (mg/kg)	MHSS-21 (0-2) 1/16/03 71.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/I)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective mg/kg
Mercury	87,9	130	354	0.097	0.12	15.6	4	9	0.042	0.1

AREAOBICONGERN SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLIDS UNITS	MHS <b>S-22</b> (0-2) 1/16/03 81.0 (mg/kg)	MHSS-23 (0-2) 1/18/03 87.0 (mg/kg)	MHSS-24 (0-2) 1/16/03 76.0 (mg/kg)	MH\$8-25 (0-2) 1/16/03 81.0 (mg/kg)	MH83-26 (0-2) 1/16/03 77.0 (mg/kg)	MHSS-27 (0-2) 1/16/03 61.0 (mg/kg)	MHSS-28 (0-2) 1/16/03 91.0 (mg/kg)	MHS8-29 (0-2) 1/18/03 74.0 (mg/kg)		NYSDEC TAGM 4048 Recommended Soli Cleanup Objective mg/kg
Mercury	5.9	10.8	7.9	7.3	9.4	5.2	1.6	6.4	0.042	0.1

机结合物 医原氨酸 化合物分配 化合物分离合金 经			可指和心理的			011 J. (1957)168 (1	PE-202101 1992	TTORE SHOULD		
SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLIDS UNITS	MH88-30 (0-2) 1/16/03 79.0 (mg/kg)	MHSS-31 (0-2) 1/16/03 74.0 (mg/kg)	MH\$B-17 (0-2) 1/16/03 82.0 (mg/kg)	MHSB-18 (0-2) 1/16/03 82.0 (mg/kg)	MH8B-19 (0-2) 1/16/03 87.0 (mg/kg)	MH38-44 (0-2) 8/11/04 91.0 (mg/kg)	MH88-44 (2-12) 8/16/04 78.0 (mg/kg)	MHSS-45 (0-2) 8/11/04 84.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/i)	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective mg/kg
Mercury	1.6	0.73	1.5	0.05	0.27	0.29	0.73	0.37	0.042	0.1
NREAMING-ING-EINCL				I GROWARDSIE				MHER 40		
AREAOD CONCERNATION SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLIDS	MH <b>3S-45</b> (2-12) 8/16/04 82.0	MHSS-46 (0-2) 8/11/04 90.0	MH8S-46 (2-12) B/16/04 84.0	MHSS-47 (0-2) 8/11/04 95.0	<b>16/mental/Secto</b> MHSS-47 (2-12) 8/16/04 48.0	01017 MHSS-48 (0-2) 8/11/04 90.0	MHSS-48 (2-12) 8/16/04 76.0	MHSS-49 (0-2) 8/11/04 86.0	INSTRUMENT DETECTION LIMITS	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective
SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION	MHSS-45 (2-12) 8/16/04	MHSS-46 (0-2) 8/11/04	MH <b>8S-46</b> (2-12) B/16/04	MHSS-47 (0-2) 8/11/04	MHSS-47 (2-12) 8/16/04	MHSS-48 (0-2) 8/11/04	MHSS-48 (2-12) 8/16/04	MHSS-49 (0-2) 8/11/04	DETECTION	Recommended Soil

QUALIFIERS:

U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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Notes:

#### TABLE 1 (continued)

#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD **DELINEATION PHASE 2 SITE ASSESSMENT**

#### SURFACE SOIL - MERCURY

BARRIE MARINE AND AL		n jan in	1-17.16	विभागमा सम्बद्धाः	TRACETTER		المراجعة المراجع المراجعة الم مراجعة المراجعة المراج			
SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLIDS UNITS	MH83-49 (2-12) 8/16/04 77.0 (mg/kg)	MH <b>SS-50</b> (0 <b>-2</b> ) 8/11/04 96.0 (mg/kg)	MH <b>33-50</b> (2-12) 8/16/04 92.0 (mg/kg)	MH88-51 (0-2) 8/11/04 97.0 (mg/kg)	MH\$8-51 (2-12) 8/16/04 85.0 (mg/kg)	MH <b>88-52</b> (0-2) 8/11/04 94.0 (mg/kg)	MH33-52 (2-12) 8/16/04 86.0 (mg/kg)	MH\$8-53 (0-2) 8/11/04 95.0 (mg/kg)	INSTRUMENT DETECTION LIMITS	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective mg/kg
Mercury	0.12	0.25	0.24	0.65	0.64	0.73	0.24	0.11	0.042	0.1

AREACE ODNOVENN SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLIDS UNITS	MH88-53 (2-12) 8/18/04 90.0 (mg/kg)	MH <b>SS-54</b> (0-2) 8/11/04 94.0 (mg/kg)	MHSS-54 (2-12) 8/16/04 87.0 (mg/kg)	MHSS-55 (0-2) 8/11/04 96.0 (mg/kg)	5)61760121155671 MHSS-55 (2-12) 8/16/04 90.0 (mg/kg)	MHS8-56 (0-2) 8/11/04 92.0 (mg/kg)	MH33-56 (2-12) 8/16/04 80.0 (mg/kg)	MHSS-57 (0-2) 8/11/04 94.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective mg/kg
Mercury	2.2	35.8	10	5.8	1.7	2.7	1.7	1.4	0.042	0.1

AREADE MONGERN SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLIDS UNITS	MHS8-57 (2-12) 8/16/04 87.0 (mg/kg)	MH88-58 (0-2) 8/11/04 94.0 (mg/kg)	MHSS-58 (2-12) 8/16/04 77.0 (mg/kg)	MHSS-59 (0-2) 8/19/04 74.0 (mg/kg)	0(0)(002159)(0) MHS8-59 (2-12) 8/16/04 77.0 (mg/kg)	MHS8-60 (0-2) 8/19/04 88.0 (mg/kg)	MHSS-60 (2-12) 8/16/04 81.0 (mg/kg)	MHSS-61 (0-2) 8/16/04 83.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4048 Recommended Soli Cleanup Objective mg/kg
Mercury	1.6	2.0	4.0	0.71	1.1	0.50	0.63	2.9	0.042	0.1
AREADE SONGLAND SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLIDS UNITS	MH88-61 (2-12) 8/16/04 90.0 (mg/kg)	MHSS-62 (0-2) 8/16/04 71.0 (mg/kg)	MHS8-62 (2-12) 8/18/04 75.0 (mg/kg)	MHSS-63 (0-2) 8/16/04 84.0 (mg/kg)	614116161818341 MHSS-63 (2-12) 8/16/04 80.0 (mg/kg)	MHSS-64 (0-2) 8/16/04 79.0 (mg/kg)	MHS8-64 (2-12) 8/16/04 84.0 (mg/kg)	MH88-65 (0-2) 8/13/04 82.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective mg/kg
Mercury	1.6	0.61	0.45	0.11	0.44	0.18	0.061	0.28	0.042	0.1

QUALIFIERS: U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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Notes:

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12/17/04

#### TABLE 1 (continued)

#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT

### SURFACE SOIL - MERCURY

AREA/OF/CONCERNESS SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLIDS UNITS	MHS8-65 (2-12) 8/13/04 88.0 (mg/kg)	MHS <b>3-66</b> (0-2) 8/13/04 85.0 (mg/kg)	01/01/ MHSS-66 (2-12) 8/13/04 91.0 (mg/kg)	MHSS-67 (0-2) 8/13/04 76.0 (mg/kg)	Slement HS5m MHSS-67 (2-12) 8/13/04 90.0 (mg/kg)	MHSS-68 (0-2) 8/13/04 67.0 (mg/kg)	MHSS-68 (2-12) 8/13/04 87.0 (mg/kg)	MHSS-69 (0-2) 8/13/04 63.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4048 Recommended Soll Cleenup Objective mg/kg
Mercury	0.25	0.95	0.74	0.55	0,19	1.5	0.41	1.6	0.042	0.1

ARPACE CONCERNIC SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLIDS UNITS	MH8S-69 (2-12) 8/13/04 86.0 (mg/kg)	MHSS-70 (0-2) 8/13/04 67.0 (mg/kg)	MHSS-70 (2-12) 8/13/04 89.0 (mg/kg)	MHSS-71 (0-2) 8/13/04 73.0 (mg/kg)	(2-12) 8/13/04 93.0 (mg/kg)	3/105 MHSS-72 (0-2) B/13/04 72.0 (mg/kg)	MHSS-72 (2-12) 8/13/04 84.0 (mg/kg)	MHSS-73 (0-2) 8/16/04 55.0 (mg/kg)	INSTRUMENT DETECTION LIMIT8 (ug/l)	NYSDEC TAGM 4048 Recommended Soil Cleanup Objective mg/kg
Mercury	1.0	0.55	0.40	0.21	0.11	0.86	0.075	0.17	0.042	0.1

AREASO ROONGERNAR SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLIDS UNITS	MH88-73 (2-12) 8/16/04 82.0 (mg/kg)	MHSS-74 (0-2) 8/16/04 58.0 (mg/kg)	MHSS-74 (2-12) 8/16/04 88.0 (mg/kg)	60-5041-5005 MH3S-75 (0-2) 8/16/04 84.0 (mg/kg)	Diamontalisa mai MHSS-76 (0-2) 8/16/04 78.0 (mg/kg)	MHSS-77 (0-2) 8/16/04 74.0 (mg/kg)	MHSS-78 (0-2) 8/16/04 68.0 (mg/kg)	MHSS-79 (0-2) 8/16/04 43.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective mg/kg
Mercury	0.051	0.29	0.052	0.12	0.093	0.15	6.2	4.5	0 <b>.042</b>	0.1
and the second second			ែកសារសេន៍ដែ	ander en ser		gige and a spectrum Contractor and	and a constant	Section - Interior		
SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLIDS	MHSS-80 (0-2) 8/16/04 34.0	MH\$B-13 (0-2) 1/15/03 90.0	MHSB-14 (0-2) 1/15/03 94.0	MHSB-15 (0-2) 1/15/03 90.0	MHSB-16 (0-2) 1/15/03 93.0	MHSS-32 (0-2) 8/12/04 82.0	MHSS-33 (0-2) 8/12/04 81.0	MHSS-34 (0-2) 8/12/04 87.0	INSTRUMENT DETECTION LIMITS	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective
UNITS	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(ug/l)	mg/kg
	5.8	8.1	193	27.9	3.5	33.8	51.0	181	0.042	0.1

QUALIFIERS: U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

: Result exceeds NYSDEC TAGM Recommended Soli Cleanup Objective

Notes:

## TABLE 1 (continued)

#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT

#### SURFACE SOIL - MERCURY

ARHAIOMODONICHT SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLIDS UNITS	MHS8-35 (0-2) 8/12/04 86.0 (mg/kg)	MHSS-36 (0-2) 8/12/04 83.0 (mg/kg)	MHSS-37 (0-2) 8/12/04 86.0 (mg/kg)	MHSS-38 (0-2) 8/12/04 82.0 (mg/kg)	MHSS-39 (0-2) 8/12/04 75.0 (mg/kg)	MHSS-40 (0-2) 8/12/04 92.0 (mg/kg)	MHSS-41 (0-2) 8/12/04 92.0 (mg/kg)	MHS8-42 (0-2) 8/12/04 89.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective mg/kg
Mercury	23.4	138	52.4	332	138	3.4	64.2	49.1	0.042	0.1

SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLIDS UNITS	MH88-43 (0-2) 8/12/04 96.0 (mg/kg)	RUID ET HEAL	1647 1837 1837 1837 1837 1837 1837 1837 183	ranite) actiliae	anna cana cana a su		INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective mg/kg
Marcury	0.34						0.042	0.1

QUALIFIERS: U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

Notes:

: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT

## SUBSURFACE SOIL - MERCURY

AREAGONGERN SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MHSB-17 (2 - 4) 1/18/03 90.0 (mg/kg)	MHSB-17 (4 - 6) 1/16/03 89.0 (mg/kg)	MHSB-17 (6 - 8) 1/16/03 90.0 (mg/kg)	MHSB-18 (2 - 4) 1/16/03 90.0 (mg/kg)	MHSB-18 (4 - 6) 1/16/03 90.0 (mg/kg)	MHSB-18 (6 - 8) 1/16/03 89.0 (mg/kg)	MHSB-19 (2 - 4) 1/16/03 91.0 (mg/kg)	MHSB-19 (4 - 8) 1/16/03 90,0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/i)	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective mg/kg
Mercury	0.023 B	υ	U	U	U	U	0.018 B	U	0.042	0.1

National Company	estimation of the second se		ugas consignings again Sin an an ang Sin an an an an ag	e ne receiver. L	n an	an a	an a			
SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MHSB-19 (6 - 8) 1/16/03 91.0 (mg/kg)	MHSB-06A (6 - 8) 1/15/03 87.0 (mg/kg)	MHSB-06A (8 - 10) 1/15/03 91.0 (mg/kg)	MH6B-13 (2 - 4) 1/15/03 89.0 (mg/kg)	MH <b>SB-13</b> (4 - 6) 1/15/03 87.0 (mg/kg)	MHSB-13 (6 - 8) 1/15/03 90.0 (mg/kg)	MHSB-13 (8 - 10) 1/15/03 92.0 (mg/kg)	MHSB-14 (2 - 4) 1/15/03 92.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective mg/kg
Mercury	υ	0.048	0.018 B	U	0.074	U	0.021 B	0.68	0.042	0.1

ABE (40) (CONCERNING SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MHSB-14 (4 - 6) 1/15/03 89.0 (mg/kg)	MH\$B-14 (6 - 8) 1/15/03 91.0 (mg/kg)	MH8B-14 (8 - 10) 1/15/03 93.0 (mg/kg)	MHSB-15 (2 - 4) 1/15/03 88.0 (mg/kg)	MHSB-15 (4 - 6) 1/15/03 87.0 (mg/kg)	MHSB-15 (6 - 8) 1/15/03 92.0 (mg/kg)	MHSB-16 (2 - 4) 1/15/03 91.0 (mg/kg)	MHSB-16 (4 - 6) 1/15/03 91.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective mg/kg
Mercury	0.12	0.025 B	0.045	0.32	0.051	U	0.079	0.088	0.042	0.1

ST LORGE (WARK)	arriel Therefor			Ann a thirt	e dri mano	n ne standing				
SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS	MHSB-16 (6 - 8) 1/15/03 94.0	MH <b>SB-24</b> (0-2) 8/12/04 89.0	MH3B-24 (2 - 4) 8/12/04 90.0	MHSB-24 (4 - 6) 8/12/04 86.0	MHSB-24 (6 - 8) 8/12/04 85.0	MHSB-25 (0-2) 8/12/04 88.0	MHSB-25 (2 - 4) 8/12/04 87.0	MHSB-25 (4 - 6) 8/12/04 92.0	LIMITS	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective
UNITS	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(ug/l)	mg/kg
Mercury	0.022 B	3.6	0.049 B	0.034 B	1.8	0.36	0.38	0.023 B	0.042	0.1

QUALIFIERS: U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective.

Notes:

#### TABLE 2 (continued)

#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD **DELINEATION PHASE 2 SITE ASSESSMENT**

#### SUBSURFACE SOIL - MERCURY

AREAND HONGERN SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MHSB-25 (6 - 8) 8/12/04 92 (mg/kg)	MHSB-26 (0 - 2) 8/13/04 88 (mg/kg)	MHSB-26 (2 - 4) 8/13/04 86 (mg/kg)	MHSB-26 (4 - 6) 8/13/04 87 (mg/kg)	MHSB-26 (6 - 8) 8/13/04 .85.0 (mg/kg)	MHSB-27 (0 - 2) 8/13/04 91.0 (mg/kg)	MHSB-27 (2 - 4) 8/13/04 85.0 (mg/kg)	MHSB-27 (4 - 6) 8/13/04 86.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective mg/kg
Mercury	0.032 B	4.0	0.23	0.041	0.13	1.7	2.2	0.030 B	0.042	0.1

AREA OMOLING ENN SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MH\$B-27 (6 - 8) 8/13/04 89.0 (mg/kg)	MH\$B-28 (0 - 2) 8/13/04 90.0 (mg/kg)	MHSB-28 (2 - 4) 8/13/04 92.0 (mg/kg)	MHSB-28 (4 - 6) 8/13/04 94.0 (mg/kg)	MHSB-28 (6 - 8) 8/13/04 89.0 (mg/kg)	MHSB-29 (0 - 2) 8/13/04 88.0 (mg/kg)	MHSB-29 (2 - 4) 8/13/04 90.0 (mg/kg)	MHSB-29 (4 - 6) 8/13/04 93.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/i)	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective mg/kg
Mercury	0.037	0.31	0.11	0.066	0.070	53.9	0.90	0.43	0.042	0.1

SAMPLE ID SAMPLE D DATE OF COLLECTION PERCENT SOLIDS UNITS	MHSB-30 (0 - 2) 8/13/04 89.0 (mg/kg)	MHSB-30 (2 - 4) 8/13/04 87.0 (mg/kg)	MHSB-30 (4 - 6) 8/13/04 86.0 (mg/kg)	MHSB-30 (6 - 8) 8/13/04 86.0 (mg/kg)	MHSB-31 (0 - 2) 8/13/04 89.0 (mg/kg)	MHSB-31 (2 - 4) 8/13/04 84.0 (mg/kg)	MHSB-31 (4 - 6) 8/13/04 87.0 (mg/kg)	MHSB-31 (6 - 8) 8/13/04 85.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective mg/kg
Mercury	523	1,700	2.3	13.0	_46.0	1.6	0.16	0.052	0.042	0.1

ARCANOL OF DEPENDENT SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MHSB-32 (0 - 2) 8/13/04 89.0 (mg/kg)	MHSB-32 (2 - 4) 8/13/04 90.0 (mg/kg)	MHSB-32 (4 - 8) 8/13/04 86.0 (mg/kg)	MHSB-32 (6 - 8) 8/13/04 85.0 (mg/kg)	MHSB-33 (0 - 2) 8/13/04 89.0 (mg/kg)	MHSB-33 (2 - 4) 8/13/04 89.0 (mg/kg)	MHSB-33 (4 - 6) 8/13/04 86,0 (mg/kg)	MHSB-33 (6 - 8) 8/13/04 88.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4048 Recommended Soll Cleanup Objective mg/kg
Mercury	208	926	24.7	0.88	204	1.8	0.57	0.033 B	0.042	0.1

Notes:

QUALIFIERS: U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

: Result exceeds NYSDEC TAGM Recommended Soll Cleanup Objective.

## TABLE 2 (continued)

#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD **DELINEATION PHASE 2 SITE ASSESSMENT**

#### SUBSURFACE SOIL - MERCURY

AREAOF/GONGERN SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MHSB-34 (0 - 2) 8/13/04 87.0 (mg/kg)	MHSB-34 (2 - 4) 8/13/04 87.0 (mg/kg)	MHSB-34 (4 - 6) 8/13/04 88.0 (mg/kg)	MHSB-34 (6 - 8) 8/13/04 88.0 (mg/kg)	MHSB-35 (0 - 2) 8/13/04 95.0 (mg/kg)	MHSB-35 (2 - 4) 8/13/04 94.0 (mg/kg)	MHSB-35 (4 - 6) 8/13/04 84.0 (mg/kg)	MHSB-35 (6 - 8) 8/13/04 89.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soli Claenup Objective mg/kg
Mercury	27.4	3.2	0.33	0.020 B	1,7	0.088	0.015 B	0.11	0.042	0.1

OUALIFIERS: U: Constituent enalyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

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Notes:

: Result exceeds NYSDEC TAGM Recommended Soll Cleanup Objective.

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#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT

#### OUTFALL TO MANHASSET BAY SURFACE WATER SEDIMENT - MERCURY AND TOTAL ORGANIC CARBON(TOC)

SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLIDS	MHSD-01 (0-2) 1/16/03 85.0	MH <b>SD-01A</b> (0-2) 1/17/03 85.0	MHSD-02A (0-2) 1/17/03 82.0	MHSD-03A (0-2) 1/17/03 77.0	INSTRUMENT DETECTION LIMITS	for Screening	inical Guidance Contaminated ts (mg/kg) Savera Effect
UNITS	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(ug/l)	Level	Level
Mercury	0.077	0.094		0.084	0.1	0.15	

SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLID	MH\$D-01 (0-2) 1/16/03 85.0	MHSD-01A (0-2) 1/17/03 85.0	MHSD-02A (0-2) 1/17/03 82.0	MHSD-03A (0-2) 1/17/03 77.0	LABORATORY QUANTITATION LIMITS
UNITS Total Organic Carbon	% 0.24	0.34	<u>%</u> 0.67	1.3	0.1

QUALIFIERS: U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

Notes:

: Result exceeds Comparison Value.

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#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD UNDERGROUND INJECTION CONTROL INVESTIGATION

## SUBSURFACE SOIL - RCRA METALS

SAMPLE ID SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MHSB-21 (2 - 4) 1/15/03 91.0 (mg/kg)	MHSB-21 (4 - 6) 1/15/03 87.0 (mg/kg)	MHSB-21 (6 - 8) 1/15/03 92.0 (mg/kg)	MHSB-21 (10 - 12) 1/15/03 91.0 (mg/kg)	MHSB-22 (8 - 10) 1/14/03 89.0 (mg/kg)	Matematouph2 (18 - 20) 1/14/03 100.0 (mg/kg)	MHSB-22 (24 - 26) 1/14/03 98.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective mg/kg
Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	2.9 44.5 0.61 6.8 96.3 9.1 U 0.21 B	6.8 477 6.5 38.9 1010 473 U 1.1 B	2.1 7 B U 4.9 2.5 U 0.15 B	4.9 44.5 0.2 B 9.6 4.1 U 0.37 B	2.5 16.8 0.22 B 9.5 4.1 0.89 U 0.19 B	1.6 73.3 1.6 10.3 172 553 0.25 B	0.6 B 9.8 U 3.4 1.3 0.045 U 0.16 B	3.0 3.0 2.0 3.0 1.0 0.1 8.0 2.0	7.5 or SB 300 or SB 10* 50* SB** 0.1 2 or SB SB

## QUALIFIERS:

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U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

Notes: SB: Site Background \*: As per proposed 4/95 NSDEC TAGM

\*\*: Average background levels in metropolitan or surburban areas or near highways range from 200-500 ppm : Result exceeds NYSDEC TAGM recommended Soil Cleanup Objective

#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD UNDERGROUND INJECTION CONTROL INVESTIGATION

## SUBSURFACE SOIL - VOLATILE ORGANIC COMPOUNDS (VOCs)

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SAMPLE ID	MHSB-21	MHSB-21	MHSB-21	MHSB-21	MHSB-22	MHSB-22	MHSB-22		
SAMPLE DEPTH (FT)	(2 - 4)	(4 - 6)	(6 - 8)	(10 - 12)	(8 - 10)	(18 - 20)	(24 - 26)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/15/03	1/15/03	1/15/03	1/15/03	1/14/03	1/14/03	1/14/03	QUANTITATION	4046 Recommended
DILUTION FACTOR	[ 1 .	1	1	1	1	1	1	LIMITS	Soll Cleanup
PERCENT SOLIDS	91.0	87.0	92.0	91.0	89,0	100.0	98.0		Objective
UNITS	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)
Dichlorodifluoromethane	υ	U	U	U	U	U	U	5	
Chloromethane	U	υ	U	U	· U	U	U	5	
Vinyl Chloride	U	U U	U	U	U	υ	U	5	200
Bromomethane	ί υ	( U	U	U	U	υ	υ	5	-
Chloroethane	lυ	U U	· U	υ	υ	U	υ	5	1900
Trichlorofiuoromethane	υ υ	( υ	υ	Ŭ	Ū	Ū	Ŭ	5	
1,1-Dichloroethene	U U	Ū	Ŭ	Ŭ	Ŭ	Ŭ	Ū	5	400
Acetone	υ	· U	Ú	Ū	Ū	11	U	5	200
Idomethane	Ū	Ū	Ŭ	Ŭ	Ŭ	U	Ū	5	
Carbone Disulfide	υ	ט ו	l ú l	Ú	Ŭ	υŪ	Ū	5	2700
Methylene Chloride	U•	i ا	Ŭ*	Ŭ*	<b>ນ</b> •	Ŭ*	Ū+	5	100
trens-1,2-Dichloroethane	l u	l Ū	Ŭ	Ŭ	Ŭ	Ŭ	Ū	5	300
Methyl tert-butyl ether	lυ	ι υ	Ū Ū	Ū	Ū	Ŭ	ū	5	
1.1-Dichloroethane	Ū	υ (	Ŭ	Ū	Ŭ	Ŭ Ŭ	Ū	5	200
Vinyl acetate	Ì Ū	) Ū	Ũ	Ŭ	Ŭ	ไ บั-	Ŭ.	5	
2-Butanone	Ŭ	Ū	Ŭ	Ŭ	Ŭ	្រ ប័	υŬ	5	300
cla-1,2-Dichloroethene	Ū	l ū	Ŭ	ŭ	Ŭ	ົ້ ບໍ່	Ū	5	-
2,2-Dichioropropane	Ū	Ŭ	Ŭ	Ŭ	Ŭ	Ũ	Ŭ	5	- 1
Bromochloromethane	U U	U	υ	່ບ	Ū	Ū	Ŭ	5	
Chloroform	υ	U U	υ	U	Ū	. U	Ŭ Ū	5	300
1,1,1-Trichloroethane	Ιυ	υ	i Ū	Ū	Ū	i u	Ŭ	5	800
1,1-Dichloropropene	Ú	Ŭ	Ū	Ū	Ū	ไ บั	Ň	5	
Carbon Tetrachioride	υ 1	Î Ū	Ŭ	Ŭ	Ŭ.	ໄ ບັ	Ŭ	5	600
1,2-Dichloroethane	U	Ŭ	Ŭ	Ū	Ū.	Ŭ	Ŭ	5	100
Benzena	Ū	Ŭ	Ū	Ŭ	Ū	Ŭ	Ŭ	5	60
Trichloroethene	Ū	Ŭ	Ŭ	Ŭ	Ŭ Ŭ	2 J	Ŭ	5	700
1,2-Dichloropropane	Ū	Ŭ	Ŭ	Ŭ	Ŭ	ĴŪ	Ŭ	5	-
Dibromomethane	Ū	Ŭ	Ŭ	Ŭ	ŭ	ιŭ	Ŭ	5	
Bromodichloromethane	Ū	Ū	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	5	-
cis-1,3-Dichloropropane	Ū	Ŭ	Ŭ	Ŭ	Ū	บั	Ŭ	5	
4-Methyl-2-pentanone	Ū	l ŭ	ů	Ŭ	ม	Ŭ	Ŭ	5	1000
Toluene	Ū	Ŭ	Ū	Ŭ	Ŭ	Ŭ	Ŭ	5	1500
trans-1,3-Dichloropropene	Ū	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	5	
1,1,2-Trichloroethane	Ū	ΰ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	5	

## QUALIFIERS:

U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

U\*: Result qualified as non-detect based on validation criteria.

NOTES: -: Not applicable.

O: 2015 (LIRR 3 Subs Del Phase II) 3 Subs Data Manhasset Data Tables for Report Table 5 REV

## TABLE 5 (continued)

#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD UNDERGROUND INJECTION CONTROL INVESTIGATION

#### SUBSURFACE SOIL - VOLATILE ORGANIC COMPOUNDS (VOCs)

Inites Stating and a statistical statistics of the statistic statistics of the statistic statistics of the statistics of		ાતના	BRAINS STORE	water of the second	sta la sua de la sua La sua de la	VIII TOUR	Rear heat as a star at		
SAMPLE ID	MHSB-21	MHSB-21	MHSB-21	MHSB-21	MHSB-22	MHSB-22	MHSB-22		
SAMPLE DEPTH (FT)	(2 - 4)	(4 - 6)	(6 - 8)	(10 - 12)	(8 - 10)	(18 • 20)	(24 - 26)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/15/03	1/15/03	1/15/03	1/15/03	1/14/03	1/14/03	1/14/03	QUANTITATION	4046 Recommended
DILUTION FACTOR	1	1	1	1	1	-1	1	LIMITS	Soll Cleanup
PERCENT SOLIDS	91.0	87.0	92.0	91.0	89.0	100.0	98.0		Objective
UNITS	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)
1,3-Dichloropropane	U 1	U 1	Ū	U_	U	U .	<u>_</u>	5	300
Tetrachloroethene	υ	U	U	U	U	( U	U U	5	1400
2-Hexanone	U	U	U	U	U	U	ט (	5	
Dibromochloromethane	υ	U	υ	υ	υ	່ <del>ບ</del>	U U	5	-
1,2-Dibromoethane	U	U U	U	U	U	υ	) U	5	-
Chlorobenzene	U	U	U	U	U	U U	U	5	1700
1,1,1,2-Tetrachloroethane	U	U	υ	U	υ	U	ט (	5	- 1
Ethylbenzene	υ	υ	υ	U	U	U	1 U I	5	5500
m,p-Xylene	U	υ	U	U	U	υ	U	5	-
o-Xylene	υ.	U U	U	U	U	υ	I U	5	[ _ '
Xylene (total)	υ	U	U	U	U	U	U U	5	1200
Styrene	U	υ	υ	U	<u>ບ</u>	υ	U	5	-
Bromoform	U	U	U	U	U	U	U U	5	
isopropylbenzene	υ	U	ບ	U	U	U	U U	5	-
1,1,2,2-Tetrachioroethane	υ	U	U U	υ	U	U	U	5	600
Bromobenzene	Ú	υ	U	U	່ປ	( U	ί U	5	-
1,2,3-Trichloropropane	U	U	U	U	U	· U	υ .	5	400
n-Propyibenzene	U	U	U	U	υ	U U	υ	5	
2-Chiorotoluane	U U	U	U	U	U	ט ן	U U	5	-
1,3,5-Trimethylbenzene	υ	υ	υ	υ	U	) ປ	ļ U	5	-
4-Chlorotoluene	U	U	U	U	U	U	υ	5	-
tert-Butyibenzene	U	U	ט ו	υ	υ	ບ	U	5	-
1,2,4-Trimethylbenzene	U	U	U	U	U	1J	υ	5	-
sec-Butylbenzene	U	U	U	U	U	( U	[ U	5	~
4-isopropyitoluene	U	U U	υ	U	U	U	U	5	~
1,3-Dichlorobenzene	U	υ	U	U	U	U U	U	5	1600
1,4-Dichlorobenzene	υ	U	U	U	U	U	U	5	8500
n-Butylbenzene	U	υ	υ	U	υ	U	U U	5	-
1,2-Dichlorobenzene	U	U	U	ບ	U	U	U	5	7900
1,2-Dibromo-3-chloropropane	U U	U	U	U	U	U	U	5	~
1,2,4-Trichlorobenzene	U	U	U	U	U	, ບ	U	5	3400
Hexachlorobutadiene	U	U	υ	U	U	U	U	5	-
Nephthalene	U	U	U	υ	U	2 J	υ	5	13000
1,2,3-Trichlorobenzene	U	U.	U	U	U	υ	U	5	-
Totais VOCs	0	0	0	0	0	16	0	-	

## QUALIFIERS:

U: Compound analyzed for but not detected.

NOTES: --: Not applicable.

J: Compound found at a concentration below the detection limit.

U\*: Result qualified as non-detect based on validation criteria.

U-2015 (LERR 3 Subs Dei Phase II)/3 Subs Data/Manhasset/Data Tables for Report/Table 5 REV

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## MANHASSET SUBSTATION LONG ISLAND RAIL ROAD UNDERGROUND INJECTION CONTROL INVESTIGATION

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

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SAMPLE ID	MHSB-21	MHSB-21	MHSB-21	MHSB-21	MHSB-22	MHSB-22	MHSB-22		
SAMPLE DEPTH (FT)	(2 - 4)	(4 - 6)	(6 - 8)	(10 - 12)	(8 - 10)	(18 - 20)	(24 - 26)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/15/03	1/15/03	1/15/03	1/15/03	1/14/03	1/14/03	1/14/03	QUANTITATION	4046 Recommended
DILUTION FACTOR	1	1	1	1	1	1	1	LIMITS	Soll Cleanup
PERCENT SOLIDS	91.0	87.0	92.0	91.0	89.0	100.0	98.0		Objective
UNITS	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)
Phenol	U	81 J	U	U	U	U	U	330	30
bis(2-Chloroethyl)ether	U	Ū	υ	υ	U U	U	U	330	
2-Chlorophenol	U	U	U	U	υ	υ	υ	330	800
1,3-Dichlorobenzene	U	U	U	U	U	U	V	330	
1,4-Dichlorobenzene	U	U	U	U	U	U	U	330	-
1,2-Dichlorobenzene	ט ו	U	U	U	U	U	U	330	- 1
2-Methylphenol	U	U	υ	U	U ]	U	U	330	100
2,2-oxybis (1-chloropropane)	U	U	U	U	V	υ	Ų	330	- 1
4-Methylphenol	U	U	U	U	U	U	υ	330	900
N-Nitroso-di-n-propylamine	U	υ	υ	υ	U	Ŭ	Ū	330	_
Hexachloroethane	U	U	Ŭ	Ū	Ŭ	Ŭ	Ŭ	330	- (
Nitrobenzene	U	υ	Ū	U	Ű	υ	υ	330	200
Isophorone	U	U	U	υ	υ	υ	υ	330	4,400
2-Nitrophenol	υ	U U	U	U	υ	Ŭ	Ū	330	330
2,4-Dimethylphenol	υ	υ	υ	υ	Ŭ	Ū	Ū	330	_
2,4-Dichlorophenol	υ	Ū	Ū	Ū	Ū	Ŭ	Ū	330	400
1,2,4-Trichlorobenzene	U	υ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	330	-
Naphthalene	U.	Ū	Ū	Ū	Ū	88 J	Ū	330	13,000
4-Chioroaniline	U	υ.	- U	U	U	Ū	υ	330	220
bis(2-Chloroethoxy)methans	υ	U U	U	U	υ	Ú	Ú	330	-
Hexachlorobutadiene	U	U	υ Ι	U	U	Ū	Ū	330	-
4-Chioro-3-methylphenol	U	U	Ū	Ū	Ū	Ŭ	Ū	330	240
2-Methylnaphthalene	υ	Ū Ū	Ŭ	บ	Ŭ	140 J	Ŭ	330	36,400
Hexachlorocyclopentadiene	U	Ŭ	Ū	Ū	Ū	Ŭ	Ŭ	330	
2,4,6-Trichlorophenol	Ú	Ŭ	Ū	Ū	Ŭ	Ŭ	ŭ	330	-
2,4,5-Trichlorophenol	υ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	660	100
2-Chloronaphthalene	Ű	Ŭ	Ŭ	Ū	Ŭ	Ŭ	Ŭ	330	
2-Nitroaniline	Ŭ	Ŭ	Ŭ	บั	Ŭ	Ŭ	Ŭ	660	430
Dimethylphthalate	Ū	Ŭ	Ŭ	Ū	Ŭ	Ū	Ŭ	330	2,000
Acenaphthylene	160 J	160 J	Ŭ	Ŭ	Ŭ	160 J	Ŭ	330	41,000
2,6-Dinitrotoluene	υ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ū	330	1,000
3-Nitroaniline	ŭ	. บั	· Ŭ	Ŭ	Ŭ	ŭ	Ŭ	660	500
Acenaphthene	78 J	81 J	Ŭ	ນັ	Ŭ	400 J	U U	330	50.000

QUALIFIERS:

U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

D: Result taken from analysis at a secondary dilution...

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NOTES:

- : Not applicable.

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#### TABLE 6 (continued)

#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD UNDERGROUND INJECTION CONTROL INVESTIGATION

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

UIORSTRUCTURE SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	MHSB-21 (2 - 4) 1/15/03 1 91.0 (ug/Kg)	MHSB-21 (4 - 6) 1/15/03 1 87.0 (ug/Kg)	MHSB-21 (6 - 8) 1/15/03 1 92.0 (ug/Kg)	MHSB-21 (10 - 12) 1/15/03 1 91.0 (ug/Kg)	MHSB-22 (8 - 10) 1/14/03 1 89.0 (ug/Kg)	MHSB-22 (18 - 20) 1/14/03 1 100.0 (ug/Kg)	MHSB-22 (24 - 26) 1/14/03 1 98.0 (ug/Kg)	LABORATORY QUANTITATION LIMITS (ug/Kg)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective (ug/Kg)
2,4-Dinitrophenol	υ	υ	U	U	U	υ	U	660	200
4-Nitrophenol	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	660	100
Dibenzofuran	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	74 J	Ŭ	330	6,200
2.4-Dinitrotoluene	l ŭ	Ū	ŭ	Ŭ	Ū	Ŭ	Ū	330	-
Diethylphthalate	Ū	Ū	Ŭ	Ū	Ū	Ū	Ŭ	330	7,100
4-Chlorophenyl-phenylether	U	U	U	U	U	υ 🛛	U	330	-
Fluorene	78 J	68 J	U	U	U	410 J	U	330	50,000
4-Nitroaniline	220 J	600 J	U	U	U	υ 🛛	U	330	-
4,6-Dinitro-2-methyiphenoi	U	U	U	U	U	U	U	330	~
N-Nitrosodiphenylamine	U	U	U	U	U	U	U	330	-
4-Bromophenyl-phenylether	U	U	U	U	U	U	U	330	
Hexachlorobenzene	U	U	U	U	U	U	U	330	410
Pentachiorophenol	U	U	U	U	U	U	U	660	1,000
Phenanthrene	5500	3100	U	U	U	4300 D	U	330	50,000
Anthracene	960	700	U	U	U	1400	U U	330	50,000
Carbazole	72 J U	58 J U	U U	UU	UU	160 J U	U	330 330	8,100
Di-n-butyiphthalate Fluoranthene	5600	4300	U U	Ŭ	U U	4600 D	U U	330	50.000
Pyrene	12000 D	9500 D	Ŭ	Ŭ	Ŭ	9500 D	Ŭ	330	50,000
Butylbenzylphthalate		U	Ŭ	Ŭ	Ŭ	<b>3000 D</b>	ŭ	330	50,000
3.3-Dichlorobenzidine	Ŭ Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	ŭ	ŭ	330	
Benzo(a)anthracene	6100	5200	Ū	Ū	Ŭ	4500 D	ū	330	224
Chrysene	7200 D	5600	Ū	Ū	Ŭ	4600 D	Ū	330	400
bis(2-Ethylhexyl)phthalate	320 J	230 J	Ŭ	Ū	Ŭ	Ū	ū	330	50,000
Di-n-octylphthalate	460	330 J	Ū	Ū	Ŭ	Ŭ	Ũ	330	50,000
Benzo(b)fluoranthene	6500 D	5500	Ū	U	Ū	3700 D	Ŭ	330	1,100
Benzo(k)fluoranthene	2800	2300	Ū	Ū	Ū	2500	Ū	330	1,100
Benzo(a)pyrene	5000	4000	Ū	Ŭ	Ū	4400	Ū	330	61
Indeno(1,2,3-cd)pyrene	1200	1000	Ū	Ū	Ŭ	1300	Ū	330	3.200
Dibenz(a,h)anthracene	440	370 J	Ū	Ŭ	Ŭ	390	Ŭ	330	14
Benzo(g,h,i)perylene	1300	1000	Ŭ	Ŭ	Ŭ	110	Ŭ	330	50,000
Total PAHs	54,918	42,879	0	0	0	42,572	0	-	100,000
Total CaPAHs	29,240	23,970	0	0	0	21,390	0	-	10,000
Total SVOCs	55,988	34,678	0	0	0	42,732	0	-	500,000

QUALIFIERS: U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

D: Result taken from analysis at a secondary dilution..

-- : Not applicable.

Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD UNDERGROUND INJECTION CONTROL INVESTIGATION

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## SUBSURFACE SOIL - TOTAL PETROLEUM HYDROCARBONS (TPH)

UICXSTRUCTURE SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLID UNITS	MHSB-21 (2 - 4) 1/15/03 91.0 (mg/kg)	MHSB-21 (4 - 6) 1/15/03 87.0 (mg/kg)	MHSB-21 (6 - 8) 1/15/03 92.0 (mg/kg)	MHSB-21 (10 - 12) 1/15/03 91.0 (mg/kg)	MHSB-22 (8 - 10) 1/14/03 89.0 (mg/kg)	MHSB-22 (18 - 20) 1/14/03 100.0 (mg/kg)	MHSB-22 (24 - 26) 1/14/03 98.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (mg/kg)
Total Petroleum Hydrocarbons	450	1500	ND	ND	ND	480	ND	12

<u>Notes:</u> ND: Not Detected

## MANHASSET SUBSTATION LONG ISLAND RAIL ROAD GROUNDWATER ASSESSMENT

## GROUNDWATER - TARGET ANALYTE LIST (TAL) METALS

SAMPLE ID DATE OF COLLECTION DILUTION FACTOR UNITS	MHMW-01 Unfiltered 1/21/03 1 (ug/L)	MHMW-01 Filtered 1/21/03 1 (ug/L)	MHMW-02 Unfiltered 1/23/03 1 (ug/L)	MHMW-02 Filtered 1/23/03 1 (ug/L)	MHMW-03 Unfiltered 1/22/03 1 (ug/L)	MHMW-03 Filtered 1/22/03 1 (ug/L)	INSTRUMENT DETECTION LIMIT (IDL) (ug/L)	NY STATE CLASS GA GROUNDWATER STANDARDS/ GUIDELINES (ug/L)
Aluminum	11600	U	10600	U	6070	U	12	-
Antimony	U	Ų	U		U	U	3	3 ST
Arsenic	25.4	U	7.1 B	U	3.3 B	ט	3	25 ST
Barium	104 B	69.5 B	68.4 B	37.9 B	58.7 B	54.3 B	3	1,000 ST
Beryllium	U	U	U	U	U	U U	2	3 GV
Cadmium	ί U	U U	Ų V	U	U	U	2	5 ST )
Calcium	24600	25200	15500	13700	25000	24700	76	1 - 1
Chromium	19,3 B	U	19 B	U	7.6 B	υ	3	50 ST
Cobalt	3.1 B	U	υ	υ	5.2 B	4.3 B	3	
Copper	31.8	4,3 B	15.8 B	2.8 B	5.3 B	3.7 B	2	200 GA
Iron	18500	υ	4470	ט ו	2850	t u	35	300 ST*
Lead	24.2	U U	7.8 B	U	3.4 B	U	1	25 ST
Magnesium	9440	9630	4510	4350	6680	6660	23	35,000 GV
Manganese	421	313	17.8 B	10.6 B	955	909	2	300 ST*
Mercury	0.59	U	0.17 B	U U	U U		0.1	0.7 ST
Nickel	21.4 B	15.6 B	12.4 B	3.9 B	17.2 B	13.3 B	1	100 ST
Potassium	6150	5570	3460	2850	5660	5500	89	
Selenium	U	l u	l	UU	ເ ີ້ນ	U	8	10 ST
Silver	) ū	Ū	<b>l</b> Ū	l Ū	ιŪ	Ū	2	50 ST
Sodium	74700	76500	52200	50900	79300	79600	118	20,000 ST
Thallium	U	U		U			4	0.5 GV
Vanadium	109	Ŭ	27.7 B	l ŭ	15.5 B	l ŭ	3	
Zinc	23.1 B	14.9 B	12.4 B	12.5 B	21.5 B	18 B	8	2,000 GV

## QUALIFIERS:

U: Compound analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

## NOTES:

- : Not applicable.

ST : New York State Ambient Water Quality Standards

GV : New York State Ambient Water Quality Guidance Values

<u>ST\*</u>:S

: Standard for the sum of iron and manganese is 500 ug/l ]: Result exceeds NYS Class GA Standard/Guideline

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#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD GROUNDWATER ASSESSMENT

SAMPLE ID	MHMW-01	MHMW-02	MHMW-03		NY STATE CLASS GA
DATE OF COLLECTION	1/21/03	1/23/03	1/22/03	LABORATORY QUANTITATION	GROUNDWATER
DILUTION FACTOR	1	(	1	LIMITS	STANDARDS/ GUIDELINES
	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Dichlorodifluoromethane	U	U	U	5	5 \$1
Chloromethane	U		U	5	
Vinyi Chloride	U	U	U.	5	2 ST
Bromomethane	U	U	U	5	5 ST
Chioroethane	U	. U	U	5	5 ST
Trichlorofluoromethane	U	U	U	5	5 ST
1,1-Dichiorosthene	U	U	U	5	5 ST
Acetone	U ·	U	U	5	50 GV
Idomethane	U	Į U Į	U	5	-
Carbone Disulfide	U	U	Ų	5	-
Methylene Chloride	U	U U	Ú	5	5 ST
trans-1,2-Dichloroethene	U	U	U	5	5 ST
Methyl tert-butyl ether	4 J	Ι υ Ι	2 J	5	10 GV*
1,1-Dichloroethane	U	υ Ι	U	5	5 ST
Vinyl scetate	U	U	U	5	-
2-Butanone	U	U	U	5	
cis-1,2-Dichloroethene	U	U	U	5	5 ST
2.2-Dichloropropane	U	i u l	U	5	5 ST
Bromochloromethane	U	ן ט	U	5	5 ST
Chloroform	U	U	1 Ĵ	5	7 ST
1,1,1-Trichloroethane	U	U	Ū	5	5 ST
1,1-Dichloropropene	U	) U	U	5	5 ST
Carbon Tetrachloride	U	υ υ	Ū	5	5 ST
1,2-Dichloroethane	U	U	Ū	5	0.6 ST
Benzene	Ū	Ū	ũ	5	1 ST
Trichioroethene	Ů	Ū	ŭ	5	5 ST
1,2-Dichloropropane	Ū	l ŭ l	Ŭ	5	1 ST
Dibromomethane	Ū	Ŭ	ŭ	5	5 ST
Bromodichloromethane	มั	ŭ	ŭ	5	50 G∨
cis-1,3-Dichloropropane	ŭ	l ū l	ŭ	j š	
4-Methyl-2-pentanone	ū	l ŭ l	ŭ	5	
Toluene	ŭ	I ŭ I	ŭ	5	5 ST
trans-1,3-Dichloropropene	ŭ	l ŭ l	ŭ	5	0.4 ST
1,1,2-Trichloroethane	Ū	Ŭ	ŭ	i š	1 1 51

## GROUNDWATER - VOLATILE ORGANIC COMPOUNDS (VOCs)

#### QUALIFIERS:

NOTES:

U: Compound analyzed for but not detected. J: Compound found at a concentration below the detection limit.

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: Not applicable. -.

: Draft Guidance Value

ST : New York State Amblent Water Quality Standards

GV : New York State Ambient Water Quality Guidance Values

#### TABLE 9 (continued)

#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD GROUNDWATER ASSESSMENT

#### GROUNDWATER - VOLATILE ORGANIC COMPOUNDS (VOCs)

SAMPLE ID	MHMW-01	MHMW-02	MHMW-03		NY STATE CLASS GA
DATE OF COLLECTION	1/21/03	1/23/03	1/22/03	LABORATORY QUANTITATION	GROUNDWATER
DILUTION FACTOR	1	1	1	LIMITS	STANDARDS/ GUIDELINES
UNITS	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
1,3-Dichloropropane					5 ST
Tetrachloroethene	U	U	U	5	5 ST
2-Hexanone	U	) υ	U	5	50 G∨
Dibromochloromethane	U	U U	U	5	50 G∨
1,2-Dibromoethane	U	U	U	5	
Chiorobenzene	U	ί υ	U	5	5 ST
1,1,1,2-Tetrachioroethane	U,	( U	U	5	5 ST
Ethylbenzene	U	U	U	5	5 ST
m,p-Xylene	U	ί υ	U	5	-
o-Xylene	U	U	U	5	
Xylens (total)	U	ι	U	5	5 ST
Styrene	U	υ	Ų	5	5 ST
Bromoform	U	l u	U	5	50 GV
Isopropylbenzene	U	) U	U U	5	5 ST
1,1,2,2-Tetrachloroethane	U	ļ U	U	5	5 ST
Bromobenzene	U	U U	U U	5	5 ST
1,2,3-Trichioropropane	U	υ	U U	5	0.04 ST
n-Propylbenzene	U	U	U	5	5 ST
2-Chlorotoluene	U	( U	U	5	5 ST
1,3,5-Trimethylbenzene	U	( U	U	5	5 ST
4-Chlorotoluene	U	j u	) U	5	5 ST
tert-Butylbenzene	U	U	U U	5	5 ST
1,2,4-Trimethylbenzene	U	Ι υ	U U	5	5 ST
sec-Butylbenzene	U	l u	U	5	5 ST
4-isopropyitoluene	U	) U	U	5	5 ST
1,3-Dichlorobenzene	U	U	Į U	5	3 ST
1,4-Dichlorobenzene	U	U	J U	5	3 ST
n-Butylbenzene	U	) V	U	5	5 ST
1,2-Dichiorobenzane	U	l u	U	5	3 ST
1,2-Dibromo-3-chloropropane	U	U U	U U	5	0.04 ST
1,2,4-Trichlorobenzene	U	l n	l. V	5	5 ST
Hexachlorobutadiene	U	l n		5	0.5 ST
Naphthaiene	U	U	l u	5	10 GV
1,2,3-Trichlorobenzene	U		UU	5	5 ST

# QUALIFIERS: U: Compound analyzed for but not detected.

NOTES:

: Not applicable. 84 .

: Draft Guidance Value

ST

: New York State Ambient Water Quality Standards : New York State Ambient Water Quality Guidance Values GV

J: Compound found at a concentration below the detection limit.

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#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD GROUNDWATER ASSESSMENT

## GROUNDWATER - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCS)

SAMPLEID	MHMW-01	MHMW-02	MHMW-03	LABORATORY	NY STATE CLASS GA
DATE OF COLLECTION	1/21/03	1/23/03	1/22/03	QUANTITATION	GROUNDWATER STANDARDS/
DILUTION FACTOR	1	1	1	LIMITS	GUIDELINES
UNITS	(ug/L)	(ug/L)	(ug/L)	(ug/L)	
Phenol	U		U	10	1 ST*
bis(2-Chloroethyl)ether	ŭ	l ü	i i	10	131
2-Chlorophenol	ŭ		i ii	10	-
1,3-Dichiorobenzene	Ŭ	l ä			
1,4-Dichlorobenzene	0			10	3 ST
1,2-Dichlorobenzene	0			10	3 ST
2-Methylphenoi	0		0	10	3 ST
2,2'-oxybis (1-chioropropane)	0		0	10	-
4-Methylphenol	Ŭ		0	10	-
	Ŭ	l U	l 0	10	-
N-Nitroso-dl-n-propylamine	U	U	U U	10	-
Hexachloroethane	Ų	l v	U	10	5 ST
Nitrobenzene	Ų	U	l u	10	0.4 ST
Isophorone	U	U	U U	10	50 GV
2-Nitrophenol	U	U	U U	10	-
2,4-Dimethylphenol	U	U U	U U	10	50 GV
2,4-Dichlorophenol	U	l u	U	10	5 ST
1,2,4-Trichlorobenzene	Ų	U	U	10	5 ST
Naphthalene	U	U	U	10	10 GV
4-Chioroaniline	Ų	U U	υ υ	10	5 ST
bis(2-Chloroethoxy)methane	U	U	U U	10	_
Hexachiorobutadiene	U	l u	Ū.	10	0.5 ST
4-Chloro-3-methylphenol	U	Í Ū	ŭ	10	-
2-Methylnaphthalene	U	Ū	l ŭ	10	
Hexachlorocyclopentadiene	Ŭ	l · ū	Ŭ Ŭ	10	5 ST
2,4,6-Trichlorophenol	Ú	l ŭ	l ŭ	10	-
2,4,5-Trichlorophenol	Ŭ	i ŭ	l ű	20	
2-Chloronaphthalene	ũ	l ű	l ŭ	10	10 GV
2-Nitroanillne	ű	i ii		20	
Dimethylphthalate	ŭ	l ü		10	5 ST 50 GV
Acenaphthylene	ŭ	i i		10	50 GV
2,6-Dinitrotoluene	ŭ	l ŭ	l ŭ	10	5 5T
3-Nitroaniline	ũ	i i			
		l ü	3	20	5 ST
Acenaphthene	U	Ŭ	Ŭ	10	20 GV

## QUALIFIERS:

## NOTES:

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U: Compound analyzed for but not detected.

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J: Compound found at a concentration below the detection limit.

E: Compound concentration exceeded the calibration range.

-- : Not applicable.

: Applies to the sum of all Phenois

: New York State Ambient Water Quality Standards

: New York State Ambient Water Quality Guidance Values

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#### TABLE 10 (continued)

#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD GROUNDWATER ASSESSMENT

#### GROUNDWATER - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID DATE OF COLLECTION DILUTION FACTOR UNITS	MHMW-01 1/21/03 1 (ug/L)	MHMW-02 1/23/03 1 (ug/L)	MHMW-03 1/22/03 1 (ug/L)	LABORATORY QUANTITATION LIMITS (ug/L)	NY STATE CLASS GA GROUNDWATER STANDARDS/ GUIDELINES (ug/L)
2,4-Dinitrophenol	U .	U	U	20	10 GV
4-Nitrophenol	U	U	U	20	-
Dibenzofuran	U	U	υ	10	-
2,4-Dinitrotoluene	U	Ü	υ	10	5 ST
Diethylphthalate	7 J	Ü	U	10	50 GV
4-Chlorophenyl-phenylether	U	U	U	10	-
Fluorene	U	U	U	10	50
4-Nitroaniline	U	U	บ บ	20	5 ST
4,6-Dinitro-2-methylphenol	U	U	U	20	-
N-Nitrosodiphenylamine	U	U	U	10	50 GV
4-Bromophenyl-phenylether	U	U	U	10	-
Hexachlorobenzene	U	U	U	10	0.04 ST
Pentachlorophenol	U	Ŭ	V	20	1 ST
Phenanthrene	U	U	Ŭ	10	50 GV
Anthracene	U	Ŭ	U	10	50 GV
Carbazole	Ű	Ū	ບ	10	-
Di-n-butylphthalate	U	U	U	10	_
Fluoranthene	U U	U	U	10	50 GV
Pyrene	U	Ū	Ū.	10	50 GV
Butylbenzylphthalate	ŭ	ŭ	ŭ	10	50 GV
3.3'-Dichlorobenzidine	Ŭ	Ū	ŭ	10	5 ST
Benzo(a)anthracene	Ū	ບໍ່	Ū	10	-
Chrysene	U	U	U	10	0.002 GV
bis(2-Ethylhexyl)phthalate	2 J	Ŭ	U	10	-
Di-n-octyiphthalate	U	U	Ŭ	10	50 GV
Benzo(b)fluoranthene	Ŭ	Ŭ	Ū	10	0.002 GV
Benzo(k)fluoranthene	บิ	Ū	Ū	10	0.002 GV
Benzo(a)pyrene	บั	Ũ	บั	10	ND ST
Indeno(1,2,3-cd)pyrene	Ū	Ū	Ū	10	0.002 GV
Dibenzo(a,h)anthracene	บั	Ū	Ū	10	
Benzo(g,h,l)perylene	Ū	Ū	Ū	10	-

QUALIFIERS: U: Compound analyzed for but not detected.

NOTES: --

ST G٧ : Not applicable.

: New York State Ambient Water Quality Standards : New York State Ambient Water Quality Guidance Values

J: Compound found at a concentration below the detection limit.

E: Compound concentration exceeded the calibration range.

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## $|\mathcal{T}_{i,j}| = |\mathcal{T}_{i,j}| + |\mathcal{T$

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## TABLE 11

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## MANHASSET SUBSTATION LONG ISLAND RAIL ROAD GROUNDWATER ASSESMENT

## GROUNDWATER - POLYCHLORINATED BIPHENYLS (PCBs)

SAMPLE ID DATE OF COLLECTION DILUTION FACTOR UNITS	MHMW-01 1/21/03 1 (ug/L)	MHMW-02 1/23/03 1 (ug/L)	MHMW-03 1/22/03 1 (ug/L)	LABORATORY QUANTITATION LIMITS (ug/L)	NY STATE CLASS GA GROUNDWATER STANDARDS/ GUIDELINES (ug/L)
Arocior- 1016		-		1	_
Aroclor- 1221	Ŭ	U U			
Aroclor- 1232	ŭ	ũ	l ü	1	
Aroclor- 1242	Ŭ l	ŭ	l ŭ	1	
Aroclor- 1248	Ū	Ū	) Ū	1	
Aroclor- 1254	U	U	Ū	1	
Aroclor- 1260	Ŭ	Ŭ	U	1	
TOTAL PCBs	0	0	0	_	0.09 ST

## QUALIFIERS:

U: Compound analyzed for but not detected.

NOTES:

st.

: Not applicable.

: New York State Ambient Water Quality Standards

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## MANHASSET SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

## SUBSURFACE SOIL - RCRA METALS

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MHSBX-01 (4-6) 1/13/03 91.0 (mg/kg)	MHSBX-01 (8-10) 1/13/03 90.0 (mg/kg)	MHSBX-01 (12-14) 1/13/03 93.0 (mg/kg)	MHSBX-01 (14-16) 1/13/03 96.0 (mg/kg)	MHSBX-01 (16-18) 1/13/03 89.0 (mg/kg)	MHSBX-01 (18-20) 1/13/03 98.0 (mg/kg)	MHSBX-02 (4-6) 1/17/03 89.0 (mg/kg)	MHSBX-02 (6-8) 1/17/03 89.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective (mg/kg)
Arsenic	2	1.9	0.45 B	0.64 B	1.5	0.41 B	1.7	2.3	3.0	7.5 or SB
Barium Cadmium	10.9 0.58	12 0.39	21.3 0.1 B	16 0.15 B	27.7 0.38	9.3 U	8.3 B U	9.9 U	3.0 2.0	300 or SB 10*
Chromium	5	5	4.6	4.8	7	4.8	4.1	6.4	3.0	50*
Lead Mercury	4 U	13 0.054	2,7 U	1.9 U	24.7 0.035 B	1.4 ປ	2.3 U	4.4 U	1.0 0.1	SB** 0.1
Selenium	Ŭ	Ų	U	Ŭ	Ŭ	U	Ŭ	U	8,0	2 or SB
Silver	0.31 B	0.17 B	0.099 B	0.2 B	0.17 B	0.11 B	0.09 B	U_	2.0	SB

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MHSBX-02 (8-10) 1/17/03 91.0 (mg/kg)	MHSBX-02 (10-12) 1/17/03 91.0 (mg/kg)	MHSBX-02 (12-14) 1/17/03 93.0 (mg/kg)	MHSBX-02 (14-16) 1/17/03 95.0 (mg/kg)	MHSBX-02 (16-18) 1/17/03 90.0 (mg/kg)	MHSBX-02 (18-20) 1/17/03 96.0 (mg/kg)	MHSBX-03 (4-6) 1/13/03 88.0 (mg/kg)	MHSBX-03 (6-8) 1/13/03 87.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective (mg/kg)
Arsenic	1.7	1.2	1.8	0.84 B	0.68 B	0.82 B	1.5	1,6	3.0	7.5 or SB
Barium	13.3	6 B	19.2	21.7	15.5	15.7	6.8 B	8 B	3.0	300 or SB
Cadmium	0.13 B	บั	0.41	υ - · · · · · · · · · · · · · · · · · ·	U	U	Ū	Ŭ	2.0	10*
Chromium	6.5	3.1	6.7	5.6	4	5	4,7	4.8	3.0	50*
Lead	8.9	1.7	24	1.9	1.3	3.3	3.1	3.4	1.0	SB**
Mercury	1.3	0.039	1.4	U	0.13	U	U	U	0.1	0.1
Selenium	<u> </u>	υ	U	U	U	U	U I	U	8,0	2 or SB
Silver	0.18 B	U	U	U	U_	0.12 B	0.14 B	0.16 B	2.0	SB

QUALIFIERS: U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

Notes:

SB: Site Background

\*: As per proposed 4/95 NSDEC TAGM

\*\*: Average background levels in metropolitan or surburban areas or near highways range from 200-500 ppm. : Result exceeds NYSDEC TAGM recommended Soil Cleanup Objective

#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - RCRA METALS

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MHSBX-03 (8-10) 1/13/03 91.0 (mg/kg)	MHSBX-03 (10-12) 1/13/03 94.0 (mg/kg)	MHSBX-03 (12-14) 1/13/03 91.0 (mg/kg)	MHSBX-03 (14-18) 1/13/03 94.0 (mg/kg)	MHSBX-03 (18-18) 1/13/03 89.0 (mg/kg)	MHSBX-03 (18-20) 1/13/03 96.0 (mg/kg)	MHSBX-04 (4-6) 1/13/03 91.0 (mg/kg)	MH\$BX-04 (6-8) 1/13/03 92.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/i)	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective (mg/kg)
Arsenic	2.3	0.5 B	1.4	0.49 B	1.3	0.45 B	1.2	1	3.0	7.5 or SB
Barlum	3.6 B	13	17.2	15.4	16.2	14.2	4.1 B	4.5 B	3.0	300 or SB
Cadmium	υ	0.11 B	0.45	0.14 B	0.46	U	U	U	2.0	10*-
Chromium	5.4	4.5	7.9	4,1	6.5	5	3	3.2	3.0	50*
Lead	2.6	1.6	10.5	1.6	12	1.4	2.6	1.7	1.0	SB**
Mercury	0.16	υ	0.14	U	0.13	U	U	υ	0.1	0.1
Selenium	0	υ	- U	υ	U	U	U	U	8.0	2 or SB
Silver	0.13_B	0.12 B	0.18 B	0.18 B	0.18 B	0.11 B	0.11 B	_0.16 B	2.0	SB

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MH\$5X-04 (8-10) 1/13/03 91.0 (mg/kg)	MHSBX-04 (10-12) 1/13/03 91.0 (mg/kg)	MHSBX-04 (12-14) 1/13/03 91.0 (mg/kg)	MHSBX-04 (14-16) 1/13/03 95.0 (mg/kg)	MHSBX-05 (4-6) 1/13/03 90.0 (mg/kg)	MHSBX-05 (6-8) 1/13/03 93.0 (mg/kg)	MHSBX-05 (8-10) 1/13/03 90.0 (mg/kg)	MHSBX-05 (10-12) 1/13/03 85.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4048 Recommended Soil Cleanup Objective (mg/kg)
Arsenic Barlum Cadmium Chromium Lead Mercury Selenium Silver	2 8.6 B 4.4 3 U 0.13 B	2.3 12.4 0.1 B 5.7 3 U U 0.24 B	1.8 20.5 0.13 B 8.9 3.7 U U 0.21 B	1.4 42.7 0.23 B 12.7 3.5 U U 0.31 B	1.5 5.6 B 3.7 3 U U 0.12 B	1.9 10 B 4.8 2.7 U 0.17 B	1.5 30.1 0.18 B 9.5 3.1 U 0.25 B	1.9 61 0.33 B 18.1 5.8 U U 0.41 B	3.0 3.0 2.0 3.0 1.0 0.1 8.0 2.0	7.5 or SB 300 or SB 10* 50* SB** 0.1 2 or SB SB

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QUALIFIERS: U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

Notes:

SB: Site Background

\*: As per proposed 4/95 NSDEC TAGM

\*\*: Average background levels in metropolitan or surburban areas or near highways range from 200-500 ppm.

: Result exceeds NYSDEC TAGM recommended Soil Cleanup Objective

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#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL - RCRA METALS

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MHSBX-05 (12-14) 1/13/03 90.0 (mg/kg)	MHSBX-05 (14-16) 1/13/03 92.0 (mg/kg)	MHSBX-05 (16-18) 1/13/03 97.0 (mg/kg)	MH\$BX-05 (18-20) 1/13/03 96.0 (mg/kg)	MHSBX-06 (4-6) 1/13/03 93.0 (mg/kg)	MHSBX-06 (6-8) 1/13/03 86.0 (mg/kg)	MHSBX-06 (8-10) 1/13/03 90.0 (mg/kg)	MHSBX-07 (10-12) 1/13/03 91.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective (mg/kg)
Arsenic Barium Cadmlum Chromium Lead Marcury Selenium Silver	1.5 29.5 0.18 B 12 3.6 U 0.23 B	1.1 48.3 0.25 B 12.4 3.6 U U 0.4 B	0.69 B 16.7 0.12 B 5.1 3 U U 0.18 B	0.6 B 17.7 0.13 B 8.9 1.4 U U 0.14 B	1.8 10.2 B 0.15 B 5.2 3 U U 0.15 B	2.1 37.6 0.83 144 5.9 U U 0.48 B	1.8 14.6 U 7.6 3.2 U U 0.17 B	1.5 38.4 0.23 B 11.2 3.5 U U 0.31 B	3.0 3.0 2.0 3.0 1.0 0.1 8.0 2.0	7.5 or SB 300 or SB 10* 50* SB** 0.1 2 or SB SB

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MHSBX-07 (12-14) 1/13/03 93.0 (mg/kg)	MHSBX-07 (14-16) 1/13/03 87.0 (mg/kg)	MHSBX-07 (16-18) 1/13/03 88.0 (mg/kg)	MHSBX-07 (18-20) 1/13/03 91.0 (mg/kg)	MHSBX-08 (4-6) 1/17/03 66.0 (mg/kg)	MHSBX-08 (6-8) 1/17/03 86.0 (mg/kg)	MH\$BX-08 (8-10) 1/17/03 87.0 (mg/kg)	MHSBX-08 (10-12) 1/17/03 94.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4048 Recommended Soil Cleanup Objective (mg/kg)
Arsenic Berlum Cadmlum Chromium Lead Mercury Selenium Silver	1.2 28.2 0.18 B 8.4 3.3 U U 0.27 B	1.3 33.5 0.28 B 8.8 3.2 U U 0.36 B	1.1 25.1 0.17 B 9.1 2.5 U 0.28 B	0.87 B 18.5 0.16 B 5.9 2.7 U U 0.3 B	2.7 15.9 7.8 5.7 U 0.16 B	2.1 14.1 7.1 4 U 0.12 B	1.2 7.3 B 4.6 2.3 0.081 U U	1.8 9.1 B 0 5.1 2.2 U U U	3.0 3.0 2.0 3.0 1.0 0.1 8.0 2.0	7.5 or SB 300 or SB 10* 50* SB** 0.1 2 or SB SB

QUALIFIERS:

U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

<u>Notes:</u> SB: Site Background

\*: As per proposed 4/95 NSDEC TAGM

\*\*: Average background levels in metropolitan or surburban areas or near highways range from 200-500 ppm. : Result exceeds NYSDEC TAGM recommended Soll Cleanup Objective

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#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR	MHSBX-01 (4-6) 1/13/03 1	MHSBX-01 (8-10) 1/13/03 1	MHSBX-01 (12-14) 1/13/03 1	MHSBX-01 (14-16) 1/13/03 1	MHSBX-01 (16-18) 1/13/03 1	MHSBX-01 (18-20) 1/13/03 1	MHSBX-02 (4-6) 1/17/03 1	MHSBX-02 (6-8) 1/17/03 1	LABORATORY QUANTITATION LIMITS	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective
PERCENT SOLIDS	91.0 (ug/kg)	90.0 (ug/kg)	93.0 (ug/kg)	96.0 (ug/kg)	89.0 (ug/kg)	98.0 (ug/kg)	89.0 (ug/kg)	89.0 (ug/kg)	(ug/kg)	(ug/kg)
2.4-Dinitrophenol	U	υ,	U	U	U	U	U	U	. 330	200
4-Nitrophenol	ŬŬ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	i ŭ	Ŭ	330	100
Dibenzofuran	i ŭ l	Ŭ	Ū	Ŭ	Ŭ	Ŭ	Ŭ	ŭl	330	6.200
2.4-Dinitrotoluene	ÍŬ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ū	330	
Diethylphthalate	Ū	Ŭ	Ū	Ŭ	l Ū	Ŭ	Ū	ŭ	330	7,100
4-Chlorophenyl-phenylether	i ŭ l	Ŭ	Ŭ	Ŭ		Ŭ	U U	Ŭ	330	
Fluorene	Ū	Ŭ	Ŭ	Ŭ	77 J	Ŭ	ů ů	Ŭ	330	50,000
4-Nitroaniline	Ŭ	Ŭ	Ŭ	Ŭ		Ŭ	Ŭ	Ŭ	330	
4,6-Dinitro-2-methylphenol	Ŭ	Ū	Ŭ	Ū	Ū	Ū	l Ū	Ũ	330	
N-Nitrosodiphenylamine	Ū	Ū	Ū	Ū	Ū	Ū	Ŭ	Ū	330	- 1
4-Bromophenyi-phenylether	Ū	Ū	Ŭ	ı Ü	Ū	บิ	Ū	Ū	330	
Hexachlorobenzene	Ū Ū	Ū	Ŭ	Ŭ	Ū	Ū	Ū	Ū	330	410
Pentachlorophenol	Ū	Ū	Ŭ	Ū	Ū	Ū	Ű	υ	330	1,000
Phenanthrene	U	380	U	U	960	U	υ	U	330	50,000
Anthracene	U	U	U	U	U	U	U U	υ	330	50,000
Carbazole	U	U	U	U	U	U	U U	υ)	330	) {
Di-n-butylphthalate	U	Ų	U	U	U	U	U U	υ	330	8,100
Fluoranthene	U U	240 J	U	U	U	U	U	U	330	50,000
Pyrene	U	140 J	U	U	U	U	υ υ	U	330	50,000
Butylbenzylphthalate	) (	U	U	U	U	U	U	U	330	50,000
3,3'-Dichlorobenzidine	U U	V I	U	U	U	U	( U	· U	330	í I
Benzo(a)anthracene	) U	97 J	U	U	U	U	) U	U	330	224
Chrysene	U U	260 J	U	U	94 J	U	U	U	330	400
bis(2-Ethylhexyl)phthalate	U	44 J	U	U	Ű	U	U	U	330	50,000
Di-n-octylphthalate	U U	U	U	U	U	U	U	U	330	50,000
Benzo(b)fluoranthene	U	230 J	U	U	72 J	U	U	U	330	1,100
Banzo(k)/luoranthene	[ [	110 J	U	U	U	U	U	U	330	1,100
Benzo(a)pyrene	U	80 J	U	U	47 J	U	U	U	330	61
indeno(1,2,3-cd)pyrane	ן ט	130 J	U	U	U	U	U	U	330	3,200
Dibenzo(a,h)anthracene	U	U	U	U	U	U	U	U	330	14
Benzo(g,h,i)perylene	U	110 J	U	U	U	U	U	U	330	50,000
Total PAHs	0	1,887	0	0	1,250	0	0	0	-	100,000
Total CaPAHs	ŏ	907	0	0	213	0	Ó	Ō	-	10,000
Total SVOCs	ŏ	1,931	ò	0	1,305	0	<u> </u>	0		500,000

OUALIFIERS: U: Compound analyzed for but not detected. J: Compound found at a concentration below the detection limit.

NOTES: : Not applicable.

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: Concentration exceeds NYSDEC TAGM Recommended Soll Cleanup Objective

G:2015 (LER 3 Subs Del Phase II)/3 Subs Data/Manhasset/Data Tables for Report/Table 13 rev ·· ---••• 

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#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	MHSBX-02	MHSBX-02	MHSBX-02	MHSBX-02	MHSBX-02	MHSBX-02	MHSBX-03	MHSBX-03	LABORATORY	NYSDEC TAGM
SAMPLE DEPTH (FT)	(8-10)	(10-12)	(12-14)	(14-16)	(16-18)	(16-20)	(4-6)	(6-8)	QUANTITATION	4046 Recommended
DATE OF COLLECTION	1/17/03	1/17/03	1/17/03	1/17/03	1/17/03	1/17/03	1/13/03	1/13/03	LIMITS	Soll Cleanup
DILUTION FACTOR	1	1	1	1	1	1	1	1		Objective
PERCENT SOLIDS	91.0	91.0	<b>93</b> .0	<b>95</b> .0	90.0	96.0	88.0	87.0		
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Phenol	i lu	U	υ	ບ	υ	U	υ	U	330	30
bis(2-Chloroethyl)ether	1	ບັ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	330	
2-Chlorophenol	i õ	Ŭ	Ŭ	U U	Ŭ	l ŭ	U U	Ŭ	330	800
1,3-Dichiorobenzene		ι ŭ	Ŭ	Ŭ	υ	ι υ	υ υ	U U	330	800
1,4-Dichlorobenzene		Ŭ	Ŭ	U U	υ	l ŭ	U U		330	-
1,2-Dichlorobenzene	i u	υ	Ŭ	Ŭ	Ŭ	U U	Ŭ	Ŭ	330	
2-Methylphenol		U U	U U	U U	υ	U U	υ	ม ม	330	100
2,2'-oxybis (1-chloropropane)	U U	Ŭ	ŭ	ŭ	υ	ŭ	ι υ		330	
4-Methylphenol	U U	u u	Ŭ	U U	υŬ	υ	υ	U U	330	900
N-Nitroso-di-n-propylamine	ไ บ้เ	บั	Ŭ	U U	Ŭ	Ŭ	Ŭ Ŭ	i ŭ	330	
Hexachloroethane	ີ້ນີ້	บี	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	ŭ	330	
Nitrobenzene	i Ŭ	Ŭ	Ŭ	Ŭ Ŭ	l ŭ	Î Ŭ	Ŭ	ໄ <u>ບ</u>	330	200
Isophorone	l ũ	Î Ŭ	ŭ	ี่ บ้	Ŭ	Ŭ	ι υ	Ŭ	330	4,400
2-Nitrophenol	ιŭ	l i ŭ l	Ū	់ បំ	i ŭ	Ŭ	ΙŪ	Ŭ	330	330
2,4-Dimethylphenol	i ŭ	ี้ บ	Ŭ	l Ū	i ū	Ŭ	l ũ	Ū	330	
2,4-Dichlorophenol	Ū	l Ū	Ū	Ū.	Ū	Ŭ	Ū	Ŭ	330	400
1,2,4-Trichiorobenzene	Ū	Ŭ	Ŭ	Ū	l ũ	Ŭ	ιŪ	υ	330	-
Naphthalene	l u	U U	Ú	Ū	Ū	l Ū	u u	Ū	330	13,000
4-Chloroaniline	U U	U	υ	{ ບ	υ	Ū	l Ú	) Ū	330	220
bis(2-Chloroethoxy)methane	ບ	υ	υ	υ	υ	ĺ Ú	lυ	υ	330	
Hexachiorobutadiene	υ	υ	U	ι υ	l u	l u	ι υ	υ U	330	
4-Chioro-3-methylphenol	ໄ ປ	υ 1	U	Ū	Ū	υ	Ŭ	l Ū	330	240
2-Methyinaphthalene	U	Ų V	υ	υ	Ū	Ū	Ū	Ū	330	36,400
Hexachlorocyclopentadiene	υ	υ	υ	υ	Ú	ί υ	l u	l u	330	
2,4,6-Trichlorophenoi	່ ບໍ	υ	U	U	Ι υ	ιu	ί υ	{ υ	330	1
2,4,5-Trichlorophenol	[ ປ	U	U	U	U	υ	ί υ	υ	330	100
2-Chioronaphthalene	U	U	U	υ	υ	ί υ	[ U	) U	330	
2-Nitroaniline	U	υ	υ	U .	Ŭ	Ū	1 Ū	Ū	330	430
Dimethylphthalate	υ	υ	U	υ	U U	υ	U	U	330	2,000
Acenaphthylene	U	U	U	U U	ļ υ	ΙU	U	U	330	41,000
2,6-Dinitrotoluane	U	U	U	U	υ	່ ບ	υ	υ	330	1,000
3-Nitroaniline	U U	Ų	υ	ບ	U	U	) U	U	330	500
Acenaphthene	UU	υ	U	U	UU	U	U	U	330	50,000

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#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR	MH\$BX-02 (8-10) 1/17/03 1	MHSBX-02 (10-12) 1/17/03 1	MH\$BX-02 (12-14) 1/17/03 1	MHSBX-02 (14-16) 1/17/03 1	MHSBX-02 (16-18) 1/17/03 1	MHSBX-02 (18-20) 1/17/03 1	MHSBX-03 (4-6) 1/13/03 1	MHSBX-03 (6-8) 1/13/03 1	LABORATORY QUANTITATION LIMITS	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective
PERCENT SOLIDS	91.0 (ug/kg)	91.0 (ug/kg)	93.0 (ug/kg)	95.0 (ug/kg)	90.0 (ug/kg)	96.0 (ug/kg)	88.0 (ug/kg)	87.0 (ug/kg)	(ug/kg)_	(ug/kg)
2,4-Dinitrophenol	U	U	U	U	U	U	U	U	330	200
4-Nitrophenol	U U	U	U	U	U	U	U	U	330	100
Dibenzofuran	U	U	U	U	U	U	) U	U	330	6,200
2,4-Dinitrotoluene	U	U	Ų	U	Ų	U	U U	U	330	
Diethylphthalate	U U	U	U	U	U	U	U	U	330	7,100
4-Chlorophenyl-phenylether	υ	U	U	U	U	U	U	U	330	
Fluorene	U	U	U	U	U	U	U U	U	330	50,000
4-Nitroaniline	U U	U	U	<u> </u>	U	U	U	U	330	
4,8-Dinitro-2-methylphenol	U	U	U	U	U	U	U	U	330	
N-Nitrosodiphenylamine	U	U	U	U	U	U	U	U	330	
4-Bromophenyl-phenylether	U U	V	U		U	U	1 U	U U	330	
Hexachlorobenzene	U	U	U	N N	U	υ	<u> </u>	U U	330	410
Pentachiorophenol	U	U	U	U U	U	U U	U U	U	330	1,000
Phenanthrene	U	U	U	U	U	U	U	U	330	50,000
Anthracene	U	U	U	U	U	U	U U	U	330	50,000
Carbazole	U	U	U	Ų	U	U	U U	U	330	
Di-n-butyiphthalate	U	U U	U U	U U	U	υ	U	U	330	8,100
Fluoranthene	U.	U	U	U	U	U 1		U	330	50,000
Pyrene	U	U	U	U U	U	U U	U	U	330	50,000
Butylbenzylphthalate	U U	U	U	U	U	U	U	U	330	50,000
3,3'-Dichiorobenzidine	U	U	U	U	U	U	) <u> </u>	U U	330	
Benzo(a)anthracene	ม (ม ม	U U	55 J 77 J	U.	U U	UU		U U	330	224
Chrysene	U U	U U	· •		U U	-		-	330	400
bis(2-Ethylhexyl)phthalate	-	U I	U	U U	-	U	U	U U	330	50,000
Di-n-octyiphthalate	U	U	U	U U	U	U	U	U U	330	50,000
Benzo(b)fluoranthene	U	U	110 J	<u> </u>	U	U	) <u>v</u>	U.	330	1,100
Benzo(k)fluoranthene	U U	U U	U 48 J	U U	U U	U U	U U	U U	330 330	1,100 61
Benzo(a)pyrene	U	Ŭ		U U	U	0		U U	330	
Indeno(1,2,3-cd)pyrene	U	-	U		U U		-	-		3,200
Dibenzo(a,h)anthracene	U	U	U	U U	U		U	U U	330	14
Benzo(g,h,i)perylene	U	U	U	U	U	U	ļ	U	330	50,000
Total PAHs	0	0	290	0	0	0	0	0		100,000
Total CaPAHs	0	0	290	0	0	0	0	0		10,000
Total SVOCs	0	0	290	0	0	0	0	0	-	500,000

# QUALIFIERS:

U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

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NOTES: -- : Not applicable.

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: Concentration exceeds NYSDEC TAGM Recommended Soli Cleanup Objective

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#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

# SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	MHSBX-03 (8-10) 1/13/03 1 91.0 (Jus/kp)	MHSBX-03 (10-12) 1/13/03 1 94.0 (ug/kg)	MHSBX-03 (12-14) 1/13/03 1 91.0 (ug/(c))	MHSBX-03 (14-16) 1/13/03 1 94.0 (us/ta)	MHSBX-03 (16-18) 1/13/03 1 89.0 (Ug/(g)	MHSBX-03 (18-20) 1/13/03 1 96.0	MHSBX-04 (4-6) 1/13/03 1 91.0 (19/1/2)	MHSBX-04 (6-8) 1/13/03 1 92.0 (ug/(c))		NYSDEC TAGM 4046 Recommended Soll Cleanup Objective
011113	(ug/kg)	(ug/kg/	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Phenol	υ	υ	υ	υ	υ	U	ι υ	u u	330	20
bis(2-Chloroethyl)ether	Ŭ	Ŭ	Ŭ	Ŭ	. U	U U		U U	330	30
2-Chlorophanol	i i	Ŭ	Ŭ	Ŭ	່ <u>ບ</u>	ບ ບ	ບ ບ	U U	330	800
1,3-Dichiorobanzena	i i	υ	υ	Ŭ	Ŭ	່ ບໍ່	U U	U U	330	800
1,4-Dichlorobenzene	i ii	Ŭ	Ű	ŭ	U U	U U	U U	U U	330	1 - 1
1,2-Dichlorobenzene		ŭ	Ŭ	U U	່ <u>ບ</u>	υ υ		U U	330	
2-Methylphenol		U U	ט ט	U U	U U	U .			330	100
2,2'-oxybis (1-chloropropane)	U 1	Ŭ	Ŭ	Ŭ	U U	U U		υ	330	100
4-Methylphenol	l ñ	U U	Ŭ	บ บ	Ű	υ		i i	330	900
N-Nitroso-di-n-propylamine	i ŭ		υ	U U	u U	υ	ໄ ບັ	U U	330	900
Hexachloroethane	U U		Ŭ	Ŭ Ŭ	ŭ	U U	Ŭ	Ŭ	330	
Nitrobenzene	i ŭ		Ŭ	ບ ບ	່ ບັ			U U	330	200
lisophorone	Ŭ	l ŭ	U U	Ŭ	່ ບ	U U		U U	330	4,400
2-Nitrophanol	l ŭ	i i	ŭ	Ŭ	U U	U U	U U	υ	330	330
2,4-Dimethylphenol	i ü	ŭ	ŭ	υ	ບັ	υŬ	Ŭ	Ŭ	330	
2,4-Dichlorophanol	l ŭ	i ü	υŬ	Ŭ	Ű	ŭ	Ιŭ	Ŭ	330	400
1.2.4-Trichlorobenzene	ŭ	ŭ	υ υ	ŭ	ŭ	U U	υ	υ	330	400
Naphthalene	i ii	U U	Ŭ	U U	ບ ບ	Ŭ	Ŭ	Ŭ	330	13,000
4-Chloroaniline	i ŭ		υ	Ŭ	Ŭ	Ŭ	υ	Ŭ	330	220
bis(2-Chloroethoxy)methane	l ŭ	Ŭ	Ŭ	u u	ŭ	U U	υ	บ	330	220
Hexachlorobutadiene	U U	ŭ	Ŭ	υ	Ŭ	υŬ	ίŭ	Ŭ	330	
4-Chloro-3-methylphenol	l ŭ	ບ ບ	υŬ	ŭ	Ŭ	Ŭ	Ιŭ	Ŭ	330	240
2-Methyinaphthalene	<b></b>	Ŭ	Ŭ	l u	ŭ	i ü	υ	ບ ບ	330	36,400
Hexachlorocyclopentadiene	Ŭ.	Ŭ	Ŭ	ບ ບ	υ	Ŭ	Ŭ	Ŭ	330	
2,4,8-Trichiorophenol	ไ นี้	Ŭ	ັບ	Ŭ	ŭ	Ŭ	Ŭ Ŭ	ŭ	330	
2,4,5-Trichlorophenol	ν υ i	Ũ	Ũ	Ŭ	Ŭ	Ū	Ŭ	Ŭ	330	100
2-Chloronaphthalene	Ŭ	Ũ	Ŭ	Ŭ	Ŭ	ນັ	Ŭ	Ŭ	330	, I
2-Nitroaniline	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	บั	ไ บั	Ŭ	330	430
Dimethylphthalate	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	330	2,000
Acenaphthylene	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	ນ ນັ	Î Ŭ	Ŭ	330	41,000
2,6-Dinitrotoluene	U	Ū	Ū	Ŭ	Ŭ	Ŭ	ΙŬ	ŭ	330	1,000
3-Nitroaniline	ບ	Ū	ŭ	Ŭ	Ū	Ŭ	υŬ	Ŭ	330	500
Acenaphthene	Ū	Ū	Ŭ	Ŭ	Ŭ	Ū	ι	Ŭ	330	50,000

#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR	MHSBX-03 (8-10) 1/13/03 1	MH\$BX-03 (10-12) 1/13/03 1	MHSBX-03 (12-14) 1/13/03 1	MHSBX-03 (14-16) 1/13/03 1	MHSBX-03 (16-18) 1/13/03 1	MHSBX-03 (18-20) 1/13/03 1	MHSBX-04 (4-6) 1/13/03 1	MHSBX-04 (6-8) 1/13/03 1	LABORATORY QUANTITATION LIMITS	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective
PERCENT SOLIDS	91.0	94.0	91.0	94.0	89.0	96.0	91.0	92.0		
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
2.4-Dinitrophenol	U U	υ	υ	U	U	υ	υ υ	υ	330	200
4-Nitrophenol	U U	U	U U	U	ປ	U	U	υ	330	100
Dibenzofuran	U U	U	U U	U	U	U	ט ט	U	330	6,200
2,4-Dinitrotoluene	U	U	U U	U	U	U	U U	U	330	
Diethylphthalate	U	U	υ	Ų	U	U	( U	U	330	7,100
4-Chlorophenyl-phenylether	U	U	ט ו	Ų	U	U	U	U	330	
Fluorene	U	U	U	U	U	U	U	U	330	50,000
4-Nitroaniline	U U	U	<u> </u>	U	U	U	U	U	330	
4,6-Dinitro-2-methylphenol	U U	U	U	U	U	U	U	U	330	
N-Nitrosodiphenylamine	U	U	U	U	U	U	U	U	330	
4-Bromophenyl-phenylether	U	U	U	U	U	U .	U	U	330	
Hexachlorobenzene	U U	U		U	U	U	<u>U</u>	U	330	410
Pentachlorophenol	U U	U	U U	U	U U	U U	U	U	330	1,000
Phenanthrene		U	U U	U U	U U	U U	U	U U	330 330	50,000
Anthracene		U		<u>v</u>	U U	บ ม	UU	-		50,000
Carbazole	U U	U	U U	Ŭ	U	0	-	U U	330 330	8,100
Di-n-butyiphthalate	U U	U	U	Ŷ		U U	U U	U U	330	
Fluoranthene	U U	U	U U	U U		U U		U U	330	50,000
Pyrene	-	U	U U	U U		U U		U U	330	50,000
Butylbenzylphthalate		U U	_	Ŭ	0	U U		U U	330	50,000
3,3'-Dichlorobenzidine		U U	U	U U		U U	l ü	U U	330	224
Benzo(a)anthracene	U U	l ü	l Ű	U U		U U	u u	U U	330	400
Chrysene bis(2-Ethylhexyl)phthalate	Ŭ	U	Ŭ	Ů		U U	[ ບ	U U	330	50,000
Dis(2-Ethylnexy)phthalate	ĬŬ	Ŭ	Ŭ	Ŭ	U U		l ĭ	Ŭ	330	50,000
Benzo(b)fluoranthene	Ŭ	Ŭ	Ŭ	U U	Ŭ	Ŭ	i i	บั	330	1,100
Benzo(k)fluoranthene	Ŭ	Ŭ	ບັ	Ű	Ŭ	Ŭ	Ŭ	Ŭ	330	1,100
Benzo(a)pyrene	Ŭ	Ű	Ŭ	Ŭ	Ŭ	Ŭ	្រៃប័	ט ע	330	61
Indeno(1,2,3-cd)pyrene	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	l ŭ	Ŭ	330	3,200
Dibenzo(a,h)anthracene	Ŭ	Ŭ	Ŭ	Ū	Ū	Ŭ	Ū	บ	330	14
[Benzo(g,h,l)perylene	Ŭ	Ŭ	Ū	Ŭ	Ŭ	Ū	Ū	Ũ	330	50,000
- anime (Minit) have a large	, J	Ţ	Ţ	, i i i i i i i i i i i i i i i i i i i	•					
Total PAHs	0	0	0	0	0	0	0	0		100,000
Total CaPAHs	0	0	0	0	0	0	0	0	**	10,000
Total SVOCs	0	0	0	0	0	0	0	0		500,000

QUALIFIERS; U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

NOTES: : Not applicable. ---

: Concentration exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

# SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOC3)

SAMPLE ID SAMPLE DEPTH (FT)	MHSBX-04 (8-10)	MHSBX-04 (10-12)	MHSBX-04 (12-14)	MHSBX-04 (14-16)	MHSBX-05 (4-6)	MH\$BX-05 (6-8)	MHSBX-05 (8-10)	MHSBX-05 (10-12)		NYSDEC TAGM 4046 Recommended
DATE OF COLLECTION	1/13/03	1/13/03	1/13/03	1/13/03	1/13/03	1/13/03	1/13/03	1/13/03	LIMITS	Soll Cleanup
DILUTION FACTOR	1	1	1	1	1	1	1	1		Objective
PERCENT SOLIDS	92.0	91.0	91.0	95.0	90.0	93.0	90.0	85.0		
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Phenoi										
	U	U	U	U	U	U	U	U	330	30
bis(2-Chloroethyl)ether	U	U	U	U	. U	U	U	U.	330	
2-Chlorophanol	l U	U	U	U	U	U	U	U	330	800
1,3-Dichlorobenzene	U	U	U	U	U	U	υ	υ	330	
1,4-Dichlorobenzene	U	U U	U	U	υ	U	U	U	330	· · ·
1,2-Dichlorobenzene		U U	U	U	U	U	U U	υ	330	
2-Methylphenol	U	U	U	U	U	U	U	U	330	100
2,2'-oxybis (1-chloropropane)	U	U	υ	U	Ų	U	U U	U	330	- 1
4-Methylphenol	U	U	U	U	U	U	υ	υ	330	900
N-Nitroso-di-n-propylamine		U	U	Ų	Ų	υ	U	U	330	
Hexachloroethane		U	υ	U	U	Ų	U	Ý	330	
Nitrobanzana		U	U	U	U	U	υ	υ	330	200
Isophorone	U	U	U	U	U	U	U	U	330	4,400
2-Nitrophenol	U	U	υ	U	U	U	U	U	330	330
2,4-Dimethylphenol	U	U	U	U	U	U	υ	U	330	- 1
2,4-Dichlorophenol	l U	U	U	U	υ	U	U	U	330	400
1,2,4-Trichlorobenzene	U	U	U	Ų	U	ļυ	U	υ	330	
Naphthalene	ļ U	U.	U	Ų	U	υ	U U	U	330	13,000
4-Chloroaniline	U	U	υ	U	U	U	ט	U	330	220
bis(2-Chloroethoxy)methane	U	U	U	U	U	U	U	υ	330	· •
Hexachlorobutadiene	U	U	U	U	υ	υ	[ U	U	330	
4-Chloro-3-methylphanol	U	U	U	υ	U	U	l u	U U	330	240
2-Methylnaphthalene	ų υ	U	U	U	U	U	) ປ	U	330	36,400
Hexachlorocyclopentadiene	j U	U U	U	υ	U	U U	) U	U	330	
2,4,6-Trichlorophanol	U	υ	U	U	U	U	) U	υ	330	
2,4,5-Trichlorophenol	U	U	U	U	U	) <u>ບ</u>	υ	U	330	100
2-Chloronaphthalene	U U	U	U	υ	U	U	U U	U	330	
2-Nitroaniline	U	U	U	U	U	U	U U	υ	330	430
Dimethylphthalate	U U	U	U	Ų	υ	υ	[ υ	U	330	2,000
Acenaphthylene	{ U	U	υ	U	U	U U	U	U	330	41,000
2,6-Dinitrotoluene	υ	U	U	U	U	U	( ບ	υ	330	1,000
3-Nitroaniline	Ų	U	U	U	υ	υ	[ υ	U	330	500
Acenaphthene	U	U	<u>ບ</u>	U	U	U	U	U	330	50,000

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#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

# SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	MHSBX-04	MHSBX-04	MHSBX-04	MHSBX-04	MHSBX-05	MHSBX-05	MHSBX-05	MHSBX-05	LABORATORY	NYSDEC TAGM
SAMPLE DEPTH (FT)	(8-10)	(10-12)	(12-14)	(14-16)	(4-6)	(6-8)	(8-10)	(10-12)	QUANTITATION	4046 Recommended
DATE OF COLLECTION	1/13/03	1/13/03	1/13/03	1/13/03	1/13/03	1/13/03	1/13/03	1/13/03	LIMITS	Soll Cleanup
DILUTION FACTOR	1	1	1	1	1	1	1	1		Objective
PERCENT SOLIDS	92.0	91.0	91.0	95.0	90.0	93.0	90.0	85.0		
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)						
							· · · · · · · · · · · · · · · · · · ·			
2,4-Dinitrophenol	U	υ	U	U	U U	U	U	U	330	200
4-Nitrophenol	U	U	υ	U	Ų	U U	υ	υ	330	100
Dibenzofuran	υ	U	U	U	ĺ Ú	U	υ	U	330	6,200
2.4-Dinitrotoluene	υ	U	U	U	υ	U	∪	U	330	
Diethylphthalate	( U	U	υ	U	υ	U	l ù	υ	330	7,100
4-Chlorophenyl-phenylether	υ	U	υ	U	υ	U	1 Ú	U	330	
Fluorene	Ū	Ŭ	Ű	U	Ű	Ŭ	Ū	Ŭ	330	50,000
4-Nitroaniline	Ū	Ŭ	Ŭ	Ŭ.	Ŭ	Ū	Ū	Ũ	330	
4,8-Dinitro-2-methylphenol	Ú	U	U	Ŭ	Ū	Ú	l Ŭ	Ŭ	330	
N-Nitrosodiphenyiamine	υ	U	υ	Ū	υ	Ú	Ú	U	330	
4-Bromophenyl-phenylether	U U	( U	U	U	U U	U	U U	U	330	
Hexachlorobenzene	U	U	U U	U	U	U	U	U	330	410
Pentachlorophenol	υ	υ [	U	U	U U	U U	υ	U	330	1,000
Phonanthrene	ι υ	ប	U	U	υ [	υ	U U	U	330	50,000
Anthracene	υ	U	U	U	U	U	U U	U)	330	50,000
Carbazole	υ	U	U	U	υ	υ	<b>υ</b>	υ	330	
Di-n-butylphthalate	υ.	U	U	U	υ	U	U	U	330	8,100
Fluoranthene	U	U	U	U	υ	U	U U	υ	330	50,000
Pyrene	U	U	υ	U	U .	U	υ (	υ	330	50,000
Butylbenzylphthalate	ι υ	υ υ	U	U	! υ	υ	υ [	υ	330	50,000
3.3'-Dichiorobenzidine	υ υ	U	U	U	U υ	U	U U	U	330	
Benzo(a)anthracene	( V	U	U	U	U	U	υ	U )	330	224
Chrysene	υ	U	U	U	U	U U	υ	U U	330	400
bis(2-Ethylhexyl)phthalate	υ	υ υ	U	U	Ι υ	υ	( U	U U	330	50,000
Di-n-octyiphthalate	U U	U	Ú	U	Ų	U	U U	U	330	50,000
Benzo(b)fluoranthene	U	U U	U	U	U U	U	U U	U U	330	1,100
Benzo(k)fluoranthene	U	U	U	U	U U	U	U U	U	330	1,100
Benzo(a)pyrene	U U	U	U	U	υ	Ų	U U	U	330	61
Indeno(1,2,3-cd)pyrene	) U	U	U	U	U U	Ų	Ų	U	330	3,200
Dibenzo(a,h)anthracene	Ū	Ŭ	Ŭ	· U	υ	Ů	Ù	Ű	330	14
Benzo(g,h,i)perylene	Ū	Ų	Ų	Ū	Ū	Ų	Ũ	Ŭ	330	50,000
					l					
Total PAHs	0	0	0	0	0	0	0	0		100,000
Total CaPAHs	0	0	D	0	0	0	0	0		10,000
Total SVOCs	0	0	0	0	0	0	0	0		500,000

<u>QUALIFIERS:</u> U: Compound analyzed for but not detected. J: Compound found at a concentration below the detection limit.

NOTES: : Not applicable.

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: Concentration exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	MHSBX-05	MHSBX-05	MHSBX-05	MHSBX-05	MHSBX-06	MHSBX-06	MHSBX-06	MHSBX-07	LABORATORY	NYSDEC TAOM
SAMPLE DEPTH (FT)	(12-14)	(14-18)	(18-18)	(18-20)	(4-6)	(8-8)	(8-10)	(10-12)	QUANTITATION	4046 Recommended
DATE OF COLLECTION	1/13/03	1/13/03	1/13/03	1/13/03	1/13/03	1/13/03	1/13/03	1/13/03	LIMITS	Soll Cleanup
DILUTION FACTOR	1 1	1	1	1	1	1	1	1		Objective
PERCENT SOLIDS	90.0	92.0	97.0	96.0	93.0	86.0	90.0	91.0		
UNITS	(ug/kg)	(ug/kg)								
Phenol	ן ט	Ų	U	U	U	U	U	U	330	30
bis(2-Chloroethyi)ether	U	U	U	U	U	υ	υ	U	330	[
2-Chlorophenol	U U	U	U	υ	υ	U	U	U	330	800
1,3-Dichlorobenzene	U	υ	υ	υ	U	U	U .	U U I	330	
1,4-Dichlorobenzene	U U	υ	U U	U	U	U	U	U	330	
1,2-Dichlorobenzene	υ	U	U	U	U	U	U	U	330	1
2-Methylphenol	U U	U	U	U	U	υ	່ ບ	υ	330	100
2,2'-oxybis (1-chioropropane)	ן טן	U	U	U	υ	Ū	Ū	Ū	330	
4-Methylphenol	U	U	υ	υ	U	υ	Ū Ū	υ	330	900
N-Nitroso-di-n-propylamine	U	U U	υ	υ	U	U	) Ú	U	330	
Hexachloroethane	U U	U U	υ	U U	υ	ι υ	ίυ	U U	330	
Nitrobenzene	ט ו	U U	U	U	U	U .	U U	Ŭ	330	200
lsophorone	) Ŭ	Ū	Ū	Ū	Ū	ີ ນີ	Ŭ	Ū	330	4,400
2-Nitrophenol	Ŭ	Ū	Ŭ	Ŭ	່ ນັ	Ŭ	ŭ	Ŭ	330	330
2,4-Dimethylphenol	ΙŬ	ΙŬ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	330	
2,4-Dichlorophenol	Ú	υ	Ū	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	330	400
1,2,4-Trichlorobenzene	( U	υ	Ū	Ū	Ū	ŭ	Ū	Ū	330	
Naphthalene	Ū	Ū	Ŭ	Ū	i Ū	. Ŭ	Ŭ	Ŭ	330	13,000
4-Chloroaniline	Ŭ	Ŭ	Ŭ	Ŭ		ບັ	Ŭ	Ŭ	330	220
bis(2-Chloroethoxy)methane	Ŭ	ΙŬ	Ŭ	Ŭ	ີ ບັ	Ŭ	Ŭ	ŭ	330	
Hexachiorobutadiene	ΙŬ	Ŭ	Ŭ	ບ ບັ	l ŭ	Ŭ	Ŭ	Ū	330	
4-Chloro-3-methylphenol	Û Û	Ū	Ū	Ū.	i ii	Ŭ Ŭ	l ŭ	ŭ	330	240
2-Methyinaphthalene	i i	ŭ	Ŭ	Ŭ Ŭ	Ŭ	l ŭ	l ŭ	u u	330	36,400
Hexachlorocyclopentadiene		Ŭ	Ŭ	Ŭ	L ŭ	Ŭ	Ŭ	υ υ	330	30,400
2,4,6-Trichlorophanol	i ŭ	ŭ	l ŭ	Ŭ	U U	Ŭ	υ υ	υ υ	330	
2,4,5-Trichlorophenol	Ŭ	l ũ	Ŭ	Ŭ	. Ŭ	Ŭ	ŭ	υ υ	330	100
2-Chloronaphthalane	l ŭ l	Ŭ	υ	Ŭ Ŭ	U U	Ŭ	Ŭ	U U	330	
2-Nitroaniline	l ŭ l	ŭ	Ŭ	u u	U U	Ŭ	Ŭ	l u	330	430
Dimethylphthalate	. ŭ	Ŭ	Ŭ	U U	Ŭ	U U	U U	U U	330	2.000
Acenaphthylene	i ii	U U	Ŭ		U U	U U	υ υ	υ υ	330	41,000
2,6-Dinitrotoluene	i ii	U U				U U	υ υ	U U	330	1,000
3-Nitroaniline	i ii	Ŭ	Ŭ	, ii	ບ ບ		υ	U	330	500
Acenaphthene	i ii	U U	υ υ	U U	U U		U U	U U	330	-
Auguaphinione	0	V		0	U		U	U	330	50,000

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#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS	(12-14) 1/13/03 1 90.0	(14-16) 1/13/03 1	(16-16) 1/13/03	(16-20)	(4-6)	(6-8)	(8-10)	(10-12)	QUANTITATION	4046 Recommended
DILUTION FACTOR PERCENT SOLIDS	1 90.0	1	1/13/03	4/40/00		\ <b>U</b> = <b>U</b> /		(10-14)	QUANTIATION	4v40 Kecommended
PERCENT SOLIDS		1		1/13/03	1/13/03	1/13/03	1/13/03	1/13/03	LIMITS	Soll Cleanup
			1	1	1	1	1	1		Objective
		92.0	97.0	96.0	93.0	86.0	90.0	91.0		
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
2,4-Dinitrophenol	U	U	U	U U	U	U	U U	U	330	200
4-Nitrophenol	U	U	υ	U	U	U	U	U	330	100
Dibenzofuran	U	U	U	U	U	U	U	υ	330	6,200
2,4-Dinitrotoluene	U	U	U	U	U	U	U	U	330	
Diethylphthalate	U	U	υ	U	U '	U	U	U	330	7,100
4-Chlorophenyl-phenylether	U	U	U	U	U	U	U	U	330	
Fluorene	U	U	U	U	U	U	U	U	330	50,000
4-Nitroaniline	U	U	U	υ	U	U	U	υ	330	
4,6-Dinitro-2-methylphenol	U	U	U	U	U	U	U	υ	330	
N-Nitrosodiphanylamine	U	U	U	U	U	υ	υ	ן ט	330	
4-Bromophenyl-phenylether	U	Ų	U	U	U U	U	U	υ	330	
Hexachlorobenzene	U	U	U	U	U 1	U	U	U	330	410
Pentachlorophenol	ບ	υ	U	U	) U	U	U	U	330	1,000
Phenanthrene	U	U	U	U	U	U	U	υ	330	50,000
Anthracene	U	U	U	U	U	U	U	U	330	50,000
Carbazole	บ	U	Ų	U	U	U	U	ປ	330	
Di-n-butylphthalate	U	U	U	U	U	U	48 J	υ	330	8,100
Fluoranthene	U	U	U	U	U U	U	U	U	330	50,000
Pyrene	U	U	U	U	U U	U	U	U	330	50,000
Butylbenzylphthalate	U	U	U	U	( U	U	U	U	330	50,000
3,3'-Dichiorobenzidine	U	U	U	U	U	U	U	U	330	_
Benzo(a)anthracene	U	U	U	U	U	U	ບ	U	330	224
Chrysene	U	U	U	U	U	υ	U	U	330	400
bis(2-Ethylhexyl)phthalate	U	U	U	U	U	U	U	U	330	50,000
Di-n-octylphthalate	υ	U	U	U	U	U	U	U	330	50,000
Benzo(b)fluoranthene	U	U	U	U	U	ບ	ບ	U	330	1,100
Benzo(k)fluoranthene	U	U	U	U	U	U	U	υ	330	1,100
Benzo(a)pyrene	υ	U	U	U	υ	U	U	υ	330	61
indeno(1,2,3-cd)pyrene	U	U	U	U	U	U	U	U	330	3,200
Dibenzo(a,h)anthracene	U	U	U	U	U	U	U	U	330	14
Benzo(g,h,i)perylene	U	U	U	U	U	U	U	υ	330	50,000
Total PAHs	0	0	0	0	0	0	0	0	_	100,000
	ŏ	ŏ	o	0	0	0	0	0	_	10,000
Total CaPAHs Total SVOCs	ŏ	0	0	0	0	. 0	48	0		500,000

QUALIFIERS: U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

NOTES: : Not applicable. ---

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: Concentration exceeds NYSDEC TAGM Recommended Soll Cleanup Objective

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#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	MHSBX-07	MHSBX-07	MHSBX-07	MHSBX-07	MHSBX-08	MHSBX-08	MHSBX-08	MHSBX-08	LABORATORY	NYSDEC TAGM
SAMPLE DEPTH (FT)	(12-14)	(14-16)	(16-18)	(18-20)	(4-6)	(6-8)	(8-10)	(10-12)	QUANTITATION	4046 Recommended
DATE OF COLLECTION	1/13/03	1/13/03	1/13/03	1/13/03	1/17/03	1/17/03	1/17/03	1/17/03	LIMITS	Soll Cleanup
DILUTION FACTOR	1	1	1	1	1	1	1	1		Objective
PERCENT SOLIDS	93.0	87.0	88.0	91.0	66.0	84.0	87.0	94.0		
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Phenol										
	U	U	υ	U	U	U	U	U	330	30
bis(2-Chloroethyl)ether	U	U	U	U	U	U	Ų	U	330	
2-Chlorophanol	U	U	U	U	U	U U	U	U	330	800
1,3-Dichlorobenzene	U	U	U	U	l U	U U	U	υ	330	
1,4-Dichlorobenzene	Ų	U	Ų	U	U	U 1	υ	U U	330	
1,2-Dichlorobenzene	U	U	U	U	υ	V	U	U U	330	
2-Methylphenol	U	U	U	U	υ	υ	U	U	330	100
2,2'-oxybis (1-chloropropane)	U	U	υ	υ	υ	U	U U	U	330	
4-Methylphenol	U	U	U	U	U U	U .	U U	U	330	900
N-Nitroso-di-n-propylamine	υ	υ	U	U	U	U	l Ú	U U	330	
Hexachloroethane	U	U	U	U	Ú	Ū	U	Ú	330	
Nitrobenzene	U	U U	U	U	U	Ŭ	U	υ	330	200
isophorone	U	U	U U	U	U	U	ι U	U	330	4,400
2-Nitrophenol	U	U	U	Ų	U	U	U	υ	330	330
2,4-Dimethylphenol	U	U (	U	U	U	່ ປີ	U	י ט	330	
2,4-Dichlorophenol	U	U	υ	υ	U	Ū	U	Ū	330	400
1,2,4-Trichlorobenzene	U	U	υ	Ŭ	Ū	Ú	Ú	Ú	330	-
Naphthalene	U	U	υ	υ	Ú	Ū	) Ū	Ū	330	13,000
4-Chloroaniline	U	U	U	U	U	l u	U	Ű	330	220
bis(2-Chloroethoxy)methane	U	υ	υ	U	U	Ú	l ú	Ū	330	
Haxachiorobutadiene	υ	U	Ú	U	Ű	Ű	Ū	Ŭ	330	
4-Chloro-3-methylphenol	υ	U	Ū	Ú	Ū	Ŭ	Ŭ	Ŭ.	330	240
2-Methylnaphthalene	U	U	Ú	Ŭ	Ū	Ū	Ū	Ū	330	36,400
Hexachlorocyclopentadiene	U	U	U	Ų	U	Ű	υ	υ	330	
2,4,6-Trichlorophenol	U	U	υ	υ	บ้	i Ŭ	l ū	Ū Ū	330	
2,4,5-Trichlorophenol	ũ l	Ŭ	Ŭ	Ŭ	Ů	ı ŭ	Ŭ	ŭ	330	100
2-Chloronaphthalene	ŭ	Ū	Ŭ	Ŭ	ı ü	ŭ	U U	Ŭ	330	
2-Nitroaniline	Ũ	Ŭ	ŭ	Ŭ	l ũ	l Ű	i ŭ	Ŭ	330	430
Dimethylphthalate	Ŭ	Ū	Ū	Ŭ	ŭ	Ŭ	l ŭ	Ŭ	330	2,000
Acenaphthylene	Ú	Ū	Ŭ	ŭ	l ŭ	ũ	l ũ	Ŭ	330	41,000
2,8-Dinitrotoluene	Ŭ	ŭ	Ŭ	Ŭ	i ŭ	l ü	l ŭ	บั	330	1,000
3-Nitroaniline	Ŭ	Ŭ	Ŭ	Ű	υ υ			U U	330	500
Acenaphthene	Ŭ	ŭ	U U	- U	່ <u>ບ</u>	. U	Ŭ	บ บ	330	50,000

#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

# SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR	MHSBX-07 (12-14) 1/13/03	MH\$BX-07 (14-16) 1/13/03	MHSBX-07 (16-18) 1/13/03	MHSBX-07 (18-20) 1/13/03	MHSBX-08 (4-6) 1/17/03	MHSBX-08 (6-8) 1/17/03	MHSBX-08 (8-10) 1/17/03	MHSBX-08 (10-12) 1/17/03	LABORATORY QUANTITATION LIMITS	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective
PERCENT SOLIDS	93.0	87.0	88.0	91.0	66.0	84.0	87.0	94.0		Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ua/ka)	(ug/kg)
	(09/109)	(09/19/	(09/18)	(08/18)	(********	(38,187	(09/119/	(09/118)		
2,4-Dinitrophenol	υ	υ	υ	υ	υ [	υ	υ	υ [	330	200
4-Nitrophenoi	υ	U	U	U	U U	U	υ [	U	330	100
Dibenzofuran	υ	U	U	U	υ [	U	υ	U	330	6,200
2,4-Dinitrotoluene	U U	U	U	U	U U	U	υ	U	330	
Diethylphthalate	U	U	U	U	υ	U	υ	υ υ	330	7,100
4-Chlorophenyi-phenyiether	U	U	U	U	U	U	υ	U	330	
Fluorene	υ	U	U	U	U	U	U U	U	330	50,000
4-Nitroaniline	υ	υ	U	υ	υ	υ	υ	υ	330	I
4,6-Dinitro-2-methylphenol	υ	U	U	υ	( U	υ	υ	υ [	330	-
N-Nitrosodiphenylamine	U	υ	U	U	U	Ų	<b>υ</b>	U	330	
4-Bromophenyl-phenylether	U	U	U U	U	U	U U	υ	U	330	
Hexachlorobenzene	ט	υ	U	υ	υ	υ	Ι υ	U	330	410
Pentachlorophenol	Ū	υ	U	υ	υ	υ	υ	U U	330	1,000
Phenanthrene	U	U	U	U U	U U	U	ļυ	ι υ	330	50,000
Anthracene	U U	U U	U	U U	U U	U	U U	U	330	50,000
Carbazole	U	U	U	U U	U V	U	U U	U U	330	<u></u> (
Di-n-butylphthalate	U	ບ 🔰	U	U	Ų V	U U	) U	U	330	8,100
Fluoranthene	U	U	U	ן U	U U	U V	U U	U	330	50,000
Pyrene	U U	U	U	U	U	U U	U	U U	330	50,000
Butylbenzylphthalate	U	U	U	U	ן ט	U U	U	ປ	330	50,000
3,3'-Dichlorobenzidine	U	U	U	í U	U U	U	U	U	330	
Benzo(a)anthracene	U	U U	U	U	U	U	U	U	330	224
Chrysene	U	U U	Ų	U	U U	U	U	( υ	330	400
bis(2-Ethylhexyl)phthalate	U	U	U	U	U	U	U	U	330	50,000
Di-n-octylphthalate	U	υ	U	U	l u	U	U	U	330	50,000
Benzo(b)fluoranthene	U	U U	U	U	U	U U	( U	U	330	1,100
Benzo(k)fluoranthene	U	U U	U	U	U	U	U U	U	330	1,100
Benzo(a)pyrene	U	U	U U	U U	U	U	U U	U	330	61
Indeno(1,2,3-cd)pyrene	U	U	U	U	U U	U	U	U	330	3,200
Dibenzo(a,h)anthracene	U	U U	U	U	U U	U	ບ	U	330	14
Benzo(g,h,i)perylene	U	U	U	U	U	Ų	U	U	330	50,000
Total PAHs	0	o	0	0	0	0	0	0		100,000
Total CaPAHs	0	٥	0	0	0	0	0	0	••	10,000
Total SVOCs	0	0	0	0	0	0	0	0	F	500,000

QUALIFIERS:

U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

NOTES: -- : Not applicable.

: Concentration exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

# SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	MHSBX-08	MHSBX-08	MHSBX-08	MHSBX-08	MHSBX-09	MHSBX-09	MHSBX-09	MHSBX-09	LABORATORY	NYSDEC TAGM
SAMPLE DEPTH (FT)	(12-14)	(14-16)	(16-18)	(18-20)	(6-8)	(8-10)	(10-12)	(12-14)	QUANTITATION	4046 Recommended
DATE OF COLLECTION	1/17/03	1/17/03	1/17/03	1/17/03	1/17/03	1/17/03	1/17/03	1/17/03	LIMITS	Soil Cleanup
DILUTION FACTOR	1	1 1	1	1	1	1	1	1		Objective
PERCENT SOLIDS	92.0	91.0	92.0	95.0	85.0	88.0	88.0	92.0		
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Phanol	u u	U	U	U	υ	U	U	υ	330	30
bis(2-Chioroethyl)ether	ů v	Ŭ	Ŭ	U U	Ŭ	U U	i ü	Ŭ	330	30
2-Chlorophanol	U U	Ŭ	Ŭ	U U	U U	U U	l ü	Ŭ	330	800
1,3-Dichlorobenzene	Ŭ	U U	Ŭ	U U	Ŭ	i Ü	Ŭ	ŬŬ	330	300
1,4-Dichlorobenzene	Ŭ	l ŭ	Ŭ	Ŭ Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	330	
1,2-Dichlorobenzene	U U	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	υ		330	
2-Mathylphenol	U U	Ŭ	U U	U U	U	U U		U U	330	100
2.2'-oxybis (1-chloropropane)	U U	l ü	U U			U U		U U	330	100
4-Methylphenol	Ŭ	l ŭ	U	บ บ	ี <u>บ</u>			U U	330	900
N-Nitroso-di-n-propylamine	i i	U U	U U	U U	. U	U U	l ŭ	υ	330	900
Hexachloroethane		υ υ	ม บ	U U	Ŭ	U U	υ	U U	330	
Nitrobenzene		l Ŭ		U U	-	-	-	-		
Isophorona		-	U .	-	U	U	U U		330	200
2-Nitrophenol		U		U U	U	U U	U U		330	4,400
2,4-Dimethylphenoi			, U	U U	U U	U U	U U	U U	330	330
2,4-Dichlorophenol				U U	U U	U			330	
1.2.4-Trichlorobenzene		-	-			L U	U	-	330	400
Naphthalene		U U	U U	U	U	U	U U	U U	330	
4-Chloroaniline	0		U	U	U U	U U	U	U	330	13,000
bis(2-Chloroethoxy)methane	U U		U U	U U	U U	U U	U	U U U	330	220
Hexachiorobutadiene	0		U U	U U		U 1 U			330	
4-Chloro-3-methylphenol	0	ļ	U U	U U	-	-	-		330	
2-Methvinaphthalene	. U		-	-	ບ ບ	U	U		330	240
Hexachlorocyclopentadlene	U U	U U	U	UU	-		U	U U	330	36,400
2.4.6-Trichlorophenol			U		U U	U U	U U	U U	330 330	· · ·
2,4,5-Trichlorophenol	U U	U U	U	. บ บ	U U			U U		100
2-Chioronaphthalene	U U	. U	U U	U U	-	-		-	330	100
2-Nitroaniline	0	U U	-	-	U	U	U	U	330	
		-	U	U	U	U	U	U	330	430
Dimethylphthalate		U	U	U	U	U	U U	U	330	2,000
Acenaphthylene	U	U	U	U	U	U	U	U	330	41,000
2,6-Dinitrotoluene	U	U	Ŷ	U	U	U U	U U	U	330	1,000
3-Nitroaniline	U U	บ บ	U U	' U	U	U	U	U	330	500
Acenaphthene	<u>U</u>		U	U	U	<u> </u>	U.	U	330	50,000

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#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

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SAMPLE ID	MHSBX-08	MHSBX-08	MHSBX-08	MHSBX-08	MHSBX-09	MHSBX-09	MHSBX-09	MHSBX-09	LABORATORY	NYSDEC TAGM
SAMPLE DEPTH (FT)	(12-14)	(14-16)	(16-18)	(18-20)	(6-8)	(8-10)	(10-12)	(12-14)	QUANTITATION	4046 Recommended
DATE OF COLLECTION	1/17/03	1/17/03	1/17/03	1/17/03	1/17/03	1/17/03	1/17/03	1/17/03	LIMITS	Soll Cleanup
DILUTION FACTOR	1	1	1	1	1	1	1	1		Objective
PERCENT SOLIDS	92.0	91.0	92.0	95.0	85.0	88.0	88.0	92.0		,
UNITS	(ug/kg)	(ug/kg)								
2,4-Dinitrophenol	U	U	U	U	U	U	U U	U	330	200
4-Nitrophenol	U	Ų	U	U	Ų	U	ļ V	U	330	100
Dibenzofuran	U	U	U	U	Ų	U	( U	U	330	6,200
2,4-Dinitrotoluene	U	U	Ų	U	U	υ	Įυ	U	330	
Diethylphthalate	U	U	U	U	U	U	U	U	330	7,100
4-Chlorophenyl-phenylether	U	U	Ų	U U	U	υ	U	U	330	
Fluorene	U	U	U	U	U	Ų	) U	U	330	50,000
4-Nitroaniline	U	U	U	Ų	U	U	U	U	330	
4,6-Dinitro-2-methylphenol	U	U	U	υ	U	U	U	U	330	
N-Nitrosodiphenylamine	U	ບ	U,	U	Ų	U	υ	U	330	
4-Bromophenyl-phenylether	U	U	U	U	U	U	្រប	U	330	
Hexachlorobenzene	U	U	υ	U	U	U	U	U	330	410
Pentachlorophenol	U	U	U	U	υ	U	U	U	330	1,000
Phenanthrene	U	U	U	U	U	U	U	U	330	50,000
Anthracene	U	U	U	U	U	U	U	U	330	50,000
Carbazole	U	V	U	U	U	U	U U	U	330	(
Di-n-butylphthalate	U	U U	U	U	U	U	U	U	330	8,100
Fluoranthene	U	U	U	U	υ	U	U	U	330	50,000
Pyrene	U	U	U	U	U	Ų	υ	U	330	50,000
Butylbenzylphthalate	U	U	U	U	U	U	U	U	330	50,000
3,3'-Dichlorobenzidine	U	U	U	U	U	U	U	U	330	
Benzo(a)anthracene	U	U	U	U	U	U	U U	U	330	224
Chrysene	U	U	υ	U	U	U	U	U	330	400
bis(2-Ethylhexyl)phthalate	U	U	U	U	U	U	ບ ບ	U	330	50,000
Di-n-octylphthalate	U	U	U	U	U	U	U	U	330	50,000
Benzo(b)fluoranthene	U	U	U	U	U	U	U	U	330	1,100
Benzo(k)fluoranthene	U	V	U	U	U	U	U	U	330	1,100
Benzo(a)pyrene	U	U	U	U	U	U	U	υ	330	61
Indeno(1,2,3-cd)pyrene	U	U	U	U	U	υ	U	U	330	3,200
Dibenzo(a,h)anthracene	U	U	U	U	U	U	U	υ	330	14
Benzo(g,h,i)perylene	υ	U	Ų	U	U	υ	μ μ	U	330	50,000
Total PAHs	0	0	0	0	0	0	0	0	_	100,000
	0	0	0	0	0	ŏ	ŏ	ŏ		10,000
Total CaPAHs	0	0	0	0	0	0	0	0	-	500,000
Total SVOCs	<u> </u>	U		U		<u> </u>		<u> </u>		

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QUALIFIERS: U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

NOTES: : Not applicable.

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: Concentration exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

# SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	MHSBX-09	MHSBX-09	MHSBX-09			 		LABORATORY	NYSDEC TAGM
SAMPLE DEPTH (FT)	(14-16)	(16-18)	(18-20)					QUANTITATION	4046 Recommended
DATE OF COLLECTION	1/17/03	1/17/03	1/17/03					LIMITS	Soll Cleanup
DILUTION FACTOR	1	1	1						Objective
PERCENT SOLIDS	93.0	95.0	94.0						Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)					(ug/kg)	(ug/kg)
		(-9 - 8)	(			 		(Uging)	
Phenol	υ	U	υ					330	30
bis(2-Chioroethyl)ether	Ú	Ŭ	Ū				1	330	
2-Chlorophenol	Ů	Ū	Ů					330	800
1,3-Dichlorobenzene	Ŭ	Ŭ	Ŭ					330	
1,4-Dichlorobenzene	Ũ	Ŭ	Ŭ					330	
1,2-Dichlorobenzene	ŭ	Ŭ	Ŭ					330	· _ }
2-Methylphenol	Ŭ	Ŭ	Ŭ	] .				330	100
2,2'-oxybis (1-chloropropane)	Ŭ	Ŭ	Ŭ					330	
4-Methylphenol	Ŭ	Ū	ν					330	900
N-Nitroso-di-n-propylamine	Ŭ	Ū	l Ŭ					330	300
Hexachloroethane	Ŭ	Ŭ	Ŭ					330	
Nitrobenzene	Ŭ	U U	Ŭ					330	200
Isophorone	Ŭ	l ů	Ŭ					330	4,400
2-Nitrophenol	Ŭ.	l ŭ	Ŭ					330	330
2,4-Dimethylphenol	Ŭ	. มี	ບັ					330	
2,4-Dichlorophenol	ŭ	Ŭ	Ŭ					330	400
1.2.4-Trichlorobenzene	ŭ	ີ ນັ່	i ü					330	
Naphthalene	Ŭ	Ŭ	Ŭ					330	13,000
4-Chioroaniline	Ū	บี	Ŭ					330	220
bis(2-Chloroethoxy)methane	Ú	Ŭ	Ŭ					330	
Hexachiorobutadiene	Ŭ	i Ŭ	Ū					330	
4-Chloro-3-methylphenol	Ŭ	Ŭ	Ŭ					330	240
2-Methylnaphthalene	Ŭ	Ŭ	Ŭ					330	36,400
Hexachiorocyclopentadiene	Ũ	Ŭ	Ŭ					330	
2,4,6-Trichlorophenol	Ŭ	Ú Ú	Ŭ					330	[
2,4,5-Trichlorophenol	Ū	Ŭ	Ů					330	100
2-Chloronaphthalene	Ũ	Ũ	Ŭ					330	
2-Nitroaniline	Ũ	Ũ	Ů	1				330	430
Dimethylphthalate	Ũ	Ŭ	Ŭ					330	2,000
Acenaphthylene	Ū	Ū	Ū		'			330	41,000
2,6-Dinitrotoluene	Ŭ	Ŭ	Ŭ					330	1,000
3-Nitroaniline	Ŭ	Ŭ	Ũ					330	500
Acenaphthene	Ŭ	Ŭ	Ŭ		ļ			330	50,000

#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	MHSBX-09 (14-16) 1/17/03 1 93.0 (ug/kg)	MHSBX-09 (18-18) 1/17/03 1	MHSBX-09 (18-20) 1/17/03					QUANTITATION	NYSDEC TAGM 4048 Recommended
DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS	1 93.0	1							
PERCENT SOLIDS	93.0							LIMITS	Soll Cleanup
			1						Objective
	(ualka)	95.0	94.0					•	
		(ug/kg)	(ug/kg)					(ug/kg)	(ug/kg)
	(-8		(	 		┝╼╌╌╴┾╸			
2,4-Dinitrophenol	U	υ	υ					330	200
4-Nitrophenol	υÌ	Ũ	Ū			1		330	100
Dibenzofuran	Ū	Ū	Ū					330	6,200
2.4-Dinitrotoluene	Ū	Ū	Ŭ					330	
Diethylphthalate	ŭ	Ŭ	ບັ			Í		330	7,100
4-Chlorophenyl-phenylether	Ŭ	Ŭ	Ŭ			ļ į		330	
Fluorene	Ŭ	Ŭ	U U			1		330	50,000
4-Nitroaniline	ŭ	Ŭ	U					330	
	Ŭ	Ŭ	υ			] ]		330	
4,6-Dinitro-2-methylphenol		-	_						
N-Nitrosodiphenylamine	U	U	U			}		330	
4-Bromophenyl-phenylether	U	U	U					330	
Hexachlorobenzene	U	· U	U			}		330	410
Pentachlorophenol	U I	U	U					330	1,000
Phenanthrene	U	U	U					330	50,000
Anthracene	υj	U	U					330	50,000
Carbazole	U	U	υ					330	
Di-n-butyiphthalate	U	U	U		1	) )	ĺ	330	8,100
Fluoranthene	U	U	υ			1		330	50,000
Pyrene	U	U	U					330	50,000
Butylbanzylphthalate	U	U	U					330	50,000
3,3'-Dichlorobenzidine	U	U	Ų				}	330	
Benzo(a)anthracene	Ų	U	U			[ }		330	224
Chrysene	Ú I	U	υ					330	400
bis(2-Ethylhexyl)phthalate	Ú (	U	U				1	330	50,000
Di-n-octylphthalate	υĪ	Ū	Ū			{		330	50,000
Benzo(b)fluoranthene	Ū	Ŭ	Ũ			l ì	ľ	330	1,100
Benzo(k)fluoranthene	Ū	Ū	Ŭ					330	1,100
Benzo(a)pyrene	ūί	Ũ	Ū				l l	330	61
Indeno(1,2,3-cd)pyrene	Ŭ	Ŭ	Ŭ					330	3,200
Dibenzo(a,h)anthracene	υĪ	Ū	Ŭ					330	14
Benzo(g,h,i)peryiene	Ŭ I	Ŭ	Ŭ					330	50,000
neutro/Atritikai kielie	5	Ŭ	Ŭ					000	00,000
Total PAHs	o	ο	o					**	100.000
Total CaPAHs	ő	ŏ	ō			ļ l	ļ		10,000
Total SVOCs	ŏ	ů	ŏ					-	500,000

# QUALIFIERS:

U: Compound analyzed for but not detected. J: Compound found at a concentration below the detection limit.

NOTES: ----

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: Not applicable. : Concentration exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

# SUBSURFACE SOIL - POLYCHLORINATED BIPHENYLS (PCBs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	MHSBX-01 (4-6) 1/13/03 1 91.0 (ug/kg)	MH\$BX-01 (8-10) 1/13/03 1 90.0 (ug/kg)	MH\$BX-01 (12-14) 1/13/03 1 93.0 (ug/kg)	MHSBX-01 (14-16) 1/13/03 1 96.0 (ug/kg)	MHSBX-01 (16-18) 1/13/03 1 89.0 (ug/kg)	MHSBX-01 (18-20) 1/13/03 1 98.0 (ug/kg)	MHSBX-02 (4-8) 1/17/03 1 89.0 (ug/kg)	MH\$BX-02 (6-8) 1/17/03 1 89.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective (ug/kg)
	(09/29)	(ug/kg)	(ug/kg)	(09/kg)	(49/kg)	(ug/kg)		(ug/ng)		
Arocior- 1016	U	υ	Ŭ	υ	υ	υ	υ	υ	34	
Araclor- 1221	υ	υ υ	υ υ	U	Ú	U	υ	υ	34	****
Araclor- 1232	υ	U	U U	U	) υ	υ.	υ	ប	34	
Aroclor- 1242	υ	) U	Ú	U	ບ	U U	υ υ	U	34	
Arocior- 1248	ί υ	ບ 🛛	Ι υ	U	) υ	υ 1	υ	ប	34	
Arocior- 1254	Ι υ	U U	U	U	υ	υ	υ	υ	34	
Aroclor- 1260	υ	U U	U	U	U	U	U	υ	34	
	0	0	0	0	0	0	0	0	-	1,000/10,000*

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	MHSBX-02 (8-10) 1/17/03 1 91.0 (ug/kg)	MHSBX-02 (10-12) 1/17/03 1 91.0 (ug/kg)	MH\$BX-02 (12-14) 1/17/03 1 93.0 (ug/kg)	MHSBX-02 (14-16) 1/17/03 1 95.0 (ug/kg)	MHSBX-02 (16-18) 1/17/03 1 90.0 (ug/kg)	MHSBX-02 (18-20) 1/17/03 1 96.0 (ug/kg)	MH\$BX-03 (4-6) 1/13/03 1 88.0 (ug/kg)	MHSBX-03 (6-8) 1/13/03 1 87.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4048 Recommended Soil Cleanup Objective (ug/kg)
Aroclor- 1016 Aroclor- 1221 Aroclor- 1232 Aroclor- 1242 Aroclor- 1248 Aroclor- 1254 Aroclor- 1254				σοσοσ		υ υ υ υ υ υ	0 0 0 0 0 0 0 0		34 34 34 34 34 34 34 34	
TOTAL PCB	0	0	0	0	0	0	0	0		1,000/10,000*

OUALIFIERS:

U: Compound analyzed for but not detected.

### NOTES:

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- : Not applicable.

: According to NYSDEC TAGM 4046 Recommended Soil Cleanup Objective, 1,000 ug/kg is utilized for surface soil [0-2' below ground surface (bgs)] and 10,000 ug/kg is utilized for subsurface soil (soil deeper than 2' bgs).

#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

# SUBSURFACE SOIL - POLYCHLORINATED BIPHENYLS (PCBs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	MHSBX-03 (8-10) 1/13/03 1 91.0 (ug/kg)	MHSBX-03 (10-12) 1/13/03 1 94.0 (ug/kg)	MHSBX-03 (12-14) 1/13/03 1 91.0 (ug/kg)	MH\$BX-03 (14-16) 1/13/03 1 94.0 (ug/kg)	MHSBX-03 (16-18) 1/13/03 1 89.0 (ug/kg)	MHSBX-03 (18-20) 1/13/03 1 96.0 (ug/kg)	MH\$BX-04 (4-6) 1/13/03 1 91.0 (ug/kg)	MHSBX-04 (6-8) 1/13/03 1 92.0 (ug/kg)	LABORATORY QUANTITATION LIMITS	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective (ug/kg)
Aroclor- 1016	11						U			
Arocior- 1221				0		U U	÷ i	L N	34	
				U U		U	U		34	
Aroclor- 1232		U	U	U	U	U	υ	U	34	
Arocior- 1242	U U	Į U	U	U	U	υ	U	U U	34	
Arocior- 1248	U	U	υ	υ	υ	U	υ	. U	34	
Arocior- 1254	U U	U U	υ	U	U	U	U	U	34	****
Aroclor- 1260	U	U	U	υ	U	U	υ	υ	34	
TOTAL PCBs	0	0	0	0	0	0	0	0		1,000/10,000*

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	<b>MHSBX-04</b> (8-10) 1/13/03 1 91.0 (ug/kg)	MH\$BX-04 (10-12) 1/13/03 1 91.0 (ug/kg)	MH\$BX-04 (12-14) 1/13/03 1 91.0 _(ug/kg)	MHSBX-04 (14-16) 1/13/03 1 95.0 (ug/kg)	MH\$BX-05 (4-6) 1/13/03 1 90.0 _(ug/kg)	MHSBX-05 (6-8) 1/13/03 1 93.0 (ug/kg)	MH\$BX-05 (8-10) 1/13/03 1 90.0 (ug/kg)	MHSBX-05 (10-12) 1/13/03 1 85.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective (ug/kg)
A	- 11	11					11			
Aroclor- 1016 Aroclor- 1221			Ŭ			11		U U	34 34	
Aroclor- 1232	Ŭ	ม ม ม	U U	มี มี	U U	ម ម	ม บ	ບ ບ	34	
Aroclor- 1242	Ŭ	ĪŪ	Ū	Ū	l ŭ	Ŭ	υ	ΙŬ	34	
Aroclor- 1248	l ŭ	Ū	Ŭ	Ū	l ŭ	Ū	Ū	Ŭ	34	
Arocior- 1254	ΙŪ	Ū	Ŭ	Ū	Î Ū	Ū	Ū	Ŭ	34	
Aroclor- 1260	Ū	บ	Ű	Ű	Ū	Ŭ	Ŭ	Ŭ	34	
	0	0	0	0	0	0	0	00	, <b></b>	1,000/10,000*

### QUALIFIERS:

U: Compound analyzed for but not detected.

#### NOTES: --- : Not applicable. --- : According to NY

: According to NYSDEC TAGM 4046 Recommended Soil Cleanup Objective, 1,000 ug/kg is utilized for surface soil [0-2' below ground surface (bgs)] and 10,000 ug/kg is utilized for subsurface soil (soil deeper than 2' bgs).

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#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - POLYCHLORINATED BIPHENYLS (PCBs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	MHSBX-05 (12-14) 1/13/03 1 90.0 (ug/kg)	MHSBX-05 (14-16) 1/13/03 1 92.0 (ug/kg)	MHSBX-05 (16-18) 1/13/03 1 97.0 (ug/kg)	MHSBX-05 (18-20) 1/13/03 1 96.0 (ug/kg)	MHSBX-06 (4-6) 1/13/03 1 93.0 (ug/kg)	MHSBX-06 (6-8) 1/13/03 1 86.0 (ug/kg)	MHSBX-06 (8-10) 1/13/03 1 90.0 (ug/kg)	MHSBX-07 (10-12) 1/13/03 1 91.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4048 Recommended Soll Cleanup Objective (ug/kg)
Araclar- 1016						11			34	
Aroclor- 1221									34	
Arocior- 1221 Arocior- 1232		l ñ		i ü	l ü	l ü	U U	l ü	34	
Arocior- 1242	i i	i ŭ	i ŭ	l ŭ	l ŭ	l Ü	l ŭ	Ŭ	34	
Aroclor- 1248	l ŭ	l ŭ	l ŭ	l ŭ	ŭ	l ŭ	l ŭ	Ū	34	
Aroclor- 1254	l ŭ	l ŭ	U U	l ŭ	l Ü	l ŭ		l ũ	34	
Arocior- 1260	Ų	Ū	U U	Ŭ	Ŭ	U U	Ŭ	υ	34	
	o	0	o	0	0	o	0	o		1,000/10,000*

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS	MHSBX-07 (12-14) 1/13/03 1 93.0	MHSBX-07 (14-16) 1/13/03 1 87.0	MHSBX-07 (16-18) 1/13/03 1 88.0	MHSBX-07 (18-20) 1/13/03 1 91.0	MHSBX-08 (4-6) 1/17/03 1 66.0	MHSBX-08 (6-8) 1/17/03 1 86.0	MHSBX-08 (8-10) 1/17/03 1 87.0	MHSBX-08 (10-12) 1/17/03 1 94.0	LABORATORY QUANTITATION LIMITS	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective
	_(ug/kg)	(ug/kg)	(ug/kg)	<u>(ug/kg)</u>	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Arocior- 1016 Arocior- 1221 Arocior- 1232 Arocior- 1242 Arocior- 1248 Arocior- 1254 Arocior- 1260	00000000000000000000000000000000000000			ບ ບ ບ ບ ບ ບ		U U U U U U U	ນ ບ ບ ບ ບ ບ	σοσοσο	34 34 34 34 34 34 34 34	
TOTAL PCBs	0	0	0	0	0	0	0	0		1,000/10,000*

<u>QUALIFIERS:</u> U: Compound analyzed for but not detected.

#### NOTES: -

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: Not applicable. : According to NYSDEC TAGM 4046 Recommended Soil Cleanup Objective, 1,000 ug/kg is utilized for surface soil [0-2' below ground surface (bgs)] and 10,000 ug/kg is utilized for subsurface soil (soil deeper than 2' bgs).

#### MANHASSET SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - POLYCHLORINATED BIPHENYLS (PCBs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	MHSBX-08 (12-14) 1/17/03 1 92.0 (ug/kg)	MHSBX-08 (14-16) 1/17/03 1 91.0 (ug/kg)	MHSBX-08 (16-18) 1/17/03 1 92.0 (ug/kg)	MHSBX-08 (18-20) 1/17/03 1 95.0 (ug/kg)	MHSBX-09 (6-8) 1/17/03 1 85.0 (ug/kg)	MHSBX-09 (8-10) 1/17/03 1 88.0 (ug/kg)	MHSBX-09 (10-12) 1/17/03 1 88.0 (ug/kg)	MHSBX-09 (12-14) 1/17/03 1 92.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective (ug/kg)
Arocior- 1016 Arocior- 1221 Arocior- 1232 Arocior- 1242 Arocior- 1248 Arocior- 1254 Arocior- 1260	ບ ບ ບ ບ ບ ບ	υυυυυ	ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ	CCCCC	0 0 0 0 0 0 0 0 0 0	000000000000000000000000000000000000000	000000000000000000000000000000000000000	σσσσσσ	34 34 34 34 34 34 34	
TOTAL PCBs	0	0	0	0	0	0	0	0		1,000/10,000*
SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	MHSBX-09 (14-16) 1/17/03 1 93.0 (ug/kg)	MHSBX-09 (16-18) 1/17/03 1 95.0 (ug/kg)	MHSBX-09 (18-20) 1/17/03 1 94.0 (ug/kg)						LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective (ug/kg)
Arocior- 1016 Arocior- 1221 Arocior- 1232 Arocior- 1242 Arocior- 1248 Arocior- 1254 Arocior- 1260	ບ ບ ບ ບ ບ ບ ບ	ນ ນ ບ ບ ບ ບ	ບ ບ ບ ບ ບ ບ ບ						34 34 34 34 34 34 34 34	
TOTAL PCBs	0	0	0						-	1,000/10,000*

QUALIFIERS: U: Compound analyzed for but not detected.

# NOTES:

: Not applicable. •

: According to NYSDEC TAGM 4046 Recommended Soil Cleanup Objective, 1,000 ug/kg is utilized for surface soil [0-2' below ground surface (bgs)] and 10,000 ug/kg is utilized for subsurface soil (soil deeper than 2' bgs).

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#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT

# C SURFACE SOIL - MERCURY AND RCRA METALS

SAMPLE ID SAMPLE ID DATE OF COLLECTION PERCENT SOLIDS UNITS	MSSS-07A (0-2) 8/10/04 99.0 (mg/kg)	MSSS-08 (0-2) 8/10/04 90.0 (mg/kg)	MSSS-09 (0-2) 8/10/04 94.0 (mg/kg)_	MSSS-10 (0-2) 8/10/04 96.0 (mg/kg)	MSSS-11 (0-2) 8/10/04 93.0 (mg/kg)	MSSS-12 (0-2) 8/10/04 97.0 (mg/kg)	MSSS-13 (0-2) 8/10/04 95.0 (mg/kg)	MSSS-14 (0-2) 8/10/04 90.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective mg/kg
Mercury	6.7	0.40	4.7	0.23	4.1	13.6	0.92	0.83	0.042	0.1

SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLIDS UNITS	MSSS-15 (0-2) 8/10/04 49.0 (mg/kg)	MSSS-16 (0-2) 8/10/04 82.0 (mg/kg)	MSSS-17 (0-2) 8/10/04 68.0 (mg/kg)	MSSS-18 (0-2) 8/10/04 88.0 (mg/kg)	MSS8-19 (0-2) 8/10/04 98.0 (mg/kg)	MSSS-20 (0-2) 8/10/04 97.0 (mg/kg)	MSSB-06A (0-2) 2/4/03 84.0 (mg/kg)	5050100000 MSSB-09 (0-2) 2/4/03 88.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective mg/kg
Mercury	0.72	0.99	0.83	6.7	4.0	2.0	0.15	57.6	0.042	0.1

AREA OF CONCERNS SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLIDS UNITS	MSSB-10 (0-2) 2/4/03 86.0 (mg/kg)	MSSB-11 (0-2) 2/4/03 92.0 (mg/kg)	MSSB-12 (0-2) 2/4/03 92.0 (mg/kg)	MSSB-13 (0-2) 2/3/03 88.0 (mg/kg)	<b>MSSB-14</b> (0-2) 2/4/03 89.0 (mg/kg)	MSSB-15 (0-2) 2/4/03 91.0 (mg/kg)	MSSB-16 (0-2) 2/4/03 93.0 (mg/kg)	MSSB-17 (0-2) 2/4/03 90.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/1)	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective mg/kg
Mercury	54.6	0.22	58.8	3.5	3.2	12.9	7.9	0.12	0.042	0.1

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SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLIDS UNITS	MSSB-18 (0-2) 2/4/03 88.0 (mg/kg)	M\$88-19 (0-2) 2/4/03 93.0 (mg/kg)	MSSE-20 (0-2) 2/4/03 91.0 (mg/kg)	MSSB-21 (0-2) 2/3/03 90.0 (mg/kg)	MSSB-22 (0-2) 2/4/03 91.0 (mg/kg)	MSSB-23 (0-2) 2/4/03 86.0 (mg/kg)	MSSB-24 (0-2) 2/4/03 91.0 (mg/kg)	MSSB-25 (0-2) 2/3/03 88.0 (mg/kg)	INSTRUMENT DETECTION LIMITS	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective mg/kg
Mercury	6.6	3.1	4,1	2.1_	3.8	1	0.67	0.86	0.042	0.1

QUALIFIERS:

U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

SB: Site Background

\*: As per proposed 4/95 NSDEC TAGM

\*\*: Average background levels in metropolitan or surburban areas or near highways range from 200-500 ppm. : Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT

#### SURFACE SOIL - MERCURY AND RCRA METALS

AREAD BOONGERNS	MSSB-26 (0-2) 2/3/03 89.0 (mg/kg)	MSSB-27 (0-2) 2/3/03 85.0 (mg/kg)	MSSB-28 (0-2) 2/3/03 84.0 (mg/kg)	MS\$B-29 (0-2) 2/3/03 92.0 (mg/kg)	ISUDCH HON MSSB-30 (0-2) 2/4/03 93.0 (mg/kg)	M\$SB-31 (0-2) 2/3/03 92.0 (mg/kg)	MSSB-32 (0-2) 2/4/03 86.0 (mg/kg)	MSSB-33 (0-2) 2/4/03 87.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/i)	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective mg/kg
Mercury	0.5	1.5	0.4	0.43	30.5	3.7	8.2	16.2	0.042	0.1

AREASCIGONOFINE SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLIDS UNITS	M358-34 (0-2) 2/4/03 88.0 (mg/kg)	M358-38 (0-2) 2/3/03 89.0 (mg/kg)	M\$\$B-39 (0-2) 2/4/03 85.0 (mg/kg)			INSTRUMENT DETECTION LIMITS (ug/i)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective mg/kg
Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	NA NA NA NA 7.3 NA NA	3.9 34.7 0.82 10 323 3.3 U 0.37 B	4 37.8 0.73 33.8 16 178 U 0.58 B			3.0 3.0 2.0 3.0 1.0 0.1 8.0 2.0	7.5 or SB 300 or SB 10* 50* SB** 0.1 2 or SB SB

QUALIFIERS:

U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL. NA: Not Analyzed for

Notes: SB: Site Background

\*: As per proposed 4/95 NSDEC TAGM

\*\*: Average background levels in metropolitan or surburban areas or near highways range from 200-500 ppm.

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: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT

#### SURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

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SAMPLE ID	MSSB-38	MSSB-39				
SAMPLE DEPTH (IN)	(0-2)	(0-2)			LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	2/3/03	2/4/03			QUANTITATION	4046 Recommended
DILUTION FACTOR	1	1			LIMITS	Soil Cleanup
PERCENT SOLIDS	89.0	85.0				Objective
UNITS	(ug/Kg)	(ug/Kg)			(ua/Ka)	(ug/Kg)
<u> </u>			 	 		(49,119)
Phenoi	U	υ			330	30
bis(2-Chloroethyl)ether	U	υ			330	
2-Chlorophenol	U	U U			330	800
1,3-Dichlorobenzene	U	υ			330	
1,4-Dichlorobenzene	U	υ [			330	
1,2-Dichlorobenzene	υ	Ū			330	
2-Methylphenol	U	Ū			330	100
2,2'-oxybis (1-chloropropane)	U	υ			330	-
4-Methylphenol	υ	υ υ			330	900
N-Nitroso-dl-n-propylamine	υ	U U			330	
Hexachioroethane	່ ບໍ່	) υ			330	
Nitrobenzene	υ 🕴	υ			330	200
Isophorone	U	υ υ			330	4,400
2-Nitrophenol	U	U			330	330
2,4-Dimethylphenol	υ	υ			330	
2,4-Dichiorophenol	U	υ			330	400
1,2,4-Trichlorobenzene	υ	U			330	-
Naphthalene	U	U			330	13,000
4-Chloroanlline	U	U			330	220
bls(2-Chloroethoxy)methane	U	U			330	
Hexachlorobutadiene	U	U			330	
4-Chloro-3-methylphenol	U	υ			330	240
2-Methylnaphthalene	44 J	U			330	36,400
Hexachlorocyclopentadiene	U	U U			330	
2,4,6-Trichlorophenoi	U	υ υ			330	
2,4,5-Trichlorophenol	U	U			660	100
2-Chloronaphthalene	U	U 🗸			330	
2-Nitroaniline	U	U U			660	430
Dimethylphthalate	U	Ų			330	2,000
Acenaphthylene	74 J	U			330	41,000
2,6-Dinitrotoluene	U	U			330	1,000
3-Nitroaniline	U	U			660	500
Acenaphthene	U	U			330	50,000

QUALIFIERS:

U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

E: Compound concentration exceeded the calibration range.

NOTES: -- : Not applicable.

E: 2015 (LIRR 3 Subs Del Phase II) 3 Subs Data Massapoqua Data Tables for Report Table 16 rov

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#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD **DELINEATION PHASE 2 SITE ASSESSMENT**

### SURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID SAMPLE DEPTH (IN)	MSSB-38 (0-2)	MSSB-39 (0-2)			LABORATORY	NYSDEC TAGM
ATE OF COLLECTION	2/3/03	2/4/03			QUANTITATION	4046 Recommended
ILUTION FACTOR	1	1			LIMITS	Soll Cleanup
PERCENT SOLIDS	89.0	85.0		1		Objective
JNITS	(ug/Kg)	(ug/Kg)			(ug/Kg)	(ug/Kg)
2,4-Dinitrophenoi	Ų	υ			660	200
-Nitrophenol	U	U			660	100
Dibenzofuran	U	U			330	6,200
1,4-Dinitrotoluene	U U	U U			330	-
)iethylphthalate	.ບຸ	[ ບ			330	7,100
-Chlorophenyl-phenylether	ປ	ປ			330	-
Fluorene	( U	U U	í l		330	50,000
-Nitroaniline	U	U			330	
I,6-Dinitro-2-methylphenol	ป	U			330	
N-Nitrosodiphenylamine	U	U			330	-
l-Bromophenyl-phenylether	U	U U			330	-
lexachlorobenzene	່ ປ	່ ບ			330	410
Pentachiorophenol	U	U			660	1,000
Phenanthrene	180 J	U U			330	50,000
Anthracene	76 J				330	50,000
	U U	ι υ			330	-
Di-n-butylphthalate	-				330	8,100
luoranthene	640				330	50,000
<sup>o</sup> yrene	650 47 J				330 330	50,000
Butylbenzylphthalate B.3'-Dichlorobenzidine	47 J	U U U			330	50,000
	360 J	υ U			330	
Benzo(a)anthracene Chrysene	490	U U			330	224 400
pis(2-Ethylhexyl)phthalate	280 J	Ŭ			330	50.000
Di-n-octylphthalate	1 0	ιŭ			330	50,000
Senzo(b)fluoranthene	620	ΙŬ			330	1,100
Senzo(k)fluoranthene	28 J	Ŭ			330	1,100
enzo(a)pyrene	430	i ŭ			330	61
ndeno(1,2,3-cd)pyrene	200 J	ιŭ			330	3,200
Dibenz(a,h)anthracene	55 J	<b>1</b> Ū			330	14
Benzo(g,h,i)perylene	200 J	Ŭ			330	50,000
otal PAHs	4,047	o				100.000
		Ö				100,000
otal CaPAHs	2,183	l ő				10,000
Total SVOCs	4,374	<u> </u>		- <u> </u>	<del>```</del>	500,000

J: Compound found at a concentration below the detection limit.

: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT

#### SURFACE SOIL - POLYCHLORINATED BIPHENYLS (PCBs)

AREAVOL CONCERNATION SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	MSSB-38 (0-2) 2/3/03 1 89.0 (ug/Kg)	MSSB-39 (0-2) 2/4/03 1 85.0 (ug/Kg)	LABORATORY QUANTITATION LIMITS	NYSDEC TAGM 4048 Recommended Soll Cleanup Objective (ug/kg)
Aroclor- 1016	U	U	34	
Arocior- 1221	Ū	Ŭ	34	
Aroclor- 1232	Ŭ	Ŭ	34	
Arocior- 1242	U U	Ų	34	
Aroclor- 1248	ן ט	U	34	
Aroclor- 1254	U U	U	34	*===
Aroclor- 1260	U	U	34	
TOTAL PCBs	0	0		1,000/10,000*

QUALIFIERS:

U: Compound analyzed for but not detected.

NOTES:

--: Not applicable.

\*: According to NYSDEC TAGM 4046 Recommended Soll Cleanup Objectives, 1,000 ug/kg is utilized for surface soil [0-2' below ground surface (bgs)] and 10,000 ug/kg is utilized for subsurface soil (soil deeper than 2' bgs). ,

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# MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT

# SUBSURFACE SOIL - MERCURY AND RCRA METALS

AREAICE CONCERN SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MS\$B-06A (2-4) 2/4/03 89.0 (mg/kg)	M\$\$8-06A (4-6) 2/4/03 96.0 (mg/kg)	MSSB-09 (2-4) 2/4/03 87.0 (mg/kg)	MSSB-09 (4-6) 2/4/03 92.0 (mg/kg)	MS8B-10 (2-4) 2/4/03 87.0 (mg/kg)	MSSB-10 (4-6) 2/4/03 98.0 (mg/kg)	M\$\$8-11 (2-4) 2/4/03 96.0 (mg/kg)	MSSB-11 (4-6) 2/4/03 98.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 404 Recommended Soil Cleanup Objective (mg/kg)
Marcury	0.13	U	0.36	0.058	0.26	0.084	0.72	1.2	0.042	0.1

SAMPLE ID SAMPLE DD DATE OF COLLECTION PERCENT SOLIDS UNITS	MS\$B-12 (2-4) 2/4/03 98.0 (mg/kg)	M\$SB-12 (4-6) 2/4/03 95.0 (mg/kg)	MSSB-13 (2-4) 2/3/03 95.0 (mg/kg)	MSSB-13 (4-6) 2/3/03 97.0 (mg/kg)	<b>MSSB-14</b> (2-4) 2/4/03 93.0 (mg/kg)	MS8B-14 (4-6) 2/4/03 95.0 (mg/kg)	M888-15 (4-6) 2/4/03 96.0 (mg/kg)	MSSB-16 (2-4) 2/4/03 93.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/i)	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective (mg/kg)
Mercury	32.1	0.56	0.31	0.015 B	0.14	U	0.061	0.27	0.042	0.1

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MSSB-17 (2-4) 2/4/03 88.0 (mg/kg)	MSSB-18 (2-4) 2/4/03 88.0 (mg/kg)	MS8B-19 (2-4) 2/4/03 94.0 (mg/kg)	MSSB-20 (2-4) 2/4/03 88.0 (mg/kg)	MSSB-21 (2-4) 2/3/03 95.0 (mg/kg)	MSSB-22 (2-4) 2/4/03 86.0 (mg/kg)	MSSB-23 (2-4) 2/4/03 94.0 (mg/kg)	MSSB-24 (2-4) 2/4/03 93.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective (mg/kg)
Meraury	8.7	7.9	1.2	6.8	1.3	4.7	0.087	0.17	0.042	0.1

AREALO CONGERNA SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MSSB-25 (2-4) 2/3/03 90.0 (mg/kg)	MSSB-26 (2-4) 2/3/03 92.0 (mg/kg)	MSSB-27 (2-4) 2/3/03 90.0 (mg/kg)	<b>M\$\$8-28</b> (2-4) 2/3/03 86.0 (mg/kg)	<b>SUbstation</b> MSSB-29 (2-4) 2/3/03 95.0 (mg/kg)	MSSB-30 (2-4) 2/4/03 94.0 (mg/kg)	MSSB-31 (2-4) 2/3/03 94,0 (mg/kg)	MSSB-32 (2-4) 2/4/03 92.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective (mg/kg)
Mercury	0.52	1	3.3	1.6	0.51	0.091	0.41	0.27	0.042	0.1

QUALIFIERS:

U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL. NA: Not Analyzed for

Notes:

SB: Site Background

\*: As per proposed 4/95 NSDEC TAGM

\*\*: Average background levels in metropolitan or surburban areas or near highways range from 200-500 ppm.

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#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT

### SUBSURFACE SOIL - MERCURY AND RCRA METALS

AREACONCONCERNIS SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MS\$8-32 (4-6) 2/3/03 92.0 (mg/kg)	MSSB-32 (6-8) 2/3/03 83.0 (mg/kg)	MSSB-32 (8-10) 2/3/03 94.0 (mg/kg)	MSSB-33 (2-4) 2/3/03 90.0 (mg/kg)	MSSB-33 (4-6) 2/3/03 98.0 (mg/kg)	MSSB-33 (6-8) 2/3/03 96.0 (mg/kg)	MSSB-33 (8-10) 2/3/03 90.0 (mg/kg)	M\$\$B-34 (2-4) 2/4/03 89,0 (mg/kg)	INSTRUMENT DETECTION LIMITS	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective (mg/kg)
Mercury	4.3	0.056	U	<u>1.9</u>	0. <b>05</b> 7	υ	0.025 B	1.8	0.042	0.1

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	M\$\$8-34 (4-6) 2/3/03 97.0 (mg/kg)	MSSB-34 (6-8) 2/3/03 96.0 (mg/kg)	MSSB-34 (8-10) 2/3/03 89.0 (mg/kg)	MSSB-40 (0-2) 8/9/04 97.0 (mg/kg)	MS\$B-40 (2-4) 8/9/04 91.0 (mg/kg)	<b>MS\$B-40</b> (4-6) 8/9/04 98.0 (mg/kg)	MSSB-41 (0-2) 8/9/04 89.0 (mg/kg)	MSSB-41 (2-4) 8/9/04 94.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective (mg/kg)
Mercury	U	U	0.09	0.23	1.2	0.029 B	0.11	3.8	0.042	0,1

ARPADE ID SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MSSB-41 (4-6) 8/9/04 95.0 (mg/kg)	MSSB-42 (0-2) 8/9/04 93.0 (mg/kg)	MSSB-42 (2-4) 8/9/04 98.0 (mg/kg)	MSSB-42 (4-6) 8/9/04 89.0 (mg/kg)	SUDSIA MARIA MSSB-43 (0-2) 8/9/04 83.0 (mg/kg)	MS\$B-43 (2-4) 8/9/04 90.0 (mg/kg)	MSSB-43 (4-6) 8/9/04 98.0 (mg/kg)	MSSB-44 (0-2) 8/10/04 98.0 (mg/kg)	INSTRUMENT DETECTION LIMITS	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective (mg/kg)
Mercury	0.090	0.53	0.7	0.45	6.7	0.12	0.091	1.7	0.042	0.1

SAMPLE ID SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MSSB-44 (2-4) 8/10/04 95.0 (mg/kg)	MSSB-44 (4-6) 8/10/04 93.0 (mg/kg)	MSSB-45 (0-2) 8/10/04 97.0 (mg/kg)	MS8B-45 (2-4) 8/10/04 98.0 (mg/kg)	MSSB-45 (4-5) 8/10/04 97.0 (mg/kg)	MSSB-46 (0-2) 8/9/04 94.0 (mg/kg)	MSSB-46 (2-4) 8/9/04 85.0 (mg/kg)	MSSB-46 (4-6) 8/9/04 94.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/i)	NYSDEC TAGM 4048 Recommended Soli Cleanup Objective (mg/kg)
Mercury	3.5	154	0.59	0.39	0.31	0.52	4.8	0.079	0.042	0.1

QUALIFIERS; U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL. NA: Not Analyzed for

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Notes: SB: Site Background \*: As per proposed 4/95 NSDEC TAGM

\*\*: Average background levels in metropolitan or surburban areas or near highways range from 200-500 ppm.

: Result exceeds NYSDEC TAGM recommended Soil Cleanup Objective

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#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD **DELINEATION PHASE 2 SITE ASSESSMENT**

#### SUBSURFACE SOIL - MERCURY AND RCRA METALS

AREALOP CONCERNA SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MSSB-47 (0-2) 8/10/04 96.0 (mg/kg)	MSSB-47 (2-4) 8/10/04 96.0 (mg/kg)	MSSB-47 (4-5) 8/10/04 96.0 (mg/kg)	MSSB-48 (0-2) 8/9/04 93.0 (mg/kg)	MSSB-48 (2-4) 8/9/04 95.0 (mg/kg)	MSSB-48 (4-6) 8/9/04 82.0 (mg/kg)	MSSB-49 (0-2) 8/9/04 92.0 (mg/kg)	MSSB-49 (2-4) 8/9/04 94.0 (mg/kg)	INSTRUMENT DETECTION LIMITS	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective (mg/kg)
Mercury	1.9	1.6	1.4	0.042	0.41	12.7	2.4	0.04 B	0.042	0.1

AREALORGONCERNING SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MSSB-49 (4-6) 8/9/04 80.0 (mg/kg)	MSSB-50 (0-2) 8/10/04 89.0 (mg/kg)	MSSB-50 (2-4) 8/10/04 92.0 (mg/kg)	MSSB-50 (4-6) 8/10/04 97.0 (mg/kg)	MSSB-51 (0-2) 8/9/04 92.0 (mg/kg)	MSSB-51 (2-4) 8/9/04 94.0 (mg/kg)	MSSB-51 (4-8) 8/9/04 90.0 (mg/kg)	MSSB-52 (0-2) 8/9/04 91.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective (mg/kg)
Mercury	0.031 B	7.2	14.6	0.18 B	0.99	0.042	0.039	0.41	0.042	0.1

AREAOLOGNOLINI SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MS8B-52 (2-4) 8/9/04 93.0 (mg/kg)	MSSB-52 (4-6) 8/9/04 95.0 (mg/kg)	MSSB-53 (0-2) 8/9/04 94,0 (mg/kg)	60/500646000 M\$\$B-53 (2-4) 8/9/04 93.0 (mg/kg)	MS\$B-53 (6-8) 8/9/04 .66.0 (mg/kg)	MS3B-54 (0-2) 8/9/04 95.0 (mg/kg)	MSSB-54 (2-4) 8/9/04 93.0 (mg/kg)	MSSB-54 (4-6) 8/9/04 98.0 (mg/kg)	INSTRUMENT DETECTION LIMITS	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective (mg/kg)
Mercury	0.053	0.045	5.4	103	2.3	0.91	0.32	0.020 B	0.042	0.1

AREA OF CONCERNIA SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MSSB-55 (0-2) 8/9/04 92.0 (mg/kg)	MSSB-55 (2-4) 8/9/04 95,0 (mg/kg)	MSSB-55 (4-6) 8/9/04 84.0 (mg/kg)	<b>MSSB-55</b> (6-8) 8/9/04 91.0 (mg/kg)	MSSB-56 (0-2) 8/9/04 96.0 (mg/kg)	MSSB-56 (2-4) 8/9/04 91.0 (mg/kg)	MSSB-56 (4-6) 8/9/04 95.0 (mg/kg)	MSSB-57 (0-2) 8/9/04 87.0 (mg/kg)	INSTRUMENT DETECTION LIMITS	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective (mg/kg)
Marcury	0.89	0.10	0.92	7.0	32.3	5.8	0.029	0.90	0.042	0.1

# QUALIFIERS:

U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL. NA: Not Analyzed for

<u>Notes:</u> SB: Site Background

\*: As per proposed 4/95 NSDEC TAGM

\*\*: Average background levels in metropolitan or surburban areas or near highways range from 200-500 ppm.

: Result exceeds NYSDEC TAGM recommended Soil Cleanup Objective

#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD **DELINEATION PHASE 2 SITE ASSESSMENT**

#### SUBSURFACE SOIL - MERCURY AND RCRA METALS

AREAGREGONCERNING SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MS8B-57 (2-4) 8/9/04 89.0 (mg/kg)	MSSB-57 (4-6) 8/9/04 98.0 (mg/kg)	14/07/SUBblen MSSB-58 (0-2) 8/9/04 91.0 (mg/kg)	<b>MSSB-58</b> (2-4) 8/9/04 96.0 (mg/kg)	MSSB-58 (4-6) 8/9/04 98.0 (mg/kg)	MSSB-38 (2-4) 2/3/03 91.0 (mg/kg)	MSSB-39         2/4/03         97.0         (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective (mg/kg)
Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	NA NA NA NA 0.11 NA NA	NA NA NA NA 0.019 B NA NA	NA NA NA NA 0.30 NA NA	NA NA NA NA 0.016 B NA NA	NA NA NA NA 0.048 NA NA	15.9 6.6 B 0.23 B 8.5 11.4 1.1 U 0.32 B	3 5.4 B 0.21 B 8.8 2.7 5.6 U 0.39 B	3.0 3.0 2.0 3.0 1.0 0.1 8.0 2.0	7.5 or SB 300 or SB 10* 50* SB** 0.1 2 or SB SB

QUALIFIERS: U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL. NA: Not Analyzed for

Notes: SB: Site Background

\*: As per proposed 4/95 NSDEC TAGM

\*\*: Average background levels in metropolitan or surburban areas or near highways range from 200-500 ppm.

: Result exceeds NYSDEC TAGM recommended Soll Cleanup Objective

B:2015 (LIRR 3 Subs Del Phase II)/3 Subs Deta/Massapoqua/Data Tables for Report/Table 18 REV 

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#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

MEL-Melteromel-EN					<u></u>			
SAMPLE ID	MSSB-38	MSSB-39						
SAMPLE DEPTH (FT)	(2-4)	(2-4)		)	1		LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	2/3/03	2/4/03					QUANTITATION	4046 Recommended
DILUTION FACTOR	1	1					LIMITS	Soil Cleanup
PERCENT SOLIDS	91.0	97.0						Objective
UNITS	(ug/kg)	(ug/kg)					(ug/Kg)	(ug/Kg)
Phenol	U	U					330	30
bis(2-Chloroethyl)ether	U	U U					330	- 1
2-Chlorophenol	U	U					330	800
1,3-Dichlorobenzene	U	U					330	i I
1,4-Dichlorobenzene	U	U					330	
1,2-Dichlorobenzene	U	U					330	
2-Methylphenol	Ų	ן ט					330	100
2,2'-oxybis (1-chloropropane)	U	U U					330	-
4-Methylphenol	U	Į U		1	]		330	900
N-Nitroso-di-n-propylamine	U	[ U		{	[ [		330	i )
Hexachioroethane	U	[ U					330	
Nitrobenzene	j U	U U			( }		330	200
Isophorone	U	U					330	4,400
2-Nitrophenol	U	U U			1 1	1	330	330
2,4-Dimethylphanol	U	( U					330	1
2,4-Dichlorophenol	l U	U			↓ \		330	400
1,2,4-Trichlorobenzene	U	) U					330	) ~ (
Naphthalene	U	( U					330	13,000
4-Chloroaniline	l U	( U					330	220
bis(2-Chioroethoxy)methane	) U	U U					330	-
Hexachlorobutadiene	U U	U		ļ	{		330	- 1
4-Chioro-3-methyiphenoi	U U	U					330	240
2-Methylnaphthalene	U	U U					330	36,400
Hexachlorocyclopentadiene	U	} U	ļ ļ		( ł		330	-
2,4,6-Trichlorophenoi	U	[ U	l (	{	ļ {		330	! _ !
2,4,5-Trichlorophenol	U	[ U					660	100
2-Chloronaphthalene	U	[ U	ł		<b>\</b>		330	- 1
2-Nitroaniline	U	{ U	l l		{ }	j	660	430
Dimethylphthalate	Ų	<u>υ</u>	l l	1	l		330	2,000
Acenaphthylene	U	U U			{ }		330	41,000
2,6-Dinitrotoluene	U	U U		1	{ }		330	1,000
3-Nitroaniline	υ	) U			4 I		660	500
Acenaphthene	U	UU		_	Į – Į		330	50,000

QUALIFIERS: U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

NOTES: - : Not applicable. . t

#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT

### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	MSSB-38 (2-4) 2/3/03 1 91.0 (ug/kg)	MSSB-39 (2-4) 2/4/03 1 97.0 (ug/kg)						LABORATORY QUANTITATION LIMITS (ug/Kg)	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective (ug/Kg)
2,4-Dinitrophenol	υ	U				1	]	660	200
4-Nitrophenol	Ŭ	ι υ			[			660	100
Dibenzofuran	U Ŭ	Ŭ			ļ			330	6,200
2.4-Dinitrotoluene	ບ	ບັ			Í			330	0,200
Diethylphthalate	Ŭ	Ŭ						330	7,100
4-Chlorophenyl-phenylether	Ū	Ŭ				ļ [		330	
Fluorene	Ū	Ŭ						330	50,000
4-Nitroaniline	Ŭ	Ŭ						330	
4.6-Dinitro-2-methyiphenoi	υ	Ŭ						330	
N-Nitrosodiphenylamine	ΙŬ	Ŭ			1	1		330	
4-Bromophenyl-phenylether	U	υ υ						330	-
Hexachlorobenzene	Ű	Ű						330	410
Pentachlorophenol	υ	U U			1	1		660	1,000
Phenanthrene	υ	U			1			330	50,000
Anthracene	U U	U			1	1		330	50,000
Carbazole	U U	ט (						330	-
Di-n-butylphthaiate	ί U	U						330	8,100
Fluoranthene	65 J	U						330	50,000
Pyrene	60 J	U						330	50,000
Butylbenzylphthalate	( U	U	ĺ					330	50,000
3,3'-Dichlorobenzidine	ט [	[ ປ						330	-
Benzo(a)anthracene	48 J	U						330	224
Chrysene	54 J	υ			1	] (		330	400
bis(2-Ethylhexyl)phthalate	υ	U		1	]			330	50,000
Di-n-octylphthalate	U	U						330	50,000
Benzo(b)fluoranthene	59 J	U			1			330	1,100
Benzo(k)fluoranthene	Ų	υ						330	1,100
Benzo(a)pyrene	44 J	U	1		1	[ [		330	61
Indeno(1,2,3-cd)pyrene	U	U	<b>)</b>			]		330	3,200
Dibenz(a,h)anthracene	U	U						330	14
Benzo(g,h,i)perviene	υ	U						330	50,000
Total PAHs	330	0						-	100,000
Total CaPAHs	205	0			1	Į			10,000
Total SVOCs	330	0			TES:			~	500,000

QUALIFIERS: U: Compound analyzed for but not detected. J: Compound found at a concentration below the detection limit.

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#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT

#### SUBSURFACE SOIL - POLYCHLORINATED BIPHENYLS (PCBs)

SAMPLE ID SAMPLE ID DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	<b>Hotential</b> <b>MSSB-38</b> (2-4) 2/3/03 1 91.0 (ug/kg)	<b>Beleases</b> (2-4) 2/4/03 1 97.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective (ug/kg)
Aroclor- 1016	ບ	υ	34	
Aroclor- 1221	Ū	Ū	34	
Aroclor- 1232	U	U	34	
Aroclor- 1242	U	U	34	
Aroclor- 1248	U	υ	34	
Arocior- 1254	U	υ	34	
Arocior- 1260	υ	U	34	
TOTAL PCBs	0	0		1,000/10,000*

QUALIFIERS:

U: Compound analyzed for but not detected.

NOTES:

-: Not applicable.

\*: According to NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives, 1,000 ug/kg is utilized for surface soil [0-2' below ground surface (bgs)] and 10,000 ug/kg is utilized for subsurface soil (soil deeper than 2' bgs).

#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD UNDERGROUND INJECTION CONTROL INVESTIGATION

#### SUBSURFACE SOIL - RCRA METALS

UICISSIRUCOURE SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	<b>MSSB-36</b> (7.5-9.5) 2/4/03 96.0 (mg/kg)	MSSB-36 (9.5-11.5) 2/4/03 87.0 (mg/kg)	MSSB-37 (12-14) 2/7/03 85.0 (mg/kg)	MSSB-37 (14-16) 2/7/03 85.0 (mg/kg)	MSSB-37 (16-18) 2/7/03 88.0 (mg/kg)	MSSB-37 (18-20) 2/7/03 82.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/i)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective (mg/kg)
Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	1.1 6.1 B 0.19 B 3.5 2.5 0.74 U 0.26 B	0.58 B 3.4 B 0.061 B 2 0.88 0.074 U U	0.6 B 3.1 B U 1.6 0.95 U U U	0.63 B 3.8 B U 2 1 U 0.11 B	0.79 B 3.4 B U 1.9 1.4 U 0.092 B	0.71 B 5.9 B U 2.1 1.9 U U U	3.0 3.0 2.0 3.0 1.0 0.1 8.0 2.0	7.5 or SB 300 or SB 10* 50* SB** 0.1 2 or SB SB

OUALIFIERS: U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

Notes:

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SB: Site Background

\*: As per proposed 4/95 NSDEC TAGM

\*\*: Average background levels in metropolitan or surburban areas or near highways range from 200-500 ppm.

: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD UNDERGROUND INJECTION CONTROL INVESTIGATION

#### SUBSURFACE SOIL - VOLATILE ORGANIC COMPOUNDS (VOCs)

SAMPLE ID         MSSB-36         MSSB-36         MSSB-37         MSSB-37         MSSB-37         MSSB-37         CAMPLE DEPTH (FT)         CF-36-50         CAMPLE DEPTH (FT)         CF-36-50         CP-36-50	MERSENCE REAL	WIRLS.	MARCE IF	and the second	in the successful of BA	William	and the life of the second starts		·
SAMPLE DEPTH (FT)         (7.5-9.5)         (9.5-11.5)         (12-14)         (14-16)         (16-20)         LABORATORY         NYSDEC TAOM           DATE OF COLLECTION         1         1         1         1         1         004703         0047013         004703         0047013         004703         0047013         004703	SAMPLE ID		MSSB-36		MSSB-37	MSSB-37	MSSB-37		
DATE OF COLLECTION         2/4/03         2/7/03         2/7/03         2/7/03         2/7/03         CUANTITATION         4046 Recommended Soli Cleanup           DERCENT SOLIDS         96.0         87.0         85.0         85.0         82.0         62.0         Objective         Objective <td>SAMPLE DEPTH (FT)</td> <td>(7.5-9.5)</td> <td>(9.5-11.5)</td> <td>(12-14)</td> <td>(14-16)</td> <td>(16-18)</td> <td></td> <td>LABORATORY</td> <td>NYSDEC TAGM</td>	SAMPLE DEPTH (FT)	(7.5-9.5)	(9.5-11.5)	(12-14)	(14-16)	(16-18)		LABORATORY	NYSDEC TAGM
PERCENT SOLIDS         99.0         87.0         85.0         86.0         82.0         (ug/Kg)         (ug/Kg	DATE OF COLLECTION	2/4/03	2/4/03	2/7/03	2/7/03	2/7/03	2/7/03		4046 Recommended
UNITS         (Ug/Kg)	DILUTION FACTOR	1		1	1	1	1	LIMITS	Soil Cleanup
UNITS         (ug/Kg)	PERCENT SOLIDS	96.0		85.0	85.0	88.0	<b>82</b> .0		
Dichlorodifluoromethane         U	UNITS	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ua/Ka)		(ua/Ka)	
Viny Chorida         Ú <t< td=""><td>Dichlorodifluoromethane</td><td></td><td></td><td></td><td></td><td></td><td></td><td>5</td><td></td></t<>	Dichlorodifluoromethane							5	
Bromonethane         U <t< td=""><td>Chloromethane</td><td>U</td><td>U</td><td>U</td><td>U</td><td>Ú</td><td>U U</td><td>5</td><td>- 1</td></t<>	Chloromethane	U	U	U	U	Ú	U U	5	- 1
Chicroethane         U <t< td=""><td>Vinyl Chloride</td><td>υ</td><td>υ</td><td>υ</td><td>υ</td><td>υ υ</td><td>U U</td><td>5</td><td>200</td></t<>	Vinyl Chloride	υ	υ	υ	υ	υ υ	U U	5	200
Trichlorofluoromethane         U	Bromomethane	U	U U	υ	υ	U	U	5	
Trichlorofluoromethane         U	Chloroethane	U	Ú	υ	υ	Ū	Ū	5	1900
1.1-Dichloroethane       U       U       U       U       U       U       U       U       U       U       U       U       U       Colored for the formed for the formed	Trichlorofluoromethane	ט ו	U	Ū	บ้	Ŭ	Ů	5	
Acetone         4 J         10         12         2 J         11         13         5         200           Idomethane         U </td <td>1.1-Dichloroethene</td> <td>-</td> <td>Ū</td> <td>ŭ</td> <td></td> <td>•</td> <td>Ŭ</td> <td>5</td> <td>400</td>	1.1-Dichloroethene	-	Ū	ŭ		•	Ŭ	5	400
Idomethane         U	Acetone	4 J	-	12		•	13	5	
Carbone Disulfide         U	Idomethane	υ I	U	- Ū		u l		5	
Methylene Chloride       U*       U*       U	Carbone Disulfide	Ű	U	Ū.	Ŭ	-	Ū Ū	5	2700
trans-1,2-Dichloroethene         U <td></td> <td>Ū•</td> <td>Ū•</td> <td>3 Ĵ</td> <td>2.1</td> <td>5</td> <td>3.</td> <td>5</td> <td></td>		Ū•	Ū•	3 Ĵ	2.1	5	3.	5	
Methyl terh- 1,1-Dichloroethane         U <t< td=""><td></td><td>Ŭ</td><td>-</td><td></td><td></td><td>-</td><td></td><td>5</td><td></td></t<>		Ŭ	-			-		5	
1,1-Dichlorosthane       U		ū	-	Ŭ	-	-	-	5	-
Vinyl acetate       U       <	1.1-Dichioroethane			_	-	-	-	5	200
2-Butanone         U <thu< td=""><td>Vinyl acetate</td><td>υŪ</td><td>Ŭ</td><td>Ŭ</td><td>-</td><td>Ŭ</td><td>Ŭ</td><td>5</td><td></td></thu<>	Vinyl acetate	υŪ	Ŭ	Ŭ	-	Ŭ	Ŭ	5	
Cis-1,2-Dichloroethene         U	2-Butanone	່ ບ	υ	Ū	Ū	Ŭ	Ŭ	5	300
2,2-Dichloropropane         U         Ú		บ	ប	Ū Ū	Ŭ	Ŭ Ŭ	Ŭ	5	· · · ·
Bromochloromethane         U		Ū	Ŭ	υŬ	Ŭ	Ŭ Ŭ	Ū Ū	5	1 - 1
1,1-Trichloroethane       U       U       U       U       U       U       U       U       Store       Store         1,1-Dichloropropane       U       U       U       U       U       U       U       Store       Store         Carbon Tetrachloride       U       U       U       U       U       U       U       Store       Store         Carbon Tetrachloride       U       U       U       U       U       U       Store       Store       Store         1,2-Dichloroethane       U       U       U       U       U       U       Store       Store       Store         Store       U       U       U       U       U       U       Store	Bromochloromethane	Ū	Ŭ	-			-	5	
1,1-Dichloropropene       U	Chloroform	Ú	Ú	Ŭ	Ū	Ū	Ū	5	300
1,1-Dichloropropane       U	1,1,1-Trichloroethane	U	U	Ú	Ŭ	Ū	Ū	5	
Carbon Tetrachloride         U	1,1-Dichloropropene	U	U	Ū	Ŭ	Ŭ	Ū	5	
1,2-Dichloroethane       Ú       Ú       Ú       Ú       Ú       Ú       Í	Carbon Tetrachloride	U	U	Ū	-	-		5	600
Trichloroethene         Ú	1,2-Dichloroethane	Ŭ	Ū	Ū		Ū		5	
1,2-Dichloropropane       U       U       U       U       U       U       J         Dibromomethane       U       U       U       U       U       U       U       U       Source	Benzene	Ū	Ū	Ŭ		Ū	Ū	5	
Dibromomethane         U	Trichloroethene	υ	υ	Ų	U ]	U	U U	5	700
Bromodichloromethane         U         U         U         U         U         U         U         Standard	1,2-Dichloropropane	υ	υ	ט ו	υ	U	υ	5	[ <b></b> ]
Cls-1,3-Dichloropropane         U         U         U         U         U         U         U         S	Dibromomethane	U	ບ	υ	U	U	υ	5	- 1
4-Methyl-2-pentanone U U U U U U 5 1000 Toluene U U U U U U 5 1500 rrans-1,3-Dichloropropene U U U U U U 5	Bromodichloromethane	U	U	υ	υ	Ū	Ū	5	-
Toluene U U U U U 5 1500 rans-1,3-Dichloropropene U U U U U 5	cis-1,3-Dichloropropane	U	U	U	Ŭ	Ū	Ū	5	) - )
rans-1,3-Dichloropropene U U U U U 5	4-Methyl-2-pentanone	U	U	Ú	U	Ū	υ	5	1000
rans-1,3-Dichloropropene UUUUUU5	Toluene	U	U	Ū	Ū	Ū	Ū	5	1500
	trans-1,3-Dichloropropene	U	U	U	Ŭ	Ŭ	Ū	5	
	1,1,2-Trichloroethane	Ū	Ŭ	Ŭ	บั	Ŭ	Ŭ	5	

QUALIFIERS: U: Compound analyzed for but not detected.

NOTES: -: Not applicable.

J: Compound found at a concentration below the detection limit.

U\*: Compound qualified as non-detect due to validation criteria.

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### TABLE 22 (continued)

#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD UNDERGROUND INJECTION CONTROL INVESTIGATION

### SUBSURFACE SOIL - VOLATILE ORGANIC COMPOUNDS (VOCs)

WILE STRATE AND	W The second		A Maria Antonio and Antonio	Weiter Breek	Wall	a and a set of the provide for the		
SAMPLE ID	MSSB-36	MSSB-36	MS88-37	MSSB-37	MSSB-37	MSSB-37		
SAMPLE DEPTH (FT)	(7.5-9.5)	(9.5-11.5)	(12-14)	(14-16)	(16-18)	(18-20)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	2/4/03	2/4/03	2/7/03	2/7/03	2/7/03	2/7/03	QUANTITATION	4046 Recommended
DILUTION FACTOR	1	1	1	1	1	1	LIMITS	Soil Cleanup
PERCENT SOLIDS	96.0	87.0	85.0	85.0	88.0	82.0		Objective
UNITS	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)
1,3-Dichloropropane	U	υ -	U U	U	υ	0	5	300
Tetrachloroethene	U	U	U	U	U	U	5	1400
2-Hexanone	U	U	U	U	U	3 J	5	
Dibromochloromethane	U	U U	U	U	U	U	5	
1,2-Dibromoethane	U	U	U	U	U	U	5	-
Chlorobenzene	U	U	U	U	U	U	5	1700
1,1,1,2-Tetrachloroethane	U	U	U	U	U	U	5	-
Ethylbenzene	U	U	U	U	U	U	5	5500
m,p-Xylene	U	U	U	U	U	U	5	-
o-Xylene	U	U	U	U	U	U	5	-
Xylene (total)	U	U U	U	U	U	U	5	1200
Styrene	່ ປ	U U I	U	U	U	U	5	- }
Bromoform	U	U	U	U	U U	U	5	- 1
Isopropyibenzene	U	U	U	U	U	) U	5	
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	5	600
Bromobenzene	U	U	U	U	U	U	5	-
1,2,3-Trichloropropane	ປ	U	U	υ	υ	U	5	400
n-Propylbenzene	( U	U U	U	U	U	U	5	
2-Chlorotoiuene	U	. U	U	U	U	U	5	
1,3,5-Trimethylbenzene	U	U	U	U	U	U	5	-
4-Chiorotoluene	U	U U	U	U	U	U	5	-
tert-Butylbenzene	U	U	U	U	U	U	5	-
1,2,4-Trimethylbenzene	U	U	υ	U	υ	U	5	
sec-Butylbenzene	U	U	U	U	U	U	5	
4-isopropyltoluene	U	U	U	U	U	U	5	- 1
1,3-Dichlorobenzene	U	U	U	U	U	U	5	1600
1,4-Dichlorobenzene	U	U	U	U	U	U	5	8500
n-Butylbenzene	U	U	U	U	U	U	5	_
1,2-Dichlorobenzene	U	U	U	U	U	U	5	7900
1,2-Dibromo-3-chloropropane	U	U	U	U	U	U	5	
1,2,4-Trichlorobenzene	U	U	U	U	U U	U	5	3400
Hexachlorobutadiene	U	l V	U	U	U U	U	5	
Naphthalene	U	4 J	U	U	U	22 B	5	13000
1,2,3-Trichlorobenzene	U	U	U	U	U	U	5	-
Totals VOCs	4	14	15	4	16	41		

# QUALIFIERS:

NOTES:

U: Compound analyzed for but not detected.

--: Not applicable.

J: Compound found at a concentration below the detection limit. U\*: Compound qualified as non-detect due to validation criteria.

Page 2 of 2

### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD UNDERGROUND INJECTION CONTROL INVESTIGATION

## SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (VOCs)

latie 1 24-381« 4at 15	NE COMPANY					and the second sec		
SAMPLE ID	MSSB-36	MSSB-36	MSSB-37	MSSB-37	MSSB-37	MSSB-37		
SAMPLE DEPTH (FT)	(7.5-9.5)	(9.5-11.5)	(12-14)	(14-16)	(16-18)	(18-20)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	2/4/03	2/4/03	2/7/03	2/7/03	2/7/03	2/7/03	QUANTITATION	4046 Recommended
DILUTION FACTOR	1	1	1	1	1	1	LIMITS	Soil Cleanup
PERCENT SOLIDS	96.0	87.0	85.0	85.0	88.0	82.0		Objective
UNITS	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)
Phenol	U	υ	U	U	U	υ	330	30
bis(2-Chioroethyl)ether	U	U	U	U	υ	U	330	- 1
1,3-Dichiorobenzene	υ	<u></u> ט	U	U	U	U	330	-
1,4-Dichlorobenzene	U	U	U	U	U	U	330	
1,2-Dichlorobenzene	U	U	U	υ	υ	υ	330	-
2-Methylphenol	U	U	U	U	U	υ	330	100
2,2'-oxybis (1-chloropropane)	U	U	U	U	U	י <del>ט</del> יי	330	-
4-Methylphenol	U U	υ	U	U	U	U	330	900
N-Nitroso-di-n-propylamine	U	U	U	U	U	U	<b>3</b> 30	-
Hexachioroethane	υ	Ú	Ú	Ū	ົບ	Ū	330	-
Nitrobenzene	U	Ŭ	Ú	Ū	ũ	Ŭ	330	200
Isophorone	U	U	U	υ	Ū	Ū	330	4,400
2-Nitrophenol	U	U	Ŭ	Ũ	Ū	Ũ	330	330
2,4-Dimethylphenoi	υ	U	Ŭ	Ú	Ū	Ū	330	-
2,4-Dichlorophenol	υ	Ū	υ	Ū	Ŭ	Ŭ	330	400
1,2,4-Trichlorobenzene	U	Ú	Ū	Ŭ	Ŭ	Ŭ	330	-
Naphthalene	ט א	Ŭ	Ū	Ŭ	Ŭ	υ	330	13,000
4-Chloroanlline	U	Ŭ	Ú	Ū	Ŭ	Ŭ	330	220
bis(2-Chloroethoxy)methane	υ	Ū	Ŭ	Ū	Ŭ	Ŭ	330	
Hexachlorobutadiene	U	U	U	U	υ	U	330	-
4-Chloro-3-methylphenol	U	U	U	U	Ŭ	Ū	330	240
2-Methylnaphthalene	υ	υ	ບ <u>ບ</u>	Ū	Ŭ	Ŭ	330	36,400
Hexachlorocyclopentadiene	U	U	Ú	U	Ū	Ū	330	
2,4,6-Trichlorophenol	υ	U	υ	U	Ū	Ū	330	-
2,4,5-Trichlorophenol	U	U	Ŭ	Ū	Ŭ	Ŭ	660	100
2-Chloronaphthalene	U	U	Ŭ	Ū	Ū	Ū	330	_
2-Nitroaniline	υ	υ	Ū	Ū	Ū	Ū	660	430
Dimethylphthalate	U	Ū	Ŭ	Ū	Ŭ	Ŭ	330	2,000
Acenaphthylene	U	Ŭ	Ŭ	Ŭ	Ŭ	Ū	330	41,000
2,6-Dinitrotoluene	U	Ū	Ŭ	Ű	Ŭ	Ŭ	330	1,000
3-Nitroaniline	U	Ū	Ŭ	Ū	Ŭ	Ŭ	660	500
Acenaphthene	U	_ U	Ú	Ŭ	Ū	Ū	330	50,000

QUALIFIERS: U: Compound analyzed for but not detected.

NOTES: -- : Not applicable.

#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD UNDERGROUND INJECTION CONTROL INVESTIGATION

## SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (VOCs)

Olessi Nienel Antonio Antonio	ALC MANYSER OF	Teally and a	and the second s		WC111	marian in and		
SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR	M\$\$B-36 (7.5-9.5) 2/4/03 1	MSSB-36 (9.5-11.5) 2/4/03 1	MSSB-37 (12-14) 2/7/03	MS8B-37 (14-16) 2/7/03 1	MSSB-37 (16-18) 2/7/03 1	MSSB-37 (18-20) 2/7/03	LABORATORY QUANTITATION LIMITS	NYSDEC TAGM 4048 Recommended Soil Cleanup
PERCENT SOLIDS	96.0	87.0	85.0	85.0	88.0	82.0	Fund	Objective
	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	_(ug/Kg)
2.4-Dinitrophenol	υ	υ	υ	υ	U	υ	660	200
4-Nitrophenol	Ŭ	ĺŬ	Ŭ	l ũ	Ŭ	Ŭ	660	100
Dibenzofuran	Ŭ	l ŭ	Ŭ	Ŭ	Ŭ	Ŭ	330	6,200
2.4-Dinitrotoluene	U U	l ŭ	Ŭ	Ŭ	Ŭ	Ŭ	330	0,200
Diethylphthalate	Ŭ	ΙŬ	Ŭ	υ	Ŭ	Ŭ	330	7,100
4-Chlorophenyl-phenylether	Ŭ Ŭ	Ŭ	Ŭ	l ŭ	Ŭ	Ŭ	330	
Fluorene	1 Ŭ	ĺŬ	Ŭ	Ì Ŭ	Ŭ	Ŭ	330	50,000
4-Nitroaniline	Ū Ū	l ũ	Ŭ	Ŭ	Ŭ	Ŭ	330	
4,6-Dinitro-2-methylphenol	l Ŭ	l ŭ	Ū	Ŭ	Ŭ	Ŭ	330	
N-Nitrosodiphenylamine	l Ŭ	l Ŭ	l Ŭ	l ŭ	Ŭ	Ū	330	
4-Bromophenyl-phenylether	Î Ŭ	l ũ	ΙŬ	l ŭ	Ŭ	Ŭ	330	
Hexachlorobenzana	l ŭ	ĺ Ū	Ū	i ŭ	Ŭ	Ŭ	330	410
Pentachlorophenol	Ŭ	Ŭ	Ū	Ŭ	Ŭ	บั	660	1,000
Phenanthrene	Ū	l ũ	Ŭ	Ū	Ū	Ŭ	330	50,000
Anthracene	l Ŭ	l ū	l ŭ	l Ŭ	l ŭ	Ŭ	330	50,000
Carbazole	Ŭ	ΙŬ	Ŭ	l ŭ	Ŭ	Ŭ	330	
Di-n-butylphthalate	l ŭ	ΙŬ	Ŭ	l ŭ	Ū	Ŭ	330	8,100
Fluoranthene	l ŭ	l ∞ŭ	ΙŬ	l ŭ	Ŭ	Ū	330	50,000
Pyrene	l ũ	Ū	Ū	Ū	Ŭ	Ū	330	50,000
Butylbenzylphthalate	l ū	l ŭ	Ū	Í Ú	Ū	Ū	330	50,000
3.3'-Dichlorobenzidine	Ŭ	l ŭ	Ŭ	l ŭ	Ŭ	Ŭ	330	
Benzo(a)anthracene	l ũ	Ū	Ū	Ū	Ū	Ū	330	224
Chrysene	Ū	Ū	U	Ū	Ū	Ŭ	330	400
bis(2-Ethylhexyl)phthalate	l ú	l u	υ	i u	υ	U	330	50,000
Di-n-octylphthalate	ĪŪ	Ū	Ū	Ū	Ū	Ū	330	50,000
Benzo(b)fluoranthene	Ů	l ŭ	Ŭ	Ŭ	Ŭ	Ŭ	330	1,100
Benzo(k)fluoranthene	ΙŬ	ΙŬ	Ŭ	l Ŭ	Ŭ	Ŭ	330	1,100
Benzo(a)pyrene	U U	Ū	Ŭ	Ů	Ŭ	Ŭ	330	61
Indeno(1,2,3-cd)pyrene	Ŭ Ŭ	Ŭ	Ŭ	Ū	Ū	Ū	330	3,200
Dibenz(a,h)anthracene	Ŭ	Ū Ū	Ŭ	ιŬ	Ŭ	Ŭ	330	14
Benzo(g,h,i)peryiene	Ŭ	Ŭ	Ŭ	Ū	Ŭ	Ŭ	330	50,000
Total PAHs	0	0	o	0	0	0		100,000
Total CaPAHs	Ó	Ó	0	0	0	0		10,000
Total SVOCs	0	0	0	0	0	0		500,000
QUALIFIERS:			·	NO	TES:		ω <u> </u>	

QUALIFIERS: U: Compound analyzed for but not detected.

-- : Not applicable.

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#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD UNDERGROUND INJECTION CONTROL INVESTIGATION

### SUBSURFACE SOIL - TOTAL PETROLEUM HYDROCARBONS (TPH)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLID UNITS	MSSB-36 (7.5-9.5) 2/4/03 96.0 (ug/kg)	MSSB-36 (9.5-11.5) 2/4/03 87.0 (ug/kg)	MSSB-37 (12-14) 2/7/03 85.0 (ug/kg)	MSSB-37 (14-16) 2/7/03 85.0 (ug/kg)	MSSB-37 (16-18) 2/7/03 88.0 (ug/kg)	MSSB-37 (18-20) 2/7/03 82.0 (ug/kg)	INSTRUMENT DETECTION LIMITS (mg/kg)
Total Petroleum Hydrocarbons	ND	ND	ND	ND	ND	ND	12.0

Notes: ND: Not Detected .

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## MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD GROUNDWATER ASSESSMENT

## GROUNDWATER - TARGET ANALYTE LIST METALS (TAL Metals)

SAMPLE ID	MSGP-01 Unfiltered	MSGP-01 Filtered	MSGP-02 Unfiltered	MSGP-02 Filtered	MSGP-03 Unfiltered	MSGP-03 Filtered	INSTRUMENT DETECTION	NY STATE CLASS GA GROUNDWATER
DATE OF COLLECTION	2/5/03	2/5/03	2/5/03	2/5/03	2/5/03	2/5/03	LIMIT	STANDARDS/
DILUTION FACTOR	1	1	1	1	1	1	(IDL)	GUIDELINES
UNITS	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Aiuminum	829	υ	1820	ບ	1290	υ	17	
Antimony	3.7 B	U	U	U	U	U	3	3 ST
Arsenic	U	U	U	υ	U	U.	3	25 ST
Barium	46.4 B	70.9 B	40.3 B	32.6 B	29.6 B	29.7 B	4	1,000 ST
Beryllium	ן טן	U	U	U	U	U	0.5	3 GV
Cadmlum	U	- U	Ų	U	U	U	0.7	5 ST
Calcium	35500	35400	24200	23600	26100	26600	240	) - 1
Chromium	26.1	0.86 B	23.5	1.8 B	19.2 B	0.96 B	0.6	50 ST
Cobalt	4.1 B	1.7 8	4.7 B	2.7 B	2.6 B	1.5 B	0.9	
Copper	7.4 B	U	6.3 B	U	8.4 B	6 B	4	200 GA
Iron	4590	1110	6070	725	5260	892	26	300 ST*
Lead			U	U	U		4	25 ST
Magnesium	7660	7570	4630	4480	5160	5160	8	35,000 GV
Manganese	434	229	501	343	354	228	0.8	300 ST*
Mercury	U	υ	U	U	U	υ	0.1	0.7 ST
Nickel	15.4 B	5.1 B	9.8 B	4.1 B	11 B	4.4 B	0.8	100 ST
Potassium	9060	9760	3870	3700	4360	4340	78	( <b>(</b>
Selenium	U.	U	U	U	υ	U	9	10 ST
Silver	U	U	U	U	U U	U	2	50 ST
Sodium	45200	40500	53700	52700	43200	43900	83	20,000 ST
Thallium	U	U	Ū	U	U	U	3	0.5 GV
Vanadium	1.8 B	υ	2.3 B	U	2.6 B	U	0.7	- 1
Zinc	27 B	22.3 B	17.7 B	20.5 B	19.7 B	14.3 B	7	2,000 GV

## QUALIFIERS:

U: Compound analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

## NOTES:

ST\*

: Not applicable. 40

ST : New York State Ambient Water Quality Standards GV

: New York State Ambient Water Quality Guidance Values

: Standard for the sum of iron and manganese is 500 ug/l

: Value exceeds Standard/Guideline.

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## MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD GROUNDWATER ASSESSMENT

### GROUNDWATER - VOLATILE ORGANIC COMPOUNDS (VOCs)

SAMPLE ID	MSGP-01	MSGP-02	MSGP-03	LABORATORY	NY STATE CLASS GA
DATE OF COLLECTION	2/5/03	2/5/03	2/5/03	QUANTITATION	GROUNDWATER STANDARDS/
DILUTION FACTOR	1	1	1	LIMITS	GUIDELINES
UNITS	(ug/l)	(ug/l)	(ug/l)	(ug/L)	(ug/L)
Dichlorodifluoromethane	U	υ	U	5	5 ST
Chloromethane	U	Ų	υ	5	) – )
Vinyi Chloride		U	U	5	2 ST
Bromomethane	U	U	( υ	5	5 ST
Chioroethane	U	U	U	5	5 ST
Trichlorofluoromethane	U I	U	U	5	5 ST
1,1-Dichloroethene	U	U	υ	5	5 ST
Acetone	U	U	) U	5	50 GV
Idomethane	U	Ų	U	5	-
Carbone Disulfide	l u	U	U .	5	-
Methylene Chioride	1 J	2 J	U	5	5 ST
trans-1,2-Dichloroethene	) U	Ų	Į U .	5	6 ST
Methyl tert-butyl ether	υ	Ų	U	5	10 GV*
1,1-Dichloroethane	U	U	U	5	5 ST
Vinyl acetate	U	U	U	5	-
2-Butanone	U	U	U	5	- 1
cis-1,2-Dichloroethene	U	U	U	5	5 ST
2,2-Dichloropropane	U	U	U	5	5 ST
Bromochloromethane	U U	U	U	5	557
Chloroform	υ	U	U	5	7 ST
1,1,1-Trichloroethane	U	U	U	5	5 ST
1,1-Dichloropropene	U U	U	U	5	5 ST
Carbon Tetrachloride	U U	U	υ	5	5 ST
1,2-Dichloroethane	U	U	U	5	0.6 ST
Benzene	U	U	U	5	1 ST
Trichloroethene	U U	U	U I	5	5 ST
1,2-Dichloropropane	U	U	U	5	1 ST
Dibromomethane	U	U	U	5	5 ST
Bromodichloromethane	L U	υ	Y U	5	50 GV
cis-1,3-Dichloropropane	U	U	U	5	- 1
4-Methyl-2-pentanone	U	U	U	5	-
Toluene	U	U	U	5	5 ST
trans-1,3-Dichloropropene		U	U	5	0.4 ST
1,1,2-Trichloroethane	UU	U	UU	5	1 ST

# QUALIFIERS: U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

NOTES:

: Not applicable. ---٠

: Draft Guidance Value

ST : New York State Ambient Water Quality Standards

GV : New York State Amblent Water Quality Guidance Values

: Value exceeds the referenced criteria.

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#### TABLE 26 (continued)

#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD GROUNDWATER ASSESSMENT

#### GROUNDWATER - VOLATILE ORGANIC COMPOUNDS (VOCs)

SAMPLE ID	MSGP-01	MSGP-02	MSGP-03	LABORATORY	NY STATE CLASS GA
DATE OF COLLECTION	2/5/03	2/5/03	2/5/03	QUANTITATION	GROUNDWATER STANDARDS/
DILUTION FACTOR	1	1	1	LIMITS	GUIDELINES
	(ug/l)	(ug/l)	(ug/l)	(ug/L)	(ug/L)
1,3-Dichloropropane				5	5 51
Tetrachioroethene	U	1 J	U.	5	5 ST
2-Hexanone	U	Ŭ	U	5	50 GV
Dibromochloromethane	U	U	U	5	50 GV
1,2-Dibromoethane	U	U	U	5	-
Chlorobenzene	U	υ	U	5	5 ST
1,1,1,2-Tetrachioroethane	U	U	U	5	5 ST
Ethylbenzene	U	U	U	5	5 ST
m,p-Xyiene	U	υ	U -	5	
o-Xylene	U	U	U	5	-
Xylene (total)	U	U	U	5	5 ST
Styrene	U	U	U	5	5 ST
Bromoform	U	υ	υ	5	50 GV
Isopropylbenzene	U	υ	Ŭ	5	5 ST
1,1,2,2-Tetrachioroethane	U	υ	υ	5	5 ST
Bromobenzene	U	υ	U	5	5 ST
1,2,3-Trichloropropane	U	υ	υ	5	0.04 ST
n-Propylbenzene	U	U	U	5	5 ST
2-Chiorotoluene	Ŭ	U	Ŭ	5	5 ST
1,3,5-Trimethylbenzane	U	U	Ū	5	5 ST
4-Chlorotoluene	Ū	U	U	5	5 ST
tert-Butylbenzene	U	U	U	5	5 ST
1,2,4-Trimethylbenzene	U	U	U	5	5 ST
sec-Butylbenzene	υ	U	U	5	5 ST
4-isopropyitotuene	Ų	U	U	5	5 ST
1,3-Dichlorobenzene	Ú	U <sup>·</sup>	U	5	3 ST
1,4-Dichlorobenzene	U	U	U	5	3 ST
n-Butylbenzene	U	υ	U	5	5 ST
1,2-Dichlorobenzene	U	υ	U	5	3 ST
1,2-Dibromo-3-chioropropane	U	U	U	5	0.04 ST
1,2,4-Trichlorobenzene	Ū	Ū	Ū	5	5 ST
Hexachiorobutadiene	Ū	Ū	Ū	5	0.5 ST
Naphthaiene	3 J	U	U	5	10 GV
1,2,3-Trichlorobenzene	U	Ű	U	5	5 ST

QUALIFIERS: U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

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NOTES: -

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: Not applicable.

: Draft Guidance Value

ST

: New York State Ambient Water Quality Standards : New York State Ambient Water Quality Guldance Values G٧

: Value exceeds the referenced criteria.

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#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD GROUNDWATER ASSESSMENT

## GROUNDWATER - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	MSGP-01	MSGP-02	MSGP-03	LABORATORY	NY STATE CLASS GA
DATE OF COLLECTION	2/5/03	2/5/03	2/5/03	QUANTITATION	GROUNDWATER STANDARDS/
DILUTION FACTOR	. 1	1	1	LIMITS	GUIDELINES
UNITS	(ug/i)	(ug/l)	(ug/l)	(ug/L)	(ug/L)
Phenol					
	U	U	U	10	1 ST*
bis(2-Chioroethyl)ether	U I	U	្រុះ	10	-
2-Chlorophenol 1,3-Dichlorobenzene	U .	U	U U	10	-
	U.	U	U U	10	3 ST
1,4-Dichlorobenzene	U	U	j U	10	3 ST
1,2-Dichlorobenzene	U	U	l u	10	3 ST
2-Methylphenol	U	U	U	10	-
2,2'-oxybis (1-chloropropane)	U	U	U	10	-
4-Methylphenol	U	U	U	10	-
N-Nitroso-di-n-propylamine	U	U	່ ບ	10	-
Hexachloroethane	U	U	l u	10	5 ST
Nitrobenzene	U	U	Ú Ű	10	0.4 ST
isophorone	U	Ŭ	l ŭ	10	50 GV
2-Nitrophenol	Ū	ŭ	l ũ	10	
2,4-Dimethylphenol	Ŭ	ŭ	l ũ	10	50 GV
2,4-Dichlorophenol	U	Ŭ	ŭ	10	5 ST
1.2.4-Trichlorobenzene	ŭ	Ŭ	i ii	10	5 ST
Naphthalene	ŭ	Ŭ	i i	10	10 GV
4-Chloroaniline	ŭ			10	
bis(2-Chloroethoxy)methane	ů.	U U		10	5 ST
Hexachlorobutadiene	ŭ	U U		10	0.5 ST
4-Chioro-3-methylphenol	ŭ	u 8	l ü	10	0.531
2-Methylnaphthalene	ŭ	а и	i ö	-	-
Hexachlorocyclopentadiene	0	ŭ	0	10	
2,4,6-Trichlorophenol	0	U U		10	5 ST
2,4,5-Trichlorophenol	0	U U	l ü	10	-
2-Chloronaphthalene	0	0		20	-
2-Nitroaniline	ů,	U	l n	10	10 GV
		U		20	5 ST
Dimethylphthalate	U	U	U U	10	50 GV
Acenaphthylene	U I	U	U	10	-
2,6-Dinitrotoluene	U	U U	U	10	5 ST
3-Nitroaniline	U I	U	U U	20	5 ST
Acenaphthene	<u> </u>	U	U	10	20 GV

## QUALIFIERS:

U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

E: Compound concentration exceeded the calibration range.

NOTES:
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G٧

: Not applicable.

: Applies to the sum of all Phenols

ST : New York State Ambient Water Quality Standards

: New York State Ambient Water Quality Guidance Values

Result exceeds NYS Class GA Standard/Guideline

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#### TABLE 27 (continued)

#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD GROUNDWATER ASSESSMENT

### GROUNDWATER - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	MSGP-01	MSGP-02	MSGP-03	LABORATORY	NY STATE CLASS GA
DATE OF COLLECTION	2/5/03	2/5/03	2/5/03	QUANTITATION	GROUNDWATER STANDARDS/
DILUTION FACTOR	1	1	1	LIMITS	GUIDELINES
	(ug/l)	(ug/l)	(ug/l)	(ug/L)	(ug/L)
2,4-Dinitrophenol	U	U	U	20	10 GV
4-Nitrophenol	ŭ	ŭ	Ŭ Ŭ	20	
Dibenzofuran	ŭ	ů	l ŭ	10	-
2.4-Dinitrotoluene	ŭ	ŭ	l ū	10	5 ST
Diethylphthalate	ŭ	ŭ	i ŭ	10	50 GV
4-Chlorophenyl-phenylether	Ŭ	U	υ ΄	10	-
Fluorene	Ŭ	U	Ι υ	10	50
4-Nitroaniline	Ŭ	Ú	l ú	20	5 ST
4,6-Dinitro-2-methylphenol	Ŭ	Ŭ	l ũ	20	_
N-Nitrosodiphenylamine	Ŭ	Ŭ	l ŭ	10	50 GV
4-Bromophenyl-phenylether	Ū	Ŭ	Ū	10	-
Hexachlorobenzene	U	U	Ú	10	0.04 ST
Pentachlorophenol	U	· U	Ι υ	20	1 ST
Phenanthrene	Ŭ	U	Ū	10	50 GV
Anthracene	ບັ	Ű	Ŭ	10	50 GV
Carbazole	U	U	Ú	10	-
Di-n-butylphthalate	U	U	Ι υ	10	-
Fluoranthene	U	U	U	10	50 GV
Pyrene	U	υ	U	10	50 GV
Butylbenzylphthalate	U	υ	U	10	50 GV
3.3'-Dichlorobenzidine	Ŭ	υ	U	10	5 ST
Benzo(a)anthracene	U	U	U	10	-
Chrysene	U	U	U	10	0.002 GV
bis(2-Ethylhexyl)phthalate	U	U	U	10	-
Di-n-octylphthalate	U	U	U	10	50 GV
Benzo(b)fluoranthene	Ŭ	U	U	10	0.002 GV
Benzo(k)fluoranthene	U	U	U	10	0.002 GV
Benzo(a)pyrene	U	Ŭ	U	10	ND ST
Indeno(1,2,3-cd)pyrene	U	Ų	U	10	0.002 GV
Dibenzo(s,h)anthracene	U	Ų	U	10	-
Benzo(g,h,i)perylene	Ŭ	Ú	U	10	-

QUALIFIERS: U: Compound analyzed for but not detected. J: Compound found at a concentration below the detection limit.

NOTES: -

ST

: Not applicable.

E: Compound concentration exceeded the calibration range. G٧ New York State Ambient Water Quality Standards New York State Ambient Water Quality Guidance Values

: Result exceeds NYS Class GA Standard/Guideline

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## MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD GROUNDWATER ASSESSMENT

## GROUNDWATER - POLYCHLORINATED BIPHENYLS (PCBs)

SAMPLE ID DATE OF COLLECTION DILUTION FACTOR UNITS	MSGP-01 2/5/03 1 (ug/l)	MSGP-02 2/5/03 1 (ug/l)	2/5/03 2/5/03 1 1		NY STATE CLASS GA GROUNDWATER STANDARDS/ (ug/L)
Aroclor- 1016	U	U	U	1	
Aroclor- 1221	Ŭ	Ŭ	U	1	
Aroclor- 1232	U	U	U	1	
Aroclor- 1242	U	U	U	1	
Aroclor- 1248	U	U	U	1	
Aroclor- 1254	U	U	U U	1	
Aroclor- 1260	U	U	U	1	-
TOTAL PCBs	0	0	0		0.09 ST

: Not applicable.

QUALIFIERS: U: Compound analyzed for but not detected.

NOTES:

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: New York State Ambient Water Quality Standards

## MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

## SUBSURFACE SOIL - RCRA METALS

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MSSBX-01 (4-6) 2/6/03 99.0 (mg/kg)	M\$\$BX-01 (6-8) 2/6/03 83.0 (mg/kg)	MSSBX-01 (8-10) 2/6/03 84.0 (mg/kg)	M\$\$BX-01 (10-12) 2/6/03 89.0 (mg/kg)	M\$\$BX-01 (12-14) 2/6/03 85.0 (mg/kg)	MSSBX-02 (4-6) 2/6/03 99.0 (mg/kg)	M\$\$BX-02 (6-8) 2/6/03 98.0 (mg/kg)	M\$\$8X-02 (8-10) 2/6/03 93.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective (mg/kg)
Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	0.54 B 2.1 B U 6.4 0.74 U U U	0.78 B 3.3 B U 2.6 1.5 U U U	3.2 3 B U 10.1 1.5 U U U	2.3 3.7 B 0.054 B 5.4 1.9 U U U	0.72 B 3.1 B U 3.8 0.93 U U U	0.33 B 2.5 B U 1.1 1.1 U U U	1.1 3.4 B 3 1.6 U U U	0.8 B 3.5 B 0.037 B 3.8 5.3 U U U	3.0 3.0 2.0 3.0 1.0 0.1 8.0 2.0	7.5 or SB 300 or SB 10* 50* SB** 0.1 2 or SB SB

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MSSBX-02 (10-12) 2/6/03 89,0 (mg/kg)	MSSBX-02 (12-14) 2/6/03 86.0 (mg/kg)	MSSBX-02 (14-16) 2/6/03 84,0 (mg/kg)	M\$\$BX-03 (4-6) 2/3/03 97.0 (mg/kg)	MSSBX-03 (6-8) 2/3/03 98.0 (mg/kg)	M\$\$BX-03 (8-10) 2/6/03 94.0 (mg/kg)	MSSBX-03 (10-12) 2/6/03 93.0 (mg/kg)	MSSBX-03 (12-14) 2/6/03 85.0 (mg/kg)	INSTRUMENT DETECTION LIMITS	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective (mg/kg)
Arsenic Barlum Cadmium Chromium Lead Mercury Selenium Silver	0.54 B 11.1 0.13 B 2 1.2 U U	0.73 B 3.8 B 2.8 1.3 U U U	1.1 5.1 B U 3 1.7 U U	0.61 B 2.3 B U 1.5 B 1 B U U U	0.8 4.4 B U 2.7 0.96 B U U U	0.7 B 7.9 B 0.037 B 2.1 1.8 U U	0.43 B 6.8 B U 1.4 1.2 U U	0.64 B 2.9 B U 1.4 0.99 U U U	3.0 3.0 2.0 3.0 1.0 0.1 8.0 2.0	7.5 or SB 300 or SB 10* 50* SB** 0.1 2 or SB SB

QUALIFIERS:

U: Constituent analyzed for but not detected. B: Constituent concentration is less than the CRDL, but greater than the IDL.

Notes:

SB: Site Background

\*: As per proposed 4/95 NSDEC TAGM

\*\*: Average background levels in metropolitan or surburban areas or near highways range from 200-500 ppm.

: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

#### TABLE 29 (continued)

#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL - RCRA METALS

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MSSBX-03 (14-16) 2/6/03 91.0 (mg/kg)	M\$\$BX-03 (16-18) 2/6/03 99.0 (mg/kg)	MSSBX-03 (18-20) 2/6/03 91.0 (mg/kg)	M\$\$BX-04 (4-6) 2/7/03 97.0 (mg/kg)	M\$\$BX-04 (6-8) 2/7/03 92.0 (mg/kg)	MSSBX-04 (8-10) 2/7/03 88.0 (mg/kg)	MSSBX-04 (10-12) 2/7/03 89.0 (mg/kg)	M\$\$BX-04 (12-14) 2/7/03 86.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/i)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective (mg/kg)
Arsenic Barlum Cadmium Chromium Lead Mercury Selenium Silver	0.6 B 3 B U 3.7 1.1 U U U	0.93 2.9 B U 2.6 1 U U U	0.69 B 2.8 B 2.4 1.1 U U U	2.2 4.2 B 0.073 B 14.3 2.8 0.025 B U 0.1 B	1.4 4.5 B 0.31 13.7 1.8 U U	U 1.6 8 U 2.2 2.2 U U U	0.55 B 3.7 B 4.2 1.1 U U U	0.58 B 3.4 B U 2.1 1.1 U U U	3.0 3.0 2.0 3.0 1.0 0.1 8.0 2.0	7.5 or SB 300 or SB 10* 50* SB** 0.1 2 or SB SB

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MSSBX-04 (14-16) 2/7/03 86.0 (mg/kg)	MSSBX-04 (16-18) 2/7/03 84.0 (mg/kg)	MSSBX-04 (18-20) 2/7/03 82.0 (mg/kg)	MSSBX-05 (4-6) 2/6/03 98.0 (mg/kg)	MSSBX-05 (6-8) 2/6/03 99.0 (mg/kg)	MSSBX-05 (8-10) 2/6/03 97.0 (mg/kg)	MSSBX-05 (10-12) 2/6/03 94.0 (mg/kg)	M\$\$8X-05 (12-14) 2/6/03 94.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4048 Recommended Soil Cleanup Objective (mg/kg)
Arsenic Barium Cadmium Chromium Lead	0.67 B 3.7 B U 2.3 1	0.77 B 3.5 B U 2.8 1.4	0.74 B 5.6 B U 3.9 1.5	0.56 B 2.2 B U 1.8 1.1	0.51 B 2.9 B U 2 1.1	4.4 5.4 B 0.068 B 11.5 3.3	0.79 B 4.8 B U 5.7 1.4	0.31 B 2.2 B U 1.7 0.93	3.0 3.0 2.0 3.0 1.0	7.5 or SB 300 or SB 10* 50* SB**
Mercury Selenium Silver	c c c		ບ ບ ບ	ີ ບ ບ	ບ ບັນ		 U U	U U U	0.1 8.0 2.0	0.1 2 or SB SB

QUALIFIERS:

U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

#### <u>Notes:</u>

SB: Site Background

\*: As per proposed 4/95 NSDEC TAGM

\*\*: Average background levels in metropolitan or surburban areas or near highways range from 200-500 ppm.
\_\_\_\_\_\_\_\_: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

### TABLE 29 (continued)

#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL - RCRA METALS

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SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MSSBX-05 (14-16) 2/6/03 88.0 (mg/kg)	MSSBX-05 (16-18) 2/6/03 90.0 (mg/kg)	MSSBX-05 (18-20) 2/6/03 92.0 (mg/kg)	MSSBX-06 (4-6) 2/6/03 90.0 (mg/kg)	MSSBX-06 (6-8) 2/6/03 96,0 (mg/kg)	MSSBX-07 (4-6) 2/6/03 97,0 (mg/kg)	MSSBX-07 (6-8) 2/6/03 98.0 (mg/kg)	MSSBX-07 (8-10) 2/6/03 97.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/i)	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective (mg/kg)
Arsenic	0.8 B	0.53 B	0.58 B	0.84 B	1.2	1.1	0.69 B	1.1	3.0	7.5 or SB
Barium	2.5 B	2.8 B	2.7 B	3 B	10.3	3.7 B	3 B	5.1 B	3.0	300 or SB
Cadmium	U	U	U	0.077 B	0.29	0.14 B	0.072 B	0.32	2.0	10*
Chromium	1.6	2.6	2	2	6.2	4.3	1.9	10.4	3.0	50*
Lead	1	1	1	24.8	71.6	1.3	1.1	38.5	1.0	SB**
Mercury	บ	ບ	ບ	ບ	0.13	บ	ບ	ບ	0.1	0.1
Selenium	บ	ບ	ບ	ບ		บ	ບ	ບ	8.0	2 or SB
Sliver	บ	ບ	ບ	ບ	ປ	บ	ບ	ບ	2.0	SB

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MSSBX-07 (10-12) 2/6/03 88.0 (mg/kg)	MSSBX-07 (12-14) 2/6/03 87.0 (mg/kg)	MSSBX-09 (4-6) 2/6/03 98.0 (mg/kg)	MSSBX-09 (6-8) 2/6/03 97.0 (mg/kg)	MSSBX-09 (8-10) 2/6/03 98.0 (mg/kg)	MSSBX-09 (10-12) 2/6/03 95.0 (mg/kg)	MSSBX-09 (16-18) 2/6/03 88.0 (mg/kg)	MSSBX-10 (4-6) 2/6/03 98.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective (mg/kg)
Arsenic Berium Cadmium Chromium	1.9 2.8 B 0.066 B 4.1	1.5 3.7 B 0.037 B 3	0.57 B 3.6 B U 1.5	0.72 B 2.7 B 0.059 B 2.3	1.3 4 B 0.065 B 8.8	1.8 3 B 0.18 B 5.5	0.58 B 2.7 B U 3.8	0.95 2.3 B 0.035 B 2	3.0 3.0 2.0 3.0	7.5 or SB 300 or SB 10* 50*
Lead Mercury Selenium Silver	1.9 ປ ປ	1.6 U U U	4 U U U	2.3 U U U	3 U U U	2 U U U	2.1 U U U	1 B U U 0 <u>.</u> 45 B	1.0 0.1 8.0 2.0_	SB** 0.1 2 or SB SB

### **OUALIFIERS:**

U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

### Notes:

SB: Site Background

\*: As per proposed 4/95 NSDEC TAGM

\*\*: Average background levels in metropolitan or surburban areas or near highways range from 200-500 ppm.

#### TABLE 29 (continued)

#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - RCRA METALS

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	MSSBX-10 (6-8) 2/6/03 96.0 (mg/kg)	MS\$BX-10 (8-10) 2/6/03 91.0 (mg/kg)	MSSBX-10 (10-12) 2/6/03 80.0 (mg/kg)	MS\$BX-10 (12-14) 2/3/03 83.0 (mg/kg)	MSSBX-10 (16-18) 2/3/03 86.0 (mg/kg)	MSSBX-10 (18-20) 2/3/03 88.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective (mg/kg)
Arsenic	0.7	3.5	0.83	1	0.67 B	0.73 B	3.0	7.5 or SB
Barium	3.6 B	19.5	5.7 B	2.8 B	3.3 B	2.1 B	3.0	300 or SB
Cadmium	U	0.17 B	0.073 B	U	υ	υ	2.0	10*
Chromium	1.8 B	11.8	2.4	2.4	2.4	2.6	3.0	50*
Lead	0.87 B	8.3	1.3 B	0.95 B	0.88 B	0.79 B	1.0	SB**
Mercury	U	0.3	U	U	U	U	0.1	0.1
Selenium	U	U	U	υ	U	U	8.0	2 or SB
Silver	0.3 B	0.39 B	0.26 B	0.14 B	<u> </u>	U	2.0	SB

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QUALIFIERS: U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

## Notes:

SB: Site Background

\*: As per proposed 4/95 NSDEC TAGM

\*\*: Average background levels in metropolitan or surburban areas or near highways range from 200-500 ppm.

: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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12/20/04

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#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	MSSBX-01	MSSBX-01	MSSBX-01	MSSBX-01	MSSBX-01	MSSBX-02	MSSBX-02	MSSBX-02		· · · · · · · · · · · · · · · · · · ·
SAMPLE DEPTH (FT)	(4-6)	(6-8)	(8-10)	(10-12)	(12-14)					
DATE OF COLLECTION	2/6/03	2/6/03				(4-6)	(6-8)	(8-10)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	2/0/03	2/0/03	2/6/03	2/6/03	2/6/03	2/6/03	2/6/03	2/6/03	QUANTITATION	4046 Recommended
	99.0	820		1	1		1	1	LIMITS	Soli Cleanup
PERCENT SOLIDS		83.0	84.0	89.0	85.0	99.0	96.0	93.0	í <i>,</i> " .	Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Phenol	υ	υ	υ	υ	່ນ		υ	υ	330	30
bis(2-Chloroethyl)ether	l ŭ	l ũ	Ŭ	Ū	ŭ	l ä	Ŭ	U U	330	
2-Chlorophenol	i ii	Ιŭ	ίυ	ι υ	l ŭ		Ŭ Ŭ	ň	330	800
1,3-Dichiorobenzene	) ŭ	ĴŬ	Ŭ	ι. υ		i ñ		Ŭ	330	800
1.4-Dichlorobenzene		Ŭ	l Ŭ	ΪŪ	i ii		Ŭ	Ŭ	330	
1.2-Dichlorobenzene		Ŭ	Ŭ	រ ប	l ä	l X	ι υ	υ	330	_
2-Methylphenol	l ŭ	l ŭ	l ŭ	ĮŪ	i i	1	łŭ	ŭ	330	100
2.2-oxybis (1-chloropropane)		i ŭ	Ŭ	ίŬ		ររ		U U	330	
4-Methylphenol	i ŭ	Ŭ	i ŭ	υŬ			i ü	Ŭ	330	900
N-Nitroso-di-n-propylamina	Ŭ	ŭ	Ŭ	Ŭ		U U		υ υ	330	900
Hexachloroethane	Ŭ Ŭ	l ŭ	υ	ΙŬ	i ii		i ü	Ŭ	330	
Nitrobenzene	i ŭ	Ŭ	) Ŭ	່ັ້	i i	U U	l ŭ	U U	330	200
lisophorone			) ŭ	Ŭ				υ	330	
2-Nitrophenol	1 Ŭ	Ŭ	υ υ	ບ ບ		[ ປ				4,400
2,4-Dimathylphenol	l ŭ	Ŭ		-		-		•	330	330
2,4-Dichlorophenol		U U				U U	1 U	U U	330	
1,2,4-Trichlorobenzene		l ŭ		U U	ט <u>ו</u>				330 330	400
Naphthalene		ι υ						U U	330	
4-Choroaniline		l ŭ	-	_				-		13,000
			} <u> </u>	) U	U	U U	r U	U U	330	220
bis(2-Chloroethoxy)methane		{ <u>.</u>	( U	U U	U U	U	U	U	330	
Hexachiorobutadiene		[	l n	U U	U	U	U U	U	330	
4-Chloro-3-methylphenol			U U	י ט נו	U	U	) !!	l U	330	240
2-Methylnaphthalene		U U	U U	U U	U U	) U	U U	U	330	36,400
Hexachlorocyclopentadiene 2,4,6-Trichlorophenol			U U			U U		U U	330	
				U U				U U	330	
2,4,5-Trichlorophenol		<u>ן</u> א	<u>ט</u>	U U	U U	ן ע		U U	330	100
2-Chloronaphthalene		<u> </u>	U U	) U		í U		U	330	
2-Nitroaniline		U U		U				U	330	430
Dimethyiphthalate	U U	U U	U U	U			l U	U U	330	2,000
Acenaphthylene	U	U U	<u>ט</u> און	U	U U	U	U U	U	330	41,000
2,6-Dinitrotoluene		U U	U U	U	U U	<u>ا</u> ا	l U	U	330	1,000
3-Nitroaniline	U		U U	U U	U U		l U	U	330	500
Acenaphthene	<u> </u>	[ <u>U</u>	UU	UU	UU	υ	U	U	330	50,000

#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCe)

SAMPLE ID SAMPLE DEPTH (FT)	MSSBX-01 (4-6)	M\$\$8X-01 (6-8)	M\$SBX-01 (8-10)	M\$SBX-01 (10-12)	MSSBX-01 (12-14)	MSSBX-02 (4-6)	MSSBX-02 (6-8)	MSSBX-02 (8-10)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	2/6/03	2/6/03	2/6/03	2/6/03	2/6/03	2/6/03	2/6/03	2/6/03	QUANTITATION	4046 Recommended
DILUTION FACTOR		1	1	1	1	1	1	1	LIMITS	Soli Cleanup
PERCENT SOLIDS	99.0	83.0	84.0	89.0	85.0	99.0	98.0	93.0		Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
2,4-Dinitrophenol	υ	υ	υ	U	U	υ	υ υ	υ	330	200
4-Nitrophenol	ι υ	υ	U	U	U	Ι υ	) υ	υ	330	100
Dibenzofuran	ί υ	υ	U	υ	U	υ [	U U	υ	330	6,200
2,4-Dinitrotoluene	υ υ	U	U	U	U U	υ	υ	υ	330	I
Diethylphthaiate	υ υ	U	U	U U	υ	υ	[ υ	υ	330	7,100
4-Chlorophenyi-phenylether	U U	U	U	U	υ	υ	l u	ן טן	330	
Fluorene	υ υ	( U	V	U	U	U	Ι υ	( U	330	50,000
4-Nitroanline	Ū	Ū	Ŭ	Ū	Ū	Ū	Ū	Ŭ	330	
4,6-Dinitro-2-methylphanoi	U U	υ	U	Ū	U	υ	υ	υ	330	
N-Nitrosodiphenylamine	υ	U	Ŭ	U	U	υ	U	U	330	
4-Bromophenyl-phenylether	l Ū	Ū	Ū	U	Ū	Ū	Ú	Ū	330	
Hexachiorobenzene	l ū	U	Ū	U	Ū	l u	υ	Ū	330	410
Pentachlorophenol	l ū'	Ū	Ū	Ū	Ū	Ū	Ū	Ū	330	1,000
Phenanthrane	l ŭ	Ū	Ū	Ū	Ū	l ū	l ũ	Ū	330	50,000
Anthracene	ן ה	Ū	Ŭ	Ū	i ŭ	ΙŪ	i ŭ	Ŭ	330	50,000
Carbazole	l ū	Ŭ	Ū	Ũ	ŭ.	່ ມັ	l ŭ	Ŭ	330	
Di-n-butyiphthalate	υŬ	Ŭ	Ŭ	Ū	ŭ	ΙŬ	υ	Ŭ	330	8,100
Fluoranthene	l ŭ	ĪŪ	Ŭ	Ū	l ŭ	l ŭ	i ū	Ū	330	50,000
Pyrene	í Ŭ	ΙŪ	Ŭ	Ū	Ū.	υ	l ŭ	ιŭ	330	50,000
Butyibenzyiphthalate	Ŭ	Ū	Ū	Ŭ	i ŭ	l ŭ	l ŭ	Ū	330	50,000
3.3-Dichlorobenzidine	Ŭ	Ŭ	Ŭ	Ŭ	l ŭ	l ū	l ŭ	Ū	330	
Benzo(a)anthracene	Ŭ	Ŭ	Ŭ	Ū	l ŭ	l ŭ	i ŭ	i ŭ	330	224
Chrysene	Ŭ	Ŭ Ŭ	Ŭ	Ŭ	Ŭ	l ŭ	Ιŭ	Ū	330	400
bis(2-Ethylhexyl)phthalate	Ŭ	ŭ	Ŭ	ี มี	ŭ	ιŭ	บั	บั	330	50,000
Di-n-octyiphthalate	l ŭ	Ū	Ŭ	Ŭ	Ū	Ū	l ū	l ũ	330	50,000
Benzo(b)fluoranthene	l ŭ	l ū	Ŭ	Ū	ŭ	ΙŬ	l ŭ	Ū	330	1,100
Benzo(k)fluoranthene	Ŭ	Ŭ	Ŭ	Ŭ	l ŭ	l ŭ	l ŭ	Ĵ Ŭ	330	1,100
Benzo(a)pyrene	Ŭ	Ŭ	Ŭ	Ŭ	ŭ	υ	l ŭ	Ŭ	330	61
Indeno(1,2,3-cd)pyrene	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ,	Ŭ	l ŭ	Ŭ	330	3,200
Dibenzo(a,h)anthracene	Ŭ	Ŭ	Ŭ	Ŭ	i ü	l ŭ	l ŭ	Ŭ	330	14
Benzo(g,h,l)perviene	Ŭ		Ŭ	ບ ບ	Ĭ	ŭ	!	U U	330	50.000
Lagren(A). (1) has have		U	5	<b>v</b>	0		Ĭ	Í		00,000
Total PAHs	0	0	0	0	0	0	0	0		100,000
Total CaPAHs	0	0	0	0	0	0	0	0	-	10,000
Total SVOCs	0	0	0	0	0	0	0	0	- +	500,000

QUALIFIERS: U: Compound analyzed for but not detected. J: Compound found at a concentration below the detection limit.

NOTES:

a .....

: Not applicable. \*\*

: Concentration exceeds NYSDEC TAGM 4046 Recommended Soil Cleanup Objective

#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

## SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

			_							1
SAMPLE ID	MSSBX-02	MSSBX-02	M\$8BX-02	MSSBX-03	MSSBX-03	MSSBX-03	MSSBX-03	MSSBX-03		
SAMPLE DEPTH (FT)	(10-12)	(12-14)	(14-16)	(4-6)	(6-8)	(8-10)	(10-12)	(12-14)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	2/6/03	2/6/03	2/6/03	2/3/03	2/3/03	2/6/03	2/6/03	2/6/03	QUANTITATION	4046 Recommended
DILUTION FACTOR	t	( 1 ;	1	1	1	1	[ 1	1	LIMITS	Soil Cleanup
PERCENT SOLIDS	89.0	86.0	84.0	97.0	98.0	94.0	93.0	85.0		Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Phenol	υ	υ	υ	υ	υ υ	U	υ υ	U	330	20
bis(2-Chloroethyl)ether	ľ ů	Ŭ	Ŭ	. Ŭ	l ŭ	Ŭ	Ŭ	l ŭ	330	30
2-Chlorophenol	Ŭ Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	ី បី	U U	Ü	330	
1.3-Dichlorobenzene	Ŭ Ŭ	υ	Ŭ	U U	ιŭ	U U		-	330	800
1.4-Dichlorobanzana	Ŭ	Ŭ	Ŭ	Ŭ	l ŭ	u u	-		330	
11,2-Dichlorobenzene		U U	Ŭ					່ ບ ເ		
2-Methylphenol		υ	Ŭ						330 330	100
2,2-oxybia (1-chloropropane)	l ŭ	Ŭ	Ŭ		Ŭ	i ŭ			330	
4-Methylphanol		Ŭ	νŬ			U U			330	
N-Nitroso-di-n-propylamine	i ii	Ŭ	Ŭ	່ <del>ບ</del>	ι υ	υ υ			330	900
Hexachloroethane	U U	Ŭ	Ŭ	. U		ໄ ນ	ມ ບ ບ			
Nitrobenzene	Ŭ	Ŭ	Ŭ	Ŭ	l	Ŭ	l ŭ	υ	330 330	200
lisophorone	U U	Ŭ	Ŭ	Ŭ	i ü	Ŭ	) ŭ		330	4,400
2-Nitrophenol		Ŭ	Ŭ		ι υ Ι υ	l u	l U	u u	330	
2,4-Dimethylphenol		ບັ	Ŭ							330
2.4-Dichlorophenol	l ŭ	U U		-		-		-	330	
1,2,4-Trichlorobenzene		U U	Ų	U U	-	L N		U	330	400
Naphthalene			U U	υυ		ບ ນ	U U	U	330	
4-Chioroaniline		Ŭ	Ŭ		) ບ		) !	U U	330 330	13,000
bis(2-Chloroethoxy)methane	Ŭ	U U	Ŭ	. U		l ŭ		บ บ	330	220
Hexachlorobutadiene	υ	U U				-	-	-		}
4-Chloro-3-methylphenol		υ υ	U		U U	U U	U U	U U	330	
2-Methylnaphthalene	U U	υ		U U			U 1	l 0	330	240
Hexachlorocyclopentadiene	υ	υ	υ	່ U ບ		U U	U U	U U	330	36,400
2,4,6-Trichiorophenol	Ŭ	Ŭ	Ŭ		U U	U U			330 330	
2,4,5-Trichlorophenol	U U	U U	Ŭ	Ŭ	l ŭ	l ŭ			330	
2-Chloronaphthalena	U U	U U	Ŭ	Ŭ	ίυ	l ŭ	l ŭ	ι υ υ	330	100
2-Nitroaniline		U U	Ŭ		U U				330	430
Dimethylphthalate		ι υ υ	υ			U U			330	2,000
Acenaphthylene	l ŭ	Ŭ	υ			υ 1 υ			330	
2,6-Dinitrotoluene	i ŭ	Ŭ	Ŭ	ນັ	Ŭ	υ		1	330	41,000
3-Nitroaniline	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	ί υ			330	500
Acenaphthene	1 1	U U	U U	U U	ŭ		ม ม		330	
		<u> </u>					JV		330	50,000

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#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	M\$\$BX-02 (10-12) 2/6/03 1 89.0 (ug/kg)	M\$\$BX-02 (12-14) 2/6/03 1 86.0 (ug/kg)	MSSBX-02 (14-16) 2/6/03 1 84.0 (ug/kg)	M\$\$BX-03 (4-6) 2/3/03 1 97.0 (ug/kg)	M\$\$BX-03 (6-8) 2/3/03 1 98.0 (ug/kg)	MSSBX-03 (8-10) 2/6/03 1 94.0 (ug/kg)	M\$888X-03 (10-12) 2/6/03 1 93.0 (ug/kg)	M8\$8X-03 (12-14) 2/6/03 1 85.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4045 Recommended Soll Cleanup Objective (ug/kg)
2,4-Dinitrophenol 4-Nitrophenol Dibenzofuran 2,4-Dinitrotolusne Diethylphthalate 4-Chlorophenyl-phenylether Fluorene 4-Nitroaniline 4,6-Dinitro-2-methylphenol	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		330 330 330 330 330 330 330 330 330 330	200 100 6,200 7,100 50,000
N-Nitrosodiphenylamine 4-Bromophenyl-phenylether Hexachlorobenzene Pentachlorophenol Phenanthrene Anthracene Carbazole Di-n-butylphthalate	υ υ υ υ υ υ υ υ υ	ככנטט	ccccc	ccccc	ccccc		υ υ υ υ υ υ υ υ		330 330 330 330 330 330 330 330 330	410 1,000 50,000 50,000  6,100
Fluoranthene Pyrene Butylbenzylphthalate 3,3-Dichlorobenzidine Benzo(a)anthracene Chrysene bis(2-Ethylhexyl)phthalate	0 0 0 0 0 0 0 0 0	2000 2000 2000	cccc	cccc			ບ ນ ບ ບ ບ ບ	000000000000000000000000000000000000000	330 330 330 330 330 330 330 330	50,000 50,000 50,000  224 400 50,000
Di-n-octylphthalate Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-od)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0		CCCC	CCCCC	00000	U U U U U U U U U U U	000000000000000000000000000000000000000	330 330 330 330 330 330 330 330	50,000 1,100 1,100 81 3,200 14 50,000
Total PAHs Total CaPAHs Total SVOCs	0	0 0 0	0 0	0 0 0	0 0	000	0 0 0	0 0 0		100,000 10,000 500,000

QUALIFIERS: U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

NOTES:

: Not applicable. -

Concentration exceeds NYSDEC TAGM 4046 Recommended Soil Cleanup Objective

#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS	MSSBX-03 (14-16) 2/6/03 1 91.0	MSSBX-03 (16-18) 2/6/03 1 99.0	M\$\$BX-03 (18-20) 2/6/03 1 91.0	MS\$BX-04 (4-6) 2/7/03 1 97.0	M\$\$BX-04 (6-8) 2/7/03 1 92.0	MS\$BX-04 (8-10) 2/7/03 1 88.0	MSSBX-04 (10-12) 2/7/03 1 89.0	MSSBX-04 (12-14) 2/7/03 1 86.0	LABORATORY QUANTITATION LIMITS	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	_(ug/kg)	(ug/kg)
Phenol bis(2-Chloroethyl)ether	U U		U I	U	U	U U	U U	U	330	30
2-Chiorophenol	U U	Ŭ	U U		U U	บ บ	L U	•	330 330	
1.3-Dichlorobenzene	υ		U U	U U	U U	U U		U	330	800
1.4-Dichiorobenzene	υ	U U	Ŭ	0		U U		U U		
1.2-Dichlorobenzene	U U	U U		U U		•			330	
2-Methylphenol	Ŭ	-	U	U	5	U	U	U	330	
2.2-oxybis (1-chloropropane)	ι υ υ	ບ ນ	U U	U	U	U		U U	330	100
4-Methylphenol	ບ ບ	υ	U ט	υ υ		U U	UUU	UU	330 330	900
N-Nitroso-di-n-propylamine	ม บ	υ υ	υ υ	υ υ		ບ ບ	U U		330	
Hexachloroathane	Ŭ	υŬ	υŬ	υ	U U	U U	-	U U		
Nitrobanzane	υ	υ	-				ļ	-	330	
	-	-	U	U.		U		U	330	200
Isophorone	<u> </u>	U U	U U	U		U U	U	U	330	4,400
2-Nitrophenol	υ υ	ບ ບ	υ	U	U U		L U	U	330	330
2,4-Dimethylphenol 2,4-Dichlorophenol	U U	U U	υ	ບ ບ		U U		U U	330	-
1.2.4-Trichlorobenzene	υ	-	U U	-	0	i u		U	330	400
	-	U	U	υ	υ	U	U	U	330	[ [
Naphthalene	U	U	υ	υ	U	l U	U U	U	330	13,000
4-Chioroaniline	U	U	υ	υ	U	U	U	U	330	220
bis(2-Chloroethoxy)methane	U	U	U	υ	U	U	U U	U	330	
Hexachiorobutadiene	U U	U	U	U	U	U	U	υ	330	
4-Chioro-3-methylphenol	U	U U	U	U		U	U	U	330	240
2-Methylnaphthalene	U U	U	U .	U	Ų	U	) U	U	330	36,400
Hexachiorocyclopentadiene	U U	U	U	U	U	U	υ	U	330	
2,4,6-Trichlorophenol	U U	U	U	U	U	U	U	U	330	
2,4,5-Trichlorophenol 2-Chioronaphthalene	U	U.	U	U U	U	U U	l U	U	330	100
2-Chloronaphinalene	U U	U U U	U	U U		U	U	U	330	
Dimethylphthalate			U	U U		U	U U	U	330	430
		U	U	U	U	U	U U	U	330	2,000
Acenaphthylene		U	U	U	U	U	- U	U	330	41,000
2,6-Dinitrotoluene	U	U	U	U U	U	U	l u	U	330	1,000
3-Nitroaniline	U U	U U	U	U	U	U	L U	U	330	500
Acenaphthene	· · · · · · · · · · · · · · · · · · ·	<u> </u>	UU	U	U	U	U	U	330	50,000

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#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCa)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	MSSBX-03 (14-16) 2/6/03 1 91,0 (ug/kg)	MSSBX-03 (16-18) 2/6/03 1 99.0 (ug/kg)	MSSBX-03 (18-20) 2/6/03 1 91.0 (ug/kg)	MS\$BX-04 (4-6) 2/7/03 1 97.0 (ug/kg)	MSSBX-04 (6-8) 2/7/03 1 92.0 (ug/kg)	MSSBX-04 (8-10) 2/7/03 1 88.0 (ug/kg)	MSSBX-04 (10-12) 2/7/03 1 89.0 (ug/kg)	MSSBX-04 (12-14) 2/7/03 1 86.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4048 Recommended Soil Cleanup Objective (ug/kg)
2,4-Dinitrophenol 4-Nitrophenol Dibenzofuran 2,4-Dinitrotoluene Diathylphthalate 4-Chiorophenyl-phenylether Fluorene 4-Nitrosodiphenylemine 4-Stromophenyl-phenylether Hexachlorobenzene Pentachlorobenzene Pentachlorobenzene Pentachlorophenol Phenanthrene Anthracene Carbazole Di-n-butylphthalate Fluoranthene Pyrene Butylbenzylphthalate 3,3-Dichiorobenzidine Benzo(a)anthracene Chrysene bis(2-Ethylhexyl)phthalate Di-n-octylphthalate Benzo(k)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Dibenzo(a,h)anthracene									330 330 330 330 330 330 330 330 330 330	200 100 8,200 
Benzo(g,h,i)perylene Total PAHs Total CaPAHs Total SVOCs	U 0 0 0	U 0 0	U 0 0 0	0 0 0	0	0 0 0	0 0 0	0 0 0	330	50,000 100,000 10,000 500,000

QUALIFIERS: U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

## NOTES:

: Not applicable. --

: Concentration exceeds NYSDEC TAGM 4046 Recommended Soll Cleanup Objective

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#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

## SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	MSSBX-04 (14-16) 2/7/03 1 66.0 (ug/kg)	M\$SBX-04 (16-18) 2/7/03 1 84.0 (ug/kg)	MSSBX-04 (18-20) 2/7/03 1 82.0 (ug/kg)	MSSBX-05 (4-6) 2/7/03 - 1 98.0 (ug/kg)	MSSBX-05 (8-8) 2/7/03 1 99.0 (ug/kg)	MSSBX-05 (8-10) 2/7/03 1 97.0 (ug/kg)	MS\$BX-05 (10-12) 2/7/03 1 94.0 (ug/kg)	MSSBX-05 (12-14) 2/7/03 1 94.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4048 Recommended Soll Cleanup Objective (ug/kg)
Phenol bis(2-Chlorosthyl)ether 2-Chlorophenol 1.3-Dichlorobenzene	U U U U	U U U U	ນ ນ ນ	ບ ບ ບ	U U U	U U U	U U U U	U U U U	330 330 330	30 800
1,4-Dichlorobenzene 1,2-Dichlorobenzene 2-Methylphenol	U U U	U U U	ບ ບ ບ ບ	ບ ບ ບ			0 0 0	U U U	330 330 330 330	
2,2-oxybis (1-chloropropane) 4-Methylphenol N-Nitroso-di-n-propylamine	U U U	ม บ บ	ບ ບ ບ	ບ ບ ບ	U U U	U U U	U U U U		330 330 330	900
Hexachlorgethane Nitrobenzene Isophorone 2-Nitrophenol	บ บ บ บ	ບ ບ ບ	ບ ບ ບ	U U U	U U U	U U U	U U U	U U U	330 330 330	200 4,400
2,4-Dimethylphenol 2,4-Dichlorophenol 1,2,4-Trichlorophenzene	U U U	ບ ບ ບ ບ	ບ ບ ບ ບ	υ Ψ υ υ	U U U	U U U U	ม ม ม ม	U U U U U U U U U U U U U U U U U U U	330 330 330 330	330 
Naphthalene 4-Chloroaniline bis(2-Chloroethoxy)methane Hexachlorobutadiene	U U U U	ນ ບ ບ ບ	ບ ບ ບ ບ	ט ט ט	U U U				330 330 330 330 330	13,000 220 
4-Chloro-3-methylphenol 2-Methylnaphthalene Hexachlorocyclopentadiene	5 0 0 0	5 5 5 7 7	0 U U U	บ บ บ	ບ ບ ບ ບ			0 0 0 0	330 330 330 330	240 36,400
2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene 2-Nitroaniline	U U U	<b>U</b> U U	U U U	ບ ບ ບ	ນ ນ ນ	U U U	U U U	U U U	330 330 330	100
2-Nitroaniine Dimethylphthalate Acenaphthylane 2,6-Dinitrotoluene	U U U U	U U U U		U U U U	ບ ບ ບ ບ	ט ט ט			330 330 330 330	430 2,000 41,000 1,000
3-Nitroaniline Acenaphthene	Ü U	U U	Ŭ	U U	Ü	ບ ບ	U U	ม บ	330 330	500 50,000

#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	MSSBX-04 (14-16) 2/7/03 1 86.0 (ug/kg)	MSSBX-04 (16-18) 2/7/03 1 84.0 (ug/kg)	M\$\$8X-04 (18-20) 2/7/03 1 (ug/kg)	MSSBX-05 (4-6) 2/7/03 1 98.0 (ug/kg)	MSSBX-05 (6-8) 2/7/03 1 99.0 (ug/kg)	MSSBX-05 (8-10) 2/7/03 1 97.0 (ug/kg)	MS\$BX-05 (10-12) 2/7/03 1 94.0 (ug/kg)	M\$\$BX-05 (12-14) 2/7/03 1 94.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective (ua/kg)
			(39,19)							
2,4-Dinitrophenol	υ	U	U	U	U	υ –	ί υ	υ	330	200
4-Nitrophenol	U U	U	U	U	U	U	I U	U	330	100
Dibenzofuran	U U	U	U	U	U U	U	) U	U	330	6,200
2,4-Dinitrotoluene	U	U	U	U	U U	U	U U	U	330	
Diethylphthalate	U	U U	U .	U	U	i U	( U	U	330	7,100
4-Chlorophenyl-phenylether	U !	U	U U	U	U	U U	{ U	U	330	
Fluorene	U	U	U	U	U	] ປ	U	U	330	50,000
4-Nitroanline	U	U	U	U	U	U	U	U	330	
4,6-Dinitro-2-methylphenol	יט	U	U	U	i U	U	( U	. U	330	
N-Nitrosodiphenylamine	U	U U	U	U	U	U U	U U	U	330	
4-Bromophenyi-phenylether	ן ט	( U	U	U	U	U U	) U	U	330	
Hexachlorobenzene	U U	U U	U	U	U	U	U	) บ	330	410
Pentachlorophenoi	U	U U	U	U	U	( υ	U U	U	330	1,000
Phenanthrene	U U	) U	υ	U	U	υ	i U	U U	330	50,000
Anthracene	U	U	U	U	U	ļ υ	U U	U	330	50,000
Carbazole	U	U U	U	U	U	U U	l U	U	330	
Di-n-butyiphthalete	U U	U	U U	U	U	U U	( U	U U	330	8,100
Fluoranthene	1 U	U U	U	U	U	U U	U U	U	330	50,000
Pyrene	υ	ίU	U	U	υ	υ	Ι υ	U	330	50,000
Butyibenzyiphthalate	U U	υ	U	U	U	U U	U U	ļ U	330	50,000
3,3-Dichlorobenzidine	U U	) U	U	U	U	<u>ι</u> υ	U U	U U	330	
Benzo(a)anthracene	U 1	U	U U	U	U	U	U	U U	330	224
Chrysene	- U '	1 U	U	U	U U	) ປ	<u>ا</u> ا	U	330	400
bis(2-Ethylhexyl)phthalate	L U	U	U	U I	l U	55 J	U	U	330	50,000
Di-n-octyiphthalate	U	[ น	Ŭ	U	U	U U	U	U	330	50,000
Benzo(b)fluoranthene	U U	U	U	U	U	U U	U U	U	330	1,100
Benzo(k)/luoranthene	U	U	U	ų	U U	U	U	U	330	1,100
Benzo(a)pyrene	U	U	U	U	U	U	U	U U	330	61
Indeno(1,2,3-cd)pyrene		U	U	U	U	U	U U	U	330	3,200
Dibenzo(a,h)anthracene	ן ט	U	ע	U	U		U	U	330	14
Benzo(g,h,i)perylene	U	U	U	U	U	U	U	U	330	50,000
Total PAHs	0	0	0	0	0	0	0	0		100,000
Total CaPAHs	0	0	0	0	0	0	0	0		10,000
Total SVOCs	0	0	0	0	0	55	0	0		500,000

QUALIFIERS: U: Compound analyzed for but not detected. J: Compound found at a concentration below the detection limit.

## NOTES:

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: Not applicable. ]: Concentration exceeds NYSDEC TAGM 4046 Recommended Soil Cleanup Objective

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#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

## SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	MSSBX-05	MSSBX-05	MSSBX-05	116687 77						
				MSSBX-06	MSSBX-06	MSSBX-07	MSSBX-07	MSSBX-07		
SAMPLE DEPTH (FT)	(14-16)	(16-18)	(18-20)	(4-6)	(8-8)	(4-6)	(6-8)	(8-10)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	2/7/03	2/7/03	2/7/03	2/6/03	2/6/03	2/6/03	2/6/03	2/6/03	QUANTITATION	4046 Recommended
DILUTION FACTOR			1	1	1	1	1	1	LIMITS	Boil Cleanup
PERCENT SOLIDS	88.0	90.0	92.0	90.0	96.0	97.0	98.0	97.0		Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Phenol	U	υ	υ	υ	U	υ. Ú	υ	U	330	30
bis(2-Chioroethyl)ether	l ũ	l ū	່ ບໍ່	ı Ŭ	Ŭ	ŭ	Ŭ	U U	330	
2-Chlorophenol	i i	. Ŭ	บั	ັບ	. Ŭ	Ŭ	Ŭ	Ŭ	330	800
1.3-Dichlorobenzene	i ii	l ä	. ប	ບ ບ	ບ ນ	U U	υ	U U	330	600
1.4-Dichlorobenzene	i ii	l ŭ	Ŭ	Ŭ	ບ ບ	ບ ບ	Ŭ	Ŭ	330	
1,2-Dichlorobenzene	i ii	i i	i i	Ŭ	U U	มี เ	ม บ	U U	330	
2-Methylphenol	i i	Ŭ	i i i	ŭ	l ŭ	l ü	U U	Ŭ	330	100
2,2-oxybis (1-chloropropane)		Ŭ	U U	Ŭ	. U	Ŭ	Ŭ	Ŭ	330	
4-Methylphenol	1 N	U U	U U	Ŭ	Ŭ	U U	0	υ	330	900
N-Nitroso-di-n-propylamine		ม ม	U U		l ü	-		-		900
iHexachioroethane		U U	-	U U		U	!!	U U	330	-
Nitrobenzene			U U		U U	U	l 9	U U	330	
	l ŭ	υ	-	U U	U U	U U	l U		330	200
	-	-	U U	U	U U	l V	U U	U U	330	4,400
2-Nitrophenol	U .	U U	U	U	l v	U	U	U	330	330
2,4-Dimethylphenol	U U	U	U		U	Ų	U	U	330	
2,4-Dichlorophenol	U U	V	U U	U	U	U	U U	[ <u>U</u>	330	400
1,2,4-Trichlorobenzene	L U	U U	υ	U U		U U	l U	U U	330	
Naphthalene I4-Chlomaniline	U	U U	U U	U	' U	U U			330	13,000
	( U	U			U	U	U	U	330	220
bis(2-Chloroethoxy)methane		U	. U	'U	U	U	U	U	330	
Hexachiorobutadiene	U	U	U	U	U	U	U	υ	330	
4-Chloro-3-methylphenol	U	U	U	U	U	U	U	U	330	240
2-Methylnaphthalene		U U	U	U	U	U	U U	U	330	36,400
Hexachlorocyclopentadiene	U U	្រ	U U	U	U U	U	L U	U U	330	
2,4,8-Trichlorophenol	l U	U U	U		U.	U	U U	U U	330	
2,4,5-Trichlorophenol	U	U U	U	U	Ų	U	U U	U U	330	100
2-Chloronaphthaiene	U U	U	υ	U	U	U	U	U	330	
2-Nitroanline	U	Ų	Ų	U	U	U	U	יט	330	430
Dimethylphthalate	U	U	υ	υ	U	U	) <u> </u>	υ	330	2,000
Acenaphthylene	U	U U	U	U	U	υ	U U	U U	330	41,000
2,8-Dinitrotoluene	U	U	U	U	U	υ	υ	υ	330	1,000
3-Nitroaniline	Į U		U	U	U	υ	υ	υ	330	500
Acenaphthene	) U	U	Ŭ	U	U	U	U	U	330	50,000

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## MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	MSSBX-05	MSSBX-05	MSSBX-05	MSSBX-06	MSSBX-06	MSSBX-07	MSSBX-07	MSSBX-07		
SAMPLE DEPTH (FT)	(14-16)	(16-18)	(18-20)	(4-6)	(6-8)	(4-6)	(6-8)	(8-10)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	2/7/03	2/7/03	2/7/03	2/6/03	2/6/03	2/6/03	2/6/03	2/6/03	QUANTITATION	4046 Recommended
DILUTION FACTOR	1	1	1	1	1	1	1	1	LIMITS	Soll Cleanup
PERCENT SOLIDS	88.0	90.0	92.0	90.0	96.0	97.0	98.0	97.0		Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
		(+9	(-g g /	(+33)	(+00/	(	(49/10)	<u> </u>		
2,4-Dinitrophenol	U	U	υ	U	U	U	υ	υ	330	200
4-Nitrophenol	υ Ι	ι υ	U	U	U	U	i u	ן ט	330	100
Dibenzofuran	Ū	Ū	U	υ	Ū	Ū	ιŭ	Ū	330	6,200
2,4-Dinitrotoluene	Ū	Ū	Ū	Ŭ	Ŭ	Ū	l Ū	Ŭ	330	
Diethylphthalate	Ū	Ū	Ŭ	Ũ	Ū	Ū	l Ū	Ū	330	7,100
4-Chlorophenyl-phenylether	Ū	Ū	Ū	U	Ū	Ū	Ū	Ū	330	
Fluorene	U	U	U	U U	Ū	Ū	) Ū	Ū	330	50,000
4-Nitroaniline	υ υ	U	U	U U	U	U	Ι υ	ί υ	330	
4,6-Dinitro-2-methylphenol	U U	U	U	] υ	U	υ.	υ	υ	330	~~
N-Nitrosodiphenyiamine	Ū	Ū	Ū	U	Ū	Ū	Î Ū	Ū	330	
4-Bromophenyl-phenylether	Í Ŭ	Ū	Ū	Ŭ	Ŭ	Ū	l ū	Ũ	330	
Hexachlorobenzene	Ū	Ŭ	Ū	Ū	Ū	ΙŪ	Ū	Ŭ	330	410
Pentachiorophenol	Ū	i Ū	Ū	Ŭ	ı Ü	ĪŪ	l Ū	L Ū.	330	1,000
Phenanthrene	{ U	Ū	ט ו	U	Ū	Ū	Ū	Î Û	330	50,000
Anthracene	Ú	ບ	Ū	Ū	Ŭ	Ū	Ū	Ŭ	330	50,000
Carbazole	Ŭ	Ū	Ū	Ū	ı Ū	Ū	l Ū	Ŭ	330	
Di-n-butyiphthalate	Î Ū	Ū	Ū	Ū	54 J	Ū	ĪŪ	Ū	330	8,100
Fluoranthene	Ū	Ū	Ũ	U	Ū	Ū	Ĵ Ū	Ū	330	50,000
Pyrane	U U	υ	U	U	Ű	υ	U	Ū	330	50,000
Butylbenzylphthalate	ί υ	U.	ປ	U	υ	ί U	υ υ	ט ו	330	50,000
3.3-Dichlorobenzidine	Ū	Ū	U	Ū	Ū	Ú	υ 1	Ű	330	
Benzo(a)anthracene	Ú	Ū	Ū	U	Ū	Ū	Ι υ	Ū	330	224
Chrysene	Ū	U	U	Ū	Ū	Ū	l ū	Ū	330	400
bis(2-Ethylhexyl)phthalate	υ υ	υ	U	υ	U	Ū	į Ū	U	330	50,000
Di-n-octyiphthalate	U U	U	υ	່ ປ່	U	U U	( U	υ	330	50,000
Benzo(b)fluoranthene	U	U	U	U	U	U	U	U	330	1,100
Benzo(k)fluoranthene	U	υ	U	U	U	υ	υ	U	330	1,100
Benzo(a)pyrene	Ū	U	Ū,	Ū	Ŭ	Ū	Ū	Ū	330	61
Indeno(1,2,3-cd)pyrene	U	U	Ū	Ū	Ũ	Ū	υ	ט (	330	3,200
Dibenzo(a,h)anthracene	U	υ	U	υ	U	U	υ (	υ	330	14
Benzo(g,h,i)perviene	U	U U	U	U	U	U	ί υ	U	330	50,000
								1		
Total PAHs	0	0	0	0	0	0	0	0		100,000
Total CaPAHs	Ō	Ō	Ō	Ō	Ō	Ō	Ō	ŏ		10,000
Total SVOCs	· Õ	0 <sup>-</sup>	0	Ő	54	Ō	Ö	Ō		500,000

QUALIFIERS: U: Compound analyzed for but not detected. J: Compound found at a concentration below the detection limit.

NOTES: : Not applicable. ....

: Concentration exceeds NYSDEC TAGM 4046 Recommended Soil Cleanup Objective

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#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	MSSBX-07	MSSBX-07	MSSBX-09	MSSBX-09	MSSBX-09	MSSBX-09	MSSBX-09	MSSBX-10		
SAMPLE DEPTH (FT)	(10-12)	(12-14)	(4-6)	(6-8)	(8-10)	(10-12)	(16-18)	(4-6)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	2/6/03	2/6/03	2/6/03	2/6/03	2/6/03	2/6/03	2/6/03	2/6/03	QUANTITATION	4046 Recommended
DILUTION FACTOR	t	1	1	1	1	1	1	1	LIMITS	Soll Cleanup
PERCENT SOLIDS	88.0	87.0	96.0	97.0	98.0	95.0	88.0	98.0		Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
)				(-3	(-9/19/			(09/.19/		
Phenol	υ	υ	ט ו	υ	U	υ	υ	ט ו	330	30
bis(2-Chioroethyi)ether	Ū	Ú	Ŭ	Ũ	Ŭ	Ŭ	Ŭ	Ŭ	330	-
2-Chlorophenol	ΰ	Ú Ú	Ú Ú	Ŭ	Ũ	Ŭ	Ŭ	ŬŬ	330	800
1,3-Dichlorobenzene	U	Ú	Ŭ	Ũ.	Ŭ	Ŭ	Ŭ	Ŭ	330	
1,4-Dichiorobenzene	ט ו	Ú	Ú	Ŭ	Ŭ	Ŭ	) Ŭ	Ŭ	330	
1,2-Dichlorobenzene	Ű	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	ł ŭ	Ŭ	330	
2-Methylphenol	Ū	Ū	Ū	Ŭ	Ũ	Ŭ	Ŭ	Ŭ	330	100
2,2-oxybis (1-chloropropane)	U U	ן ט	Ŭ	Ŭ	ŭ	Ŭ	Ū	Ŭ	330	
4-Methylphenol	ט ו	Ű	Ŭ	Ū	ŭ	Ŭ	Ŭ	Ŭ	330	900
N-Nitroso-di-n-propylamina	Ú Ú	Ú.	Ū		Ŭ	່ ນັ່	່ ບໍ່	Ŭ	330	
Hexachloroethane	Ŭ	Ŭ	Ŭ	ů	ŭ	Ů	Ŭ	ŭ	330	
Nitrobenzene	Ū	Ŭ	Ũ	Ŭ.	Ŭ	ນັ	υŬ	Ŭ.	330	200
lsophorone	U	Ú	Ũ	Ũ	Ŭ	Ũ	Ŭ	Ŭ	330	4,400
2-Nitrophenol	U	U	U	υ	Ŭ	υ	ΰ	Ú	330	330
2,4-Dimethylphenol	U	U	U	U	U	U	Ú	Ű	330	
2,4-Dichlorophenol	U	υ	υ	ι U <sup>'</sup>	Ŭ	Ŭ	Ŭ	Ŭ	330	400
1,2,4-Trichlorobenzene	U	U	U	Ŭ	Ŭ	Ŭ	Ū	Ũ	330	
Naphthalene	U	υ	U 1	Ŭ	Ŭ	Ū	ΪŪ	Ŭ	330	13,000
4-Chloroaniline	U	Ŭ	Ŭ	Ū	Ū	Ŭ	Ŭ	Ũ	330	220
bis(2-Chloroethoxy)methane	υ	U	U	U	Ŭ	Ū	Ū	Ŭ	330	
Hexachlorobutadiene	U	υ	Ú	U	Ŭ	Ŭ	Uυ	Ú	330	
4-Chloro-3-mathylphenol	υ	U	U	U	U	U	i u	U	330	240
2-Methylnaphthalene	U	U	U	U	Ú	U	l Ú	U	330	36,400
Hexachlorocyclopentadiene	U U	U	U	U	U	U	υ.	U	330	
2,4,6-Trichiorophenol	U	U	U	U	U	U	ι. υ	U	330	
2,4,5-Trichlorophenoi	υ	U	U	U	· U	υ	U U	U	330	100
2-Chloronaphthalene	U U .	U	U	U	U	U	U	υ	330	
2-Nitroanlline	U	U	U	U	U	U	υ	U	330	430
Dimethylphthalate	U	U	U	U .	υ	U	υ	υ	330	2,000
Acenaphthylene	Ų	U	U	· U	U	U	U	U U	330	41,000
2,8-Dinitrotoluene	U U	U	บ	U	υ	U	ί υ	υ	330	1,000
3-Nitroaniline	U U	U	U	U	U	U	U	U	330	500
Acenaphthene	<u> </u>	UU	<u>U</u>	່ປ	ບ	ບ	U U	U	330	50,000

#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	MSSBX-07	MSSBX-07	MSSBX-09	MŚŚBX-09	MSSBX-09	MSSBX-09	MSSBX-09	MSSBX-10	·	
SAMPLE DEPTH (FT)	(10-12)	(12-14)	(4-6)	(6-8)	(8-10)	(10-12)	(16-18)	(4-6)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	2/6/03	2/6/03	2/6/03	2/6/03	2/6/03	2/8/03	2/6/03	2/6/03	QUANTITATION	4046 Recommended
DILUTION FACTOR	1	1	1	1	1	1.	1	1	LIMITS	Soli Cleanup
PERCENT SOLIDS	88.0	67.0	98.0	97.0	98.0	95.0	88.0	98.0		Objective
UNITS	(ug/kg)	(ug/kg)								
2,4-Dinitrophenol	U	U	U	U	U	U U	U	U	330	200
4-Nitrophenol	U	U	U	U	U U	U	U U	U	330	100
Dibenzofuran	U	U	U	U	U U	U U	U	U	330	6,200
2,4-Dinitrotoluene	U	U	U	U	U U	U	U	U	330	
Diethylphthalate	U	U	U U	U	U U	U	U	U	330	7,100
4-Chlorophenyl-phenylether	U	U	U U	U	U U	U	U	U	330	
Fluorene	U	U	U	U	U U	U U	U	U	330	50,000
4-Nitroaniline	U	U	U	U	U	υ	U	U	330	
4,6-Dinitro-2-methylphenol	U	U	U U	U	U	υ	υ	U	330	
N-Nitrosodiphenylamine	U	U	U U	U	U	υ	υ	υ	330	
4-Bromophenyl-phenylether	U	U	U U	U	U	υ	U	U	330	
Hexachlorobenzene	U	U	U U	U	U U	υ	U	U	330	410
Pentachlorophenol	U	U	U	U	U	U U	U	U	330	1,000
Phenanthrene	U	U	U	U	U	U U	] υ	U	330	50,000
Anthracene	U	U	U	U	U	υ	υ υ	U	330	50,000
Carbazole	U	U	U	U	U	U U	υ [	U	330	<u> </u>
Di-n-butyiphthalate	U	U	U	U	U	U	υ 🔰	U	330	8,100
Fluoranthene	U	U	U	U	U	U	υ 🔰	U	330	50,000
Pyrane	U	U	U	U	U	U	υ 🔰	U	330	50,000
Butyibenzyiphthalate	U	U	U	U	U	U	υ	U	330	50,000
3,3-Dichlorobenzidine	U	U	U	U	U	U	U	U	330	
Benzo(a)anthracene	U	U	U	U	U	U	U	U	330	224
Chrysene	U	U	U	U	. U	U U	U	U	330	400
bis(2-Ethylhexyl)phthalate	U	U	. U	U	U	U	U U	U	330	50,000
Di-n-octylphthalate	U	U	U	U	U	U U	U U	U	330	50,000
Benzo(b)fluoranthene	U	U	U	U	U	U	U	U	330	1,100
Benzo(k)fluoranthene	U	U	U	U	U	U	U	U	330	1,100
Benzo(a)pyrene	U U	U	U	U	U	U	U	U	330	61
Indeno(1,2,3-cd)pyrane	U U	U	U	U	· U	U	U	U	330	3,200
Dibenzo(a,h)anthracene	U U	Ų	U	U	U	U	U U	U	330	14
Benzo(g,h,i)perylene	U	U	U	U	U	U	U U	U	330	50,000
Total PAHs	0	0	<u>م</u>	٥	0	0		o	·	100.000
Total CaPAHs	Ö	l o	0	l o	0	0	ů ů	ŏ		10,000
		0	0	0	0	0	0	0		
Total SVOCs	L V	<u> </u>	v	U	v	V	U V	Ų		500,000

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OUALIFIERS: U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.



: Not applicable.

: Concentration exceeds NYSDEC TAGM 4046 Recommended Soll Cleanup Objective

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#### MASSAPEGUA SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

## SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	MSSBX-10	MSSBX-10	MSSBX-10	MSSBX-10	MSSBX-10	MSSBX-10		 	
SAMPLE DEPTH (FT)	(6-8)	(8-10)	(10-12)	(12-14)	(16-18)	(18-20)		LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	2/6/03	2/6/03	2/3/03	2/3/03	2/3/03	2/3/03	)	QUANTITATION	4046 Recommended
DILUTION FACTOR	1	1	1	1	1	1		LIMITS	Soil Cleanup
PERCENT SOLIDS	96.0	91.0	80.0	83.0	86.0	88.0		Putter A	Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	1	(ug/kg)	(ug/kg)
			(~9/(9/	(09/19/	(09/19)		┼───┼		( <u>Ug/kg</u> )
Phenol	υ 1	ט ט	U	U	u	υ		330	30
bis(2-Chloroethyl)ether	Ŭ	Ŭ	Ŭ	Ŭ	ມີ	Ŭ		330	
2-Chlorophenol	Ū	Ū	Ŭ	Ŭ	Ŭ	Ŭ		330	800
1.3-Dichiorobanzene	Ū	Ŭ	i Ŭ	Ŭ	Ŭ	ΙŬ		330	000
1,4-Dichiorobenzena	Ū	Ŭ	Ŭ	Ŭ	ŭ	Ŭ	1	330	
1,2-Dichlorobenzene	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	j ł	330	
2-Methylphenol	ů ů	ŭ	i ŭ	Ŭ	ŭ	l ũ		330	100
2,2-oxybis (1-chloropropane)	ŭ	Ŭ	Ŭ	Ŭ	ŭ	l ŭ	) I	330	
4-Methylphenoi	Ŭ	Ū	Ŭ	Ŭ	Ŭ	Ŭ		330	900
N-Nitroso-di-n-propylamine	Ŭ	ŭ	ŭ	ŭ	Ŭ	l ŭ		330	
Hexachloroethane	Ŭ	Ŭ	Ŭ	ŭ	Ů Ů	Ĭ		330	
Nitrobenzene	Ŭ	Ŭ Ŭ	Ŭ	i ŭ	ů	Ŭ		330	200
isophorone	Ŭ	Ū	ů ů	ŭ	Ů	Ιŭ		330	4,400
2-Nitrophenol	Ū	Ŭ	Ŭ	ŭ	່ ນັ	l ŭ		330	330
2,4-Dimethylphenol	Ū	Ū	Ŭ	Ŭ	Ŭ	Ŭ		330	
2,4-Dichlorophenol	υ	Ű	Ŭ	Ŭ	Ū.	Ŭ		330	400
1,2,4-Trichlorobenzene	U U	Ū	Ū	Ŭ.	ไ บ้	Ŭ		330	
Naphthalene	ί υ	U U	Ū	Ŭ	Ŭ	Ŭ		330	13,000
4-Chloroaniline	Ū	Ū	Ū	Ŭ	Ŭ	Ŭ		330	220
bis(2-Chloroethoxy)methane	ບ .	Ū	Ü	Ū	Ŭ	Ŭ		330	
Hexachlorobutadiene	U U	U	U	U	U	U		330	
4-Chioro-3-methylphenol	υ	υ .	υ	Ū	Ū	Ŭ		330	240
2-Methylnaphthalene	U	U	υ	υ	Ū	Ū		330	36,400
Hexachiorocyclopentadiene	U	U	U U	Ű	Ú	Ū		330	
2,4,6-Trichlorophenol	U	U	U	υ	U	U	1	330	
2,4,5-Trichlorophenol	) U	U	υ	U	U	U		330	100
2-Chloronaphthaiene	U 1	U	υ	U	U	U		330	
2-Nitroaniline	U	U	U	U	U	ι υ	1	330	430
Dimethylphthalate	) U	U	U	U	U	U U	{	330	2,000
Acenaphthylene	U U	U	U	U	U	U	]	330	41,000
2,6-Dinitrotoluene	U U	U	U	U	Ų	υ		330	1,000
3-Nitroaniline	U	U)	U	U	U	υ	[ }	330	500
Acenaphthene	U	UU	U	U	U	U		330	50,000

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#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	MSSBX-10	MSSBX-10	MSSBX-10	MSSBX-10	MSSBX-10	MSSBX-10			·
SAMPLE DEPTH (FT)	(6-8)	(8-10)	(10-12)	(12-14)	(16-18)	(18-20)	1 1	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	2/6/03	2/6/03	2/3/03	2/3/03	2/3/03	2/3/03		QUANTITATION	4046 Recommended
DILUTION FACTOR	1	1	1	1	1	1		LIMITS	Soll Cleanup
PERCENT SOLIDS	96.0	91.0	80.0	83.0	86.0	88.0	]		Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	1 1	(ug/kg)	(ug/kg)
				_					
2,4-Dinitrophenol	U U	U U	U	υ	U	U	1	330	200
4-Nitrophenol	U U	U U	U U	U	U	U		330	100
Dibenzofuran	U U	υ	U	U	U	U	1 1	330	6,200
2,4-Dinitrotoluene	U U	U U	U	U	U	U		330	
Diethylphthalate	U U	U	U	U	υ	U		330	7,100
4-Chlorophanyl-phenylether	U	U	U	U	υ	U	1 1	330	
Fluorene	) U	U U	U	υ	Ų	U		330	50,000
4-Nitroaniline	U	U	U	U	Ú	U	1	330	
4,6-Dinitro-2-methylphenol	U	U U	U U	U	U	U U	i I	330	
N-Nitrosodiphenylamine	U U	υ	ี บ	U	U	υ		330	
4-Bromophenyl-phenylether	U U	) U	ט	U	ບ	U		330	
Hexachlorobenzene	U U	υ	U	U	υ	U		330	410
Pentachiorophenol	U U	υ	U	U	υ	U	1	330	1,000
Phenanthrene	U	υ	U	U	U	U	1 1	330	50,000
Anthracene	U	U U	υ	U	U	U		330	50,000
Carbazole	U	υ	U	U	Ų	U	\	330	
Di-n-butyiphthalate	U	U U	U	U	Ú	U		330	8,100
Fluoranthene	U'	l u	υ	U	U	U		330	50,000
Pyrene	υ 1	υ 1	υ	Ú	U	Ú		330	50,000
Butylbenzylphthalate	υ υ	υ	υ	U	Ú	Ū	l l	330	50,000
3.3-Dichlorobenzidine	υ υ	υ.	U U	Ŭ	U	Ŭ		330	
Benzo(a)anthracene	) U	ί υ	U U	U	U	U		330	224
Chrysene	U	U	U	U	U	υ	1	330	400
bis(2-Ethylhexyi)phthalate	38 J	46 J	υ υ	U	U	U		330	50,000
Di-n-octylphthalate	U	υ	υ	Ų	U	U		330	50,000
Benzo(b)fluoranthene	U	υ	U	Ú	υ	U		330	1,100
Benzo(k)fluoranthene	υ υ	υ	U	Ú	U	υ		330	1,100
Benzo(a)pyrene	υ υ	Ū	Ū	Ū	Ú	Ū	1	330	61
Indeno(1,2,3-cd)pyrene	Ū	Ū	Ū	Ū	Ū	Ū		330	3,200
Dibenzo(a,h)anthracena	U	υ	Ŭ	Ū	Ū	Ū		330	14
Benzo(g,h,i)perylene	U U	U U	U	Ū	Ū	Ū		330	50,000
Total PAHs	0	0	0	0	0	0	1 1	40	100,000
Total CaPAHs	0	0	0	0	0	0		-	10,000
Total SVOCs	38	48	0	0	0	0			500,000

## QUALIFIERS:

U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

NOTES:

71

--\_\_\_: Not applicable.

: Concentration exceeds NYSDEC TAGM 4046 Recommended Soll Cleanup Objective

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12/20/04

#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

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## SUBSURFACE SOIL - POLYCHLORINATED BIPHENYLS (PCBs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	MSSBX-01 (4-6) 2/6/03 1 99.0 (ug/kg)	MSSBX-01 (6-8) 2/6/03 1 83.0 (ug/kg)	MSSBX-01 (8-10) 2/6/03 1 84.0 (ug/kg)	MSSBX-01 (10-12) 2/6/03 1 89.0 (ug/kg)	MSSBX-01 (12-14) 2/6/03 1 84.0 (ug/kg)	MSSBX-02 (4-6) 2/6/03 1 99.0 (ug/kg)	MSSBX-02 (6-8) 2/6/03 1 98.0 (ug/kg)	MSSBX-02 (8-10) 2/6/03 1 93.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective (ug/kg)
Arocior- 1016 Arocior- 1221 Arocior- 1232 Arocior- 1242 Arocior- 1248 Arocior- 1254 Arocior- 1254 Arocior- 1260 TOTAL PCBs		U U U U U U U U						0 0 0	34 34 34 34 34 34 34 34	   1,000/10,000*
SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	MSSBX-02 (10-12) 2/6/03 1 89.0 (ug/kg)	MSSBX-02 (12-14) 2/6/03 1 86.0 (ug/kg)	MSSBX-02 (14-16) 2/6/03 1 84.0 (ug/kg)	M\$\$85.03 (4-8) 2/3/03 1 97.0 (ug/kg)	MSSBX-03 (6-8) 2/3/03 1 98.0 (ug/kg)	M\$SBX-03 (8-10) 2/6/03 1 94.0 (ug/kg)	MSSBX-03 (10-12) 2/6/03 1 93.0 (ug/kg)	MSSBX-03 (12-14) 2/6/03 1 85.0 (ug/kg)		NYSDEC TAGM 4046 Recommended Soil Cleanup Objective (ug/kg)
Aroclor- 1018 Aroclor- 1221 Aroclor- 1232 Aroclor- 1242 Aroclor- 1248 Aroclor- 1254 Aroclor- 1254	ນ ບ ບ ບ ບ ບ ບ	ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ						υ υ υ υ υ υ	34 34 34 34 34 34 34 34 34 34	
TOTAL PCBs	0	0	0	00	0	0	0	0		1,000/10,000*

OUALIFIERS: U: Compound analyzed for but not detected.

## NOTES:

- 5-

---: Not applicable. •

: According to NYSDEC TAGM 4046 Recommended Soil Cleanup Objective, 1,000 ug/kg is utilized for surface soil [0'-2' below ground surface (bgs)] and 10,000 ug/kg is utilized for subsurface soil (soil deeper than 2' bgs).

#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL - POLYCHLORINATED BIPHENYLS (PCBs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	MS\$BX-03 (14-16) 2/6/03 1 91.0 (ug/kg)	MSSBX-03 (16-18) 2/6/03 1 99.0 (ug/kg)	MSSBX-03 (18-20) 2/6/03 1 91.0 (ug/kg)	MSSBX-04 (4-6) 2/7/03 1 97.0 (ug/kg)	MŠŠBX-04 (6-8) 2/7/03 1 92.0 (ug/kg)	M\$SBX-04 (8-10) 2/7/03 1 88.0 (ug/kg)	MSSBX-04 (10-12) 2/7/03 1 89.0 (ug/kg)	M\$\$BX-04 (12-14) 2/7/03 1 86.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective (ug/kg)
Aroclor- 1018 Aroclor- 1221 Aroclor- 1232 Aroclor- 1242 Aroclor- 1248 Aroclor- 1254 Aroclor- 1254	ບ ບບບ ບບ ບ ບ ບ ບ	0 0 0 0 0 0 0 0 0 0	ccccc	ccccc	0 0 0 0 0 0 0 0 0 0	000000000000000000000000000000000000000	000000000000000000000000000000000000000	ccccc	34 34 34 34 34 34 34 34	
	0	0	0	0	0	0	0	_0		1, <u>00</u> 0/10, <u>0</u> 00*

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	M\$\$BX-04 (14-16) 2/7/03 1 86.0 (ug/kg)	M\$\$8X-04 (16-18) 2/7/03 1 84.0 (ug/kg)	M\$\$8X-04 (18-20) 2/7/03 1 82.0 (ug/kg)	M\$\$BX-05 (4-6) 2/6/03 1 98.0 (ug/kg)	MSSBX-05 (6-8) 2/6/03 1 99.0 (ug/kg)	MSSBX-05 (8-10) 2/6/03 1 97.0 (ug/kg)	MSSBX-05 (10-12) 2/6/03 1 94.0 (ug/kg)	M\$\$BX-05 (12-14) 2/6/03 1 94.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4048 Recommended Soll Cleanup Objective (ug/kg)
Arocior- 1016 Arocior- 1221 Arocior- 1232 Arocior- 1242 Arocior- 1248 Arocior- 1254 Arocior- 1254	0 0 0 0 0 0 0 0 0	σοσοσο	ccccc	cccc	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	σσσσσσ	000000000000000000000000000000000000000	34 34 34 34 34 34 34 34	
TOTAL PCBs	0	0	0	0	00	<u>0</u>	0	0	-	1,000/10,000*

## QUALIFIERS:

U: Compound analyzed for but not detected.

## NOTES:

- : Not applicable.

: According to NYSDEC TAGM 4046 Recommended Soil Cleanup Objective, 1,000 ug/kg is utilized for surface soil [0'-2' below ground surface (bgs)] and 10,000 ug/kg is utilized for subsurface soil (soil deeper than 2' bgs).

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#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL - POLYCHLORINATED BIPHENYLS (PCBs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	MS\$BX-05 (14-16) 2/6/03 1 88.0 (ug/kg)	MSSBX-05 (16-18) 2/6/03 1 90.0 (ug/kg)	M\$\$BX-05 (18-20) 2/6/03 1 92.0 (ug/kg)	MSSBX-06 (4-6) 2/6/03 1 90.0 (ug/kg)	M\$SBX-06 (6-8) 2/6/03 1 96.0 (ug/kg)	MSSBX-07 (4-8) 2/6/03 1 97.0 (ug/kg)	MSSBX-07 (6-8) 2/6/03 1 98.0 (ug/kg)	M\$\$88X-07 (8-10) 2/6/03 1 97.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4048 Recommended Soll Cleanup Objective (ug/kg)
							υ		34	
Arocior- 1016			U.	U U	U U					
Aroclor- 1221		U	U	U U	U	U	0	U U	34	
Aroclor- 1232	U U	U U	U	U	0	0	U U	U	34	****
Aroclor- 1242	U	0	U	U	U	) U	l U	U	34	
Aroclor- 1248	) U	υ	υ	υ	υ	U	<b>Ι</b> υ	U U	34	
Aroclor- 1254	U U	U	U	U	ປີ	υ (	ί υ	U	34	****
Arocior- 1280	ט (	ບ	ບ	υ	υ	υ	υ	υ	34	
TOTAL PCB8	<u> </u>	0	0	0	0	0	0	0	<u></u>	1,000/10,000*
									· <u>········</u> ···	
SAMPLE ID	MSSBX-07	MSSBX-07	MSSBX-09	MSSBX-09	MSSBX-09	MSSBX-09	MSSBX-09	MSSBX-10	LABORATORY	NYSDEC

SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	(10-12) 2/6/03 1 88.0 (ug/kg)	(12-14) 2/6/03 1 87.0 (ug/kg)	(4-6) 2/6/03 1 98.0 (ug/kg)	(6-8) 2/6/03 1 97.0 (ug/kg)	(8-10) 2/6/03 1 98.0 (ug/kg)	(10-12) 2/6/03 1 95.0 (ug/kg)	(16-18) 2/6/03 1 88.0 (ug/kg)	(4-6) 2/6/03 1 98.0 (ug/kg)	QUANTITATION LIMITS	TAGM 4048 Recommended Soll Cleanup Objective (ug/kg)
Arocior- 1016 Arocior- 1221 Arocior- 1232	U U	U U U	ບ ບ	ບ ບ	ບບບ	ບ ບ	UUU	U U U	34 34 34	
Aroclor- 1242 Aroclor- 1248	U U	υ υ	ບ ບ	υ υ	ม บ บ		υ υ		34 34	
Aroclor- 1254 Aroclor- 1260	U U	บ บ	บ บ	U U	U U	U U	ບ ບ	U U	34 34	
	0	0	0	0	0	0	_0	0		1,000/10,000*

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QUALIFIERS: U: Compound analyzed for but not detected.

: Not applicable. ----

: According to NYSDEC TAGM 4046 Recommended Soil Cleanup Objective, 1,000 ug/kg is utilized for surface soil [0'-2' below ground surface (bgs)] and 10,000 ug/kg is utilized for subsurface soil (soil deeper than 2' bgs).

#### MASSAPEQUA SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

## SUBSURFACE SOIL - POLYCHLORINATED BIPHENYLS (PCBs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	M\$\$BX-10 (6-8) 2/6/03 1 96.0 (ug/kg)	MSSBX-10 (8-10) 2/6/03 1 91.0 (ug/kg)	MSSBX-10 (10-12) 2/6/03 1 80.0 (ug/kg)	MSSBX-10 (12-14) 2/3/03 1 83.0 (ug/kg)	MSSBX-10 (16-18) 2/3/03 1 86.0 (ug/kg)	MSSBX-10 (18-20) 2/3/03 1 88.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4048 Recommended Soil Cleanup Objective (ug/kg)
Aroclor- 1016	II	l 11	і – п	L)			34	
Aroclor- 1221	Ŭ	l ŭ	ŭ	Ŭ	u u	U U	34	
Aroclor- 1232	l ŭ	l ŭ	Ŭ	Ŭ	l Ŭ	ŭ	34	
Aroclor- 1242	Ū	Ŭ	Ū	Ŭ	Ū	Ŭ	34	
Aroclor- 1248	U	U	υ	υ	υ	Ú	34	
Aroclor- 1254	U	U U	U	U	U	U	34	
Aroclor- 1260	U	U	U	U	U	U	34	
TOTAL PCBs	0	0	0	0	0	0		1,000/10,000*

**QUALIFIERS:** 

NOTES:

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U: Compound analyzed for but not detected.

-- : Not applicable.

: According to NYSDEC TAGM 4048 Recommended Soil Cleanup Objective, 1,000 ug/kg is utilized for surface soil [0'-2' below ground surface (bgs)] and 10,000 ug/kg is utilized for subsurface soil (soil deeper than 2' bgs).

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### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD **DELINEATION PHASE 2 SITE ASSESSMENT**

### SURFACE SOIL - MERCURY AND RCRA METALS

	iP\$8-12	IPSB-13	iPSB-14	IP88-15	IPSB-18	PSS-05	ISULTITRI-Dama IPSS-06	INSTRUMENT	
SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLIDS UNITS	(0 - 2) 1/27/03 95.0 (mg/kg)	(0 - 2) 1/29/03 94.0 (mg/kg)	(0 • 2) 1/29/03 92.0 (mg/kg)	(0 - 2) 1/29/03 90.0 (mg/kg)	(0 - 2) 1/30/03 84.0 (mg/kg)	(0-2) 1/28/03 90.0 (mg/kg)	(0-2) 1/28/03 93.0 (mg/kg)	DETECTION LIMITS	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective mg/kg
Mercury	2.2	12.9	0.21	1.1	0.12 8	0.52	0.49	0.1	0.1

AREADECONCERN SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLIDS UNITS	IPSB-19 (0 - 2) 1/27/03 92.0 (mg/kg)	IPSB-26 (0-2) 1/30/03 87.0 (mg/kg)	iPSB-27 (0-2) 1/30/03 83.0 (mg/kg)	IPSB-28 (0-2) 1/30/03 94.0 (mg/kg)	<b>R414419</b> IPSB-29 (0-2) 1/28/03 85.0 (mg/kg)	INSTRUMENT DETECTION LIMITS	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective (mg/kg)
Arsenic	NA	4	3.6	2,4	7.6	3.0	7.5 or SB
Barium	NA	17	15.6	23,6	79.3	3.0	300 or SB
Cadmium	NA	0.2 B	ບ ບ	U	0.93	2.0	10*
Chromium	NA	9.2	8.5	4.2	14.8	3.0	50*
Lead	NA	7.9	11	42.9	60.5	1.0	SB**
Mercury	1.3	U	0.031 B	0.087 B	0.16	0.1	0.1
Selenium	NA	ן ט	U	0.47 B	υ	8.0	2 or SB
Silver	NA	υ	U	U	1 B	2.0	SB

<u>QUALIFIERS:</u> U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

Notes: SB: Site Background

\*: As per proposed 4/95 NSDEC TAGM

\*\*: Average background levels in metropolitan or surburban areas or near highways range from 200-500 ppm. : Result exceeds NYSDEC TAGM recommended Soil Cleanup Objective

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E/2015 (LER 3 Subs Del Phase II)/J Subs Data/Island Park/Data Tables for Report/Table 32 rev.xis

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT

## SURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

MARANGE GUINGERN		Start First		0000		
SAMPLE ID	IPSB-26	IPSB-27	IPSB-28	IPSB-29		
SAMPLE DEPTH (IN)	(0-2)	(0-2)	(0-2)	(0-2)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/30/03	1/30/03	1/30/03	1/28/03	QUANTITATION	4046 Recommended
DILUTION FACTOR	1	1	1	1	LIMITS	Soll Cleanup
PERCENT SOLIDS	87.0	83.0	94.0	85.0		Objective
	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/Kg)	(ug/Kg)
Phenol	U	U	U	U	330	30
bis(2-Chloroethyl)ether	U	ບ	Ų	V	330	
2-Chlorophenol	U	Ų	U	U	330	800
1,3-Dichlorobenzene	U	U	U	U	330	-
1,4-Dichlorobenzene	U	U	U	U	330	
1,2-Dichlorobenzene	υ	U	U	U	330	-
2-Methylphenol	U	Ų	U	υ	330	100
2,2'-oxybis (1-chloropropane)	U	V	U	U U	330	-
4-Methylphenol	Ų	U	U	υ	330	900
N-Nitroso-di-n-propylamine	U	U	U	U	330	-
Hexachloroethane	) U	υ	U	U	330	-
Nitrobenzene	υ	Ú	υ	- Ū	330	200
Isophorone	U	U	Ŭ	Ū	330	4,400
2-Nitrophenol	U	Ú	Ú	Ū	330	330
2,4-Dimethylphenol	U	υ	U	Ū	330	-
2,4-Dichlorophenol	U	υ	υ	Ű	330	400
1,2,4-Trichlorobenzene	U	υ	U	U	330	
Naphthalene	U	U	Ŭ	U	330	13,000
4-Chloroaniline	U	υ	U	Ŭ	330	220
bis(2-Chiorcethoxy)methane	U	U	U	U	330	
Hexachlorobutadiene	U	Ú	Ú	Ů	330	-
4-Chloro-3-methylphenol	υ	U	Ŭ	Ū	330	240
2-Methylnaphthalene	U	υ	Ŭ	Ŭ	330	36,400
Hexachlorocyclopentadiene	U	Ŭ	Ū	Ū	330	_
2,4,6-Trichlorophenol	Ū	Ű	Ū	Ŭ	330	-
2,4,5-Trichlorophenol	U	U	U	Ū	660	100
2-Chloronaphthaiene	Ŭ	Ū	Ū	Ū	330	-
2-Nitroaniline	U	Ū	Ű	Ū	660	430
Dimethylphthalate	Ŭ	Ŭ	Ū	Ū	330	2,000
Acenaphthylene	Ŭ	67 J	Ŭ	Ŭ	330	41,000
2,6-Dinitrotoluene	Ū	Ŭ	Ŭ	Ŭ	330	1,000
3-Nitroaniiine	Ŭ	Ŭ	Ŭ	Ŭ	660	500
Acenaphthene	Ŭ	200 J	Ŭ	Ŭ	330	50,000

QUALIFIERS:

U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

D: Compound concentration was obtained from a diluted analysis.

12/20/04

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT

## SURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

APPENDE (CONTRACTS)	in the second second			20001193 2 13		
SAMPLE ID	IPSB-26	IP88-27	IP88-28	IP88-29		
SAMPLE DEPTH (IN)	(0-2)	(0-2)	(0-2)	(0-2)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/30/03	1/30/03	1/30/03	1/28/03	QUANTITATION	4046 Recommended
DILUTION FACTOR		1	1	1	LIMITS	Soll Cleanup
PERCENT SOLIDS	87.0	83.0	94.0	85.0	(	Objective
	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/Kg)	(ug/Kg)
2,4-Dinitrophenoi	υ	υ	υ	υ	660	200
4-Nitrophenol	U	U	U	U	660	100
Dibenzofuran	U	U	U	υ	330	6,200
2,4-Dinitrotoluene	U	U	U	U	330	
Diethylphthalate	U	U U	U 1	U	330	7,100
4-Chlorophenyl-phenylether	U U	U	U	U	330	-
Fluorene	U U	160 J	U	U	330	50,000
4-Nitroaniline	) ບ	U	υ	U	330	-
4,6-Dinitro-2-methylphenol	U (	U	U	U	330	-
N-Nitrosodiphenylamine	) U	υ	υ	υ	330	-
4-Bromophenyl-phenylether	Į U	U	U	U	330	
Hexachlorobenzene	U U	U	ן ט	U	330	410
Pentachlorophenol	U	U	U [	U	660	1,000
Phenanthrene	U	2900	37 J	150 J	330	50,000
Anthracene	U	840	U	U	330	50,000
Carbazole	U U	U U	U	U	330	-
Di-n-butyiphthalete	{ U	U	U	U	330	8,100
Fluoranthene	U	5300	52 J	200 J	330	50,000
Pyrane	U	9200 D	50 J	210 J	330	50,000
Butylbenzylphthalate	U	U	U	U	330	50,000
3,3'-Dichlorobenzidine	) U	UU	U	U	330	-
Benzo(a)anthracene	U	5200	U [	97 J	330	224
Chrysene	U	6200	38 J	110 J	330	400
bls(2-Ethylhexyl)phthalate	U		U	540	330	50,000
Di-n-octylphthalate	Ú	U	U	υ	330	50.000
Benzo(b)fluoranthene	U	5000	U U	130 J	330	1,100
Benzo(k)fluoranthene	υ 1	1800	υ	66 J	330	1,100
Benzo(a)pyrene	່ ບ	3800	υ	92 J	330	61
Indeno(1,2,3-cd)pyrene	l Ū	800	Ŭ	64 J	330	3.200
Dibenz(a,h)anthracene	υ	350 J	U U	Ŭ	330	14
Benzo(g,h,i)perviene	Ŭ	750	Ŭ	67 J	330	50,000
		10 507		4 4 9 9		400.000
Total PAHs	0	42,567	177	1,186		100,000
Total CaPAHs	0	23,150	38	559		10,000
Total SVOCs	0	42,587	177	1,728		500,000

U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

D: Compound concentration was obtained from a diluted analysis.

12/20/04

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT

#### SURFACE SOIL - POLYCHLORINATED BIPHENYLS (PCBs)

AREA OF CONGERN SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	IPSB-28 (0-2) 1/30/03 1 87.0 (ug/kg)	P/m1/0 IPSB-27 (0-2) 1/30/03 1 83.0 (ug/kg)	IPSB-28 (0-2) 1/30/03 1 94.0 (ug/kg)	Relo r.c. IPSB-29 (0-2) 1/28/03 1 85.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4048 Recommended Soil Cleanup Objective (ug/kg)
Aroclor- 1016	υ	υ	υ	U	34	
Arocior- 1221	U U	υ	U	U	34	
Arocior- 1232	U	U	U	U	34	
Aroclor- 1242	( U	U	U	ן ט	34	
Arocior- 1248	U	υ	υ -	U	34	
Aroclor- 1254	υ	U	U	U	34	****
Aroclor- 1280	U	U	U	U	34	
TOTAL PCBs	0	0	0	0		1,000/10,000*

#### QUALIFIERS:

U: Compound analyzed for but not detected.

#### NOTES:

--- : Not applicable.

: According to NYSDEC TAGM 4048 Recommended Soll Cleanup Objectives, 1,000 ug/kg is utilized for surface soil [0-2' below ground surface (bgs)] and 10,000 ug/kg is utilized for subsurface soil (soil deeper than 2' bgs).

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD **DELINEATION PHASE 2 SITE ASSESSMENT**

# SUBSURFACE SOIL - MERCURY AND RCRA METALS

AREASOR CONCERNISH SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	IPSB-04A (6 - 8) 1/29/03 73.0 (mg/kg)	IPSB-12 (2 - 4) 1/27/03 85.0 (mg/kg)	iPSB-12 (4 - 8) 1/27/03 57.0 (mg/kg)	IPSB-12 (8 - 10) 1/27/03 91.0 (mg/kg)	IPSB-13 (2 - 4) 1/29/03 89.0 (mg/kg)	IPSB-13 (4 - 6) 1/29/03 87.0 (mg/kg)	IPSB-14 (2 - 4) 1/29/03 84.0 (mg/kg)	IPSB-14 (4 - 6) 1/29/03 83.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Appendix A Comparison Criteria mg/kg
Mercury	11.3	0,1 B	0.048 B	U	0.28	1.2	0.13	U	0.1	0.1

AREAION CONCERNING SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	IPSB-14 (6 - 8) 1/29/03 63.0 (mg/kg)	IPSB-14 (8 - 10) 1/29/03 60.0 (mg/kg)	IPSB-15 (2 - 4) 1/29/03 86.0 (mg/kg)	<b>IPSB-15</b> (4 - 6) 1/29/03 84.0 (mg/kg)	IPSB-15 (6 - 8) 1/29/03 76.0 (mg/kg)	(PSB-15 (8 - 10) 1/29/03 75.0 (mg/kg)	IN an In Viet History (0 - 2) 1/30/03 86.0 (mg/kg)	<b>IPSB-16</b> (2 - 4) 1/30/03 86.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Appendix A Comparison Criteria mg/kg
Mercury	0.028 B	U	0.11	0.41	U	U	0.29	0.038 B	0.1	0.1

AREAIORICONCERN SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	IPSB-17 (0 - 2) 1/28/03 88.0 (mg/kg)	IPSB-17 (2 - 4) 1/28/03 78.0 (mg/kg)	IPSB-18 (2 - 4) 1/30/03 85.0 (mg/kg)	IPSB-20 (0 - 2) 1/27/03 91.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Appendix A Comparison Criteria mg/kg
Marcury	0.057 B	0.07 B	0.1 B	0,15	0.1	0.1

QUALIFIERS: U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

Notes:

: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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#### TABLE 35 (continued)

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT

#### SUBSURFACE SOIL - MERCURY AND RCRA METALS

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	IPSB-04A (8-10) 1/29/03 84.0 (mg/kg)	IPSB-13 (6-8) 1/29/03 82.0 (mg/kg)	IPSB-13 (8-10) 1/29/03 74.0 (mg/kg)	IPSB-20 (2-4) 1/27/03 87.0 (mg/kg)	IPSB-19 (2 - 4) 1/27/03 82.0 (mg/kg)	IPSB-26 (0-2) 1/30/03 94.0 (mg/kg)	IPSB-26 (2-4) 1/30/03 76.0 (mg/kg)	IPSB-27 (0-2) 1/30/03 89.0 (mg/kg)	INSTRUMENT DETECTION LIMITS	NYSDEC TAGM 4048 Recommended Soll Cleanup Objective (mg/kg)
Arsenic Barlum Cadmium Chromium Lead Mercury	4.3 17.5 0.097 B 13.4 29.3 0.11 B	3.8 21.9 0.091 B 8.7 13.6 0.57	5.7 9.4 B 0.24 B 8.2 19 0.041	4.1 15.7 0.33 9.2 15.7 0.34	NA NA NA NA U	3.1 28.2 1.2 5.7 18.2 0.051 B	1.3 6.2 B U 5.7 2 B U	3.7 26.4 0.85 6.7 12.7 0.05 B	3.0 3.0 2.0 3.0 1.0 0.1	7.5 or SB 300 or SB 10* 50* SB** 0.1
Selenium Silver	UUU	UUU	U U	U 0.64 B	NA NA	U U	ม บ	UUU	8.0 2.0	2 or SB SB

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	iP\$B-27 (2-4) 1/30/03 73.0 (mg/kg)	iPSB-28 (2-4) 1/30/03 85.0 (mg/kg)	<b>IP8B-29</b> (2-4) 1/28/03 87.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/i)	NYSDEC TAGM 4048 Recommended Soil Cleanup Objective (mg/kg)
Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	3.9 7.4 B 8.4 3.9 U U U	6.6 32.7 U 14.2 24.7 0.14 U U	11.8 70.7 0.53 7 47.3 0.11 U 0.93 B	3.0 3.0 2.0 3.0 1.0 0.1 8.0 2.0	7.5 or SB 300 or SB 10* 50* SB** 0.1 2 or SB SB

QUALIFIERS:

U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

Notes:

SB: Site Background

\*: As per proposed 4/95 NSDEC TAGM

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\*\*: Average background levels in metropolitan or surburban areas or near highways range from 200-500 ppm. : Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD **DELINEATION PHASE 2 SITE ASSESSMENT**

#### SUBSURFACE SOIL - VOLATILE ORGANIC COMPOUNDS (VOCs)

RAN KYOL THON HAND	i in the	NHECOMON	THE STREET		
SAMPLE ID	IPSB-04A	IPSB-13	IPSB-13		
SAMPLE DEPTH (FT)	(8-10)	(6-8)	(8-10)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/29/03	1/29/03	1/29/03	QUANTITATION	Recommended
DILUTION FACTOR	57	250	57	LIMITS	Soil Cleanup
PERCENT SOLIDS	84.0	82.0	74.0		Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/Kg)	(ug/Kg)
Dichlorodifluoromethane	Ū	U	Ű	5	
Chloromethane	U	U	U	5	
Vinyl Chloride	U	U	U	5	200
Bromomethane	U	U	U	5	-
Chloroethane	υ	U	U	5	1900
Trichlorofluoromethane	U U	U .	U	5	
1,1-Dichloroethene	U	U	U	5	400
Acetone	U	U	210 J	5	200
Idomethane	( U	υ	U	5	-
Carbone Disulfide	<u> </u>	υ	υ	5	2700
Methylene Chloride	260 J	260 J	120 J	5	100
trans-1,2-Dichloroethene		U		5	300
Methyl tert-butyl ether	Ú	Ú	Ú	5	
1,1-Dichloroethane	U	U	U	5	200
Vinyl acetate	U	U	ບ	5	-
2-Butanone	U	U	U	5	300
cis-1,2-Dichloroethene	U	U	υ	5	
2,2-Dichloropropane	U U	U	υ	5	
Bromochloromethane	U U	U	U	5 5 5	
Chioroform	υ	U	U	5	300
1,1,1-Trichloroethane	U	U	U	5 5	800
1,1-Dichloropropene	U	υ	υ	5	
Carbon Tetrachloride	U	U	U	5	600
1,2-Dichloroethane	U	U	U	5	100
Benzene	U	υ	U	5	60
Trichloroethene	U	U	U	5	700
1,2-Dichloropropane	U	U	U	5	i –
Dibromomethane	U	U	U	5	-
Bromodichloromethane	ບ	υ	υ	5	-
cis-1,3-Dichloropropane		U	U	5	
4-Methyl-2-pentanone	U	U	U	5	1000
Toluene	U	U	U	5	1500
trans-1,3-Dichloropropane	U	U	U	5	
1,1,2-Trichloroethane	<u> </u>	U	UU	5	
QUALIFIERS:			NOT	<u>(ES;</u>	

QUALIFIERS: U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

D: Compound concentration was obtained from a diluted analysis.

-: Not applicable.

: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

# TABLE 36 (continued)

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT

# SUBSURFACE SOIL - VOLATILE ORGANIC COMPOUNDS (VOCs)

机体织动力和动物动动制造工作法计	C C Section	TER BRANCH ST	anten de la dela		
SAMPLE ID	IPSB-04A	IPSB-13	IPSB-13		
SAMPLE DEPTH (FT)	(8-10)	(6-8)	(8-10)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/29/03	1/29/03	1/29/03	QUANTITATION	Recommended
DILUTION FACTOR	57	250	57	LIMITS	Soll Cleanup
PERCENT SOLIDS	84.0	82.0	74.0		Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/Kg)	(ug/Kg)
1,3-Dichloropropane	U	U	U	5	300
Tetrachloroethene	U	U	U	5	1400
2-Hexanone	U	U	U	5	
Dibromochloromethane	U	U	U	5	
1,2-Dibromoethane	U	U	U U	5	
Chlorobenzene	U	U	U	5	1700
1,1,1,2-Tetrachloroethane	U	U	U	5	
Ethylbenzene	U	U	U	5	5500
m,p-Xylene	U	U	U	5	-
o-Xylene	U	U	U	5	
Xylene (total)	U	U	U	5	1200
Styrene	U	U	U	5	-
Bromoform	U	U	U	5	
isopropylbanzana	U	Ų	U	5	
1,1,2,2-Tetrachloroethane	U	U	U	5	600
Bromobenzene	U	U	U	5	-
1,2,3-Trichloropropane	U	Ų	U	5	400
n-Propylbenzene	Ų	U	U	5	
2-Chlorotoluene	U	Ų	U U	5	
1,3,5-Trimethylbenzene	U	U	U	5	-
4-Chlorotoluene	U	U	U	5	
tert-Butylbenzene	U	U	U U	5	
1,2,4-Trimethylbenzene	U	U	U	5	-
sec-Butylbenzene	• U	U	U U	5	
4-Isopropyitoluene	U.	U	U U	5	
1,3-Dichlorobenzene	U	U	U U	5	1600
1,4-Dichlorobenzene	U	U	U U	5	8500
n-Butylbenzene	U	U	U	5	
1,2-Dichlorobenzene	U	U	U U	5	7900
1,2-Dibromo-3-chloropropane	UU	U U	U U	5 5	3400
1,2,4-Trichlorobenzene	UU	U U		5	
Hexachlorobutadiene	-				
Naphthalene	1600	50000	15000 D	5	13000
1,2,3-Trichlorobenzene	U	0	Ū	5	-
Totals VOCs	1,860	50,260	15,330		-
QUALIFIERS:			NOT	<u>[ES:</u> lot epolicable	

U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

D: Compound concentration was obtained from a diluted analysis.

--: Not applicable.

: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD **DELINEATION PHASE 2 SITE ASSESSMENT**

## SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

	្រះ្លាំ ំងោរ		1001	Construction of the second second		Jun Da	en an anaiste anna ann ann an		
AMPLE ID	IPSB-04A	IPSB-13	IP88-13	IPSB-26	IPS8-26	IPSB-27	IPSB-27		
AMPLE DEPTH (FT)	(8-10)	(6-8)	(8-10)	(0-2)	(2-4)	(0-2)	(2-4)	LABORATORY	NYSDEC TAGM
ATE OF COLLECTION	1/29/03	1/29/03	1/29/03	1/30/03	1/30/03	1/30/03	1/30/03	QUANTITATION	Recommended
DILUTION FACTOR	1	5	2	1	1	1	1	LIMITS	Soll Cleanup
PERCENT SOLIDS	84.0	82.0	74.0	94.0	76.0	89.0	73.0		Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/Kg)	(ug/Kg)
Phenoi	U	U	U	U	υ	U U	U U	330	30
is(2-Chloroethyl)ether	U U	U	U	U	U	U	υ	330	-
-Chlorophenol	υ	U	υ	Ű	Ū	Ū	Ū	330	800
,3-Dichlorobenzene	Ú	U	Ū	Ū	Ū	ũ	ŪŪ	330	
,4-Dichlorobenzene	Ū	Ū	Ū	Ŭ	Ŭ	Ū	Ŭ	330	-
,2-Dichlorobenzene	Ū	Ū	Ū	Ŭ l	Ŭ	Ŭ	Ŭ Ū	330	
-Methylphenol	Ū	Ŭ	Ū	Ŭ	Ŭ	Ŭ	Ŭ	330	100
2,2-oxybis (1-chloropropane)	Ū	Ū	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	330	-
-Methylphenol	Ŭ	บ	ŭ	υŪ	Ŭ	Ŭ	υŬ	330	900
N-Nitroso-di-n-propylamine	ιŭ	Ŭ	Ŭ	ŭ	Ŭ	Ŭ	Ŭ	330	
lexachioroethane	Ū	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	330	-
Vitrobenzene	บั	Ŭ	ŭ	ŭ	Ŭ	ບ ບ	Ŭ . Ŭ	330	200
sophorone	ŭ	ŭ	ŭ	ŭ	Ŭ	Ŭ	Ŭ	330	4,400
	ŭ	Ŭ	Ŭ	ŭ	Ŭ	Ŭ	Ŭ	330	330
2,4-Dimethylphenol	U U	Ŭ	Ŭ	Ŭ	ŭ	U U	U U	330	
2,4-Dichlorophenol	บ บ บ	Ŭ	ŭ	Ŭ I	Ŭ	-	-		-
.2.4-Trichlorobenzene	Ŭ	U U	i i i	-	-	U	U	330	400
Naphthalene	-		U U	U	U	Ų	U	330	
	3000	27000	9900	U	U	U	U	330	13,000
	U U	:0	U U	U	U	U	U U	330	220
bis(2-Chloroethoxy)methane fexachlorobutadiene	U U	U	U I	U	· U	U	U	330	-
	U U	U	U I	U	U	U	U	330	
-Chloro-3-methylphenol	U	U	U	<u>U</u>	U	U	U	330	240
2-Methylnaphthalene	190 J	7600	1600	U.	U	U	U	330	36,400
exachiorocyclopentadiene	U	U	U I	U	U	U U	U	330	
2,4,6-Trichlorophenol	U U	U	U U	U	U	U	U U	330	-
2,4,5-Trichlorophenol	U	U	U	U	U	U	U	660	100
2-Chloronaphthalene	U	U	U	U	U	U	U	330	
2-Nitroaniline	U U	U	U	U	U	U	U	660	430
Dimethylphthalate	U	U	U	U	Ų	U	U	330	2,000
cenaphthylene	U	U	U	U	U	U	U	330	41,000
1,6-Dinitrotoluene	U	U	U	Ψ	U	U	U	330	1,000
Nitroaniline	U	U	U	U	U	U	U	660	500
cenaphthene	450	6700	3700	U	U	U	ט ו	330	50,000

U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

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- : Not applicable.

: Result exceeds NYSDEC TAGM Recommended Soll Cleanup Objective

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	IPSB-04A			1000 04			1000.07		
SAMPLE DEPTH (FT)		IPSB-13	IPSB-13	IPSB-26	IPSB-26	IPSB-27	IP88-27	1 4000 47001	
	(8-10)	(6-8)	(8-10)	(0-2)	(2-4)	(0-2)	(2-4)	LABORATORY	NY8DEC TAGM
DATE OF COLLECTION	1/29/03	1/29/03	1/29/03	1/30/03	1/30/03	1/30/03	1/30/03 1	QUANTITATION	Recommended
PERCENT SOLIDS	1 84.0	5 82.0	2 74.0	1 94.0	1	1 100 0		LIMITS	Soll Cleanup
JNITS					76.0	100.0	100.0	1	Objective
	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/Kg)	(ug/Kg)
,4-Dinitrophenol	ບ	υ	U	U	υ	υ	υ	660	200
-Nitrophenol	U	U	U	υ	U	υ	U	660	100
Dibenzofuran	53 J	6000	2500	U	U	υ	υ	330	6,200
4-Dinitrotoluene	U	U	U	U	U	U	U	330	
Diethylphthalate	U	U	U	U	U	U	U	330	7,100
-Chiorophenyi-phenyiether	U	υ	U	U	U	U)	U	330	
luorene	240 J	6900	4200	U	U	U	U	330	50,000
-Nitroaniline	υ	U	U	U	U	U	U	330	
,6-Dinitro-2-methylphenol	U	U	U	U	U	U	U	330	-
I-Nitrosodiphenyiamine	U	Ų	U	U	U	U	υ	330	-
-Bromophenyl-phenylether	U	U	U	υ	U	U	υ	330	
lexachiorobenzene	U	U	U	U	U	υ	υ	330	410
entachlorophenoi	U	U	U U	U	U	υ	U	660	1,000
henanthrene	300 J	17000	11000	270 J	200 J	560	U	330	50,000
athracene	80 J	4900	3300	84 J	47 J	170 J	U	330	50,000
Carbazole	U	810 J	520 J	U	U	U	U	330	
Di-n-butyiphthalate	U	U	U	U	U	U	U	330	8,100
luoranthene	170 J	5400	5900	530	210 J	1200	U	330	50,000
Pyrene	160 J	5100	5400	830	320 J	2100	U	330	50,000
Butylbenzylphthalate	Ų	U	U	U	U	U	U	330	50,000
,3-Dichlorobenzidine	U	U	<u> </u>	U	Υ	Ų	U	330	-
Benzo(a)anthracene	56 J	1200 J	920	510	180 J	1200	U	330	224
Chrysene	61 J	1300 J	<u> </u>	560	210 J	1400	U	330	400
ois(2-Ethyihexyl)phthalate	U [	U	Ų –	U	υ	— U	υ	330	50,000
Di-n-octylphthalate	U	U	U	U	U	U	U	330	50,000
Benzo(b)fluoranthene	60 J	840 J	530 J	370	140 J	990	U	330	1,100
lenzo(k)fluoranthene	υ	380 J	260 J	160 J	51 J	370	U	330	1,100
lenzo(a)pyrene	<b>4</b> 4 J	580 J	<u>350</u> J	350	130 J	920	U	330	61
ndeno(1,2,3-cd)pyrene	υ	U ]	100 J	14 <u>0</u> J	51 J	280 J	U	330	3,200
benz(s,h)anthracene	υ)	U	υ	56 J	U	120 J	Ų	330	14
lenzo(g,h,i)perylene	υ	U	95 J	150 J	58 J	280 J	U	330	50,000
otal PAHs	4,864	90.880	50,665	4,010	1,597	9,590	o	-	100,000
otal CaPAHs	221	4,280	3,070	2,146	762	5,280	ŏ	-	10,000
Fotal SVOCs	4,864	91,690	51,185	4,010	1,597	9.590	ŏ	-	500,000

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J: Compound found at a concentration below the detection limit.

: Result exceeds NYSDEC TAGM Recommended Soll Cleanup Objective

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

AREANOBICONORRAN SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	iPSB-28 (2-4) 1/30/03 1 85.0 (ug/kg)	<b>IPSB-29</b> (2-4) 1/28/03 1 87.0 (ug/kg)						NYSDEC TAGM Recommended Soll Cleanup Objective (ug/Kg)
Phenol								
	U U	U	1				330	30
bis(2-Chloroethyl)ether	U	U					330	-
2-Chlorophenol	U	U U					330	800
1,3-Dichlorobenzene 1,4-Dichlorobenzene	U	U					330	
	U	U	1 1				330	-
1,2-Dichlorobenzene	U	U	1				330	-
2-Methylphenol	U	U					330	100
2,2-oxybis (1-chloropropane)	U	U	4 1				330	~
4-Methylphenol	U	U					330	900
N-Nitroso-di-n-propylamine	U	U					330	- 1
Hexachloroethane	U U	U					330	
Nitrobenzene	U	U					330	200
Isophorone	U	U					330	4,400
2-Nitrophenol	U	U	1				330	330
2,4-Dimethylphenol	U	U					330	-
2,4-Dichlorophenol	U	υ	1				330	400
1,2,4-Trichlorobenzene	U	U					330	
Naphthalene	U	390					330	13,000
4-Chloroaniline	U	U			i		330	220
bis(2-Chloroethoxy)methane	U	U U					330	
Hexachlorobutadiene	U U	U					330	- 1
4-Chloro-3-methylphenol	U	U					330	240
2-Methylnaphthalene	U	540	1				330	36,400
Hexachlorocyclopentadiene	U	U					330	- (
2,4,6-Trichlorophenol	U	U	1 1				330	-
2,4,5-Trichiorophenol	U	U					660	100
2-Chloronaphthalene	U	υ				[	330	-
2-Nitroaniline	U	U	l				660	430
Dimethylphthalate	U	υ					330	2,000
Acenaphthylene	U	U					330	41,000
2,6-Dinitrotoiuene	U	U					330	1,000
3-Nitroaniline	U	U	{ {				660	<b>50</b> 0
Acenaphthene	<u> </u>	<u>210_J</u>		NOT	 _		330	50,000

QUALIFIERS: U: Compound analyzed for but not detected.

J: Compound found et a concentration below the detection limit.

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NOTES: - : Not applicable.

: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

ALTERNOL GIONGLER ME ALLER THE								
SAMPLE ID	IPSB-28	IPSB-29						
SAMPLE DEPTH (FT)	(2-4)	(2-4)					LABORATORY	NYSDEC TAGM
ATE OF COLLECTION	1/30/03	1/28/03					QUANTITATION	Recommended
ILUTION FACTOR	1	1					LIMITS	Soll Cleanup
PERCENT SOLIDS	100.0	87.0						Objective
INITS	(ug/kg)	(ug/kg)					(ug/Kg)	(ug/Kg)
4-Dinitrophenol	U	υ					660	200
-Nitrophenol	ŭ	Ŭ					660	100
ibenzofuran	Ŭ	220 J					330	6,200
4-Dinitrotoluene	u u	U					330	0,200
iethylphthalate	Ŭ	Ŭ					330	7,100
-Chlorophenyl-phenylether	Ŭ	Ŭ					330	-
luorene	Ŭ	150 J					330	50,000
Nitroaniline	ů	Ŭ					330	
6-Dinitro-2-methylphenol	Ŭ	Ŭ					330	
-Nitrosodiphenylamine	Ŭ	Ŭ					330	-
-Bromophenyl-phenylether	l ū	Ŭ					330	-
exachiorobenzene	Ū	Ŭ					330	410
entachlorophenol	U	υ					660	1,000
henanthrene	320 J	1500					330	50.000
nthracene	60 J	280 J					330	50,000
arbazole	39 J	150 J					330	-
Di-n-butylphthalate	U	U					330	8,100
luoranthene	530	1500					330	50,000
yrene	500	1200					330	50,000
lutylbenzyiphthalate	U	U					330	50,000
,3-Dichlorobenzidine	Ū	Ū					330	
enzo(a)anthracene	260 J	690					330	224
hrysene	360 J	740					330	400
ls(2-Ethylhexyl)phthalate	U U	U					330	50,000
Di-n-octylphthalate	ũ	Ū.					330	50,000
lenzo(b)fluoranthene	300 J	930					330	1,100
ienzo(k)fluoranthene	160 J	380					330	1,100
enzo(a)pyrehe	220 J	590					330	61
ndeno(1,2,3-cd)pyrene	120 J	260 J					330	3,200
libenz(a,h)anthracene	Ŭ	73 J					330	14
lenzo(g,h,i)perylene	110 J	260 J					330	50,000
otal PAHs	2,940	9,913					-	100,000
otal CaPAHs	1,420	3,663					-	10,000
Total SVOCs	2,979	10,063						500,000
QUALIFIERS:				NO	ES:			

QUALIFIERS: U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

-- : Not applicable.

: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD DELINEATION PHASE 2 SITE ASSESSMENT

#### SUBSURFACE SOIL - POLYCHLORINATED BIPHENYLS (PCBs)

AREA OF CONSTRNI SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	(8-10) 1/29/03 1 84.0 (ug/kg)	<b>iPSB-13</b> (6-8) 1/29/03 1 82.0 (ug/kg)	1115 IPSB-13 (8-10) 1/29/03 1 74.0 (ug/kg)	IPSB-26 (0-2) 1/30/03 1 94.0 (ug/kg)	(2-4) 1/30/03 1 76.0 (ug/kg)	0(1) IPSB-27 (0-2) 1/30/03 1 89.0 (ug/kg)	IPSB-27 (2-4) 1/30/03 1 73.0 (ug/kg)	IC(10111 IPSB-28 (2-4) 1/30/03 1 85.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4048 Recommended Soil Cleanup Objective (ug/kg)
Arocior- 1016 Arocior- 1221 Arocior- 1232 Arocior- 1242 Arocior- 1248 Arocior- 1254 Arocior- 1254 Arocior- 1260 TOTAL PCBs	0 22220	0 22222	0 כככככ	0 55555	0 0000	ο	0 0 0 0 0	0 0 0	34 34 34 34 34 34 34 34	    1,000/10,000*
ARE OF CONSTRUCTOR SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	1/28/03 1/28/03 1/28/03 1 87.0 (ug/kg)								LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective (ug/kg)
Aroclor- 1016 Aroclor- 1221 Aroclor- 1232 Aroclor- 1242 Aroclor- 1248 Aroclor- 1254 Aroclor- 1260 TOTAL PCBs	0 0 0 0								34 34 34 34 34 34 34 34	   1.000/10.000*

QUALIFIERS: U: Compound analyzed for but not detected. NOTES:

-- : Not applicable.

: According to NYSDEC TAGM 4046 Recommended Soil Cleanup Objective, 1,000 ug/kg is utilized for surface soil [0'-2' below ground surface (bgs)] and 10,000 ug/kg is utilized for subsurface soil (soil deeper than 2' bgs).

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD UNDERGROUND INJECTION CONTROL INVESTIGATION

#### SUBSURFACE AND SURFACE SOIL - RCRA METALS

				SUBSURFA					
un de la company de la comp		and a constantes and	CHILDER WWW						
SAMPLE ID	IP88-21	IP88-21	IPSB-21	IP8B-21	IPSB-21	IPSB-22	IPSB-23	INSTRUMENT	NYSDEC TAGM
SAMPLE DEPTH (FT)	(10-12)	(12-14)	(14-16)	(16-18)	(18-20)	(2-4)	(2-4)	DETECTION	4046
DATE OF COLLECTION	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03	LIMITS	Recommended Soll
PERCENT SOLIDS	32.0	33.0	48.0	89.0	85.0	89.0	73.0	() (1)	Cleanup Objective
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(ug/l)	(mg/kg)
Arsenic ·	8.9	17.6	16.3	2.5	2.4	2.9	3.9	3.0	7.5 or SB
Barium	35.7	81.8	27.2	1,9 B	1.4 B	28.2	27.8	3.0	300 or SB
Cadmium	0.5 8	0.48 B	0.36 B	U	U	0.098 B	0.18 8	2.0	10*
Chromium	34.7	39	37.1	4.6	3.3	7.3	8.4	3.0	50*
Lead	20.6	31.6	12	1.8 B	1.3 B	38.1	42.9	1.0	SB**
Mercury	5.4	2.4	0.058 B	U U	U	0.047 B	0.47	0.1	0.1
Selenium	C	U	U U	U U	υ	U	Ū	8.0	2 or SB
Silver	U	U U	U	U U	υ	U	U	2.0	SB
				SUB SURFA	CE SOIL	,			·
falles Photographic and									
SAMPLE ID	IPSB-24	IP88-25						INSTRUMENT	NYSDEC TAGM
SAMPLE DEPTH (FT)	(2-4)	(2-4)						DETECTION	4048
DATE OF COLLECTION	1/29/03	1/29/03						LIMITS	Recommended Soil
PERCENT SOLIDS	83.0	77.0							Cleanup Objective
UNITS	(mg/kg)	(mg/kg)						(ug/l)	(mg/kg)
Arsenic	7.3	27.3						3.0	7.5 or SB
Barium	130	148						3.0	300 or SB
Cadmium	0.48	0.49						2.0	10*
Chromlum	11.5	9.4						3.0	50*
Lead	478	174						1.0	SB**
Mercury	0.79	0.28						0.1	0.1
Selenium	U	υ	1					8.0	2 or SB
Silver	U	U U						2.0	SB
·			· · · · · · · · · · · · · · · · · · ·	SURFAC	ESOIL				l
<b>建成5%出现40%和</b> 45%。1.3	ana ta ta ta ta		ACTED AND AND A	- m - Sur die met stad					1
SAMPLE ID	IPSB-22	IP88-23	IP88-24	IPSB-25				INSTRUMENT	NYSDEC TAGM
SAMPLE DEPTH (IN)	(0-2)	(0-2)	(0-2)	(0-2)				DETECTION	4046
DATE OF COLLECTION	1/29/03	1/29/03	1/29/03	1/29/03				LIMITS	Recommended Soli
PERCENT SOLIDS	87.0	90.0	89.0	85.0					Cleanup Objective
UNITS	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)				(ug/l)	(mg/kg)
Arsenic	5.2	8.5	3,8	5				3.0	7.5 or SB
Barium	231	86	27.2	38.2				3.0	300 or SB
Cadmium	0.16 B	0.39	0,11 B	38.∠ 0.2 B				2.0	300 or SB
Chromium	8.8	9.2	8.4	7.7				3.0	50*
Lead	4.4	116	36.3	48.8				1,0	SB**
Marcury	0.028 B	0.99	0,045 B	0.55				0.1	0.1
Selenium	U	<u>U</u>	U 0,040 U	0.00				8.0	2 or SB
Silver	U U	U U	U U	U U				2.0	SB
	U U	l ü	l č					2.0	50

OUALIFIERS: U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

<u>Notes:</u> SB: Site Background

\*: As per proposed 4/95 NSDEC TAGM

\*\* Average background levels in metropolitan or surburban areas or near highways range from 200-500 ppm.

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Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD UNDERGROUND INJECTION CONTROL INVESTIGATION

# SURFACE AND SUBSURFACE SOIL - VOLATILE ORGANIC COMPOUNDS (VOCs)

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fulle 13 craner lates			Second Second	S. SILLIVERSITE C.	AND BARRAN	es de la cont			
SAMPLE ID	IPSB-22	IPSB-23	IPSB-24	IPSB-25	IPSB-22	IPSB-23	IPSB-24		
SAMPLE DEPTH	(0-2 IN)	(0-2 IN)	(0-2 IN)	(0-2 IN)	(2-4 FT)	(2-4 FT)	(2-4 FT)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03	QUANTITATION	4046 Recommended
DILUTION FACTOR	1 1	1	1	1	1	1	1 ]	LIMITS	Soll Cleanup
PERCENT SOLIDS	87.0	90.0	89.0	85.0	89.0	73.0	83.0		Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/Kg)	(ug/Kg)
Dichlorodifluoromethane	U	0		0	U	U	U 1	5	_
Chloromethane	U U I	U	U	U	U	U	υ	5	
Vinyl Chioride	U U	U	U	U	U	U	U	5	200
Bromomethane	U U	U	U	U	U	U	U	5	-
Chloroethane	U	υĮ	U	U	U	U	U	5	1900
Trichlorofluoromethane	ן ט	U	U	U	U	U	U	5	-
1,1-Dichloroethene	ן ט	U	U	U	U	U	U	5	400
Acetone	6	39	57	7	25	100	35	5	200
Idomethane	υ	U	U	U	U	U	U	5	-
Carbone Disuifide	U	2 J	3 J	U	2 J	4 J	5 J	5	2700
Methylene Chloride	27 B	33	15	50 B	23 B	140	21	5	100
trans-1,2-Dichloroethene		υ	U	υ	U		U	5	300
Methyl tert-butyl sther	U U	υ	υ	ΰ	· Ū	Ū	Ŭ	5	-
1,1-Dichloroethane	U U	U [	U	υ	Ū	Ū	Ũ	5	200
Vinyl acetate	U	U	U	U	· U	U	Ŭ	5	-
2-Butanone	{ U	5 J	9	U	U	9	8	5	300
cis-1,2-Dichloroethene	U U	U	υ	U	U	U	U	5	
2,2-Dichloropropane	υ υ	U	U	U	U	U	Ŭ	5	! _
Bromochloromethane	) U	U	υ	U	U	υ	Ū	5	
Chloroform	υ	U	U	U	U	U	U	5	300
1,1,1-Trichioroethane	υ	U	U	U	U	U U	U	5	800
1,1-Dichloropropene	[ υ	U	U	U	U	υ	U	5	-
Carbon Tetrachloride	υ	U U	υ	U	U	U	U	5	600
1,2-Dichloroethane	<b>υ</b>	U	U	Ŭ	Ū	Ŭ	Ŭ	5	100
Benzene	ι υ	5 J	Ú	Ŭ	Ŭ	Ŭ	Ŭ	5	60
Trichloroethene	( U	υ	ט	Ŭ	Ψ	Ū	Ŭ	5	700
1,2-Dichloropropane	U	U	Ű	υ	Ú	υ	U	5	
Dibromomethane	U	U	U	Ų	υ	ט ו	U	5	) _
Bromodichioromethane	ι υ	. U	Ų	Ŭ	Ŭ	Ŭ	U	5	-
cis-1,3-Dichloropropane	Į U	U	U	U	Ų	Ů	Ű	5	-
4-Methyl-2-pentanone	U	Ŭ l	U	Ų	Ú	Ŭ	Ŭ	5	1000
Toluene	6	9	1 Ĵ	3 J	Ŭ	2 J	4 J	5	1500
trans-1,3-Dichloropropene	) U	U	U	U	Ú	U	Ŭ	5	-
1,1,2-Trichloroethane	U .	U	U	U	Ŭ	Ũ	Ŭ	5	-
QUALIFIERS:				NOT	ES:				

U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

B: Compound was also detected in the associated Method Blank.

Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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-: Not applicable.

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD UNDERGROUND INJECTION CONTROL INVESTIGATION

#### SURFACE AND SUBSURFACE SOIL - VOLATILE ORGANIC COMPOUNDS (VOCs)

1		SURFAC	ESOIL		\$U	BSURFACE SO			I
Inter Protection:			the second second	- TREADE	and the second second	Sana Tangan Angéria. Tanèn aran-kana ara-dan	and a state of the second state of the		
SAMPLE ID	IPSB-22	IPSB-23	IPSB-24	IPSB-25	IPSB-22	IPSB-23	IPSB-24		
SAMPLE DEPTH	(0-2 IN)	(0-2 IN)	(0-2 IN)	(0-2 IN)	(2-4 FT)	(2-4 FT)	(2-4 FT)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03	QUANTITATION	4046 Recommended
DILUTION FACTOR	1	1	1	1	1	1	1	LIMITS	Soil Cleanup
PERCENT SOLIDS	67.0	90.0	89.0	85.0	89.0	73.0	83.0	•	Objective
UNITS	_(ug/kg)	(ug/kg)	(ug/kg)	<u>(ug/kg)</u>	(ug/kg)	(ug/kg)	(ug/kg)	(ug/Kg)	(ug/Kg)
1,3-Dichloropropane		U_]		U	U	_ U		5	300
Tetrachloroethene	U	U	U	U	U	U	U	5	1400
2-Hexanone	• U	υI	U	U	U	U (	U	5	
Dibromochloromethane	U	U	U	U ]	U	U	U	5	
1,2-Dibromoethane	U	U	U	, UĮ	U	U	U	5	
Chlorobenzene	U	U	U	U	U	U	U	5	1700
1,1,1,2-Tetrachioroethane	U	U	U	U	U	U	U	5	
Ethyibenzene	U	1 J	U	U	U	U	2 J	5	5500
m,p-Xylene	3 J	3 J	υ	U	U	2 J	2 J	5	-
o-Xylene	2 J	2 J	U	U	U	U 1	U	5	
Xylene (total)	5 J	6	U	U	U	2 J	2 J	5	1200
Styrene	U	U	U	U	U	U U	10	5	
Bromoform	U	U	U	U U	U	U	U	5	í -
Isopropylbenzene	U	U	U	U	U	U	U	5	
1,1,2,2-Tetrachioroethane	U	U	U	U	U	U	U	5	600
Bromobenzene	U	U	U	U	U	U	U	5	. <del>-</del>
1,2,3-Trichloropropane	U	U	U	U	U	U	U	5	400
n-Propylbenzene	U	U	U	U	U	U	U	5	-
2-Chlorotoluene	U	U	U	U	U	U	U	5	1 -
1,3,5-Trimethylbenzene	1 J	U	U	3 J	U	U	3 J	5	-
4-Chiorotoluene	U	U	U U	U	U	U	U	5	-
tert-Butylbenzene	U	U	U	U	U	U	. υ	5	-
1,2,4-Trimethylbenzene	3 J	2 J	2 J	7	1 J	2 J	5 J	5	-
sec-Butyibenzene	U	U	U	. U ]	U	U	2 J	5	-
4-Isopropyitoluene	U	U	U	U	U	U	U	5	-
1,3-Dichlorobenzene	U	U	U	U	U	U	U	5	1600
1,4-Dichlorobenzene	U	U	U	U	U	U	U	5	8500
n-Butylbenzene	1 J	U I	U	U	U	U	1 J	5	
1,2-Dichlorobenzene	1 J	U	U	U	U	U	U	5	7900
1,2-Dibromo-3-chloropropane	U J	U I	U	U.	U	U	U	5	-
1,2,4-Trichlorobenzene	2 J	U	· U	U	U	Ű	U	5	3400
Hexachiorobutadiene	U	U U	<u> </u>	U	U		Ŭ	5	
Naphthalene	7	11	8	25	160	7	160	5	13000
1,2,3-Trichlorobenzene	3 J	U	U	U	U	U	U	5	-
Totals VOCs	67	118	95	95	211	268	258		
QUALIFIERS:				NOT	ES:				

# QUALIFIERS:

U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

--: Not applicable.

: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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B: Compound was also detected in the associated Method Blank.

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD UNDERGROUND INJECTION CONTROL INVESTIGATION

# SURFACE AND SUBSURFACE SOIL - VOLATILE ORGANIC COMPOUNDS (VOCs)

<b>[</b>			SUBSURF						
Uller ( Markel Harris and Andrews				netho, televite		ور این			
SAMPLE ID	IPSB-25	IPS8-21	IP\$8-21	IPSB-21	IP88-21	IP88-21			
SAMPLE DEPTH DATE OF COLLECTION	(2-4 FT) 1/29/03	(10-12 FT) 1/29/03	(12-14 FT)	(14-16 FT)	(16-18 FT)	(18-20 FT)		LABORATORY	NYSDEC TAGM
DILUTION FACTOR	1/28/03	1/28/03	1/29/03	1/29/03	1/29/03	1/29/03	ł	QUANTITATION	4046 Recommended
PERCENT SOLIDS	77.0	32.0	33.0	48.0	89.0	85.0	i i	LIMITS	Soil Cleanup
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	48.0 (ug/kg)	(ug/kg)	(ug/kg)		(ug/Kg)	Objective
Dichlorodifluoromethane	U	( <u>ag</u> , <u>ng</u> )		U	<u>(ug/kg)</u>				(ug/Kg)
Chloromethane	·Ŭ	Ŭ	ŭ	ŭ	ັ້ນ	U U	l I	5	-
Vinyi Chloride	ŭ	ŭ	ŭ i	ŭ	<u>ម</u>	ບ ບ	l i	5	200
Bromomethane	U U	ŭ	u U	U U	Ŭ	ບ ບ		5	200
Chloroethane	ŭ	ŭ	ŭ	ŭ	Ŭ	ບ ບ	ļ :	5	1900
Trichlorofluoromethane	Ŭ	Ŭ	Ŭ	ŭ	ŭ	ม บ		5	
1,1-Dichloroethene	Ū	Ů	Ŭ	ŭ	Ŭ	Ű	i i	5	400
Acetone	17	130	240	280	31	55		5	200
Idomethane	U	U	U	Ú	U	U	1	5	
Carbone Disulfide	Ū	18	18	28	7	31		5	2700
Methylene Chloride	15 B	45 B	110	110	3 J	38		5	100
trans-1,2-Dichloroethene	U	U		U	U	U		5	300
Methyl tert-butyl ether	U	U U	U	U	U	U		5	-
1,1-Dichloroethane	U	3 J	5 J	U.	U I	U		5	200
Vinyi acetate	U U	U	U	U	U	U		5	-
2-Butanone	υ	24	31	9 J	U	4 J	l I	5	300
cis-1,2-Dichloroethene	U	υ	U	υ	U	U	l I	5	- 1
2,2-Dichloropropane	U	U	U	U	U	U	[	5	- 1
Bromochloromethane	U	U	U	U	U	U	[	5	-
Chloroform	U	U	U	U	U	U	l	5	300
1,1,1-Trichloroethane	U I	U	υ	υ	U	U		5	800
1,1-Dichloropropene Carbon Tetrachloride	U	U	U	υ	U	U	l i	5	-
1.2-Dichlorcethane	U U	U	U	U U	U	U		5	600
1,2-Dichlorcethane		U	U	U	ບ ນ	υ		5	100
Trichlorcethene		U		U	U 3 J	บ ม		5	60
1,2-Dichloropropane	U U	U	U U	U U	3 J U	บ บ	2	5	700
Dibromomethane		U U	U U	u u	U U	U U	1	5	
Bromodichloromethane	ŭ		U U	U U U	U U	U U	·	5	-
cis-1,3-Dichloropropane	ŭ				ŭ	u U	1	5	-
4-Methyl-2-pentanone	ŭ	i i i	ŭ	ŭ	ŭ	U U	l	5	1000
Toluene	Ŭ	14 J	U U	8 J	Ŭ	ŭ	1	5	1500
trans-1,3-Dichloropropene	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ		5	
1,1,2-Trichloroethane	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ		5	- 1

QUALIFIERS:

U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

B: Compound was also detected in the associated Method Blank.

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D: Compound concentration was obtained from a diluted analysis.

-: Not applicable.

NOTES:

: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD UNDERGROUND INJECTION CONTROL INVESTIGATION

#### SURFACE AND SUBSURFACE SOIL - VOLATILE ORGANIC COMPOUNDS (VOCs)

			SUBSURF	ACE SOIL					·
Talle distriction of the second state	Contraction -			(FURTED SCI					
SAMPLE ID	IP8B-25	IPSB-21	IPSB-21	IPSB-21	IPSB-21	IPSB-21		1	
SAMPLE DEPTH	(2-4 FT)	(10-12 FT)	(12-14 FT)	(14-16 FT)	(16-18 FT)	(18-20 FT)		LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03		QUANTITATION	4046 Recommended
DILUTION FACTOR	1	1	1	1	1	1		LIMITS	Soli Cleanup
PERCENT SOLIDS	77.0	32.0	33.0	48.0	89.0	85.0		ĺ	Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)		(ug/Kg)	(ug/Kg)
1,3-Dichloropropane	Ų	U - U		U	U	υ		5	300
Tetrachloroethene	U	U (	U	U	U	U		5	1400
2-Hexanone	U	U	υ	U	U	U		5	i - j
Dibromochloromethane	U	U	υ	U	U	U		5	-
1,2-Dibromoethane	υ	υ	U	υ	U	U		5	-
Chlorobenzene	U	U	U	U	U	U		5	1700
1,1,1,2-Tetrachioroethane	U	U	U	U	U	U		5	- 1
Ethylbenzene	U	10 J	8 J	10 J	υ	U		5	5500
m,p-Xylene	U	ļ V (	U	U	U	U		5	-
o-Xylene	U	U 1	U	U	υ	U		5	-
Xylene (total)	U	U	υ	U	U	U		5	1200
Styrene	U	U	U	υ	U	U		5	-
Bromoform	U	U	U	U	U	υ		5	- 1
isopropylbenzene	U	U	U	U	U	U		5	-
1,1,2,2-Tetrachloroethane	U	υ	υ	Ų	U	ί υ		5	600
Bromobenzene	U	U	υ	U	U	) U		5	
1,2,3-Trichloropropane	U	U	U	U	U	U		5	400
n-Propylbenzene	U	U	U	U	U	U		5	
2-Chiorotoluene	U U	U	U	U	U	U		5	
1,3,5-Trimethylbenzene	U	U	U	U	U	U		5	
4-Chiorotoluene	U	U	U	U	U	U		5	-
tert-Butylbenzene	U	U	U	. U	U	U		5	-
1,2,4-Trimethylbenzene	U	U	U	U	U	U		5	-
sec-Butylbenzene	U	U	U	U	U	U		5	-
4-isopropyitoluene	U	U	U	U	U	U		5	-
1,3-Dichlorobenzene	U	U	U	U	U	U		5	1600
1,4-Dichlorobenzene	υ	υ	υ	U	U	U		5	8500
n-Butylbenzene	U	U	U	U	U	U		5	
1,2-Dichlorobenzene	U	U U	U	U	U	U		5	7900
1,2-Dibromo-3-chloropropane	U	4 J	υ	U	U	U		5	- 1
1,2,4-Trichlorobenzene	U	U U	U	U	U	U		5	3400
Hexachlorobutadiene	υ	U	υ	U	U	U		5	-
Naphthalene	3 J	15 J	U	U	U	U		5	13000
1,2,3-Trichlorobenzene	U	8 J	U	U	U	U		5	-
T-4-15-1/000	35	271	410	446	44	128			
Totals VOCs	30		410	440		120		·	

#### QUALIFIERS:

U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

B: Compound was also detected in the associated Method Blank.

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D: Compound concentration was obtained from a diluted analysis.

NOTES: --: Not applicable.

: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD UNDERGROUND INJECTION CONTROL INVESTIGATION

# SURFACE AND SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCS)

		SURFAC	ESOIL		SU	BSURFACE SC			
Physical Contractions and the second s		and the second sec	and the state of the	Engle to the State	n an				
SAMPLE ID	IPSB-22	IPSB-23	IPSB-24	IPSB-25	IPSB-22	IPSB-23	IPSB-24		
SAMPLE DEPTH	(0-2 IN)	(0-2 IN)	(0-2 IN)	(0-2 IN)	(2-4 FT)	(2-4 FT)	(2-4 FT)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03	QUANTITATION	4046 Recommended
DILUTION FACTOR	1	1	1	1	1 1	1	10	LIMITS	Soll Cleanup
PERCENT SOLIDS	87.0	90.0	89.0	85.0	89.0	73.0	83.0		Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/Kg)	(ug/Kg)
Phanol	U	υ	υ	U	υ	U	υ	330	30
bis(2-Chloroethyl)ether	ŭ	Ŭ	Ŭ	υ Ŭ	Ŭ	Ŭ	Ŭ	330	50
2-Chlorophenol	บั	Ŭ	Ŭ	ນ ນ	Ŭ	Ŭ	Ŭ	330	800
1.3-Dichlorobenzene	บั	Ŭ	υŬ	Ű	U U	Ŭ	U U	330	800
1,4-Dichlorobenzene	ŭ	υ	υ	U U	Ŭ	U	U U	330	-
1.2-Dichlorobenzena	ŭ	Ŭ	່ ບໍ່	ບ ບ	υ	U U	U U	330	-
2-Methylphenol	ŭ	Ŭ	Ŭ	บ บ	υ	υ	υ υ	330	100
2,2'-oxybis (1-chloropropane)	ŭ	Ŭ	Ŭ	υ	υ	υ	υ	330	100
4-Methyiphenol	Ŭ	Ŭ	ŭ	ี่ บ	υ υ	υ υ	υ υ	330	900
N-Nitroso-di-n-propylamine	Ŭ	Ŭ	Ŭ	บ บ	ม มี บ	υ υ	υ υ	330	
Hexachloroethane	Ŭ	Ŭ	Ŭ	ม บ	Ŭ	υ	υ	330	-
Nitrobenzene	Ŭ	ŭ	ŭ	Ū	ŭ	Ŭ	Ŭ	330	200
Isophorone	Ŭ	Ŭ	ŭ	Ű	Ŭ	Ŭ	Ŭ	330	4,400
2-Nitrophenol	Ŭ	Ŭ	Ŭ	. ŭ	Ŭ	Ŭ	Ŭ	330	330
2,4-Dimethylphenol	Ŭ	Ŭ	Ũ	ŭ	Ŭ	ŭ	U U	330	550
2,4-Dichlorophenol	Ū	Ŭ	Ŭ	u u	Ŭ	u u	Ŭ	330	400
1,2,4-Trichlorobenzene	Ŭ	ů ů	Ŭ	Ŭ	Ŭ	ŭ	Ŭ	330	400
Naphthalene	Ŭ	60 J	Ŭ	ŭ	790	72 J	2300 J	330	13,000
4-Chloroaniline	ŭ	Ŭ	Ŭ	Ŭ	U , SU	, , , , , , , , , , , , , , , , , , ,	u little	330	220
bis(2-Chloroethoxy)methane	Ŭ Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	U U	330	220
Hexachlorobutadiene	Ŭ	Ŭ	Ŭ	ŭ	Ŭ	Ŭ	ŭ	330	-
4-Chioro-3-methylphenol	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	U U	330	240
2-Methylnaphthalene	Ŭ	48 J	Ŭ	Ŭ	350 J	74 J	840 J	330	36,400
Hexachiorocyclopentadiene	Ŭ	Ŭ	Ŭ	Ŭ	Ű	Ű	U	330	
2,4,6-Trichlorophenol	Ŭ	Ŭ	Ŭ	Ū	Ŭ	Ŭ	Ŭ	330	_
2,4,5-Trichiorophenol	Ŭ	Ŭ	Ŭ	Ū	Ŭ	Ŭ	Ŭ	660	100
2-Chloronaphthalene	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	330	
2-Nitroaniline	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	660	430
Dimethylphthalate	Ŭ	Ŭ	Ŭ	Ū	Ŭ	Ŭ	Ŭ	330	2,000
Acenaphthylene	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	330	41,000
2,6-Dinitrotoluene	Ŭ	υŬ	Ŭ	υ υ	U U	Ŭ	Ŭ	330	1,000
3-Nitroaniline	Ŭ	ŭ	Ŭ	Ŭ	Ŭ	U U	U U	660	500
Acenaphthene	ŭ	100 J	Ŭ Ŭ	Ŭ	720	190 J	5700	330	50,000
OLIAL FIERS		100 0	U U	0	140	<u>180 1</u>	0/00		50,000

QUALIFIERS:

U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

D: Compound concentration was obtained from a diluted analysis.

NOTES: — : Not applicable.

: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD UNDERGROUND INJECTION CONTROL INVESTIGATION

#### SURFACE AND SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

		SURFAC	ESOIL		<u>su</u>	<b>BSURFACE SC</b>			·
ALCENTRACIALES CONTRACTOR	a gran a strange	and a second	n an a' guar an	a montar	wana ngoo portona ilayo Aliana	an a service and a service of the se			
SAMPLE ID	P8B-22	IPSB-23	IP\$B-24	IP88-25	IP\$8-22	IP88-23	IP58-24		ĺ
SAMPLE DEPTH	(0-2 IN)	(0-2 IN)	(0-2 IN)	(0-2 IN)	(2-4 FT)	(2-4 FT)	(2-4 FT)	LABORATORY	NYSDEC TAGM
ATE OF COLLECTION	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03	QUANTITATION	4046 Recommended
DILUTION FACTOR	1 1	1	1	1	1	1	10	LIMITS	Soll Cleanup
PERCENT SOLIDS	87.0	90.0	89.0	85.0	89.0	73.0	83.0		Objective
	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/Kg)	(ug/Kg)
.4-Dinitrophenol	U.	U U	υ	U	U	U	U	660	200
-Nitrophenol	U U	Ŭ	ŭ	ŭ	ŭ	Ŭ	U U	660	100
	U U	57 J	Ŭ	U U	550	110 J	4000		
Dibenzofuran			-	-				330	6,200
2,4-Dinitrotoluene	U	U	U	U	U	U	U	330	-
Diethylphthalate	U U	U I	U	U	U U	U	U I	330	7,100
-Chlorophenyl-phenylether	U.	U	U.	U	U	U	U Constant	330	
fluorene	U	150 J	U	U	840	190 J	6900	330	50,000
I-Nitroanlline	U	U	U	U	U	U	U	330	-
i,6-Dinitro-2-methylphenol	U	U	U	U	U U	U	U	330	
N-Nitrosodiphenylamine	U	U	U	Ų	U U	U	U	330	-
I-Bromophenyl-phenylether	U	U	U	U	U U	U	U	330	
lexachiorobenzene	U U	U	U	U	U	U	U	330	410
Pentachlorophenol	U	U	U	U	U V	U	U	660	1,000
Phenanthrene	79 J	1400	160 J	160 J	4600	2600	48000	330	50,000
Anthracene	U U	490	υ	50 J	1200	680	15000	330	50,000
Carbazole	i u	53 J	U	υ	420	210 J	4500	330	_
Di-n-butyiphthalate	Ú	Ū	υ	U	U U	U	U	330	8,100
Fluoranthene	140 J	1800	230 J	210 J	3500	3800	49000	330	50,000
Pyrene	170 J	1700	280 J	230 J	3800	3200	53000	330	50.000
Butylbenzylphthalate	Ŭ	U	Ŭ	U	U U	U	U	330	50,000
3.3'-Dichlorobenzidine	Ŭ Ŭ	ŭ	ŭ	Ŭ	Ŭ	ŭ	ŭl	330	
Benzo(a)anthracene	L 69	880	130 J	120 J	1400	1700	23000	330	224
Chrysene	76 J	800	130 J	140 J	1400	1900	21000	330	400
bis(2-Ethylhexyl)phthalate	38 J	000	,30 U	40 J	1400 59 J	47 J	<u>21000</u>	330	50,000
	30 J U	U U	U U	47 J U	1 U 39 J	47 J U	Ŭ	330	50,000
Di-n-octylphthalate	-	•		-	1700	2400	27000		
Benzo(b)fluoranthene	100 J	1100	180 J	180 J				330	1,100
Benzo(k)fluoranthene	40 J 63 J	450	75 J 120 J	89 J 110 J	780	950	20000	330 330	1,100 61
Senzo(a)pyrene		250 J	120_J		450	580	7600	330	•
ndeno(1,2,3-cd)pyrene									3,200
Dibenz(a,h)anthracene	U	69 J	U	U	<u>130_J</u>	170 J	2100 J	330	14
Benzo(g,h,i)perylene	U	210 J	55 J	55 J	390	500	6600	330	50,000
Total PAHs	737	10,284	1,408	1,392	21,940	20,380	297200		100,000
Total CaPAHs	348	4,269	683	687	7,060	9,300	114700	-	10.000
Total SVOCs	775	10,337	1,408	1.439	24,279	20,973	310,540	_	500,000
UALIFIERS:					TES:				

U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

D: Compound concentration was obtained from a diluted analysis.

- : Not applicable.

: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD UNDERGROUND INJECTION CONTROL INVESTIGATION

# SURFACE AND SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

			SUBSURF				1		
allestriktanenka)terneten singer	A MICHAR			(Tollin and 200)		an a			
SAMPLE ID	IP88-25	IP88-21	IP88-21	IP88-21	IP88-21	IP88-21	1		
SAMPLE DEPTH	(2-4 FT)	(10-12 FT)	(12-14 FT)	(14-16 FT)	(16-18 FT)	(18-20 FT)		LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03		QUANTITATION	4046 Recommended
DILUTION FACTOR	1	2	1	1	1	1	4	LIMITS	Soli Cleanup
PERCENT SOLIDS	77.0	32.0	33.0	48.0	89.0	85.0	l I		Objective
	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)		(ug/Kg)	(ug/Kg)
hanol	U	υ υ	U	υ	350 J	υ		330	30
is(2-Chloroethyl)ether	l ũ	Ŭ	Ū	Ŭ	<u>_</u>	Ŭ		330	50
-Chlorophenol	U U	Ŭ	Ŭ	l ŭ	ŭ	υ		330	800
,3-Dichlorobenzene	υ	ιŭ	Ŭ	l ŭ	υ	l ŭ		330	
I,4-Dichlorobenzene	l ŭ	υ	Ŭ	Ŭ	υ	υŬ		330	
.2-Dichlorobenzene	l ŭ	Ŭ	ບັ	Ŭ	Ŭ	υ	{	330	-
2-Methylphenol	U U	U U	ບ ບ	Ŭ	ม ม	U U	(	330	100
2,2-oxybis (1-chloropropane)	U U	l ŭ	u u	U U	U U			330	100
-Methylphenol	ບ ບ	) Ŭ	Ŭ	U U	48 J			330	900
Nitroso-di-n-propylamine	i ŭ	ί Ŭ	υ	U U	40 J U			330	900
iexachioroethane	ι ŭ	υ	Ŭ	Ŭ	Ŭ			330	-
litrobenzene		υ	ບ ບັ	υ	υ υ	υ		330	200
sophorone	l ŭ	U U	U U	U U	-	-			
-Nitrophenol		-		-	U U	U		330	4,400
2,4-Dimethylphenol		U	-	U	U U	U		330	330
2,4-Dimethylphenot		U U	[ ປ ປ	U U	U U U	U U		330	400
.2.4-Trichlorobenzene	ŭ		ບ ບ	υ υ		U		330 <b>33</b> 0	400
Naphthalene	Ŭ	U	U U	. U	[ ]	U U U	1	330	13.000
-Chloroaniline	Ŭ	i ü		U U					
is(2-Chloroethoxy)methane	U U		U U	U U		U U		330 330	220
iexachiorobutadiene	υ		U U	U U				330	-
-Chloro-3-methylphenol	Ŭ	υ υ	υ	ບ ບ	U U	υ	(	330	240
-Methyinaphthalene	l ŭ	l ŭ	Ŭ	Ŭ	U U	Ŭ		330	36,400
lexachiorocyclopentadiene	Ŭ	Ŭ	U U	U U	l ŭ	U U		330	36,400
,4,6-Trichlorophenol	l ŭ		U U	່ບ		ΙŬ	}	330	_
,4,5-Trichlorophenoj	Ŭ	Ŭ	U U	U U	i ŭ	Ŭ		660	100
-Chloronaphthalene	u u	ໄ ບັ	ບ ບ	U U	ບ 1 ບ	ί υ		330	
-Nitroaniline	ŭ	l ŭ	Ŭ	l ŭ	U U	Ŭ		660	430
limethylphthalate	Ŭ	l ŭ	U U	U U	l ŭ				
cenaphthylene	ι υ		U U	U U	ι υ υ			330	2,000
,6-Dinitrotoluene			, v	-	U U	U		330	41,000
-Nitroaniline			U U	ບ ບ	ι υ Ι υ	U		330	1,000
cenaphthene	83 J	2300	420 J	ม เ	្រ ប ប	บ บ	1	660 330	500
UALIFIERS:		<u> </u>	420 J	NO		U	L	330	50,000

U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

t

- : Not applicable.

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD UNDERGROUND INJECTION CONTROL INVESTIGATION

#### SURFACE AND SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

			SUBSURF					·
UIONSTRUCTUR SAMPLE ID SAMPLE DEPTH DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	<b>IP\$B-25</b> (2-4 FT) 1/29/03 1 77.0 (ug/kg)	IPSB-21 (10-12 FT) 1/29/03 2 32.0 (ug/kg)	IPSB-21 (12-14 FT) 1/29/03 1 33.0 (ug/kg)	IPSB-21 (14-16 FT) 1/29/03 1 48.0 (ug/kg)	<b>IPSB-21</b> (16-18 FT) 1/29/03 1 89.0 (ug/kg)	IPSB-21 (18-20 FT) 1/29/03 1 85.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/Kg)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective (ug/Kg)
2,4-Dinitrophenol 4-Nitrophenol Dibenzofuran 2,4-Dinitrotoluene Diethyiphthalate 4-Chlorophenyi-phenylether Fluorene 4-Nitroaniline 4,8-Dinitro-2-methylphenol N-Nitrosodiphenylamine 4-Bromophenyl-phenylether Hexachlorobenzene Pentachlorophenol Phenanthrene Anthracene Carbazole Di-n-butyiphthalate Fluoranthene Pyrene Butylbenzyiphthalate 3,3-Dichlorobenzidine Benzo(a)anthracene Chrysene bis(2-Ethylhexyl)phthalate Di-n-octyiphthalate Benzo(b)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(a,h)perylene	47 J 47 J U U U 87 J U U 870 170 J 840 170 J 8470 170 J 8470 190 J 190 J 1	U 550 J U U 1400 J U U U U U 12000 3700 1200 J U 18000 19000 19000 U U U 8700 8700 8700 0 0 U U U U U 0 0 0 0 0 0 0 0 0 0 0	U 100 J U 270 J U 270 J U U 2400 750 J 260 J U U 3900 3800 U U 1800 1900 U U 2400 1900 0 U U U 1800 610 J 170 J 550 J	<ul> <li>כככ כ כ כ כ כ כ כ כ כ כ כ כ כ כ כ כ כ</li></ul>	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	U U U U U U U U U U U U U U U U U U U	660 660 330 330 330 330 330 330 330 330	200 100 6,200 
Total PAHs Total CaPAHs Total SVOCs QUALIFIERS:	4,986 1,990 5,260	103,750 44,200 104,950	2 <b>2,</b> 070 9,880 22,330	0 0 0 NO	126 0 174	0		100,000 10,000 500,000

QUALIFIERS: U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

<u>NOTES:</u> \_--\_: Not applicable.

: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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# ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD UNDERGROUND INJECTION CONTROL INVESTIGATION

# SURFACE AND SUBSURFACE SOIL - TOTAL PETROLEUM HYDROCARBONS (TPH)

·		SURFA	CE SOIL		SU	OIL I		
DICEMENT SAMPLE ID SAMPLE DEPTH DATE OF COLLECTION PERCENT SOLID UNITS	IPSB-22 (0-2 IN) 1/29/03 87.0 (mg/kg)	IPSB-23 (0-2 IN) 1/29/03 90.0 (mg/kg)	IPSB-24 (0-2 IN) 1/29/03 89.0 (mg/kg)	IPSB-25 (0-2 IN) 1/29/03 85.0 (mg/kg)	IPSB-22 (2-4 FT) 1/29/03 89.0 (mg/kg)	(2-4 FT) 1/29/03 73.0 (mg/kg)	IPSB-24 (2-4 FT) 1/29/03 83.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (mg/kg)
Total Petroleum Hydrocarbons	260	150	810	69	40	49	1600	12.0

			SUBSURF	ACE SOIL			 
DIGRAFT DE CONTRA	f sign strikes	the states of the	et in de la set	training and the second	Ne gui per el	n an ann an ann an ann an an Stallachan Albana an Stalla	
SAMPLE ID SAMPLE DEPTH DATE OF COLLECTION PERCENT SOLID UNITS	<b>IPSB-25</b> (2-4 FT) 1/29/03 77.0 (mg/kg)	IPSB-21 (10-12 FT) 1/29/03 32.0 (mg/kg)	IPSB-21 (12-14 FT) 1/29/03 33.0 (mg/kg)	IPSB-21 (14-16 FT) 1/29/03 48.0 (mg/kg)	IPSB-21 (16-18 FT) 1/29/03 89.0 (mg/kg)	IPSB-21 (18-20 FT) 1/29/03 85.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (mg/kg)
Total Petroleum Hydrocarbons	140	330	250	ND	23	ND	

Notes: ND: Not Detected

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD GROUNDWATER ASSESSMENT

# GROUNDWATER - TARGET ANALYTE LIST METALS (TAL Metals)

SAMPLE ID	IPGP-01	IPGP-01	IPGP-02	IPGP-02	IPGP-03	IPGP-03	IPTP-03	IPTP-03	INSTRUMENT	NY STATE CLASS GA
	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	DETECTION	GROUNDWATER
DATE OF COLLECTION	1/30/03	1/30/03	1/30/03	1/30/03	1/30/03	1/30/03	1/22/03	1/22/03	LIMIT	STANDARDS/
DILUTION FACTOR		1	1	1	1	1	1	1	(IDL)	GUIDELINES
UNITS	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Aluminum	8950	່ ບ	3310	Ū	64600	35.8 B	NA	NA	12	
Antimony	4.6 B	3.3 B	4,4 B	ບ	3.2 B	4.1 B	NA	NA	3	3 ST
Arsenic	11.8 8		4.7 B	U	66.8	3.2 B	60,4	20.1	3	25 ST
Barium	78.1 8	34.3 B	90.7 B	60.8 B	273	50.1 B	179 B	67.9 B	3	1,000 ST
Beryllium	0.53 B	Ū	U	U	4 B	U	NA	NA	2	3 GV
Cadmium	0.71 B	U	U	ບ	7.3	U	υ	υ	2	5 ST
Calcium	110000	109000	67800	66200	66300	61500	NA	NA	76	. !
Chromium	74.8	2.5 B	34.1 B	. u <b>l</b>	130	U	28.8	υ	3	50 ST
Cobait	5.5 B	Ū	1.8 B	Ŭ	43.6 B	1.9 B	NA	NA	3	
Copper	96.7 B	Ū	27.6 B	Ū	242	Ū	NA	NA	2	200 GA
Iron	34000	1370	5480	39.6 B	118000	757	NA	NA	35	300 ST*
Lead	96.1	U	59.7	υ U	181		74.2	U	1	25 ST
Magnesium	26300	24100	10500 B	10200 B	23100	14000 B	NA	NA	23	35,000 GV
Manganese	508	339	136	82.5	1010	275	NA	NA	2	300 ST*
Mercury	0.17 B	U	0.16 B	U	0.64 B	U	0.19 B	U	0.1	0.7 ST
Nickel	37.8 B	1.7 B	18 B	1.6 8	117 B	6.5 B	NA	NA	1	100 ST
Potassium	23800	22100	32700	34300	45200	40000	NA	NA	89	[ ]
Selenium	U U	U	υ	U	U	U	l ul	U	8	10 ST
Silver	4.1 B	υ	11.2 B	U	Ŭ	U	Ι υ	U	2	50 ST
Sodium	82800	81600	35700	36600	37100	32400	NA	NA	118	20,000 ST
Thallium	6.3 B	5.2 B	U	5.3 B	U	4.2 B	NA	NA	4	0.5 GV
Vanadium	39.2 B	5.6 B	10 B	3.1 B	154 B	3 B	NA	NA	3	- I
Zinc	235 B	9 B	57.2 B	9.2 B	4050	50.7 B	NA	NA	8	2,000 GV

# QUALIFIERS:

U: Compound analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL. NA: Not Analyzed for

# NOTES:

: Not applicable.

ST : New York State Ambient Water Quality Standards

GV : New York State Ambient Water Quality Guidance Values

ST\*\_\_: Standard for the sum of iron and manganese is 500 ug/l

: Value exceeds Standard/Guideline.

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD GROUNDWATER ASSESSMENT

#### GROUNDWATER - VOLATILE ORGANIC COMPOUNDS (VOCs)

SAMPLE ID	IPGP-01	(PGP-02	(PGP-03	IPTP-03	LABORATORY	NY STATE CLASS GA
DATE OF COLLECTION	1/30/03	1/30/03	1/30/03	1/22/03	QUANTITATION	GROUNDWATER STANDARDS/
DILUTION FACTOR	1 {	1	1	1	LIMITS	GUIDELINES
UNITS	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/L)	(ug/L)
Dichlorodifluoromethane			U	U	5	5 ST
Chloromethane	U ·	υ	U	) Ú	1 5	
Vinyi Chioride	υ	Ŭ	Ū	) , Ū	1 5	2 ST
Bromomethane	υ	Ŭ	Ū	Ū	5	5 ST
Chloroethane	U	Ú	Ū	U	5	5 ST
Trichlorofluoromethane	U	U	U	! U	5	5 ST
1,1-Dichloroethene	U	U	U	U	5	5 ST
Acetone	U	U	U U	U	5	50 GV
Idomethane	U I	U	រ ប	ט !	5	
Carbone Disulfide	1 J	Ŭ	Ū	Ū Ū	5	-
Methylene Chloride	U	υ	Ū	) Ū	5	5 ST
trans-1,2-Dichloroethene	U	υ	ن (	ł ŭ	5	5 ST
Methyl tert-butyl ether	5	2 J	6	Ŭ Ŭ	5	10 GV*
1,1-Dichloroethane	U•	Ū	) U	Î Û	5	5 ST
Vinyl acetate	Ū	Ū	) Ū	ł ū	5	_
2-Butanone	Ū	Ū	ιŪ	lŪ	5	-
cis-1,2-Dichloroethene	υ	Ú	l Ū	l ū	5	5 ST
2,2-Dichloropropane	U	U	Ŭ	( U	5	5 ST
Bromochioromethane	U	U	Ú Ú	l Ū	5	5 ST
Chloroform	υĮ	U	Ū	i u	5	7 ST
1,1,1-Trichloroethane	U l	Ű	Ū	t ū	5	5 ST
1,1-Dichloropropana	Ū	Ū	i ŭ	) Ū	5	5 ST
Carbon Tetrachloride	U	Û	Ū Ū	) Ū	5	5 ST
1,2-Dichloroethane	U	υ	U	U	5	0.6 ST
Benzene	U	U	U	) U	5	1 ST
Trichloroethene	υ I	U	U	ι υ	5	5 ST
1,2-Dichloropropane	υĺ	U	l u	L U	5	1 ST
Dibromomethane	Ū	Ŭ	l ū	Ū	5	5 ST
Bromodichloromethane	Ū	Ũ	l ũ	Ū	5	50 GV
cis-1,3-Dichloropropane	U	Ú	l ú	Ū	5	-
4-Methyl-2-pentanone	υĮ	U	Ú	l Ú	5	
Toluene	U	Ú	ί <u>υ</u>	i ŭ	5	5 ST
trans-1,3-Dichloropropene	Ū	บ	Ū	1 Ū	5	0.4 ST
1,1,2-Trichloroethane	Ū Į	Ū	l ū	1 Ū	5	1 ST

#### QUALIFIERS:

U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

U\*: Compound qualified as non-detect due to validation criteria,

# NOTES:

: Not applicable.

: Draft Guidance Value

: New York State Ambient Water Quality Standards



Value exceeds the referenced criteria.

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD GROUNDWATER ASSESSMENT

#### GROUNDWATER - VOLATILE ORGANIC COMPOUNDS (VOCs)

SAMPLEID	IPGP-01	IPGP-02	IPGP-03	IPTP-03	LABORATORY	NY STATE CLASS GA
DATE OF COLLECTION	1/30/03	1/30/03	1/30/03	1/22/03	QUANTITATION	GROUNDWATER STANDARDS/
DILUTION FACTOR	1	1 1	1	1 1	LIMITS	GUIDELINES
UNITS	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/L)	(ug/L)
1,3-Dichloropropane		0	0		5	551
Tetrachloroethene	U	JU	U	) U	5	) 5 ST
2-Hexanone	U	U	U	U	5	50 GV
Dibromochloromethane	U	U	U	U	5	50 GV
1,2-Dibromoethane	U	U	U	ι U	5	-
Chiorobenzene	U	( U I	U	[ ບ	5	5 ST
1,1,1,2-Tetrachloroethene	υ	U	U	່ ບ	5	5 ST
Ethylbenzene	υ	U	U	] <b>ບ</b>	5	5 ST
m,p-Xylane	υ	U	U	) U	5	
o-Xylene	U ·	U U	U	ί υ	5	-
Xylene (total)	U	U U	U	U	5	5 ST
Styrene	U	U	U	U	5	5 ST
Bromoform	U	U	U	l U	5	50 GV
Isopropyibenzene	U	U	U	ί υ	5	5 ST
1,1,2,2-Tetrachloroethane	U	) U	U	U	5	5 ST
Bromobenzene	υ	U	U	U U	5	5 ST
1,2,3-Trichloropropane	υ	U	U	U U	5	0.04 ST
n-Propylbenzene	U	U U	U	U U	5	5 ST
2-Chlorotoluene	U	U U	U	ί υ	5	5 ST
1,3,5-Trimethylbenzene	υ	U	U	) U	5	5 ST
4-Chlorotokiene	U	U	U	U	5	5 ST
tert-Butylbenzene	U	U	U	U	5	5 ST
1,2,4-Trimethylbenzene	U	U U	U	U U	5	5 ST
sec-Butylbenzane	U	U	U	U	5	5 ST
4-isopropyltoluene	ប	U	1 J	U	5	5 ST
1,3-Dichlorobenzene	U	U	U	υ	5	3 ST
1,4-Dichlorobenzene	U	U	U	) υ	5	3 ST
n-Butylbenzene	υ	) U	U	j u	5	5 ST
1,2-Dichlorobenzene	υ	1 U	U	l u	5	3 ST -
1,2-Dibromo-3-chioropropane	U	U U	U	U	5	0.04 ST
1,2,4-Trichlorobenzene	U	U U	U	U U	5	5 ST
Hexachlorobutadiene	U	( U	U	ໄ <u>ບ</u>	5	0.5 ST
Naphthaiene	U	18	U .	Ι υ	5	10 GV
1,2,3-Trichlorobenzene	Ŭ		Ū	l ū	5	5 ST

QUALIFIERS: U: Compound analyzed for but not detected. J: Compound found at a concentration below the detection limit.

U": Compound qualified as non-detect due to validation criteria.

#### NOTES: -

: Not applicable.

. : Draft Guidance Value ST

: New York State Ambient Water Quality Standards G٧

: New York State Ambient Water Quality Guidance Values

: Value exceeds the referenced criteria.

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD GROUNDWATER ASSESSMENT

#### GROUNDWATER - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs) 1 IPGP-02 NY STATE CLASS GA SAMPLE ID IPOP-01 IPGP-03 IPTP-03 LABORATORY DATE OF COLLECTION 1/30/03 1/30/03 1/30/03 1/22/03 QUANTITATION GROUNDWATER STANDARDS/ DILUTION FACTOR LIMITS GUIDELINES 1 1 1 1 UNITS (ug/l) (ug/l) (ug/i) (ua/L) (ug/i) (ua/L) 1 ST\* Phenol u U1 U. u 10 bis(2-Chloroethyl)ether u 11 11 u 10 ----2-Chlorophenol u υ υ U 10 \_ 1,3-Dichlorobenzene U Ú U 10 3 ST υ U 1.4-Dichlorobenzene υ υ U 10 3 ST 1.2-Dichlorobenzens U υ U υ 10 3 ST 2-Methylphenol ú υ Ù υ 10 ----2.2'-oxybis (1-chloropropane) u υ υ υ 10 -U U 4-Methylphenol υ υ 10 -N-Nitroso-di-n-propylamine u U υ U 10 ----Hexachloroethane u U υ U 5 ST 10 Nitrobenzene u υ υ U 10 0.4 ST Ū Isophorone U ΰ. U 10 50 GV 2-Nitrophenol U υ υ U 10 -Û 50 GV 2,4-Dimethylphenol u U υ 10 2.4-Dichlorophenoi Ū U υ υ 10 5 ST 1.2.4-Trichlorobenzene U U U U 10 5 ST Naphthalene U 52 υ 10 10 GV 8 J 4-Chloroaniline U 5 ST U υ U 10 bis(2-Chloroethoxy)methane U υ υ υ 10 ---Hexachlorobutadiene U U บ υ 10 0.5 ST 4-Chloro-3-methylphenol U U 10 U u -2-Methylnephthalene U ũ IJ. 10 8 J -Hexachiorocyclopentadiene U U υ 5 ST U 10

# Acenaphthene

3-Nitroaniline

2-Nitroaniline

Dimethylphthalate

Acenaphthylene

2,6-Dinitrotoluene

2,4,6-Trichlorophenol

2.4.5-Trichlorophenol

2-Chloronaphthalene

NOTES:

U: Compound analyzed for but not detected. J: Compound found at a concentration below the detection lim

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: Not applicable. : Applies to the sum of all Phenois

lim \* : Applies to the ST : New York St

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: New York State Ambient Water Quality Standards

: New York State Ambient Water Quality Guidance Values

: Result exceeds NYS Class GA Standard/Guideline

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10 GV

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5 ST

5 ST

20 GV

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD GROUNDWATER ASSESSMENT

#### GROUNDWATER - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	IPGP-01	IPGP-02	IPGP-03	IPTP-03	LABORATORY	NY STATE CLASS GA
DATE OF COLLECTION	1/30/03	1/30/03	1/30/03	1/22/03	QUANTITATION	GROUNDWATER STANDARDS/
DILUTION FACTOR	1		1	1 1	LIMITS	GUIDELINES
UNITS	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/L)	(ug/L)
2,4-Dinitrophenol	U	υ	υ	υ	20	10 GV
4-Nitrophenol	ũ	ł Ū	Ŭ	U	20	-
Dibenzofuran	Ũ	10	4 J	Ū	10	_
2.4-Dinitrotoluene	Ŭ	U	U	U	10	5 ST
Diethylphthalate	Ŭ	U	Ű	່	10	50 GV
4-Chlorophenyl-phenylether	ŭ	Ū	4 J	Ū	10	
Fluorene	ŭ	12	ŭ	ŭ	10	50
4-Nitroanline	ŭ	U	ŭ	Ū	20	5 ST
4,6-Dinitro-2-methylphenol	ŭ	Ŭ	ŭ	Ū	20	-
N-Nitrosodiphenylamine	Ŭ	1 Ū	Ŭ	Ū	10	50 GV
4-Bromophenyi-phenyiether	Ŭ	l u	Ŭ	υ	10	-
Hexachlorobenzene	Ŭ	Ū.	ย์	Ŭ	10	0.04 ST
Pentachlorophenol	ŭ	l ŭ	ŭ	Ŭ Ŭ	20	1 ST
Phenanthrene	ŭ	31	ธมั	l ŭ	10	50 GV
Anthracene	ŭ	6 J	1 J	Ŭ	10	50 GV
Carbazole	Ŭ	16	Ū	Ū	10	-
Di-n-butylphthalate	U	່ ບ	U	U	10	-
Fluoranthene	Ŭ	20	2 J	U	10	50 GV
Pyrene	Ŭ	14	Ū	l ū	10	50 GV
Butylbenzylphthalate	Ŭ	l U	Ŭ	Ū	10	50 GV
3.3'-Dichlorobenzidine	Ū	- U	Ū	Ū	10	5 ST
Benzo(a)anthracene	Ŭ	7 J	U	U	10	-
Chrysene	U	7 J	U	ί υ	10	0.002 GV
bis(2-Ethylhexyl)phthalate	Ŭ	l	U	υ	10	-
Di-n-octylphthalate	Ŭ	ŰŬ	Ŭ	Ū	10	50 GV
Benzo(b)fluoranthene	ŭ	8 J	ū	l ŭ	10	0.002 GV
Benzo(k)fluoranthene	บ้	4 J	บ้	ĪŪ	10	0.002 GV
Benzo(a)pyrene	ŭ	5 J		l ŭ	10	NDST
		3 J	8	l ñ	10	0.002 GV
Indeno(1,2,3-cd)pyrene	0					0.002 GV
Dibenzo(a,h)anthracene	U	U L E	0		10 10	-
Banzo(g,h,i)perylene	<u> </u>	<u> </u>	U	<u>U</u>	10	~

QUALIFIERS: U: Compound analyzed for but not detected.

NOTES:

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J: Compound found at a concentration below the detection lim

: Not applicable.

: New York State Ambient Water Quality Standards : New York State Ambient Water Quality Guidance Values : Result exceeds NYS Class GA Standard/Guideline

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### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD GROUNDWATER ASSESSMENT

# GROUNDWATER - POLYCHLORINATED BIPHENYLS (PCBs)

SAMPLE ID DATE OF COLLECTION DILUTION FACTOR UNITS	IPGP-01 1/30/03 1 (ug/I)	IPGP-02 1/30/03 1 (ug/i)	IPGP-03 1/30/03 1 (ug/l)	IPTP-03 1/22/03 1 (ug/l)	LABORATORY QUANTITATION LIMITS (ug/L)	NY STATE CLASS GA GROUNDWATER STANDARDS/ (ug/L)
Arocior- 1016	U	U	1)	υ	1	
Aroclor- 1221	Ū I	Ŭ	ũ l	Ŭ	1	
Aroclor- 1232	Ū	Ū	Ū	Ŭ	1	
Arocior- 1242	υ	U	υ	U	1	
Aroclor- 1248	υ	υ	υ	U	) 1	-
Aroclor- 1254	U	U	U	υ	1	
Aroclor- 1260	U	U	U	Ų	1	-
TOTAL PCBs	0	0	0	0	-	0.09 ST

QUALIFIERS:

NOTES:

ST

U: Compound analyzed for but not detected.

: Not applicable.

: New York State Ambient Water Quality Standards

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# ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

## SUBSURFACE SOIL - RCRA METALS

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	IP\$BX-01 (4-6) 1/27/03 73.0 (mg/kg)	IPSBX-01 (6-8) 1/27/03 24.0 (mg/kg)	iPSBX-01 (8-10) 1/27/03 31.0 (mg/kg)	IPSBX-01 (10-12) 1/27/03 27.0 (mg/kg)	IPSBX-01 (12-14) 1/27/03 25.0 (mg/kg)	IP\$BX-01 (14-16) 1/27/03 44.0 (mg/kg)	IPSBX-01 (16-18) 1/27/03 60.0 (mg/kg)	IPSBX-01 (18-20) 1/27/03 92.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/I)	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective (mg/kg)
Araenic Barium	2.6 19.9	5.8 29.6 B	5.6 29.2	7.6 30.3 B	5.5 24.9 B	13.7 26.3	5.2 8.3 B	2.6 1.3 B	3.0 3.0	7.5 or SB 300 or SB
Cadmium Chromium Lead	0.21 B 6.4 14.1	0.55 B 29.8 6 B	0.43 B 35.5 9.8	0.68 B 40.3 9.1	0.6 B 34 7	0.69 25.3 15,5	0.27 B 9.5 6.5	3.2 1.3 B	2.0 3.0 1.0	10* 50* SB**
Mercury Selenium	0.036 B	0 B U	9.8 U	9.1 U	໌ ບ	0.044 B	6.5 U	1.3 B U	0.1	0.1
Silver	U	0.93 B	0.9 B	1.3 B	0.99 B	1.1_B	0.6 B	0.2 B	8.0 2.0	2 or SB SB

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	IPSBX-02 (6-8) 1/28/03 68.0 (mg/kg)	IP\$8X-02 (8-10) 1/28/03 39.0 (mg/kg)	(10-12) 1/28/03 81.0 (mg/kg)	IPSBX-02 (12-14) 1/28/03 47.0 (mg/kg)	iPSBX-02 (14-16) 1/28/03 42.0 (mg/kg)	iPSBX-02 (16-18) 1/28/03 83.0 (mg/kg)	IPSBX-02 (18-20) 1/28/03 58.0 (mg/kg)	IPSBX-03 (6-8) 1/28/03 81.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective (mg/kg)
Arsenic Barium	8.2 33.9	11.7	1.4 4.1 B	6.6 15.3 B	<u>8.7</u> 25.9	2.5 5.6 B	3.3 13.1 B	1.6 5.2 B	3.0 3.0	7.5 or SB 300 or SB
Cadmium	0.66 20.4	0.64 28.8	ັບ 3.8	0.41 B 16.8	0.76 33.9	Ū	0.25 B 12.8	4.1	2.0 3.0	10* 50*
Lead	15.3	14.8	1,6 B	6.5	7.4	2 B	4.2	3	1.0	SB**
Mercury	0.043 B	0.12 B	U	U	U	U	U	U	0.1	0.1
Selenium Sliver	ບ ບ	18	0.25 B	0.83 B	U 1.4 B	0.31 B	0.58 B	0.35 B	8.0 2.0	2 or SB SB

QUALIFIERS: U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

#### Notes:

SB: Site Background

\*: As per proposed 4/95 NSDEC TAGM

\*\*: Average background levels in metropolitan or surburban areas or near highways range from 200-500 ppm.

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: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

#### **ISLAND PARK SUBSTATION** LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - RCRA METALS

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	(8-10) (8-10) 1/28/03 85.0 (mg/kg)	IPSBX-03 (10-12) 1/28/03 81.0 (mg/kg)	IPSBX-03 (12-14) 1/28/03 44.0 (mg/kg)	IPSBX-03 (14-16) 1/28/03 81.0 (mg/kg)	IPSBX-03 (16-18) 1/28/03 53.0 (mg/kg)	IPSBX-03 (18-20) 1/28/03 76.0 (mg/kg)	(PS8X-04 (4-6) 1/28/03 56.0 (mg/kg)	(6-8) (6-8) 1/28/03 61.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective (mg/kg)
Arsenic	1,2	1.4	5.9	1.7	5.9	2.5	16.2	9.2	3.0	7.5 or SB
Barlum	6.2 B	6 B	24.7	5 B	19.7	6 B	29.7	18.4	3.0	300 or SB
Cadmium	U	U	0.8	U	0.52	0.14 B	1.1	0.74	2.0	10*
Chromium	4.5	4.4	27.3	4.9	18.6	8.4	31.5	21.5	3.0	50*
Lead	1.7 B	2 B	8	5.7	36	2.7	15.4	8	1.0	SB**
Mercury	U	U	U	U	0.25	U	U	U [	0.1	0.1
Selenium	U	U	υ	υ	<u> </u>	υ	U	υ	8.0	2 or SB
Sliver	0.3 B	0.3_8	1.4 B	_0.31_B	0.93 B	0.38 B	1.3 B	1.2 B	2.0	SB

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	(8-10) 1/28/03 40.0 (mg/kg)	IPSBX-04 (10-12) 1/28/03 75.0 (mg/kg)	(12-14) 1/28/03 65.0 (mg/kg)	(14-16) 1/28/03 78.0 (mg/kg)	IPSBX-04 (16-18) 1/28/03 80.0 (mg/kg)	(18-20) 1/28/03 52.0 (mg/kg)	IPSBX-05 (10-12) 1/23/03 52.0 (mg/kg)	IPSBX-05 (12-14) 1/23/03 78.0 (mg/kg)	INSTRUMENT DETECTION LIMITS	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective (mg/kg)
Arsenic	6.2	1.4	5.6	3	1.8	3.5	4	2.6	3.0	7.5 or SB
Barium	27.3	5.9 B	15.4	4.6 B	5.9 B	12.4 B	24.9	4.5 B	3.0	300 or SB
Cadmium	1	U	0.42	0.16 B	U	0.25 B	0.48	U	2.0	10*
Chromlum	33.6	4.7	15.5	5.9	7.2	12.4	33.2	6.8	3.0	50*
Lead	9.5	8.5	5.6	2.4 B	2.3 B	5	7.7	2.7	1.0	SB**
Mercury	U	ų	U	U	U	υ	U	U U	0.1	0.1
Selenium	U	Ú	U	U (	U	U ]	U	U	8.0	2 or SB
Silver	1.6 B	0.28 B	<u>1.1 B</u>	0.37_B	0. <u>34</u> B	<u>0.61</u> B	0.33 B	0.12 B	2.0	SB

OUALIFIERS: U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

# Notes:

SB: Site Background

\*: As per proposed 4/95 NSDEC TAGM

\*\*: Average background levels in metropolitan or surburban areas or near highways range from 200-500 ppm.

: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - RCRA METALS

IPSBX-05 IPSBX-06 IPSBX-06 SAMPLE ID IP\$8X-05 IPSBX-05 IPSBX-06 IPSBX-06 IPSBX-06 INSTRUMENT NYSDEC TAGM 4046 SAMPLE DEPTH (FT) (14-16)(16-18) (18-20) (4-6) (14-16) DETECTION (6-8) (8-10) (12-14) 1/23/03 1/23/03 1/23/03 1/27/03 1/27/03 1/27/03 1/27/03 1/27/03 LIMITS **Recommended Soli** DATE OF COLLECTION PERCENT SOLIDS 88.0 86.0 88.0 88.0 68.0 53.0 66.0 0.98 Cleanup Objective UNITS (mg/kg) (mg/kg) (mg/kg) (mg/kg) (mg/kg) (mg/kg) (mg/kg) (mg/kg) (ug/l) (mg/kg) 7.5 or SB 2.4 3.0 Arsenic 3.1 3.1 2.5 3.2 6.3 12.5 1.7 Barium 2.5 B 1.8 B 2 B 12.8 29.6 30.7 7.8 B 2.2 B 3.0 300 or SB Cadmium 0.27 B 2.0 10\* U 0.54 1.2 0.14 B υ U U 5.2 13.7 16.9 35.6 7.6 3.2 3.0 50\* Chromium 3.1 2.8 S8\*\* 18 12.3 12.3 1.9 B 1 B 1.0 Lead 2.4 1.2 1.1 0.1 Mercury U U U 0.019 B 0.037 B 0.041 B U. 11 0.1 U Selenium U υ υ 1 B U. U U 8.0 2 or SB Silver 0.13 B 0.11 B υ υ U 1.7 B 0.45 B 0.25 B 2.0 SB

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	<b>iPSBX-06</b> (16-18) 1/27/03 69.0 (mg/kg)	iPSBX-06 (18-20) 1/27/03 53.0 (mg/kg)	(4-8) 1/27/03 87.0 (mg/kg)	IPSBX-07 (6-8) 1/27/03 69.0 (mg/kg)	(PSBX-07 (8-10) 1/27/03 54.0 (mg/kg)	(10-12) 1/27/03 83.0 (mg/kg)	IPSBX-07 (12-14) 1/27/03 54.0 (mg/kg)	IPSBX-07 (14-16) 1/27/03 47.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/I)	NYSDEC TAGM 4048 Recommended Soll Cleanup Objective (mg/kg)
Arsenic	4.7	4.3	2	10.2	17.2	1.4	6.1	5.9	3.0	7.5 or SB
Barium	10.3 B	13.1 B	28.6	18.4	30.4	5.5 B	18.3	24.5	3.0	300 or SB
Cadmium	0.26 B	0.38 B	0.46	0.68	1.5	0.12 B	0.48	0.47 B	2.0	10*
Chromium	13.2	14.2	12	19.5	38.2	5.5	19.3	29,3	3.0	50*
Lead	3.5	4	7.3	6.2	13.3	3.7	6.1	8.7	1.0	SB**
Mercury	U	υ	U	U	0.038 B	U	U	U	0.1	0.1
Selenium	υ	υ	Ű	υ	l u	U	U	U	8.0	2 or SB
Silver	0.55 B	0.88 B	Ū	18	1.6 B	0.27 B	0.95 B	0.83 B	2.0	SB

QUALIFIERS:

U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

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## Notes:

SB: Site Background

\*: As per proposed 4/95 NSDEC TAGM

\*\*: Average background levels in metropolitan or surburban areas or near highways range from 200-500 ppm. : Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - RCRA METALS

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	IPSBX-07 (16-18) 1/27/03 64.0 (mg/kg)	IPSBX-07 (18-20) 1/27/03 41.0 (mg/kg)	1PSBX-08 (4-6) 1/28/03 77.0 (mg/kg)	IPSBX-08 (6-8) 1/28/03 72.0 (mg/kg)	IPSBX-08 (8-10) 1/28/03 66.0 (mg/kg)	IPSBX-08 (10-12) 1/28/03 60.0 (mg/kg)	(PSBX-08 (12-14) 1/28/03 78.0 (mg/kg)	IPSBX-08 (14-16) 1/28/03 76.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective (mg/kg)
Arsenic	5.2	8.6	5.9	9.2	13.8	2.3	2.2	2.1	3.0	7.5 or SB
Barlum	14.5 B	25.6	6.9 B	16.4	31.1	17.4	11.1 B	9.2 B	3.0	300 or SB
Cadmium	0.4	0.81	0.26 B	0.63	1.1	0.2 B	0.17 B	0.16 B	2.0	10*
Chromium	14,6	32.5	7.1	16.5	30.7	7.2	7.9	7.3	3.0	50*
Lead	5.6	10.3	2.6	6.9	10.8	3.3	2 B	2.4 B	1.0	SB**
Mercury	U	U	U	U	0.025 B	U	U	U U	0.1	0.1
Selenium	U	υ	υ	υ	U	U	υ	U	8.0	2 or SB
Silver	0. <u>75</u> B	1.3 B	0.4 <u>8</u> B	0. <u>99_</u> B	1.4_B	0.5 B	0.48 B	0.4 B	2.0	SB

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	IP\$BX-08 (16-18) 1/28/03 48.0 (mg/kg)	iP\$8X-08 (18-20) 1/28/03 90.0 (mg/kg)	IPSBX-09 (4-6) 1/29/03 84.0 (mg/kg)	IPSBX-09 (6-8) 1/29/03 65.0 (mg/kg)	IPSBX-09 (8-10) 1/29/03 52.0 (mg/kg)	(10-12) (10-12) 1/29/03 69.0 (mg/kg)	IPSBX-09 (12-14) 1/29/03 46.0 (mg/kg)	(14-16) (14-16) 1/29/03 89.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/i)	NYSDEC TAGM 4048 Recommended Soll Cleanup Objective (mg/kg)
Arsenic	2.6	1.6	4.3	11.7	23.1	2	5.2	2.3	3.0	7.5 or SB
Barium	15 B	2.7 B	19.4	23.1	29.9	7 B	18.7	1.6 B	3.0	300 or SB
Cadmlum	0.25 B	υ	U	0.2 B	0.36 B	υ	U	U	2.0	10*
Chromium	9.5	3.2	9.8	27	38.9	8.3	24	3.4	3.0	50*
Lead	2.9 B	1.3 B	14.9	11.2	17,7	2.2 B	7.5	1.4 B	1.0	SB**
Mercury	U	U	υ (	υ	υ	U	U (	U	0.1	0.1
Selenium	U.	U	υ	υ	U	υ	υ	ט	8.0	2 or SB
Silver	_0.65 B	0.21 B	U	U	ບ	U	ື້	U	2.0	SB

# QUALIFIERS:

U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

# Notes:

SB: Site Background

\*: As per proposed 4/95 NSDEC TAGM

\*\*: Average background levels in metropolitan or surburban areas or near highways range from 200-500 ppm.

: Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

# SUBSURFACE SOIL - RCRA METALS

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	IPSBX-09 (18-16) 1/29/03 43.0 (mg/kg)	IPSBX-09 (18-20) 1/29/03 77.0 (mg/kg)	IPSBX-10 (8-10) 1/23/03 50.0 (mg/kg)	IPSBX-10 (10-12) 1/23/03 72.0 (mg/kg)	IPSBX-10 (12-14) 1/23/03 86.0 (mg/kg)	IPSBX-10 (14-16) 1/23/03 80.0 (mg/kg)	IPSBX-10 (16-16) 1/23/03 82.0 (mg/kg)	IPSBX-11 (4-6) 1/27/03 76.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective (mg/kg)
Arsenic Barium	7.6 21.2 B	2 5.5 B	4.2 21.2	5.6 9.6 B	1.9 2.4 B	2.6 4.2 B	3 1.5 B	8.5 26.5	3.0 3.0	7.5 or SB 300 or SB
Cadmium	0.14 B	U [	0.29 B	0.21 B	2.4 U		1.5 B U	0.44	2.0	10*
Chromium	27.9	5.8	25.8	11,7	3	6,4	3.2	4.7	3.0	50*
Lead	9.6	2.5	7.3	3.8	1,5	2.9	1.3	23.2	1.0	SB**
Mercury	υ	U	U	U	U .	U	υ	U	0.1	0.1
Selenium	U	U	U	U	U	U	υ	υ	8.0	2 or SB
Silver	U	U	0.27 B	0.22 B	<u> </u>	0.16 B	υ	<u> </u>	2.0	SB

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	IPSBX-11 (6-8) 1/27/03 83.0 (mg/kg)	iPSBX-11 (8-10) 1/27/03 43.0 (mg/kg)	(PSBX-11 (10-12) 1/27/03 82.0 (mg/kg)	IPSBX-11 (12-14) 1/27/03 92.0 (mg/kg)	(P\$BX-11 (14-16) 1/27/03 87.0 (mg/kg)	IPSBX-11 (16-18) 1/27/03 82.0 (mg/kg)	IPSBX-11 (18-20) 1/27/03 83.0 (mg/kg)	IPSBX-12 (4-8) 1/23/03 65.0 (mg/kg)	INSTRUMENT DETECTION LIMITS (ug/l)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective (mg/kg)
Arsenic	0.49 B	3.8	2.9	1.6	1.5	3	2.9	25.7	3.0	7.5 or SB
Barium	3.4 B	27.7	2.4 B	1.2 B	1.2 B	1.9 B	1.6 B	125	3.0	300 or SB
Cadmium	U	0.65	0.12 B	U	U	U	U	0.7	2.0	10"
Chromium	1.6 B	31.5	3.7	2.5	2.4	3.5	3.1	9.1	3.0	50"
Lead	0.81 B	10	1.9 B	0.96 B	0.91 B	1.4 B	1.1 B	13.7	1.0	SB**
Mercury	U	0.06 B	U	U	U	U	U	0.14	0.1	0.1
Selenium	U	U	U	U	U	U	U	U	8.0	2 or SB
Silver	0.13 B	0.85 B	0.3 B	0.19 B	0.13 B	0.25 B	0.24 B	0.32 B	2.0	SB

<u>OUALIFIERS;</u> U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.

Notes: SB: Site Background

\*: As per proposed 4/95 NSDEC TAGM

\*\*: Average background levels in metropolitan or surburban areas or near highways range from 200-500 ppm. : Result exceeds NYSDEC TAGM Recommended Soil Cleanup Objective

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

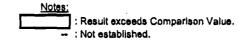
#### SUBSURFACE SOIL - RCRA METALS

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION PERCENT SOLIDS UNITS	IPSBX-12 (6-8) 1/23/03 82.0 (mg/kg)	IP\$BX-12 (8-10) 1/23/03 87.0 (mg/kg)	IPSBX-12 (10-12) 1/23/03 87.0 (mg/kg)	IP\$BX-12 (12-14) 1/23/03 90.0 (mg/kg)	IPSBX-12 (14-16) 1/23/03 89.0 (mg/kg)	iPSBX-12 (16-18) 1/23/03 80.0 (mg/kg)	IPSBX-12 (18-20) 1/23/03 86.0 (mg/kg)		INSTRUMENT DETECTION LIMITS	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective (mg/kg)
Arsenic	0.93 B	0.85 B	4	1.6	1.8	2.3	2,1		3.0	7.5 or SB
Barlum	5.8 B	5.9 B	1.1 B	0.9 B	1.5 B	3.2 B	0.86 B		3.0	300 or SB
Cadmium	υ	υ	0.13 B	U	U U	U	U U		2.0	10*
Chromium	2.8	2.8	2.5	1.7	3.4	4.7	3.2		3.0	50*
Lead	2.1	1.6	1.8	0.8	1.1	1.8	0.62	ł	1.0	SB**
Mercury	υ	υ	υ	υ	U	υ	υ		0.1	0,1
Selenium	υ	U U	υ	υ	υ	U	U U	1	8.0	2 or SB
Silver	υ	υ	0.14 B	U	U	U	U		2.0	SB

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QUALIFIERS: U: Constituent analyzed for but not detected.

B: Constituent concentration is less than the CRDL, but greater than the IDL.



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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

# SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLEID	IPSBX-01	IPSBX-01								
SAMPLE DEPTH (FT)	(4-6)	(6-8)	(8-10)	(10-12)	(12-14)	(14-16)	(16-18)	(18-20)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/27/03	1/27/03	1/27/03	1/27/03	1/27/03	1/27/03	1/27/03	1/27/03	QUANTITATION	Recommended
DILUTION FACTOR	1	1	3	2	2	2	1	1	LIMITS	Soli Cleanup
PERCENT SOLIDS	73.0	24.0	31.0	27.0	25.0	44.0	60.0	92.0	Lintro	Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)						
				(-9. 9)		(+8,		(•9,9)		
Phenoi	U	υ	υ	U U	U	U	י <u>ט</u>	υ	330	30
bis(2-Chloroethyl)ether	י י	) U	U	U	U -	Ú	บ	บั	330	
2-Chlorophenol	U	U	U	י ט	U	Ū	Ū	Ū	330	800
1,3-Dichlorobenzene	U	U U I	Ú	Ú	U	Ū	Ū	υŬ	330	
1,4-Dichlorobenzene	U	) U	U	υ	U	Ū	Ū	Ū	330	
1,2-Dichlorobenzene	U	U U	U	U	U U	U	( บ	υ	330	
2-Mathylphanol	U U	U	U	U	3300	240 J	510 J	Ŭ	330	100
2,2-oxybia (1-chloropropane)	U.	U	U	υ	υ	U	U	υ	330	
4-Methylphenol	υ	U U	Ŭ	Ŭ	Ú	Ū	Ŭ	Ū	330	900
N-Nitroso-di-n-propylamine	ບ	U	Ŭ	Ū	Ŭ	Ŭ	Ū	Ū	330	
Hexachloroethane	U	U	Ŭ	Ú	Ŭ	Ú Ú	Ū	Ŭ Ŭ	330	
Nitrobenzene	U	U	U	υ	υ	Ŭ	Ū	Ŭ	330	200
Isophorone	l u	U	Ŭ	Ŭ	Ū.	Ŭ	Ū.	Ŭ	330	4,400
2-Nitrophenol	Ū	Ū	υ	Ŭ.		Ŭ	U U	Ŭ Ŭ	330	330
2,4-Dimethylphenol	Ŭ	Ŭ	υ	13000	29000	2700	4400	36 J	330	
2,4-Dichlorophenol	Ū	Ŭ	Ŭ	υ	U	2,00	1 100	1 <u> </u>	330	400
1,2,4-Trichiorobenzene	Ū	Ū	Ū	υ	i Ŭ	Ŭ Ŭ	Ŭ Ŭ	i ŭ	330	
Naphthaiene	3000	43000 D	42000	36000	24000	12000	8000	130 J	330	13,000
4-Chiorogniline	U	Ū	<u> </u>	U		U			330	220
bis(2-Chloroethoxy)methane	Ŭ	Ŭ	υ υ υ	υŬ	ŭ	Ŭ	ŭ	Ŭ	330	
Hexachlorobutadiene	Ŭ	υ	Ŭ	Ŭ	Ŭ	Ŭ	ŭ	Ŭ	330	
4-Chloro-3-methylphenol	Ū	Ū υ	Ŭ	Ŭ	Ū	Ŭ	) Ŭ	Ŭ	330	240
2-Methylnaphthalene	1000	1300 J	Ū	U U	Ū	380 J	700	52 J	330	36,400
Hexachlorocyclopentadiene	υ	Ū	Ū	Ū	Ū	U U	l u	u u	330	
2,4,6-Trichlorophenol	Ŭ	Ŭ	Ū	Ŭ	ŭ	Ū	Ŭ	Ŭ	330	
2,4,5-Trichlorophenol	บั	Ū	i ŭ	Ŭ	l Ŭ	Ŭ	Ŭ	Ŭ	330	100
2-Chloronaphthalene	U	Ú	Ū	Ū	Ŭ	Ŭ	Ŭ	Ŭ	330	~~~
2-Nitroaniline	Ū	Ū	Ū Ū	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	330	430
Dimethylphthelate	Ŭ	Ū	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	330	2.000
Acenaphthylene	Ŭ	Ŭ	Ŭ	Ŭ Ŭ	ŭ	Ŭ	ŭ	U U	330	41,000
2,6-Dinitrotoluene	Ŭ	Ŭ	U U	U U	U U	Ŭ	l ŭ l	U U	330	1,000
3-Nitroaniline	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	ŭ	l ŭ	U U	330	500
Acanaphthene	4100	2900	Ŭ	U U	ŭ.	1200 J	280 J	50 J	330	50,000

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

# SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	IPSBX-01									
SAMPLE DEPTH (FT)	. (4-6)	(6-8)	(8-10)	(10-12)	(12-14)	(14-16)	(16-18)	(18-20)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/27/03	1/27/03	1/27/03	1/27/03	1/27/03	1/27/03	1/27/03	1/27/03	QUANTITATION	Recommended
DILUTION FACTOR	1	1	3	2	2	2	1	1	LIMITS	Soll Cleanup
PERCENT SOLIDS	73.0	24.0	31.0	27.0	25.0	44.0	60.0	92.0		Objective
UNITS	(ug/kg)	(ug/kg)								
	1-3-1-01	(	<u> </u>							
2.4-Dinitrophenoi	ט (	υ	U	U	U	U U	υ	U	330	200
4-Nitrophenol	υ υ	U	U	U	U	U	Ι υ	U	330	100
Dibenzofuran	2900	1100 J	U	U	U	820 J	200 J	67 J	330	6,200
2,4-Dinitrotoluene	U	U U	U	U	U	U	U	υ	330	
Diethylphthalate	υ 1	U	U	Ų	U	U	υ υ	ί υ	330	7,100
4-Chlorophenyl-phenylether	U U	U	U	Ú	υ	Ú	U (	U	330	
Fluorene	3000	1000 J	Ū	U	U	860 J	140 J	52 J	330	50,000
4-Nitroaniline	U	U	U	Ū	Ū	Ū	Ū	U	330	
4,6-Dinitro-2-methylphenol	U U	U	U	U	U	U	} U	U U	330	
N-Nitrosodiphenylamine	U	U	U	U U	U	U	U U	U	330	
4-Bromophanyl-phenylether	i U	υ	U	U	U	U	Ι υ	υ	330	
Hexachlorobenzene	υ	υ	U	U	U U	U	U υ	υ	330	410
Pentachlorophenol	υ 1	υ	U	U	υ υ	U	υ	U U	330	1,000
Phenanthrene	6000	670 J	U	U U	υ	2700	230 J	110 J	330	50,000
Anthracene	1000	U	U	υ	U	490 J	) U	U	330	50,000
Carbazole	760	280 J	U	U	U	U	U U	41 J	330	
Di-n-butylphthalate	ί υ	U	U	U	U	U	Ι υ	U	330	8,100
Fluoranthene	1700	U	U U	U	U	1100 J	140 J	U	330	50,000
Pyrane	1400	υ	U	U	U	790 J	110 J	U	330	50,000
Butylbenzylphthalate	U U	U	U	U	U	U	U U	U .	330	50,000
3,3-Dichlorobenzidine	<u> </u>	U U	U	U	U	U	JU	U	330	
Benzo(a)anthracene	500	U	U	U	U	320 J	) ປ	U	330	224
Chrysene	530	υ	U	U	U	320 J	1 υ	υ	330	400
bis(2-Ethylhexyl)phthalate	50 J	170 J	U	υ	Ū	U	U U	64 J	330	50,000
Di-n-octylphthalats	Ū	Ū	Ū	Ū	Ŭ	Ū	) Ū	U	330	50,000
Benzo(b)fluoranthene	610	U	U	U	U	U	U U	U U	330	1,100
Benzo(k)fluoranthene	300 J	υ	U	U	U	U	υ	U U	330	1,100
Benzo(a)pyrene	400 J	υ	U	U	ι υ	U	ט	U	330	61
Indeno(1,2,3-cd)pyrane	120 J	Ū	υ	Ū	Ū	Ū	Ū	י ט	330	3,200
Dibenzo(a,h)anthracene	Ū	Ū	Ū	Ū	υ	Ŭ	ΙŬ	Ū	330	14
Benzo(g,h,i)perylene	110 J	Ŭ	ม	Ŭ	Ũ	Ŭ.	Ū	Ū	330	50,000
(g,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		-								
Total PAHs	22,770	47,570	42,000	36,000	24,000	19,780	8,900	342		100,000
Total CaPAHs	2,460	0	0	0	0	640	0	0	-	10,000
Total SVOCs	27,480	50,420	42,000	49,000	56,300	23,920	14,710	602		500,000

<u>QUALIFIERS:</u> U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

D: Compound concentration was obtained from a diluted analysis.

NOTES: : Not applicable.

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Concentration exceeds NYSDEC TAGM 4046 Recommended Soil Cleanup Objective

E:12015 (LIRR 3 Subs Del Phase II)13 Subs Data laland Park Data Tables for Report Table 48 rev

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

# SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	IPSBX-02	IPSBX-02	IPSBX-02	IPSBX-02	IPSBX-02	IPSBX-02	IP\$BX-02	IPSBX-03		
SAMPLE DEPTH (FT)	(6-8)	(8-10)	(10-12)	(12-14)	(14-16)	(16-18)	(18-20)	(6-8)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/28/03	1/28/03	1/28/03	1/28/03	1/28/03	1/28/03	1/28/03	1/28/03	QUANTITATION	Recommended
DILUTION FACTOR	1	1	1	1	1	1	1	1	LIMITS	Soll Cleanup
PERCENT SOLIDS	68.0	39.0	81.0	47.0	42.0	83.0	58.0	81.0		Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)						
Phenol	U	υ	U	υ	650 J	U	U	U	330	30
bis(2-Chloroethyl)ether	U	υ	υ	υ	U_	U	) U	U	330	
2-Chlorophenol	U	U	U	U	U	υ	U	U	330	800
1,3-Dichlorobenzene	U (	U	U	U	U	U	<b>υ</b>	່ <b>ບ</b>	330	
1,4-Dichlorobenzene	U	Ų	U	U	U	U	υ	υ	330	
1,2-Dichlorobenzene	U	U	U	U	υJ	U	υ	U	330	
2-Methylphenol	U	U	U	Ū	Ū	Ū	Ŭ	Ű	330	100
2,2-oxybis (1-chloropropane)	U	' U	U	U	U	U	U U	U	330	
4-Methylphenol	ט ו	U	U	U	220 J	U	U U	U	330	900
N-Nitroso-di-n-propylamine	υ	U )	U	U	U	U	i ul	U	330	
Hexachloroethane	U	U	U	U	Ū	Ŭ	ÌŪ	Ŭ	330	
Nitrobenzene	U U	່ນ	U	Ū	Ū	Ū	Ú Ú	Ū	330	200
Isophorone	U	<u>ป</u>	υ	υ	U	Ú	Ŭ	Ũ	330	4,400
2-Nitrophanoi	U	U	U U	U	υ	υ	υ	U	330	330
2,4-Dimethylphenol	U	U	U	U	U	U	U U	υ	330	
2,4-Dichlorophenol	ן ט	U	U	U	U	U 1	υ	υ	330	400
1,2,4-Trichiorobenzene	U	U U I	U	U	U	U	U	υ	330	
Naphthalene	130 J	Ú	U	Ŭ	Ū	ŭ	Ū	Ū	330	13,000
4-Chioroaniline	U U	U	Ú	Ū.	Ū	Ũ	l ũ	Ŭ	330	220
bis(2-Chloroethoxy)methane	υ	U	U	U	U	Ŭ	Ũ	Ū	330	
Hexachlorobutadiene	U	υ	U	υ	Ű	U	Ú Ú	ũ	330	
4-Chloro-3-methylphenol	U	ט ו	Ŭ	Ū	Ů	Ŭ	Ŭ	ū	330	240
2-Methylnaphthalene	170 J	υ	U	Ŭ	Ů	Ŭ	Ŭ Ŭ	Ŭ	330	36,400
Hexachlorocyclopentadiene	U	บั	Ŭ	Ū	Ŭ	Ŭ	Ŭ	Ŭ	330	
2,4,6-Trichlorophenol	Ú L	Ū	Ū	Ū	Ū	Ŭ	Ŭ	Ũ	330	
2,4,5-Trichlorophenol	U	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	υŬ	บ	330	100
2-Chloronaphthalene	U 1	Ŭ	Ū	Ŭ	ŭ	Ŭ	Ŭ	Ū	330	
2-Nitroaniline	U	Ŭ	Ŭ	Ŭ	Ŭ.	Ŭ	Ŭ	Ŭ	330	430
Dimethylphthalate	ט ו	Ŭ	Ū	Ū	Ŭ l	ŭ	Ŭ	Ŭ	330	2,000
Acenaphthylene	U 1	Ū	Ū	Ũ	Ũ	ŭ	Ŭ	Ū	330	41,000
2,6-Dinitrotoluene	U	Ŭ	Ū	Ŭ	ŭ	Ŭ	Ū	Ŭ	330	1,000
3-Nitroaniline	Ŭ	Ŭ	Ŭ	Ŭ	ŭ	ŭ	Ŭ	Ŭ	330	500
Acenaphthene	Ū	υŬ	Ŭ	Ŭ	່ ນັ່	Ŭ	Ŭ	Ŭ	330	50,000

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	IP\$BX-02 (6-8) 1/28/03 1 68.0 (ug/kg)	IPSBX-02 (8-10) 1/28/03 1 39.0 (ug/kg)	IPSBX-02 (10-12) 1/28/03 1 81.0 (ug/kg)	IPSBX-02 (12-14) 1/28/03 1 47.0 (ug/kg)	IPSBX-02 (14-16) 1/28/03 1 42.0 (ug/kg)	(PSBX-02 (16-18) 1/28/03 1 83.0 (ug/kg)	IP\$BX-02 (18-20) 1/28/03 1 58.0 (ug/kg)	IPSBX-03 (6-8) 1/28/03 1 81.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM Recommended Soll Cleanup Objective (ug/kg)
		(	(- <u>a</u> /		<u></u>		(- <u>3</u> , <u>3</u> /	(+997		
2,4-Dinitrophenol	U U	ນ	U	U	U	U	) U	U	330	200
4-Nitrophenol	U	U	U	U	U	U	U (	U	330	100
Dibenzofuran	56 J	U	U	U	U	U U	U	U	330	6,200
2,4-Dinitrotoluene	U	U	U	U	U	υ	U	U	330	
Diethylphthalate	U U	U	U	U	U	υ	υ	U	330	7,100
4-Chlorophenyl-phenylether	) U	U	U	U	U	ប	U U	U U	330	
Fluorene	U U	U	U	U	U	U	U	U	330	50,000
4-Nitroaniline	) U	U	U	U	U	U	U	U U	330	
4,6-Dinitro-2-methylphenol	U	U	U	U	U	U U	U	U U	330	
N-Nitrosodiphenylamine	) U	U	U	U	U	U	U	U U	330	
4-Bromophenyl-phenylether	U	U	U	U	υ	U	ί υ	U	330	
Hexachlorobenzene	υ (	U	U (	U	U	U	U	U	330	410
Pentachiorophenol	U U	U	U	U	U	U	U U	ט (	330	1,000
Phenanthrene	300 J	U U	U 1	U	U	U	U	U U	330	50,000
Anthracene	68 J	U	U	U	U	י <u>י</u>	ט ו	υ	330	50,000
Carbazole	U 1	υ	υ	U	U	U	] υ	U U	330	
Di-n-but/iphthalate	U U	U	U	U	U	U	ίυ	U	330	8,100
Fluoranthene	270 J	U	U	U	U	U	U	52 J	330	50,000
Pyrena	250 J	U	U	U .	U	U	U	47 J	330	50,000
Butylbenzylphthalate	υ υ	U	υ	U	U	U	) U	υ	330	50,000
3.3-Dichlorobenzidine	U U	U	U	U	U	U	i U	U	330	
Benzo(a)anthracene	140 J	Ū	Ū	Ū	Ū	Ū	Ū	υ .	330	224
Chrysene	140 J	Ū	Ū	Ú	U	U	ίυ	ี ป	330	400
bis(2-Ethylhaxyi)phthalata	140 J	Ū	Ū	Ū	Ū	68 J	500 J	Ū	330	50,000
Di-n-octyiphthalate	Ŭ	Ŭ	Ū	Ŭ	Ŭ	Ŭ	Ū	Ū	330	50,000
Benzo(b)fluoranthene	200 J	Ŭ	Ū	Ū	Ŭ	Ū	ΙŪ	Ū	330	1,100
Benzo(k)fluoranthene	81 J	Ŭ	Ŭ	Ū	Ū	Ū	ΙŬ	Ŭ	330	1,100
Benzo(a)pyrene	130 J	Ŭ	Ŭ	Ŭ	Ŭ	Ū	Ū.	Ū	330	61
Indeno(1,2,3-cd)pyrena		Ū	Ŭ	Ŭ	Ū	Ŭ	l ŭ	Ŭ	330	3,200
Dibenzo(a,h)anthracene		บั	i ŭ	ŭ	Ŭ	Ŭ	ΙŬ	Ŭ	330	14
Benzo(g,h,i)perylene	Ŭ Ŭ	U U	U U	Ŭ	.Ŭ	ŭ	Ιŭ	Ŭ	330	50,000
Dauzo(8'u'i)hei Naua		U		5	0	U U			000	00,000
Total PAHs	1,709	0	0	0	0	0	0	99		100,000
Total CaPAHs	691	0	0	0	0	0	0	0		10,000
Total SVOCs	2,075	0	0	0	870	68	500	99	-	500,000

# **QUALIFIERS:**

U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

D: Compound concentration was obtained from a diluted analysis.

NOTES: -- : Not applicable.

: Concentration exceeds NYSDEC TAGM 4046 Recommended Soil Cleanup Objective

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLEID	IPSBX-03	IPSBX-03	IPSBX-03	IPSBX-03	IPSBX-03	IPSBX-03	IPSBX-04	IPSBX-04		
SAMPLE DEPTH (FT)	(8-10)	(10-12)	(12-14)	(14-16)	(16-18)	(18-20)	(4-6)	(6-8)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/28/03	1/28/03	1/28/03	1/28/03	1/28/03	1/28/03	1/28/03	1/28/03	QUANTITATION	Recommended
DILUTION FACTOR	1	1	1	1	1	1	1	1	LIMITS	Soli Cleanup
PERCENT SOLIDS	85.0	81.0	44.0	81.0	53.0	76.0	56.0	61.0		Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
	ي معنينا المنوالي بالمرود بين									
Phenoi	υ	U U	110 J	U	110 J	240 J	U	U	330	30
bis(2-Chloroethyl)ether	U	U	U	U I	U - U	U	U	U	330	
2-Chlorophenol	U	U	υ	υ	υ	U	Ú	U	330	800
1,3-Dichlorobenzene	U	U	υ	UI	υ	U	Ú Ú	Ū	330	
1,4-Dichlorobenzene	υ	υ	υ	υ	Ú	U	U	Ú	330	
1,2-Dichlorobenzene	υ	υ	υ	U	บั	Ū	Ū	Ū	330	
2-Methylphenol	υ	U	υ	U	U	U	Ŭ	Ŭ	330	100
2,2-oxybia (1-chloropropane)	υ	U	υ	U	U	U	Ú	Ú Ú	330	
4-Methylphenol	υ	U	י ט	Ŭ	ט ו	Ŭ	Ú	Ŭ	330	900
N-Nitroso-di-n-propylamine	υ	υ	Ú	Ū.	Ŭ	Ū	l ŭ	Ū	330	
Hexachioroethane	ΰ	Ŭ	Ú	Ŭ	Ū	Ū	l ů	Ū	330	
Nitrobenzene	υ	υ	Ú	U	Ŭ	Ū	Ŭ	l ũ	330	200
Isophorone	υ	U	Ú	U	Ú Ú	Ū	Ŭ	Ŭ	330	4,400
2-Nitrophenol	ບ	υ	Ú Ú	Ŭ.	Ŭ	Ū	Ŭ	Ū	330	330
2,4-Dimethylphenol	υ	U	Ú	Ŭ	Ŭ	Ū	ΙŬ	Ū	330	
2,4-Dichlorophenol	Ū	Ŭ	Ŭ	Ũ	Ŭ	l ŭ	Ū	Ŭ	330	400
1,2,4-Trichlorobenzene	Ŭ	Ŭ	Ŭ	Ū	Ū	l ŭ	Ŭ.	l ũ	330	
Naphthalene	Ŭ	Ŭ	Ũ	Ŭ	Ŭ	l ŭ	ĴŪ.	Ŭ	330	13,000
4-Chioroaniline	Ŭ	Ū	Ũ	Ŭ	ιŪ	Ŭ	Ŭ	Ů	330	220
bis(2-Chloroethoxy)methane	U	U	Ú	Ŭ	Ū	Ū	Ŭ	Ū	330	
Hexachiorobutadiene	Ŭ	υ	Ŭ	Ū	Ū	Ū	Ŭ	Ŭ	330	
4-Chloro-3-methylphenol	U	U	U	U	υ	Ú	Ŭ.	Ŭ	330	240
2-Methylnaphthalene	U	υ	U U	υ	U	Ú	U	Ŭ	330	36,400
Hexachlorocyclopentadiene	U	υ	U	υ	Ŭ	Ŭ	Ŭ	Ŭ	330	
2,4,6-Trichlorophenol	. U	Ū	Ŭ	Ŭ	Ŭ	Ŭ	) Ŭ	Ũ	330	
2,4,5-Trichlorophenol	Ŭ	Ŭ	Ū	Ū	Ŭ	Ŭ	Ŭ	Ŭ	330	100
2-Chloronaphthalene	Ŭ	Ŭ	Ŭ	Ŭ	Ū	Ŭ	Ŭ	Ŭ	330	
2-Nitroaniline	Ŭ	Ŭ	Ŭ	Ŭ	i Ŭ	Ŭ	Ŭ	Ŭ	330	430
Dimethylphthalate	Ũ	Ŭ	Ŭ	Ŭ	ι Ŭ	ŭ	Ŭ	Ŭ	330	2,000
Acenaphthylene	ΰI	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	330	41,000
2,6-Dinitrotoluene	Ũ	Ŭ	ี บั	ū	i ŭ	Ŭ	Ŭ	Ŭ	330	1,000
3-Nitroaniline	Ú I	Ŭ	Ŭ	Ŭ	Ŭ	ŭ	Ŭ	Ŭ	330	500
Acenaphthene	Ŭ	υŪ	Ŭ	Ŭ	ı ü	Ŭ	ŭ	Ŭ	330	50,000

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCa)

SAMPLE ID SAMPLE DEPTH (FT)	(8-10)	IPSBX-03 (10-12)	IPSBX-03 (12-14)	IPS8X-03 (14-16)	IPSBX-03 (16-18)	IPSBX-03 (18-20)	IPSBX-04 (4-6)	IPSBX-04 (6-8)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/28/03	1/28/03	1/28/03	1/28/03	1/28/03	1/28/03	1/28/03	1/28/03	QUANTITATION	Recommended
DILUTION FACTOR	1 1	1	1	1	1	1	1	1	LIMITS	Soll Cleanup
PERCENT SOLIDS	85.0	81.0	44.0	81.0	53.0	76.0	56.0	61.0		Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
2,4-Dinitrophenol	U U	υ	U	υ	U	<u> </u>	U	U	330	200
	Ŭ	Ų	Ŭ	Ŭ	0	Ŭ	ໄ ບັ	Ŭ	330	100
4-Nitrophenol Dibenzofuran	U U	Ŭ	Ŭ Ū	Ŭ		U U	Ŭ	U U	330	6,200
2.4-Dinitrotoluene	U U	U U	ı Ŭ	U U		Ŭ		U U	330	8,200
_,	Ŭ	Ŭ		υ	Ŭ	U U		U U	330	7,100
Diethylphthalate	U U	Ŭ	Y I	-	. U	ı Ü		U U	330	
4-Chiorophenyl-phenylether	U U	U	U	Ų U		-				
Fluorene	-	U	U	U	<u>v</u>	<b>ບ</b> ບ	U U	-	330	50,000
4-Nitroaniline		-	U	•	U	-	U U	U	330	-
4,6-Dinitro-2-methylphenol	U U	U	U	U	U	U	U U	U	330	
N-Nitrosodiphenylamine		U	U I	Ų	U	U	) U	U U	330	
4-Bromophenyl-phenylether	U	U	U U	U	U	U	U	U	330	
Hexachlorobenzene	U	U	U	U	U	U	U U	U	330	410
Pentachlorophenol	U	U	U	U	U	U	U	U	330	1,000
Phenanthrene	U	U	U	U	73 J	U	U	U	330	50,000
Anthracene	U U	U	U	U	U	U	U	U	330	50,000
Carbazole	U	U	U	U	U	U	U	U	330	
Di-n-butyiphthalate	U	U	U U	U	U.	U	U U	U	330	8,100
Fluoranthene	) U	U	U	U	190 J	U	U	U	330	50,000
Pyrene	U U	U	U	U	160 J	U U	j U	U	330	50,000
Butylbenzylphtheiste	U	U	U	U	U	U	) U	U	330	50,000
3,3-Dichlorobenzidine	U	U	U	U	U U	U	U	U	330	
Benzo(a)anthracene	U U	U	U	U	63 J	U	U	U	330	224
Chrysene	U	U	U	U	81 J	Ų	U	U	330	400
bis(2-Ethylhexyl)phthalate	U	U	U	U	U	U	120 J	U	330	50,000
Di-n-octyiphthalate	U	U	U	U	U	U	U U	U	330	50,000
Benzo(b)fluoranthene	U	U	U	U	87 J	U	U	U	330	1,100
Benzo(k)fluoranthene	U U	U	U	U	U	U	U U	U	330	1,100
Benzo(a)pyrene	U U	U	U U	U	U	U	U U	U	330	61
Indeno(1,2,3-cd)pyrene	U	U	U (	υ	U	U	U	U	330	3,200
Dibenzo(a,h)anthracene	U	U	U	U	U	U	U U	U	330	14
Benzo(g,h,i)perylene	U	U	U	U	U	U	ί U	U	330	50,000
Tetal DALLA	o	0	0	0	654	0	0	o	_	100,000
Total PAHs		0	0	ŏ	231	0	0	ŏ	-	10,000
Total CaPAHs	0	0	110	0	764	240	120			
Total SVOCs	0	U			/04	240		<u> </u>		500,000

<u>QUALIFIERS:</u> U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

D: Compound concentration was obtained from a diluted analysis.

NOTES: : Not applicable. ---

: Concentration exceeds NYSDEC TAGM 4046 Recommended Soil Cleanup Objective

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLEID	IPSBX-04	IPSBX-04	IPSBX-04	IPSBX-04	IPSBX-04	IPSBX-04	IPSBX-05	IPSBX-05		
SAMPLE DEPTH (FT)	(8-10)	(10-12)	(12-14)	(14-16)	(16-18)	(18-20)	(10-12)	(12-14)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/28/03	1/28/03	1/28/03	1/28/03	1/28/03	1/28/03	1/23/03	1/23/03	QUANTITATION	Recommended
DILUTION FACTOR	1	1	1	1	1	1	1	1	LIMITS	Soll Cleanup
PERCENT SOLIDS	40.0	75.0	65.0	76.0	80.0	52.0	52.0	78.0		Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Phenol	100 J	υ	υ	180 J	130 J	340 J	2600	U	330	
bis(2-Chloroethyi)ether	100 5	U .	-					-		30
2-Chlorophenol		-	U	UUU	U	. U	U	U	330	-
1,3-Dichlorobenzene		U U	U U	-	U	U	U U	U	330	800
1,4-Dichlorobenzene		U U	-	U	U	U	U	U	330	
1,2-Dichlorobenzene		-	U	<b>v</b> 1	U	U	U U	U	330	
2-Methylphenol		U	Ų	U	U	U	U	U	330	
		U U	U	U	U	U	U	U	330	100
2,2-oxybis (1-chloropropane)	U	U	U	U	· U	U	U	U	330	
4-Methylphenol	U	U	U	U	U	U	420 J	U	330	900
N-Nitroso-di-n-propylamine		U	U	U	U	U	U	U	330	
Hexachloroethane	U	U	U	U	U	U	U U	U	330	
Nitrobenzene	U	U	U	U	U	U	U	U	330	200
laophorone	U	U	U	U	U	U	U U	U	330	4,400
2-Nitrophenol	ויט	U	U	U	U	U	, u	U	330	330
2,4-Dimethylphenol	U	U	U	U	U	U	) U	U	330	
2,4-Dichlorophenol	U	U	U	U	U	U	U	U	330	400
1,2,4-Trichlorobenzene	U	U	U	U	U	U	U	U	330	
Naphthalene		U	U	U.	U	U	U U	U	330	13,000
4-Chloroaniline	U	U	Ų	U	U	U	U	U	330	220
bis(2-Chloroethoxy)methane	U	Ų	U	U	U	U	l U	U	330	- 1
Hexachiorobutadiene	U	U	U	U	U	U	U	U	330	
4-Chloro-3-methylphenol	U	Ų	U	U	U	U	υ	U	330	240
2-Methyinaphthalene	U	U U	U	U	U	U	[ U	U	330	36,400
Hexachiorocyciopentadiene	U	U	U	U	U	U	U	[ U	330	
2,4,8-Trichlorophanol	U	U	U U	U.	U	U	U	U	330	
2,4,5-Trichlorophenol	U	U	U	U	U	U	U	U	330	100
2-Chioronaphthalene	U	Ų	U	U	U	Ų	( U	U	330	-
2-Nitroaniline	ן ט	υ	U	U	U	U	U U	U .	330	430
Dimethylphthalate	U	U	U	U	U	U	Į U	( U	330	2,000
Acenaphthylane	υ	U	U	U	U	U	l u	U	330	41,000
2,6-Dinitrotoluane	υ	U	U	U	U	U	U	U U	330	1,000
3-Nitroaniline	υ	υ	U	U	U	U	[ ປ	U	330	500
Acenaphthene	ບ	ບ	U	U	U	U	Ú	U	330	50,000

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	IPSBX-04	IPSBX-04	IPSBX-04	IPSBX-04	IPSBX-04	IPSBX-04	IPSBX-05	IPSBX-05		
SAMPLE DEPTH (FT)	(8-10)	(10-12)	(12-14)	(14-16)	(16-18)	(18-20)	(10-12)	(12-14)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/28/03	1/28/03	1/28/03	1/28/03	1/28/03	1/28/03	1/23/03	1/23/03	QUANTITATION	Recommended
DILUTION FACTOR	1	1	1	1	1	1	1	1	LIMITS	Soil Cleanup
PERCENT SOLIDS	40.0	75.0	65.0	78.0	80.0	52.0	52.0	78.0		Objective
UNITS	(ug/kg)	(ug/kg)								
2,4-Dinltrophenol	U	U	υj	U	U	Ų	U	U	330	200
4-Nitrophenol	j U	U	U	U	U	U	) U	U	330	100
Dibenzofuran	U	U	U	U	U '	U	U	U U	330	6,200
2,4-Dinitrotoluene	U U	U	U	U	U	U	U	U	330	
Diethylphthalate	U U	U	U	U	U	U	U	U	330	7,100
4-Chlorophenyl-phenylether	U	U	U	U	U	U	U	U	330	
Fluorene	U U	U	U	U	U	U	U	U	330	50,000
4-Nitroaniiine	U	U	U	U	Ų	U	U	U	330	
4,6-Dinitro-2-methylphenol	U	U	U	U	U	U,	U U	U	330	
N-Nitrosodiphenylamine	U	Ų	U	U	U	U	U U	U	330	
4-Bromophenyl-phenylether	U	U	U	U	U	U	U	U	330	
Hexachlorobenzene	U	U	υI	U	U	U	U	U	330	410
Pentachlorophenol	U	Ų	U (	U	U	U	U U	U	330	1,000
Phenanthrene	U	Ų	U	U	U	U	U U	U	330	50,000
Anthracene	U U	U	U	U	U	U	U U	U	330	50,000
Carbazole		U	U	U	U	U	U	U	330	
Di-n-butyiphthalate	U	U	U	U	U	U	U U	) U	330	8,100
Fluoranthene	U	U	U	Ų	U	U	U	U	330	50,000
Pyrene	U U	U	U	U	U	U	U U	U U	330	50,000
Butylbenzylphthalate	U	U	U	U	U	U	U U	U	330	50,000
3,3-Dichlorobenzidine	U	Ŭ	U	U	Ų	Ų	Ų Ų	U	330	
Benzo(a)anthracene	U	Ų	U	U	U	U	U	U	330	224
Chrysene	U	U	Ŭ	U	U	U	U	U	330	400
bis(2-Ethylhexyl)phthalate	U	Ų	U	U	160 J	290 J	110 J	61 J	330	50,000
Di-n-octyiphthalate	U	U	U	U	U	U	U	U	330	50,000
Benzo(b)fluoranthene	U	U	U	U	U	U	U	U	330	1,100
Benzo(k)fluoranthene	U	U	U U	U	U	U	U U	U	330	1,100
Benzo(a)pyrene	U	U	U	U	Ų.	U	U.	U	330	61
Indeno(1,2,3-cd)pyrene	U	Ų.	U I	U	U	U	U U	· U	330	3,200
Dibenzo(a,h)anthracene	U	U	U	U	U	U	U	U	330	14
Benzo(g,h,i)perylene	U	U	U	U	Ų	Ų	U	U	330	50,000
]  Total PAHs	0	0	o	0	0	0	0	0		100,000
		0	ŏ	ŏ	õ	0	ň	ŏ		10,000
Total CaPAHs	100	ů 0	o J	180	290	630	3,130	61		500.000
Total SVOCs	100	UU	U		280	030	3,130	01	-	500,000

<u>QUALIFIERS:</u> U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

D: Compound concentration was obtained from a diluted analysis.

NOTES: : Not applicable.

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Concentration exceeds NYSDEC TAGM 4046 Recommended Soil Cleanup Objective

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLEID	IPSBX-05	IPSBX-05	IPSBX-05	IPSBX-06	IP\$BX-06	IPSBX-06	IPSBX-06	IPSBX-06		
SAMPLE DEPTH (FT)	(14-16)	(16-18)	(18-20)	(4-6)	(6-8)	(8-10)	(12-14)	(14-16)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/23/03	1/23/03	1/23/03	1/27/03	1/27/03	1/27/03	1/27/03	1/27/03	QUANTITATION	Recommended
DILUTION FACTOR	1	1	1	1	1	1	1	1	LIMITS	Soil Cleanup
PERCENT SOLIDS	86.0	86.0	88.0	88.0	68.0	53.0	66.0	89.0		Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Phenol	U	υ	υ	υ	υ	U	U	U	330	30
bis(2-Chloroethyl)ether	U	υ	υ	υ	υ	U	U	U	330	
2-Chlorophenol	U	υ	υ	υ	ບ	U	U	U	330	800
1,3-Dichlorobenzene	U	υ	υ	U	U	U	) U	U	330	
1,4-Dichlorobenzene	U	U	U	υ	. υ	U	U	U	330	
1,2-Dichlorobenzene	U	U	U U	υ	υ	U	υ	U	330	
2-Methylphenol	U	U U	υ	υ	υ	υ	Ū	Ú	330	100
2,2-oxybis (1-chloropropane)	U	υ	υ	υ	υ	υ	υ	U	330	
4-Methylphenol	U	υ	ט ו	υ	υ	U	υ	Ú	330	900
N-Nitroso-dl-n-propylamine	U	U	υ	ບ	υ	Ú	l Ū	Ū	330	
Hexachloroethane	U	Ú	Ū	บ	υ	Ŭ	Ū	Ũ	330	
Nitrobenzene	U	U	υ	Ŭ	Ū	Ŭ	Ū	Ŭ	330	200
isophorone	U	Ŭ	Ū Ū	Ū Ū	Ŭ	Ŭ	Ŭ Ŭ	Ŭ	330	4,400
2-Nitrophenol	Ú Ú	ี่ บั	Ū	Ŭ	Ŭ	Ŭ	l ŭ	Ŭ	330	330
2.4-Dimethylphenol	Ū.	υ	Ŭ	ι Ŭ	υ	່ ບໍ່	ιŬ	Ŭ	330	
2,4-Dichlorophenol	Ū	Ŭ	Ŭ	Ŭ	บั	រ ប័	ιŭ	υŬ	330	400
1,2,4-Trichlorobenzene	Ŭ	l. Ū	Ū	Ŭ	Ŭ	່ ບໍ	{ Ŭ	Ũ	330	
Naphthalene	υ	Ū Ū	Ú	110 J	Ŭ	Ū	ίŪ	υŪ	330	13.000
4-Chloroaniline	Ŭ	Ū	Ŭ	Ŭ	Ū.	ម ម	l ŭ	ŭ	330	220
bis(2-Chloroethoxy)methane	Ū.	Ū Ū	Ŭ	Ŭ.	Ŭ	υ	υ	υ υ i	330	
Hexachlorobutadiene	Ŭ	Ŭ	Ŭ	Ŭ	· ŭ	ບ ບ	Ŭ	บั	330	
4-Chioro-3-methylphenol	Ŭ	Ŭ	Ū	L Ŭ	ี่ นี้	Ŭ	Ŭ	Ŭ	330	240
2-Methylnaphthalene	Ŭ	Ŭ	Ū	120 J	L Ŭ	Ŭ	Ŭ.	Ŭ	330	38,400
Hexachlorocyclopentadiene	Ú	Ŭ	l ú	Ŭ	Ū	Ŭ	Ŭ	Ŭ	330	
2,4,6-Trichlorophenol	Ů	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	ιŭ	Ū	330	
2,4,5-Trichiorophenol	Ŭ	Ŭ	Ū	ŭ	Ū	ιŭ	l ŭ	ŭ	330	100
2-Chioronaphthalene	Ŭ	Ŭ	Ŭ	ŭ	ŭ	Ŭ	Ŭ Ŭ	Ŭ	330	
2-Nitroaniline	Ŭ	ŬŬ	Ŭ	ŭ	Ū	Ŭ	i ŭ	Ŭ	330	430
Dimethylphthalate	Ŭ	ŬŬ	Ŭ	ŭ	Ŭ	Ŭ	ι ŭ	Ŭ	330	2,000
Acenaphthylene	Ŭ	Ŭ	ŭ	140 J	ŭ	Ŭ	i ŭ	Ŭ	330	41,000
2.6-Dinitrotoluene	Ŭ	Ŭ	Ŭ	U 140 5	l ŭ	l ñ	l ŭ	Ŭ	330	1,000
3-Nitroaniline	Ŭ	Ŭ	Ŭ		ไ บ้	Ŭ Ŭ	Ŭ	Ŭ	330	500
Acenaphthene	Ŭ	i i	Ŭ	450	U U	l ü	l ŭ	U U	330	50,000

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	IPSBX-05	IPSBX-05	IPSBX-05	IPSBX-06	IPSBX-06	IPSBX-06	IPSBX-06	IPSBX-06		
SAMPLE DEPTH (FT)	(14-16)	(16-18)	(18-20)	(4-6)	(6-8)	(8-10)	(12-14)	(14-16)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/23/03	1/23/03	1/23/03	1/27/03	1/27/03	1/27/03	1/27/03	1/27/03	QUANTITATION	Recommended
DILUTION FACTOR	1	1	1	1	1	1	1	1	LIMITS	Soil Cleanup
PERCENT SOLIDS	86.0	86.0	88.0	88.0	68.0	53.0	66.0	89.0		Objective
	(ug/kg)	(ug/kg)								
2,4-Dinitrophenoi	υ	υ	U	υ	υ	U	υ	υ	330	200
4-Nitrophanol	U U	. U	U	U	U	U	U U	U	330	100
Dibenzofuran	1 U	U	U	280 J	Ų	U	U U	U	330	6,200
2,4-Dinitrotoluene	U	U	υ	U	U	U	U U	U	330	
Diethylphthalate	U U	U	U	Ų	U U	U	ι υ	U	330	7,100
4-Chiorophenyl-phenylether	Ų Ų	U	U	U	U	U	U U	U	330	
Fluorene	. U	U	U	540	U	U	U	U	330	50,000
4-Nitroanliine	U	U	U	U	U	U	U	U	330	
4,6-Dinitro-2-methylphenol	) U	U	U	U	Ų	U	) U	U	330	
N-Nitrosodiphenylamine	U		U	U	U	U	l U	U	330	
4-Bromophenyl-phenylether	U U	U	U	U	U	U	U U	U	330	
Hexachlorobenzene	υ	U	U	U	U	U	U	U	330	410
Pentachlorophenol	ļ U	U	U	U	U	U	U	U	330	1,000
Phenanthrene	U U	U	U	1400	U	U	U	U	330	50,000
Anthracene	U U	U	U (	230 J	U U	U	U U	U	330	50,000
Carbazole	U U	Ų	U	U	U U	U	U	U	330	
Di-n-butyiphthalate	ι υ	υ [	υ .	U	U	U U	) U	U	330	8,100
Fluoranthene	U	U	U	110 J	U	) U	U	U	330	50,000
Pyrene	U	U	U	280 J	U	U	U	U	330	50,000
Butylbenzylphthalate	U U	U	U U	U	U	U	U	U	330	50,000
3.3-Dichlorobenzidine	U U	U	U	U	U	U	U	U	330	
Benzo(a)anthracene	U U	υ	U	52 J	U	U	U	U	330	224
Chrysene	U U	U	U U	81 J	U	U	U	U	330	400
bis(2-Ethylhexyl)phthalate	61 J	56 J	56 J	99 J	89 J	76 J	53 J	U	330	50,000
Di-n-octyiphthalate	U	U	U	U	· U	U	U	U	330	50,000
Benzo(b)fluoranthene	U U	U	U	85 J	Ų	U	U U	U	330	1,100
Benzo(k)fluoranthene	U U	U	υ	U	U	U	U	U	330	1,100
Benzo(a)pyrene	U	U	U	43 J	86 J	U	U	U	330	61
Indeno(1,2,3-cd)pyrene	U	υ	U	υ	Ų –	υ	U	U	330	3,200
Dibenzo(a,h)anthracene	Ŭ	U	U	Ŭ	Ú	Ú	υ	Ū	330	14
Benzo(g,h,i)perviene	U	U	υ	U	Ų	U	U	U	330	50,000
Total PAHs	0	0	0	3,521	86	0	o	0	-	100,000
Total CaPAHs	0	Q	0	261	86	0	0	0		10,000
Total SVOCs	61	56	56	4,020	175	76	53	0	-	500,000

### **OUALIFIERS:**

U: Compound analyzed for but not detected. J: Compound found at a concentration below the detection limit.

D: Compound concentration was obtained from a diluted analysis.

NOTES: : Not applicable.

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: Concentration exceeds NYSDEC TAGM 4048 Recommended Soil Cleanup Objective

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	IPSBX-06	IPSBX-06	IPSBX-07	IPSBX-07	IPSBX-07	IPSBX-07	IPSBX-07	IPSBX-07		
SAMPLE DEPTH (FT)	(16-18)	(18-20)	(4-6)	(6-8)	(8-10)	(10-12)	(12-14)	(14-16)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/27/03	1/27/03	1/27/03	1/27/03	1/27/03	1/27/03	1/27/03	1/27/03	QUANTITATION	Recommended
DILUTION FACTOR	1	1	10	1	1	1	1	1	LIMITS	Soll Cleanup
PERCENT SOLIDS	69.0	53.0	87.0	69.0	54.0	83.0	54.0	47.0		Objective
UNITS	(ug/kg)	(ug/kg)								
Phenol	640	870	U	U	υ	υ	υ	910	330	20
bis(2-Chloroethyl)ether	<u> </u>	<u> </u>		U U	-	-	1 -			30
2-Chlorophenol		υ	U	Ŭ	UU	U	U	U U	330	
1,3-Dichlorobenzene		U U	U U	U	- 1	U	l ü		330	800
1,4-Dichlorobenzene		U U	U U	U	U	U	u u	U U	330	
1,2-Dichiorobenzene		U U	U	U U	U	U	U	U U	330	
2-Methylphenol			U	U U	U	U	U U	U U	330	
2,2-oxybis (1-chloropropane)		Ŭ	UU	-	U	U	<u>ບ</u>		330	100
4-Methylphenoi	l ŭ	U U	U	U U	ບ ບ	ບ ບ		U U	330 330	900
N-Nitroso-di-n-propylamine		U U	ี U	ບ ບ	υ	Ŭ	ບ ບ	U U	330	
Hexachloroethane	U U	บ บ	υ	U	U	Ŭ	U U	U U	330	
Nitrobanzena		υ	U	-		-	f –	1 -		
Isophorone	-		_	U	U	U	U	U	330	200
	U	U	U	U	U	U	U	U	330	4,400
2-Nitrophenol	U	U.	U	U	U	U	U U	U	330	330
2,4-Dimethylphenol	U		U	U	U	υ	υ	U	330	
2,4-Dichlorophenol	· U	U	U	U	υ	U	ן ט	U	330	400
1,2,4-Trichlorobenzene	U	U	υ	υ	U	U	U	U	330	***
Naphthalene	U	υ	U U	U	U.	U	U	U U	330	13,000
4-Chloroaniline	U	U	U	U	U	U	U	U	330	220
bis(2-Chloroethoxy)methane	l V	U	U	U	U	U	U	U	330	
Hexachlorobutadiene	U U	U	U	U	U	U	U	υ	330	
4-Chloro-3-methylphenol	U	U	U	U	U	U	U	υ	330	240
2-Methylnaphthalene	U	U	U	U	U	U	) υ	) U	330	36,400
Hexachlorocyclopentadiene	U	Ų	U	U	υ	U	U	U	330	
2,4,6-Trichlorophenol	U	U	U	υ	U	U	U	U	330	
2,4,5-Trichlorophenol	U	U	ບ	U	U	U	U U	U	330	100
2-Chloronaphthalene	U	U	U	บ	U	U	U	U	330	
2-Nitroaniline	U	U	U	U	U	U	U	U	330	430
Dimethylphthalate	υ	U	U	U	U	U	ļ υ	U	330	2,000
Acenaphthylene	U	U	U	U	U	U	U	υ	330	41,000
2,5-Dinitrotoluene	U	U	U	U	U	U	υ	U	330	1,000
3-Nitroaniline	, U	Ų Ų	U	U	υ	υ	U U	υ	330	500
Acenaphthene	U	U	U	υ	U	U	U	U	330	50,000

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID SAMPLE DEPTH (FT)	(PSBX-06 (16-18)	IPSBX-06 (18-20)	IP\$BX-07 (4-6)	IPSBX-07 (6-8)	IPSBX-07 (8-10)	IPSBX-07 (10-12)	IPSBX-07 (12-14)	IPSBX-07 (14-16)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/27/03	1/27/03	1/27/03	1/27/03	1/27/03	1/27/03	1/27/03	1/27/03	QUANTITATION	Recommended
DILUTION FACTOR	1	1	10	1	1	1	1	1	LIMITS	Soil Cleanup
PERCENT SOLIDS	69.0	53.0	87.0	69.0	54.0	83.0	54.0	47.0	Funt of	Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
	(09/19/		(09.19)	(00,00)	(-9/9/	(	(	<u>\-aa/</u>		(09/19)
2,4-Dinitrophenoi	U	U	U	υ	U	U	U	U	330	200
4-Nitrophenol	U	U	U	U	U	U	{ U	U	330	100
Dibenzofuran	U U	U	U	U U	Ų	U	) V	υ	330	6,200
2,4-Dinitrotoluene	U	U	U	U	Ŭ	υ	) Ú	U	330	- 1
Diethylphthalate	) U	U	U	U	U	U	U U	U	330	7,100
4-Chlorophenyl-phenylether	U	U	U	U	U	U	U U	U	330	
Fluorene	U	U	U	U	U	U	U	U	330	50,000
4-Nitroanlline	( U	U	U	V	U	U	U	U	330	- (
4,6-Dinitro-2-methylphenol	ן ט	Ų	U U	U	U	U	U	U	330	
N-Nitrosodiphenylamine	U	U	U	U	U	Ų	U U	U	330	-
4-Bromophenyl-phenylether	U	υ.	U	U	U	U	U	U	330	
Hexachlorobenzene	. U	U	U U	U	U	U	ן ט	U	330	410
Pentachlorophenol	U U	U	Ų	U	U	U	Į Ų	U	330	1,000
Phenanthrane	U U	U	Ų	U	U	U	U	U	330	50,000
Anthracene	ί υ	U	Ų	U	U	U	U	U	330	50,000
Carbazole	U	U	) U	U U	· U	U	ן ט	U	330	
Di-n-butyiphthalate	U	) U	U U	U	U	U	U U	U	330	8,100
Fluoranthene	U	U	U	U	U	U	95 J	U	330	50,000
Pyrene	) U	U	U	U	U	U	84 J	U	330	50,000
Butylbenzylphthalate	ן ט	U	U	U	U	Ų	υ.	U	330	50,000
3,3-Dichlorobenzidine	U	U	Ų V	Ų	U	Ų	]. U	U	330	
Benzo(a)anthracene	U	U	U	U	U	U	U U	U	330	224
Chrysene	U U	U	U	Ų V	υ	U	L U	U	330	400
bis(2-Ethylhexyl)phthalate	62 J	65 J	U	U	U,	U	U U	U	330	50,000
Di-n-octylphthalate	U U	U	U	U	U	U U	( U	U	330	50,000
Benzo(b)fluoranthene	) U	U	U	U	U	U	76 J	U	330	1,100
Benzo(k)fluoranthene	U U	U	U	U	U	U	U	U	330	1,100
Benzo(a)pyrene	U	U U	U	U	Ų	U	ι υ	U	330	61
Indeno(1,2,3-cd)pyrene	U U	Ų	U	U	U	U	) U	U	330	3,200
Dibenzo(a,h)anthracene	U U	U	U	U	U	U	U U	U	330	14
Benzo(g,h,i)perviene	U	U	U	U	U	U	Ŭ	U	330	50,000
							ĺ			
Total PAHs	0	0	0	0	0	0	255	0		100,000
Total CaPAHs	0	0	0	0	0	0	76	0		10,000
Total SVOCs	702	935	0	0	0	0	255	910		500,000

QUALIFIERS: U: Compound analyzed for but not detected. J: Compound found at a concentration below the detection limit.

D: Compound concentration was obtained from a diluted analysis.

NOTES: : Not applicable. ----

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: Concentration exceeds NYSDEC TAGM 4046 Recommended Soil Cleanup Objective

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	IPSBX-07	IPSBX-07	IPSBX-08	IPSBX-08	IPSBX-08	IPSBX-08	IPSBX-08	IPSBX-08		
SAMPLE DEPTH (FT)	(16-18)	(18-20)	(4-6)	(6-8)	(8-10)	(10-12)	(12-14)	(14-16)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/27/03	1/27/03	1/28/03	1/28/03	1/28/03	1/28/03	1/28/03	1/28/03	QUANTITATION	Recommended
DILUTION FACTOR	1	1	1	1	1/20/03	1 1	1	1/20/03	LIMITS	Soil Cleanup
PERCENT SOLIDS	64.0	41.0	77.0	72.0	66.0	80.0	78.0	76.0	Canas 1 G	Objective
UNITS	(ug/kg)	(ug/kg)								
		(*9.19/	(09/119)		(09,49)	(09/107)	(09/10)	(29/29)	(Ug/kg/	(ug/kg)
Phenol	U U	2500	U I	U	u	U	U	U	330	30
bis(2-Chloroethyl)ether	i i		Ŭ	ŭ	ŭ	. บั	Ŭ	ŭ	330	
2-Chlorophenol	i i i	i ŭ i	ŭ	ŭ	Ű	U U	ບັ	Ŭ	330	800
1,3-Dichlorobenzene	1 . ŭ l	Ŭ Ŭ	ŭ	U U	Ŭ	υ υ	Ŭ	Ŭ	330	000
1,4-Dichlorobenzene	1 ŭ )	ŭ	ŭ	Ŭ	Ŭ	U U	ບັ	Ŭ	330	
1,2-Dichlorobenzene	1 1	ŭ	ŭ	ม ม	υ	ບັ	U U	U U	330	
2-Methylphenol	l ŭ l	l ŭ l	Ŭ	. Ŭ	υ υ	່ ນັ	Ŭ	Ŭ	330	100
2,2-oxybis (1-chloropropane)	l ŭ l	l ŭ l	Ŭ	ម	ů	U U	U U	Ŭ	330	
4-Methylphenol	l ŭ l	110 J	Ŭ	บั	ບັ	Ŭ	Ŭ	Ŭ	330	900
N-Nitroso-di-n-propylamine	l ŭ !	Ŭ	Ŭ	ំ បំ	U U	Ŭ Ŭ	Ŭ	Ŭ	330	
Hexachloroethane	l ŭ l	l ŭ l	Ŭ	υ	ນັ	Ŭ	Ŭ	Ŭ	330	
Nitrobenzana	l ũ l	i i i	ນັ	. Ŭ	ŭ	Ŭ	Ŭ	Ŭ	330	200
Isophorone	l ŭ	Ŭ Ŭ	υŬ	U U	Ŭ	Ŭ	U U	Ŭ	330	4,400
2-Nitrophenol	Ŭ	Ŭ	Ŭ	ŭ	Ŭ	U U	Ŭ	Ŭ	330	330
2,4-Dimethylphenol	ι ŭ	Ŭ Ŭ	ŭ	. Ŭ	Ŭ	ŭ	Ŭ	Ŭ	330	
2,4-Dichlorophenol	ίŨ	υŬ	Ū Ū	ı Ŭ	i ŭ	Ŭ	Ŭ	Ŭ	330	400
1,2,4-Trichlorobenzene	ū	Ū	Ŭ	ŭ	U U	Ŭ	Ŭ	Ū	330	
Naphthalene	l ũ l	Ũ	Ū	Ū Ū	ŭ	Ŭ Ū	l ŭ	Ŭ	330	13,000
4-Chloroaniline	Ŭ	ιŭ	ŭ	มี มี	l Ŭ	Ŭ	Į Ŭ.	Ŭ	330	220
bis(2-Chioroethoxy)methane	l Ū	Ŭ	ŭ	Ŭ	Ū	Ū	l ŭ	Ŭ	330	
Hexachlorobutadiene	Ú Ú	Ű	Ŭ	Ũ	Ū	Ū	l ŭ	Ū	330	
4-Chloro-3-methylphenol	l úl	Ú	Ů	Ū	Ū	Ū	l ŭ	Ū	330	240
2-Methyinaphthalene	י ט ו	ן ט	U U	U	U	l ū	U .	บั	330	36,400
Hexachlorocyclopentadiene	l U	Ú Ú	Ŭ	ان ا	Ū	Ū	Ŭ	Ū	330	
2,4,6-Trichlorophenol	(Ú)	Ű	υĺ	Ū	Ū	Ŭ	บั	υŪ	330	
2,4,5-Trichlorophenoi	u	Ū	Ũ	Ū	Ŭ	Ŭ	Ū	Ū	330	100
2-Chloronaphthaiene	U	Ú	Ū	Ū	Ŭ	Ŭ	Ŭ	Ū	330	—
2-Nitroaniline	( U	Ŭ	ύl	Ů	Ū	Ū	Ū	Ū	330	430
Dimethylphthalate	( U	Ŭ	Ū	U	Ŭ	Ū	Ū	Ū	330	2,000
Acenaphthylene	U U	U	U	U	U	υ	Ū	Ū	330	41,000
2,6-Dinitrotoluene	U U	U	Ų	U	ບ	Ū	U	Ū	330	1,000
3-Nitroaniline	Ú	U	Ů	Ŭ	Ū	Ū	. Ŭ	Ū	330	500
Acenaphthene	U	U	U	บ	260 J	Ū	130 J	Ũ	330	50,000

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	IPSBX-07	IPSBX-07	IPSBX-08	IPSBX-08	IPSBX-08	IPSBX-08	IPSBX-08	IPSBX-08		
SAMPLE DEPTH (FT)	(16-18)	(18-20)	(4-6)	(6-8)	(8-10) -	(10-12)	(12-14)	(14-16)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/27/03	1/27/03	1/28/03	1/28/03	1/28/03	1/28/03	1/28/03	1/28/03	QUANTITATION	Recommended
DILUTION FACTOR	1	1	1	1	1	1	1	1	LIMITS	Soll Cleanup
PERCENT SOLIDS	64.0	41.0	77.0	72.0	66.0	80.0	78.0	76.0		Objective
UNITS	(ug/kg)	(ug/kg)								
	(	(				(-9/1.9/				
2,4-Dinitrophenol	U	, U	U	υ	U	U	υ.	U	330	200
4-Nitrophenol	) U	U	U	U	U	U	U U	U	330	100
Dibenzofuran	U	U	U	U	U	U	[ υ	U	330	6,200
2,4-Dinitrotoluene	U	U	U	U	U	ט	U U	U	330	
Diethylphthalate	U	U	υ	U	U	U U	U U	U	330	7,100
4-Chlorophenyl-phenylether	U	U	U	U	U	U	( U	U	330	
Fluorene	U	. U	U	U	88 J	U	100 J	U	330	50,000
4-Nitroaniline	U	U	U	U	U	Ŭ	U U	U	330	-
4,6-Dinitro-2-methylphenol	U	υ	U	U	Ú	U	( U	U	330	
N-Nitrosodiphenylamine	U U	U U	U	υ	U	U	ι υ	U	330	
4-Bromophenyl-phenylether	U U	U U	U U	U	U	U	U U	· U	330	
Hexachlorobenzene	U	U	υ	U	U	U	υ υ	U	330	410
Pentachlorophenol	υ υ	υ	Ú	U	U	U	υ	U	330	1,000
Phenanthrene	U	υ	U	U	U	υ	ן ט	U	330	50,000
Anthracene	Ū	L Ū	Ū	Ŭ	Ū	Ū	Ū	Ŭ	330	50,000
Carbazole	υ.	U	U	U	U	U	υ	U	330	
Di-n-butyiphthalate	U	U	U	U	U	U	U U	U	330	8,100
Fluoranthene	74 J	U	U	U	U	U	U	U	330	50,000
Pyrene	66 J	υ	U	U	U	U	י ט ו	U	330	50,000
Butylbenzylphthaiate	. U	υ	U	U	U	U	) υ	U	330	50,000
3,3-Dichlorobenzidine	( U	U U	U	υ	· U	U	υ.	U	330	
Benzo(a)anthracene	U U	U	U	U	U	U	U	U	330	224
Chrysene	U U	U	IJ	U	U	U	U	U	330	400
bis(2-Ethylhexyl)phthalate	320 J	1300	U	U	U	ี ป	U U	270 J	330	50,000
Di-n-oct/iphthalate	i U	U	U	U	U	U	ט	U	330	50,000
Benzo(b)fluoranthene	60 J	υ	U	υ	U	U	l U	. U	330	1,100
Benzo(k)fluoranthene	U U	U U	U	U	U	U	U U	U	330	1,100
Benzo(a)pyrene	Ι U	υ υ	U	U	υ	U	ប	U	330	61
Indeno(1,2,3-cd)pyrene	U	U	U	U	Ų	U	ί υ	U	330	3,200
Dibenzo(a,h)anthracene	Ū	Ū	Ŭ	Ű	Ú	Ú	U	U	330	14
Benzo(g,h,i)perylene	Ū	Ŭ	Ū	Ū	Ū	Ŭ	υ	Ú	330	50,000
Total PAHs	200	0	0	0	348	0	230	0		100,000
Total CaPAHs	60	0	0	0	0	0	0	0		10,000
Total SVOCs	520	3,910	0	0	348	0	230	270	<b></b>	<u>500,000</u>

<u>QUALIFIERS:</u> U: Compound analyzed for but not detected. J: Compound found at a concentration below the detection limit.

D: Compound concentration was obtained from a diluted analysis.

NOTES: --

: Not applicable.

: Concentration exceeds NYSDEC TAGM 4046 Recommended Soil Cleanup Objective

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	IPSBX-08	IPSBX-08	IPSBX-09	IPSBX-09	IPSBX-09	IPSBX-09	IPSBX-09	IPSBX-09		
SAMPLE DEPTH (FT)	(16-18)	(18-20)	(4-6)	(6-8)	(8-10)	(10-12)	(12-14)	(14-16)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/28/03	1/28/03	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03	QUANTITATION	Recommended
DILUTION FACTOR	1	1	1	1	1	-1	1	1	LIMITS	Soil Cleanup
PERCENT SOLIDS	48.0	90.0	84.0	65.0	52.0	69.0	46.0	89.0	East 1 C	Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
		(- 0 - 0 /	(*991	(	(,)	(-3/18/	(*3***3/	(********		
Phenoi	υ υ	υ	υ	U	บ	υ	78 J	U	330	30
bls(2-Chloroethyl)ether	ט ו	บ	Ū	U	Ū	Ū	<u> </u>	Ŭ	330	-
2-Chlorophenol	U	Ū	Ū	Ū	Ŭ	Ū	Ŭ	Ū	330	800
1,3-Dichlorobenzene	υ	Ū	Ū	Ū	Ū	Ũ	ไ บั	Ŭ	330	
1,4-Dichlorobenzene	υ	U	Ū	Ū	Ŭ	ŭ	Ŭ	Ŭ	330	
1,2-Dichlorobenzene	Ū	Ū	Ū	Ū	Ū	Ŭ	Ŭ	Ŭ	330	
2-Methylphenol	Ū	Ŭ	Ŭ	Ū	Ŭ	Ŭ	ີ ບ	Ŭ	330	100
2,2-oxybis (1-chloropropane)	Ū	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	330	
4-Methylphenol	ļ Ū	Ű	Ŭ	Ŭ	Ŭ	Ŭ	Ū	Ŭ	330	900
N-Nitroso-di-n-propylamine	υ υ	U	Ŭ	Ū	Ū	Ū	i ŭ	Ŭ	330	
Hexachloroethane	U	U	U	Ū	Ū	ū	Ū	Ŭ	330	
Nitrobenzene	Ū	Ū	ŭ	Ū	ũ l	Ŭ	Ŭ	Ŭ	330	200
Isophorona	Ū	Ŭ	Ŭ	Ŭ	บั	Ŭ	Ŭ	Ŭ	330	4,400
2-Nitrophenol	Ŭ	Ū	Ū	Ŭ	ū	ŭ	Ū	Ŭ	330	330
2,4-Dimethylphenol	υ (	Ŭ	Ū	Ŭ	Ū	Ŭ	Ū	Ŭ	330	
2,4-Dichlorophenol	υ	υ	U	Ū	U U	ū	Ū	Ŭ	330	400
1,2,4-Trichlorobenzene	U U	U	υ	Ú	ŭ	. มั	Ŭ	Ū	330	
Naphthalene	Ŭ	Ū	Ū	Ŭ	ŭ	Ŭ	Ŭ	Ŭ	330	13,000
4-Chloroaniline	Ū	Ū	Ū	Ū	Ŭ	Ŭ	Ŭ	Ŭ	330	220
bis(2-Chloroethoxy)methane	U U	U	Ū	Ū	Ū	Ŭ	Ū	Ŭ	330	
Hexachlorobutadiene	U	U	U	Ú	Ū	Ū	Ū	Ŭ	330	
4-Chioro-3-methylphenol	) U	U	υ	U	Ū	Ū	Ū	Ū	330	240
2-Methylnaphthalene	U U	υ	Ú	Ű	Ū	Ū	Ū	Ŭ	330	36,400
Hexachlorocyclopentadiene	Ū	Ū	Ū	Ŭ	ŭ	ม	Ŭ	Ū	330	
2,4,8-Trichlorophenol	Ŭ	Ū	Ū	Ū	Ū	Ŭ	Ŭ	Ŭ	330	
2,4,5-Trichlorophenol	U U	U	U	U	U	U	U	Ū	330	100
2-Chloronaphthalene	U	U	U	U	U	บ	Ū	Ū	330	
2-Nitroaniline	) U	υ	υ	U	Ū	U	Ū	Ū	330	430
Dimethylphthalate	U U	U	Ū	U	υl	Ū	Ŭ	Ū	330	2,000
Acenaphthylene	U U	Ū	Ū	Ū	Ū	Ū	Ū	Ū	330	41,000
2,6-Dinitrotoluene	U U	Ū	Ū	Ū	Ū	Ū	Ŭ	Ū	330	1,000
3-Nitroaniline	U U	U	Ú	U	Ū	Ū	Ū	Ū	330	500
Acenaphthene	U	U	- U -	ປ	U	U	U	U	330	50,000

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLEID	IPSBX-08	IPSBX-08	IPSBX-09	IPSBX-09	IPSBX-09	IPSBX-09	IPSBX-09	IPSBX-09		
SAMPLE DEPTH (FT)	(16-18)	(18-20)	(4-6)	(6-8)	(8-10)	(10-12)	(12-14)	(14-16)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/28/03	1/28/03	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03	QUANTITATION	Recommended
DILUTION FACTOR	· 1	1	1	1	1	1	1	1	LIMITS	Soil Cleanup
PERCENT SOLIDS	48.0	90.0	84.0	65.0	52.0	69.0	46.0	89.0		Objective
UNITS	(ug/kg)	(ug/kg)								
2,4-Dinitrophenol	U	U	U	U	U	ບ	U	U	330	200
4-Nitrophenol	U U	U	U	U	U	U	U U	U	330	100
Dibenzofuran	U	U	U	U	U	U	U U	U	330	6,200
2,4-Dinitrotoluene	U	U	υ	U	U	U	U	U	330	
Diethylphthalate	U	U	U	U	U	U	υ	υ	330	7,100
4-Chlorophenyl-phenylether	) U	U	U	U	U	U	U U	U	330	
Fluorene	U	U	U	U	U	U	) U	U	330	50,000
4-Nitroanillne	U	U	U	U	U	υ	U	U	330	
4,6-Dinitro-2-methylphenol	U -	U	U	U	U	U	U U	U	330	
N-Nitrosodiphenyiamine	U	U	U	U	U	U	U	υ	330	
4-Bromophenyi-phenylether	U	υ.	U	U	U	U	( U	U	330	
Hexachiorobenzene	U	U	U	U	· U	U	U	U	330	410
Pentachlorophenol	) U	U	U	υ	U	U	U U	U	330	1,000
Phenanthrene	U U	U	U	U	U	U	) U	U	330	50,000
Anthracene	U	U	U	U	U	U	U U	U	330	50,000
Carbazole	U	υ	U	U	U	U	i U	U	330	
Di-n-butylphthalate	U	U	U	U	U	U	່ ບ	U	330	8,100
Fluoranthene	73 J	U	U	U	U	U U	l U	· U	330	50,000
Pyrene	U	U	U	U	U	Ų	U U	Ų	330	50,000
Butylbenzylphthalate	) U	Ų	U	U	U	U	U	U	330	50,000
3,3-Dichlorobenzidine	U	Ų	Ų.	U	U	Ų	U	U	330	
Benzo(a)anthracene	Ų	U	Û	Ų	Ų	υ	U	U	330	224
Chrysene	U	U	U	U	U	U	} U	U	330	400
bis(2-Ethylhexyl)phthalate	120 J	60 J	82 J	50 J	U	· U	U U	U	330	50,000
Di-n-octylphthalate	U	U	U	Ų	U	U	ļ U	U	330	50,000
Benzo(b)fluoranthene	U U	U	U	U	U	U	U	U	330	1,100
Benzo(k)fluoranthene	U	U	U.	U	U	U	U U	U	330	1,100
Benzo(a)pyrene	U	U	U	U	U	U	) U	U	330	61
Indeno(1,2,3-cd)pyrene	U U	U	U	U	U	U	U U	U	330	3,200
Dibenzo(a,h)anthracene	U	U	U	U	U	U	U	U	330	14
Benzo(g,h,i)perviene	U	U	Ų	Ų	U	Ų	U	U	330	50,000
Total PAHs	73	o	0	0	0	0	o	0	-	100.000
Total CaPAHs	0	o i	ō	Õ.	Ō	ŏ	ŏ	ŏ		10,000
Total SVOCs	193	60	82	50	ŏ	Ō	78	ŏ	-	500,000

<u>QUALIFIERS:</u> U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

D: Compound concentration was obtained from a diluted analysis.

NOTES: ---

: Not applicable.

: Concentration exceeds NYSDEC TAGM 4046 Recommended Soil Cleanup Objective

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	IPSBX-09	IPSBX-09	IPSBX-10	IPSBX-10	IPSBX-10	IPSBX-10	IPSBX-10	IPSBX-11		
SAMPLE DEPTH (FT)	(16-18)	(18-20)	(8-10)	(10-12)	(12-14)	(14-16)	(16-18)	(4-6)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/29/03	1/29/03	1/23/03	1/23/03	1/23/03	1/23/03	1/23/03	1/27/03	QUANTITATION	Recommended
DILUTION FACTOR	1	1	1	1	1	1	1	1	LIMITS	Soll Cleanup
PERCENT SOLIDS	43.0	77.0	50.0	72,0	86.0	80.0	82.0	7 <b>6</b> .0		Objective
	(ug/kg)	(ug/kg)	(ug/kg)							
Phenol	190_J	U	U	U	υĮ	· U	U	U	330	30
bis(2-Chloroethyl)ether	U U	U	υ	· U	U	U	U	U	330	
2-Chlorophenol	U	U U	U	U	υ	U	U	U	330	800
1,3-Dichlorobenzene	U U	U	U	U	U	U	U	υ	330	
1,4-Dichlorobenzene	[ U ]	U	υ	U	υ	υ	U	U	330	
1,2-Dichlorobenzene	U U	U	U	Ų	υ	U	U	Ú	330	
2-Methylphenol	U .	U	Ū	Ú	Ŭ	Ũ	Ŭ	Ŭ	330	100
2,2-oxybis (1-chloropropane)	U	U	U U	Ų	U	Ú	Ŭ	Ū	330	
4-Methylphenol	U U	U	Ù	Ú	υl	Ũ	Ŭ	Ū	330	900
N-Nitroso-dl-n-propylamine	ן ט	υ	U	U	Ū	Ŭ	Ū	Ū	330	
Hexachloroethane	Ű	Ů	Ū	ı ŭ l	ŭ	ŭ	Ŭ Ŭ	ŭ	330	
Nitrobenzene	Ú	Ū	Ũ	Ũ	Ŭ	ŭ	บั	Ŭ	330	200
Isophorone	U U	Ŭ	Ũ	Ŭ	Ū Ū	Ŭ	Ŭ	ιŭι	330	4,400
2-Nitrophenol	Ú	υ	U	Ú	Ů	Ŭ	Ŭ	Ū	330	330
2,4-Dimethylphenol	ן ט	U	υ	υΙ	υÌ	Ū	Ŭ	Ŭ	330	
2,4-Dichlorophenol	υ	Ŭ	Ũ	Ū Ū	- ŭ	ŭ	Ŭ Ŭ	u ŭ	330	400
1,2,4-Trichlorobenzene	Ú	Ŭ	Ū	Ŭ	ŭ	ŭ	Ŭ	Ŭ	330	400
Naphthalene	Ú	Ũ	Ũ	Ũ	ū l	ม้	Ŭ	73 J	330	13,000
4-Chloroaniline	υ	Ũ	Ŭ	Ū Ū	Ũ	Ŭ	Ŭ	Ŭ	330	220
bis(2-Chloroethoxy)methane	U	U)	Ų	υ	U	Ŭ	Ú	Ŭ	330	
Hexachlorobutadiene	U	U U	υ	Ú	Ú Í	Ū.	Ū	Ŭ	330	
4-Chloro-3-methylphenol	υ Ι	U	Ū	Ū	ū	Ŭ	Ŭ	ŭ	330	240
2-Methyinaphthalene	ีย บิไ	Ũ	Ŭ	υŪ	Ŭ	ŭ	Ŭ	140 J	330	36,400
Hexachlorocyclopentadlene	Ů	Ŭ	Ũ	Ŭ	ŭ	ŭ	l ŭ	1 <sup>140</sup> U	330	00,400
2,4,6-Trichlorophenol	Ū	Ŭ	Ŭ	ũ	Ū	Ŭ	Ŭ	Ŭ	330	
2,4,5-Trichlorophenoi	Ű	Ũ	Ŭ	Ů	Ŭ l	บั	Ŭ	Ŭ	330	100
2-Chloronaphthaiene	Ū	Ŭ	Ū	Ŭ	ŭ	Ŭ	Ŭ.	ັ້	330	100
2-Nitroaniline	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ Ŭ	Ŭ	330	430
Dimethylphthalate	Ũ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	330	2.000
Acenaphthylene	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	330	41,000
2,6-Dinitrotoiuene	Ū	Ű	Ŭ	Ű Ű	ŭ l	Ŭ	Ŭ Ŭ	Ŭ	330	1,000
3-Nitroaniline	Ū	Ū	Ū	ī ūl	บั	ũ	U U	ŭ	330	500
Acenaphthene	บั	ŭ	ŭ	Ŭ	ŭ	Ŭ	រ បំ	ŭ	330	50,000

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	IPSBX-09	PSBX-09	PSBX-10	IPSBX-10	IPSBX-10	IPSBX-10	IPSBX-10	IPSBX-11		
SAMPLE DEPTH (FT)	(16-18)	(18-20)	(8-10)	(10-12)	(12-14)	(14-18)	(16-18)	(4-8)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/29/03	1/29/03	1/23/03	1/23/03	1/23/03	1/23/03	1/23/03	1/27/03	QUANTITATION	Recommended
DILUTION FACTOR	1 1	1	1	1	1	1	1	1	LIMITS	Soll Cleanup
PERCENT SOLIDS	43.0	77.0	50.0	72.0	86.0	80.0	82.0	76.0		Objective
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
2,4-Dinitrophenol	υ	U	U	U	U	U	ļυ	U	330	200
4-Nitrophanol	U U	U	U	U	U	U	( U	U	330	100
Dibenzofuran	U U	U	Ψ	U	U	U	U U	U	330	6,200
2,4-Dinitrotoluene	) U	υ	U	U	U	U	U U	U	330	
Diethylphthalate	U	U	U	U	U	U	U	U	330	7,100
4-Chlorophenyl-phenylether	U	U	U	U	U	U	U U	U	330	
Fluorene	U	U	U	υ	U	U	U U	U	330	50,000
4-Nitroaniline	U	U	U U	U	U	U	U	U	330	
4,6-Dinitro-2-methylphenol	U	U	U	U	U	U	l U	U	330	
N-Nitrosodiphenyiamine	U	U	U	U	ບ	U	υ	U	330	
4-Bromophenyl-phenylether	U	ບ	U	U	U	U	υ υ	U	330	
Hexachlorobenzene	U	υ	U	U	U	U	υ	U	330	410
Pentachiorophenoi	U	υ	U	U	U	U	U	U	330	1,000
Phenanthrène	U U	U	U	U	U	U	U U	130 J	330	50,000
Anthracene	<u>υ</u>	U	U	U	U	U	Ι υ	U	330	50,000
Carbazole	U	U	Ų	U	U	U	U	U	330	
DI-n-butyiphthalate	U U	U	U	U	U	U	U U	U	330	8,100
Fluoranthene	U U	U	U	U	U	U	U U	120 J	330	50,000
Pyrene	U	U	U	U	U	U	U U	130 J	330	50,000
Butylbenzylphthalate	U	U	U	U	U	U	J U	U	330	50,000
3,3-Dichlorobenzidine	U U	U	U	U	U	U	U U	U	330	
Benzo(a)anthracene	U	U	Ų	U	U	U	U	69 J	330	224
Chrysene	U	U	U	U	U	U	) V	92 J	330	400
bis(2-Ethylhexyl)phthalate	U	U	96 J	69 J	U	54 J	46 J	100 J	330	50,000
Di-n-octyiphthalate	U	υ	U	U	U	U	l u	U	330	50,000
Benzo(b)fluoranthene	U	U	U	U	U	U	U	100 J	330	1,100
Senzo(k)fluoranthene	U	U	U	U	U	U	U	U	330	1,100
Benzo(a)pyrene	U	U	U	U	U	U	U U	56 J	330	61
Indeno(1,2,3-cd)pyrene	U	U	U	U	U	U	U	U	330	3,200
Dibenzo(a,h)anthracene	Ų	U	U	U	U	U	) U	U	330	14
Benzo(g,h,i)perylene	U	U	U	U	U	U	U	U	330	50,000
Total PAHs	0	0	o	o	0 -	0	0	770	-	100.000
Total CaPAHs	ŏ	Ō	Ō	Ō	Ó	Ō	Ō	317		10,000
Total SVOCs	190	Ŭ	96	69	0	54	46	1,010		500,000

QUALIFIERS: U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

D: Compound concentration was obtained from a diluted analysis.

NOTES: ---

: Not applicable.

: Concentration exceeds NYSDEC TAGM 4046 Recommended Soil Cleanup Objective

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID SAMPLE DEPTH (FT)	IPSBX-11 (6-8)	(PSBX-11 (8-10)	IPSBX-11 (10-12)	IPSBX-11 (12-14)	IPSBX-11 (14-16)	IPSBX-11 (16-18)	IPSBX-11 (18-20)	IP\$BX-12 (4-6)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION DILUTION FACTOR	1/27/03	1/27/03 1	1/27/03	1/27/03	1/27/03	1/27/03	1/27/03	1/23/03	QUANTITATION	Recommended
PERCENT SOLIDS	83.0	43.0	82.0	92.0	87.0	82.0	83.0	65.0	LIMIT\$	Soil Cleanup
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	Objective (ug/kg)
			(08/18/	(09/19/	(49/19)	(dy/ky)		_(09/69/		
Phenol	ט	υ	U U	υ	U	υ	υ	U U	330	30
bis(2-Chloroethyl)ether	U	υ	U	U	U	Ŭ	ΙŪ	Ŭ	330	
2-Chlorophenol	U	υ	U	U	U	U	Ú	υ	330	800
1,3-Dichlorobenzene	U	υ	U	ΰ	Ú	Ŭ	l Ū	Ū	330	
1,4-Dichlorobenzene	Ú	U	Ú	Ŭ	i Ū	Ŭ	Ū	Ū	330	
1,2-Dichlorobenzene	υ	U	U	U	Ú	Ŭ	Ū	Ū	330	
2-Methylphenol	U U	U	U	U	Ŭ	Ŭ	Ū	Ŭ	330	100
2,2-oxybis (1-chloropropane)	ບ	U	U	U	U (	υ	U	U	330	
4-Methylphenol	Ų	U	U U	U U	່ ບ	U	U	U	330	900
N-Nitroso-di-n-propylamine	U U	υ	Ŭ	U	U	υ	U	U	330	
Hexachloroethane	υ	Ú	Ú	Ú	Ū	Ŭ	Ū	Ŭ	330	
Nitrobenzene	υ	U	υ	Ű	Ū	Ú	) Ŭ	Ū	330	200
Isophorone	U	U	Ú	U	υ (	Ŭ	U	U	330	4,400
2-Nitrophenol	U	Ų	υ	U	υ	U	υ	U	330	330
2,4-Dimethylphenol	) U	U	U	υ	U	U	U	U	330	
2,4-Dichiorophenol	U	U	U	U	U	U	υ	υ	330	400
1,2,4-Trichlorobenzene	U	U	U	U	U U	U	U	υ υ	330	
Naphthalene	U	U	U	U	Ú	U	υ –	140 J	330	13,000
4-Chioroaniline	U	U	U	U	U	U	U	) U	330	220
bis(2-Chloroethoxy)methane	U	U	U	U	U	U	U	U	330	
Hexachlorobutadiene	ປ	U	U	Ų	U	U	U U	U	330	
4-Chloro-3-methylphenoi	U	U	U	U	U U	U	υ	U	330	240
2-Methylnaphthalene	U	U	Ų	U	U	U	U	150 J	330	36,400
Hexachiorocyclopentadiene	U	U	U	U	[ U	U	U	U	330	
2,4,6-Trichlorophenol	U	U	U	ן ט	U U	U	U U	U	330	
2,4,5-Trichlorophenol	U	υ	U	U	U	U	U (	U	330	100
2-Chloronaphthalene	U	U	U	U	U	U	U	U	330	
2-Nitroaniline	U	U	U	U	U	U	U	U	330	430
Dimethylphthalate		U	U	U	U	U	U	U	330	2,000
Acenaphthylene	U U	U	U	U	U	U	) U	υ	330	41,000
2,6-Dinitrotoluene	U	U	U	U	U	U	U	U	330	1,000
3-Nitroaniline	U	υ	υ	U	υ	U	U	υ	330	500
Acenaphthene	UU	U	<u> </u>	U	UU	U	U	U	330	50,000

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	IPSBX-11 (6-8) 1/27/03 1 83.0 (ug/kg)	IPSBX-11 (8-10) 1/27/03 1 43.0 (ug/kg)	IPSBX-11 (10-12) 1/27/03 1 62.0 (ug/kg)	IPSBX-11 (12-14) 1/27/03 1 92.0 (ug/kg)	IPSBX-11 (14-16) 1/27/03 1 87.0 (ug/kg)	IPSBX-11 (16-18) 1/27/03 1 82.0 (ug/kg)	IPSBX-11 (18-20) 1/27/03 1 83.0 (ug/kg)	(PSBX-12 (4-8) 1/23/03 1 65.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM Recommended Soil Cleanup Objective (ug/kg)
2,4-Dinitrophenol 4-Nitrophenol Dibenzofuran 2,4-Dinitrotoluene Diethylphthalate 4-Chlorophenyl-phenylether Fluorene 4-Nitroanlilne 4,8-Dinitro-2-methylphenol N-Nitrosodiphenylamine 4-Bromophenyl-phenylether Hexachlorobenzene Pentachlorophenol Phenanthrene Anthracene Carbazole Di-n-butylphthalate Fluoranthene								U U U U U U U U U U U 76 J	330 330 330 330 330 330 330 330 330 330	200 100 6,200 
Pyrene Butylbenzylphthalate 3,3-Dichlorobenzidine Benzo(a)anthracene Chrysene bis(2-Ethylhexyl)phthalate Di-n-octylphthalate Benzo(b)fluoranthene Benzo(b)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene Total PAHs	0 0000000000000000000000000000000000000	0 2222222	o ccccccccc	0 0 0	o ccc c c c c c c c c c c c c c c c c c	0 0 0 4 4 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 48 0 0 0 0 0 0 0 0 0 0 0 0 0	66 J U 56 J 220 J 91 J U 100 J U 83 J U U U 921	330 330 330 330 330 330 330 330 330 330	50,000 50,000  224 400 50,000 50,000 1,100 1,100 61 3,200 14 50,000 100,000
Total CaPAHs Total SVOCs	0	0	0	0	0	0 44	0 48	459 1,16 <u>2</u>		10,000 500,000

NOTES: --

<u>QUALIFIERS:</u> U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit.

D: Compound concentration was obtained from a diluted analysis.

: Not applicable.

: Concentration exceeds NYSDEC TAGM 4046 Recommended Soll Cleanup Objective

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

## SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	IPSBX-12									
SAMPLE DEPTH (FT)	(6-8)	(8-10)	(10-12)	(12-14)	(14-16)	(16-18)	(18-20)		LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/23/03	1/23/03	1/23/03	1/23/03	1/23/03	1/23/03	1/23/03		QUANTITATION	Recommended
DILUTION FACTOR	1	1	1	1	1	1	1		LIMITS	Soil Cleanup
PERCENT SOLIDS	83.0	87.0	87.0	90.0	89.0	80.0	86.0		Enter o	Objective
UNITS	(ug/kg)		(ug/kg)	(ug/kg)						
									(99/09/	
Phenol	υ	υ	υ	υ	U	U (	υ		330	30
bis(2-Chloroethyl)ether	i U	υ	U	Ű	Ū	Ū	Ū		330	
2-Chlorophenol	U U	Ū	Ŭ	Ū	Ū	Ŭ	l ŭ		330	800
1,3-Dichiorobenzene	Ū	Ŭ	Ū	Ū	Ū.	l Ŭ	l ŭ		330	
1,4-Dichlorobenzene	) U	υ	U	U	Ū	Ŭ	ł ŭ		330	
1,2-Dichlorobenzene	U U	Ū	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ		330	
2-Methylphenol	l ŭ	Ū Ū	Ŭ	Ŭ	Ŭ Ŭ	U U	Ŭ		330	100
2,2-oxybis (1-chloropropane)	l ū	Ŭ	Ŭ	Ŭ	Ŭ	Ű	Ŭ		330	
4-Methylphenol	l ŭ	U U	Ŭ	Ŭ	Ŭ	U U	l ŭ		330	900
N-Nitroso-di-n-propylamine	t ŭ l	) มี	Ŭ	ŭ	ŭ	υ	ŭ		330	
Hexachloroethane	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	i i		330	
Nitrobenzene	i ŭ	l ŭ	บั	Ŭ	Ŭ	u U	l ŭ		330	200
Isophorone	l ñ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	i ŭ		330	4.400
2-Nitrophenoi	I III	l. ŭ	Ŭ	ŭ	Ŭ	Ŭ	l ŭ		330	330
2,4-Dimethylphenol	ŭ	l ŭ	U U	Ŭ	U U	Ŭ	l ŭ		330	
2.4-Dichlorophanol	ιŭ	ŭ	Ŭ	ŭ	ŭ	Ŭ	l ŭ		330	400
1.2.4-Trichiorobenzene	l ŭ	l ŭ	Ŭ	ŭ	ŭ	ŭ	łŭ		330	+00
Naphthalene	160 J	Ŭ.	Ŭ	Ŭ	Ŭ	l ŭ	l ŭ		330	13,000
4-Chloroaniline	i u	Ŭ Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	l ŭ		330	220
bis(2-Chloroethoxy)methane	l ŭ	Ŭ	Ŭ	U .	ŭ	Ŭ	l ŭ		330	
Hexachlorobutadiene	ł ŭ	i ŭ	Ŭ	Ŭ	ŭ	Ŭ	l ŭ		330	
4-Chloro-3-methylphenol	i ŭ	i i	Ŭ	Ŭ	Ŭ	Ŭ	l ŭ		330	240
2-Methylnaphthalene	100 J	ŭ	Ŭ	Ŭ	Ŭ	Ŭ	U U		330	36,400
Hexachlorocyclopentadiene		ŭ	Ŭ	U U	Ŭ	ŭ	l ŭ		330	30,400
2,4,6-Trichlorophenol	ΪŬ	Ŭ	Ŭ	ŭ	Ŭ	Ŭ	l ŭ		330	
2,4,5-Trichlorophenoi	Ū	Ŭ	Ū	Ŭ	Ū	Ŭ	ΙŬ		330	100
2-Chloronaphthalene	Ū	Ū	Ū	Ū	Ū	Ū	Ŭ		330	
2-Nitroaniline	Ū	Ū	Ū	Ŭ	Ū	Ŭ	Ŭ		330	430
Dimethylphthalate	Î Ŭ	Ŭ	Ŭ	Ŭ	Ū	Ŭ	l ŭ		330	2.000
Acenaphthylene	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ		330	41,000
2,6-Dinitrotoluene	Ŭ	Ŭ	Ŭ	Ŭ	ŭ	Ŭ	Ŭ		330	1,000
3-Nitroaniline	Ū	Ŭ	Ŭ	Ū	Ŭ	ΙŪ	Ŭ		330	500
Acenaphthene	53 J	Ū	Ŭ	Ŭ	Ŭ	Ŭ	ΙŬ		330	50.000

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL - SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

SAMPLE ID	IPSBX-12	 							
SAMPLE DEPTH (FT)	(6-6)	(8-10)	(10-12)	(12-14)	(14-16)	(16-18)	(18-20)	LABORATORY	NYSDEC TAGM
DATE OF COLLECTION	1/23/03	1/23/03	1/23/03	1/23/03	1/23/03	1/23/03	1/23/03	QUANTITATION	Recommended
DILUTION FACTOR	1	1	1	1	1	1	1	LIMITS	Soli Cleanup
PERCENT SOLIDS	83.0	87.0	87.0	90.0	89.0	80.0	86.0		Objective
UNITS	(ug/kg)	(ug/kg)							
	(09/109/	(09/19/	(09/19)	(09/19/	(09/19/	(49/19/			
2,4-Dinitrophenol	υ	υ	υ	υ	U	U	ט	330	200
4-Nitrophenol	U U	U	υ	υ	U	ປ	υ	330	100
Dibenzofuran	78 J	U	υ	U	U	U	υ	330	6,200
2,4-Dinitrotoluene	υ υ	U	U	υ	U	υ	υ	330	
Diethylphthalate	ບ 🛛	υ	υ	υ	υ	υ	ן ט	330	7,100
4-Chlorophenyl-phenylether	υ υ	υ	υ	υ	υ	U	Ú	330	
Fluorene	120 J	95 J	ΰ	Ū	Ŭ	Ŭ	Ŭ	330	50,000
4-Nitroanline	່ ປ	υ	υ	υ	U	υ	Ú	330	
4,6-Dinitro-2-methylphenol	υ υ	U	υ	υ	U	Ŭ	Ú Ú	330	
N-Nitrosodiphenylamine	Ú Ú	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ú Ú	330	
4-Bromophenyl-phanylether	υ υ	Ú	U	Ŭ	Ū	ΰ	Ú	330	
Hexachlorobenzene	ן ט	υ	U	υ	υ	U	υ	330	410
Pentachlorophenol	ן ט	υ	υ	υ	υ	Ű	υ	330	1,000
Phenanthrene	180 J	150 J	U	U	U	Ŭ	ן ט	330	50,000
Anthracene	58 J	54 J	υ	U	υ	U	Ι υ Ι	330	50,000
Carbazole	110 J	120 J	υ	υ	υ	Ú	ן ט	330	
Di-n-butylphthalate	Ú	υ	Ú	υ	Ŭ	บ	l ŭ l	330	8,100
Fluoranthene	380 J	110 J	υ	Ű	Ŭ	บ	Ŭ	330	50,000
Pyrene	370 J	85 J	υ	U	Ŭ	υ	Ú	330	50,000
Butylbenzylphthalate	ט ו	U	υ	U	U	U	υ	330	50,000
3,3-Dichlorobenzidine	υ	υ	U	ບ	υ	U	ບ 🛛	330	
Benzo(a)anthracene	95 J	υ	Ų	υ	U	υ	U U	330	224
Chrysene	170 J	U	ບ 🗸	ປ	υ	ບ	υ	330	400
bis(2-Ethylhexyl)phthalate	71 J	49 J	58 J	60 J	54 J	270 J	470	330	50,000
Di-n-octylphthalate	ບ 🛛	υ	υ	υ	U	ບ	ן ט	330	50,000
Benzo(b)fluoranthene	130 J	υ	υ	Ų	U	Ų	ן ט	330	1,100
Benzo(k)fluoranthene	57 J	U	U	Ú	υ	Ú	U	330	1,100
Benzo(a)pyrene	82 J	U	υ	υ	υ	Ų	U	330	61
Indeno(1,2,3-cd)pyrana	42 J	Ū	Ű	Ų	Ű	Ů	Ú	330	3,200
Dibenzo(a,h)anthracene	Ū Ū	Ū	Ŭ	Ű	Ū	Ŭ	Ŭ	330	14
Benzo(g,h,i)perylene	46 J	U	U	U	Ŭ	Ū	Ŭ	330	50,000
Total PAHs	1,943	494	0	0	0	0	0		100,000
Total CaPAHs	576	0	0	0	0	0	0	 -	10,000
Total SVOCs	2,302	663	58	60	54	270	470	 	500,000

<u>QUALIFIERS:</u> U: Compound analyzed for but not detected.

J: Compound found at a concentration below the detection limit. D: Compound concentration was obtained from a diluted analysis.

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: Concentration exceeds NYSDEC TAGM 4046 Recommended Soli Cleanup Objective

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### TABLE 49

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL POLYCHLORINATED BIPHENYLS (PCBs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	IPSBX-01 (4-6) 1/27/03 1 73.0 (ug/kg)	IP\$BX-01 (6-8) 1/27/03 1 24.0 (ug/kg)	IPSBX-01 (8-10) 1/27/03 1 31.0 (ug/kg)	IPSBX-01 (10-12) 1/27/03 1 27.0 (ug/kg)	IP\$BX-01 (12-14) 1/27/03 1 25.0 (ug/kg)	IP\$BX-01 (14-16) 1/27/03 1 44.0 (ug/kg)	IPSBX-01 (16-18) 1/27/03 1 60.0 (ug/kg)	IPSBX-01 (18-20) 1/27/03 1 92.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4046 Recommended Soll Cleanup Objective (ug/kg)
Arocior- 1016 Arocior- 1221 Arocior- 1232 Arocior- 1242 Arocior- 1248 Arocior- 1254 Arocior- 1254	σσσσσσ	000000000000000000000000000000000000000		כככככ	כככככ		0 0 0 0 0 0 0 0	σσσσσσ	34 34 34 34 34 34 34 34	
	0	0	0	0	00	00	0	0	u	1,000/10,000*
SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	(6-8) (6-8) 1/28/03 1 68.0 (ug/kg)	( <b>PSBX-02</b> (8-10) 1/28/03 1 39.0 (ug/kg)	IPSBX-02 (10-12) 1/28/03 1 81.0 (ug/kg)	IPSBX-02 (12-14) 1/28/03 1 47.0 (ug/kg)	IPSBX-02 (14-16) 1/28/03 1 42.0 (ug/kg)	IP\$BX-02 (16-18) 1/28/03 1 83.0 (ug/kg)	12802 (18-20) 1/28/03 1 58.0 (ug/kg)	<b>IPSBX-03</b> (6-8) 1/28/03 1 81.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective (ug/kg)
Arocior- 1016 Arocior- 1221 Arocior- 1232 Arocior- 1242 Arocior- 1248 Arocior- 1254 Arocior- 1254	ccccc	0000000	ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ	σσσσσσ	σσσσσ	ບ ບ ບ ບ ບ ບ ບ ບ	ບ ບ ບ ບ ບ ບ ບ ບ ບ		34 34 34 34 34 34 34 34	
TOTAL PCBs	0	0	0	0	0	0	0	0		1,000/10,000*

QUALIFIERS:

NOTES:

- : Not applicable.

: According to NYSDEC TAGM 4046 Recommended Soil Cleanup Objective, 1,000 ug/kg is utilized for surface soil [0'-2' below ground surface (bgs)] and 10,000 ug/kg is utilized for subsurface soil (soil deeper than 2' bgs).

U: Compound analyzed for but not detected.

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#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL POLYCHLORINATED BIPHENYLS (PCBs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	IP\$BX-03 (8-10) 1/28/03 1 85.0 (ug/kg)	IPSBX-03 (10-12) 1/28/03 1 81.0 (ug/kg)	(PSBX-03 (12-14) 1/28/03 1 44.0 (ug/kg)	IP\$BX-03 (14-16) 1/28/03 1 81.0 (ug/kg)	IPSBX-03 (16-18) 1/28/03 1 53.0 (ug/kg)	IPSBX-03 (18-20) 1/28/03 1 76.0 (ug/kg)	IP\$BX-04 (4-8) 1/28/03 1 56.0 (ug/kg)	iP\$8X-04 (6-8) 1/28/03 1 61.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4048 Recommended Soil Cleanup Objective (ug/kg)
Arocior- 1016 Arocior- 1221 Arocior- 1232 Arocior- 1242 Arocior- 1248 Arocior- 1254 Arocior- 1254	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	CCCCC		00000		0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		34 34 34 34 34 34 34	
TOTAL PCB3	0	0	0	0	0	0	0	0		1,000/10,000*
SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	IP\$BX-04 (8-10) 1/28/03 1 40.0 (ug/kg)	(P\$BX-04 (10-12) 1/28/03 1 75.0 (ug/kg)	iPSBX-04 (12-14) 1/28/03 1 65.0 (ug/kg)	IPSBX-04 (14-16) 1/28/03 1 78.0 (ug/kg)	IPSBX-04 (16-18) 1/28/03 1 80.0 (ug/kg)	IPSBX-04 (18-20) 1/28/03 1 52.0 (ug/kg)	IPSBX-05 (10-12) 1/23/03 1 52.0 (ug/kg)	IP\$BX-05 (12-14) 1/23/03 1 78.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective (ug/kg)
Arocior- 1018 Arocior- 1221 Arocior- 1232 Arocior- 1242 Arocior- 1248 Arocior- 1254 Arocior- 1254	000000	000000	000000000000000000000000000000000000000	CCCCC	ccccc		ccccc		34 34 34 34 34 34 34 34	
	0	0	0	0	0	0	0	0	-	1,000/10,000*

QUALIFIERS: U: Compound analyzed for but not detected.

## NOTES:

: Not applicable. -٠

: According to NYSDEC TAGM 4046 Recommended Soil Cleanup Objective, 1,000 ug/kg is utilized for surface soil [0'-2' below ground surface (bgs)] and 10,000 ug/kg is utilized for subsurface soil (soil deeper than 2' bgs).

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL POLYCHLORINATED BIPHENYLS (PCBs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	IPSBX-05 (14-16) 1/23/03 1 86.0 (ug/kg)	(16-18) (16-18) 1/23/03 1 86.0 (ug/kg)	IP\$BX-05 (18-20) 1/23/03 1 88.0 (ug/kg)	iP\$BX-06 (4-6) 1/27/03 1 88.0 (ug/kg)	(PSBX-06 (6-8) 1/27/03 1 68.0 (ug/kg)	IPSBX-06 (8-10) 1/27/03 1 53.0 (ug/kg)	IPSBX-06 (12-14) 1/27/03 1 66.0 (ug/kg)	(PSBX-06 (14-16) 1/27/03 1 89.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4048 Recommended Soil Cleanup Objective (ug/kg)
Aroclor- 1016 Aroclor- 1221 Aroclor- 1232 Aroclor- 1242 Aroclor- 1248 Aroclor- 1254 Aroclor- 1260		υ υ υ υ υ υ	υ υ υ υ	0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0 0	υ υ υ υ υ υ υ		34 34 34 34 34 34 34	
	o	o	0	0	0_	0_	0	0		1,000/10,000*

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	IPSBX-06 (16-18) 1/27/03 1 69.0 (ug/kg)	IPSBX-06 (18-20) 1/27/03 1 53.0 (ug/kg)	IPSBX-07 (4-6) 1/27/03 1 87.0 (ug/kg)	IPSBX-07 (6-8) 1/27/03 1 69.0 (ug/kg)	(8-10) (8-10) 1/27/03 1 54.0 (ug/kg)	IPSBX-07 (10-12) 1/27/03 1 83.0 _(ug/kg)_	IPSBX-07 (12-14) 1/27/03 1 54.0 (ug/kg)	IP\$BX-07 (14-16) 1/27/03 1 47.0 (ug/kg)	LABORATORY QUANTITATION LIMITS	NYSDEC TAGM 4048 Recommended Soli Cleanup Objective (ug/kg)
Aroclor- 1016	U								34	
Arocior- 1221	l · ŭ	l ŭ	Ŭ	Ŭ,	U U	Ŭ	l ŭ	Ŭ	34	
Aroclor- 1232	Ū	Ū	Ŭ	Ū	Ŭ	Ū	ΙŪ	Ū	34	•
Aroclor- 1242	U	υ	Ū	U	Ū	U	U U	U	34	
Aroclor- 1248	υ	l Ū	Ū	Ū	Ū	Ū	l Ū	) Ū	34	
Arocior- 1254	Ū	Ĵ Ū	Ū	Ū	Ū	Ū	Ū	Ū	34	
Aroclor- 1260	U	U	U	U	U	Ú	U	U	34	-
	0	0	0	0	0	0	0	0	-	1,000/10,000*

<u>QUALIFIERS:</u> U; Compound analyzed for but not detected.

NOTES: : Not applicable. -

: According to NYSDEC TAGM 4046 Recommended Soil Cleanup Objective, 1,000 ug/kg is utilized for surface soil [0-2' below ground surface (bgs)] and 10,000 ug/kg is utilized for subsurface soil (soil deeper than 2' bgs).

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL POLYCHLORINATED BIPHENYLS (PCBs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	IP\$BX-07 (16-18) 1/27/03 1 64.0 (ug/kg)	IPSBX-07 (18-20) 1/27/03 1 41.0 (ug/kg)	IP\$BX-08 (4-6) 1/28/03 1 77.0 (ug/kg)	IPSBX-08 (6-8) 1/28/03 1 72.0 (ug/kg)	IPSBX-08 (8-10) 1/28/03 1 66.0 (ug/kg)	IP\$BX-08 (10-12) 1/28/03 1 80.0 (ug/kg)	IPSBX-08 (12-14) 1/28/03 1 78.0 (ug/kg)	(14-16) (14-16) 1/28/03 1 76.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective (ug/kg)
Aroclor- 1016	) U	U U	U	U	u	U	υ	υ	34	
Arocior- 1221	l Ŭ	Ŭ	Ū	Ŭ	Ŭ	l ŭ	l ŭ	Ū	34	
Aroclor- 1232	Ū	Ū	Ŭ	U	Ū Ū	l ū	ĪŪ	l Ū	34	
Aroclor- 1242	U	U	U	υ	Ū	Ū	υ (	υ	34	
Aroclor- 1248	) U	υ (	υ	U	υ	( U	U U	U	34	
Aroclor- 1254	U U	U	U U	U	U -	υ	υ	U	34	
Aroclor- 1260	U	U	U	U	U	U	υ	υ	34	
TOTAL PCBs	0	0	0	0	0	0	0	0		1,000/10,000*
		IPSBX-08	IPSBX-09	IPŚBX-09	IPSBX-09	IPSBX-09	IPSBX-09	IPSBX-09	LABORATORY	NYSDEC
SAMPLE DEPTH (FT)	(16-18)	(18-20)	(4-6)	(6-8)	(8-10)	(10-12)	(12-14)	(14-16)	QUANTITATION	TAGM 4046
DATE OF COLLECTION	1/28/03	1/28/03	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03	1/29/03	LIMITS	Recommended
DILUTION FACTOR	1	1	1	1	1	1	1	1		Soil Cleanup
	40.0			85.0	600		40.0	80.0		0.5.1

SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	(16-18) 1/28/03 1 48.0 (ug/kg)	(18-20) 1/28/03 1 90.0 (ug/kg)	(4-6) 1/29/03 1 84.0 (ug/kg)	(6-8) 1/29/03 1 85.0 (ug/kg)	(8-10) 1/29/03 1 52.0 (ug/kg)	(10-12) 1/29/03 1 69.0 (ug/kg)	(12-14) 1/29/03 1 48.0 (ug/kg)	(14-16) 1/29/03 1 89.0 (ug/kg)	QUANTITATION LIMITS (ug/kg)	TAGM 4046 Recommended Soil Cleanup Objective (ug/kg)
Aroclor- 1016			11			U		U	34	
		ŭ	U U	i i		U U		l ü		****
Arocior- 1221		U	U		U U	U	) <u> </u>	0	34	
Arocior- 1232	U U	U	U	U	U	U	U	U	34	****
Aroclor- 1242	U	U	U	U	) U	U	) U	U	34	
Aroclor- 1248	υ	U	U	U	U	U	Ι υ	U	34	****
Arocior- 1254	υ	U	U	U	υ	U	l u	U	34	
Aroclor- 1260	U	U	U	U	U	Ū	Ū	U	34	
TOTAL PCB:	0	0	0	0	0	0	0	0		1,000/10,000*

QUALIFIERS: U: Compound analyzed for but not detected.

## NOTES:

: Not applicable. ... .

: According to NYSDEC TAGM 4046 Recommended Soil Cleanup Objective, 1,000 ug/kg is utilized for surface soil [0'-2' below ground surface (bgs)] and 10,000 ug/kg is utilized for subsurface soil (soil deeper than 2' bgs).

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

#### SUBSURFACE SOIL POLYCHLORINATED BIPHENYLS (PCBs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	IPSBX-09 (16-18) 1/29/03 1 43.0 (ug/kg)	<b>IPSBX-09</b> (18-20) 1/29/03 1 77.0 (ug/kg)	IPSBX-10 (8-10) 1/23/03 1 50.0 (ug/kg)	IPSBX-10 (10-12) 1/23/03 1 72.0 (ug/kg)	iPSBX-10 (12-14) 1/23/03 1 86.0 (ug/kg)	IPSBX-10 (14-16) 1/23/03 1 80.0 (ug/kg)	IP\$BX-10 (16-18) 1/23/03 1 82.0 (ug/kg)	IPSBX-11 (4-6) 1/27/03 1 76.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective (ug/kg)
Aracior- 1018 Arocior- 1221 Arocior- 1232 Arocior- 1242 Arocior- 1248 Arocior- 1254 Arocior- 1260	υ υ υ υ υ υ υ υ υ υ υ	ນ ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ	υυυυ υυυυυ	υυυυ		0 0 0 0 0 0 0 0 0 0 0 0 0 0	ט ט ט ט ט ט ט ט ט ט ט ט ט ט ט ט ט ט ט	υ υ υ υ υ υ υ υ υ	34 34 34 34 34 34 34	
TOTAL PCBs	0	0	0	0	0	0	0	0	*=	1,000/10,000*
SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	IPSBX-11 (6-8) 1/27/03 1 83.0 (ug/kg)	(PSBX-11 (8-10) 1/27/03 1 43.0 (ug/kg)	iPSBX-11 (10-12) 1/27/03 1 82.0 (ug/kg)	IPSBX-11 (12-14) 1/27/03 1 92.0 (ug/kg)	iPSBX-11 (14-16) 1/27/03 1 87.0 (ug/kg)	IPSBX-11 (16-18) 1/27/03 1 82.0 (ug/kg)	iPSBX-11 (18-20) 1/27/03 1 83.0 (ug/kg)	IPSBX-12 (4-8) 1/23/03 1 65.0 (ug/kg)	LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4046 Recommended Soli Cleanup Objective (ug/kg)
Aroclor- 1016 Aroclor- 1221 Aroclor- 1232 Aroclor- 1242 Aroclor- 1248 Aroclor- 1254 Aroclor- 1260	ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ ບ	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	ບ ບ ບ ບ ບ ບ ບ ບ ບ	ט ככי כ	ນ ບ ບ ບ ບ ບ ບ	ບ ບ ບ ບ ບ ບ	υ υ υ υ υ	34 34 34 34 34 34 34 34	
TOTAL PCBs	a	0	0	0	0	0	0	0		1,000/10,000*

<u>QUALIFIERS:</u> U: Compound analyzed for but not detected.

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## NOTES:

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: Not applicable. ---

: According to NYSDEC TAGM 4048 Recommended Soil Cleanup Objective, 1,000 ug/kg is utilized for surface soil [0'-2' below ground surface (bgs)] and 10,000 ug/kg is utilized for subsurface soil (soil deeper than 2' bgs).

#### ISLAND PARK SUBSTATION LONG ISLAND RAIL ROAD CONSTRUCTION EXCAVATION INVESTIGATION

### SUBSURFACE SOIL POLYCHLORINATED BIPHENYLS (PCBs)

SAMPLE ID SAMPLE DEPTH (FT) DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS UNITS	IPSBX-12 (6-8) 1/23/03 1 82.0 (ug/kg)	(PSBX-12 (8-10) 1/23/03 1 87.0 (ug/kg)	IPSBX-12 (10-12) 1/23/03 1 87.0 (ug/kg)	IP\$BX-12 (12-14) 1/23/03 1 90.0 (ug/kg)	IP\$BX-12 (14-16) 1/23/03 1 89.0 (ug/kg)	IPSBX-12 (16-18) 1/23/03 1 80.0 (ug/kg)	IPSBX-12 (18-20) 1/23/03 1 86.0 (ug/kg)		LABORATORY QUANTITATION LIMITS (ug/kg)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective (ug/kg)
Aroclor- 1016				11	· · · -				34	
Arocior- 1221	i i		U .	U U	ŭ	0			34	
Aroclor- 1232	i ŭ	Ŭ Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ		34	
Aroclor- 1242	Ů	Ŭ	Ŭ	υŬ	Ŭ	บั	Ŭ		34	****
Aroclor- 1248	ĴŪ	Ū	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ	1	34	
Arocior- 1254	Ŭ	υ	· U	Ŭ	Ŭ	Ŭ	Ū		34	
Arocior- 1260	Ű	Ŭ	Ŭ	Ŭ	Ū	Ŭ	Ū		34	
	0	0	0	0	0	0	0			1,000/10,000*

QUALIFIERS:

NOTES:

U: Compound analyzed for but not detected.

: Not applicable.

: According to NYSDEC TAGM 4046 Recommended Soil Cleanup Objective, 1,000 ug/kg is utilized for surface soil [0'-2' below ground surface (bgs)] and 10,000 ug/kg is utilized for subsurface soil (soil deeper than 2' bgs).

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Appendix F

## **APPENDIX F**

# OCTOBER 4, 2004 LETTER REPORT ENTITLED, "REMOVAL OF STAGED SOIL AT THE LONG ISLAND RAIL ROAD MANHASSET SUBSTATION"

Jamaica Station Jamaica, NY 11435-4380 718-558-7711 Kenneth J. Bauer President



October 4, 2004

Ms. Tara L. Diaz New York State Department of Environmental Conservation Division of Environmental Remediation Bureau of Eastern Remedial Action 625 Broadway, 11th Floor Albany, NY 12233-7015

Re: Removal of Staged Soil at the Long Island Rail Road Manhasset Substation D&B No. 2015

Dear Ms. King:

The purpose of this correspondence is to document the soil removal activities which were conducted at the Long Island Rail Road (LIRR) Manhasset Substation in June of 2004, and to present the New York State Department of Environmental Conservation (NYSDEC) with the analytical results associated with the post-removal sampling activities. The following provides a brief review of background information concerning the deposition of soil at this site, a summary of the soil removal activities and post-removal sampling activities, as well as an evaluation of the post-removal analytical data.

## Background

While undertaking a drainage improvement program at the LIRR Manhasset Train Station, located approximately 1,800 feet east of the Manhasset Substation site, the LIRR Capital Program Management Department (LIRR CPM) excavated soil from an area of the train station that historically received storm water runoff from both on-site and off-site properties. In order to complete the project, the LIRR CPM temporarily staged the excavated soil along with miscellaneous construction debris at the LIRR Manhasset Substation site.

Immediately upon notification that the LIRR CPM had temporarily staged soil at the Manhasset Substation site, the LIRR's System Safety Department along with representatives of Dvirka and Bartilucci Consulting Engineers (D&B) conducted site inspections of the substation and train station. At that time, it was agreed to collect several grab and composite soil samples to assess the nature and extent of the staged soil and to determine if the soil had been staged in areas of known mercury contamination as identified by the ongoing site investigation program.

Seven piles of soil were identified at the Manhasset Substation site and one pile of soil was identified at the Manhasset Train Station. As mentioned above, several soil samples were collected to characterize the staged soil. D&B collected a total of nine grab samples and nine composite soil

samples. In addition, one grab and one composite background sample was collected from a random, undisturbed area 200 feet east of the eastern border of the Manhasset Substation site. The results of this sampling effort were presented in the December 10, 2003, letter report provided to the NYSDEC.

As presented in the December 10, 2003, letter report, the soil samples collected at that time exhibited polycyclic aromatic hydrocarbons (PAHs) at relatively low concentrations but above respective NYSDEC soil cleanup objectives, including benzo(a)anthracene, chrysene, benzo(b) fluoranthene, benzo(a)pyrene and dibenzo(a,h)anthracene. In addition, several TAL metals, including arsenic, beryllium, copper, mercury, nickel, selenium and zinc were also detected above respective NYSDEC soil cleanup objectives. In general, however, many of the metal and PAHs detected in the samples collected from the staged soil were at concentrations that were comparable to that of the background samples. Furthermore, as explained in the December 10, 2003, letter report, the staged soil was originally excavated from an area of the Manhasset Train Station that had historically received storm water runoff from off-site commercial and industrial properties. USEPA studies have demonstrated that the PAHs and metals detected in the soil samples are commonly found at similar concentrations in soil that has been subjected to this type of runoff (USEPA Ref. Document 600/SR-94/051).

Based on the findings of the site inspections and sampling program, the following recommendations were made:

- All stockpiled soil north of the Port Washington rail line be removed and transported offsite for disposal.
- Upon removal of the staged soil at the Manhasset Substation site, a post-removal endpoint sampling program be undertaken to ensure all material has been successfully removed.
- Soil stockpiled at the Manhasset Train Station should be removed for off-site disposal.

A post-soil removal sampling plan was prepared by D&B and approved by the NYSDEC via e-mail on January 21, 2004. This plan called for the collection of 54 surface soil samples throughout the area in which soil had been staged. As had been recommended by the NYSDEC, approximately half of the samples were to be analyzed for TAL metals and PAHs. The remainder of the samples were to be analyzed solely for mercury.

## Soil Removal and Post-Removal Endpoint Sampling

The staged soil at the Manhasset Substation and Manhasset Train Station sites was removed by the LIRR on June 5 through June 7 of 2004. Two mini "bobcat"-style loaders were utilized to move the soil to the site's western gate where a full-sized front-end loader was employed to load the soil onto

triaxle dump trucks for disposal. As recommended in the December 10, 2003, letter report, all soil staged to the north of the Port Washington rail line, including Piles I through 4, "West Pile" and any soil spread at grade, was removed from the Manhasset Substation site for disposal. A figure depicting the former location of each soil pile is presented in Attachment 1. In addition, the soil stockpiled adjacent to the residential area at the Manhasset Train Station was removed for disposal. In total, 335.30 tons of nonhazardous soil was transported off-site for disposal. A copy of the nonhazardous waste manifests are included as Attachment 2 of this correspondence. Photographs which depict the condition of the Manhasset substation site prior to soil removal are included as Attachment 3. Photographs which depict the site after the soil had been removed are provided as Attachment 4.

After completing the soil removal activities, surface soil samples were collected between 0 and 2 inches below ground surface throughout the area in which the soil had been staged in accordance with the NYSDEC-approved sampling plan. A total of 48 post-removal samples were collected. It should be noted that, due to minor variation between the estimated and actual areal extent of the site which contained staged soil, six fewer samples were required to sufficiently cover the staged soil area with a grid-like sample pattern than had been prescribed in the approved sampling plan. Of the 48 samples collected, 25 were analyzed for TAL metals and PAHs and 23 were analyzed solely for mercury. The location of each post-removal sample is depicted on the figure provided as Attachment 1 of this letter. Analytical summary tables are provided in Attachment 5.

## Evaluation of Post-Removal Soil Data

The following presents a discussion of the analytical results of the post-removal samples:

• Polycyclic Aromatic Hydrocarbons (PAHs)

In general, PAHs were found at relatively low concentrations with several individual PAHs detected in excess of their respective NYSDEC soil cleanup objectives. However, none of the samples were found to exceed the NYSDEC TAGM 4046 Recommended Soil Cleanup Objective for total PAHs of 100,000 ug/kg, and only 1 of the 25 samples contained total CaPAHs at a concentration which exceeded the NYSDEC CaPAH cleanup objective of 10,000 ug/kg. Individual PAHs which exceeded the NYSDEC cleanup objectives include the following:

- Benzo(a)anthracene
- Chrysene
- Benzo(b)fluoranthene
- Benzo(a)pyrene
- Dibenzo(a,h)anthracene

It is important to note that the PAHs listed above were also detected in background samples collected and analyzed as part of this project. PAHs are common byproducts of the partial combustion of fossil fuels such as coal and diesel fuel, both of which have been used historically on the Port Washington rail line. Furthermore, as discussed above, the temporarily staged soil that was originally excavated from an area of the Manhasset Train Station historically received storm water runoff from the LIRR right-of-way, as well as off-site commercial and industrial properties. Numerous studies have demonstrated that storm water draining from industrial and commercial properties contains a wide range of contaminants including metals and PAHs (USEPA Ref. Document 600/SR-94/051).

• TAL Metals

Several metals, including arsenic, beryllium, copper, mercury, nickel, selenium, and zinc were detected in excess of the NYSDEC soil cleanup objectives in the majority of the 25 samples for which TAL metals were analyzed.

It is important to note that beryllium, copper, selenium, mercury and zinc were also observed in background samples collected as part of this project and are commonly encountered in surficial soil associated with or adjacent to railroad operations and/or various industrial activities for an extended period of time. For example, arsenic is known to have been historically used in the manufacture of herbicides that may have been applied to LIRR property as part of routine maintenance and is also historically a major constituent of wood preservative formulations. Furthermore, similar to PAHs, the abovelisted metals have been shown to be present in storm water runoff (USEPA Ref. Document 600/SR-94/051).

As discussed above, 23 samples were collected solely for analysis of mercury. The samples were collected in a grid like pattern traversing the entire area where soil had been staged. Based on the analytical results, 21 out of the 23 samples exceeded the NYSDEC soil cleanup objective of 0.1 mg/kg for mercury. However, of these samples, 14 did not exceed a concentration of 1 mg/kg.

While mercury was detected in a number of soil samples above the NYSDEC soil cleanup objective, the objective of the post-soil removal sampling program within this area was to confirm that surface soil from the adjacent mercury-impacted drainage swale was not dispersed from this area as the result of the soil staging activities. Based on the above results, and in consideration of the fact that samples within the swale typically have been found to contain mercury up to concentrations of 10 mg/kg, it is apparent that soil from the swale had not been disturbed during the soil staging activities.

## Conclusions and Recommendations

Soil recommended for off-site transportation and disposal has been successfully removed from the Manhasset Substation and Train Station sites by the LIRR, and properly disposed. In addition, an aggressive post-removal endpoint sampling program was completed in accordance with the NYSDEC-approved sampling plan. The findings of the post-removal sampling program show that surface soil at the site contains concentrations of PAHs and TAL metals typical of background conditions for railroad rights-of-way. Furthermore, based on the analytical results, there is no indication that mercury-impacted surface soil within the drainage swale at the site has been disturbed and/or dispersed to adjacent areas as a result of the soil staging activities. As a result, it can be concluded that all appropriate actions have been completed and no further action is warranted with regard to this matter.

If you have any questions or comments, please do not hesitate to contact me at (718) 558-3252.

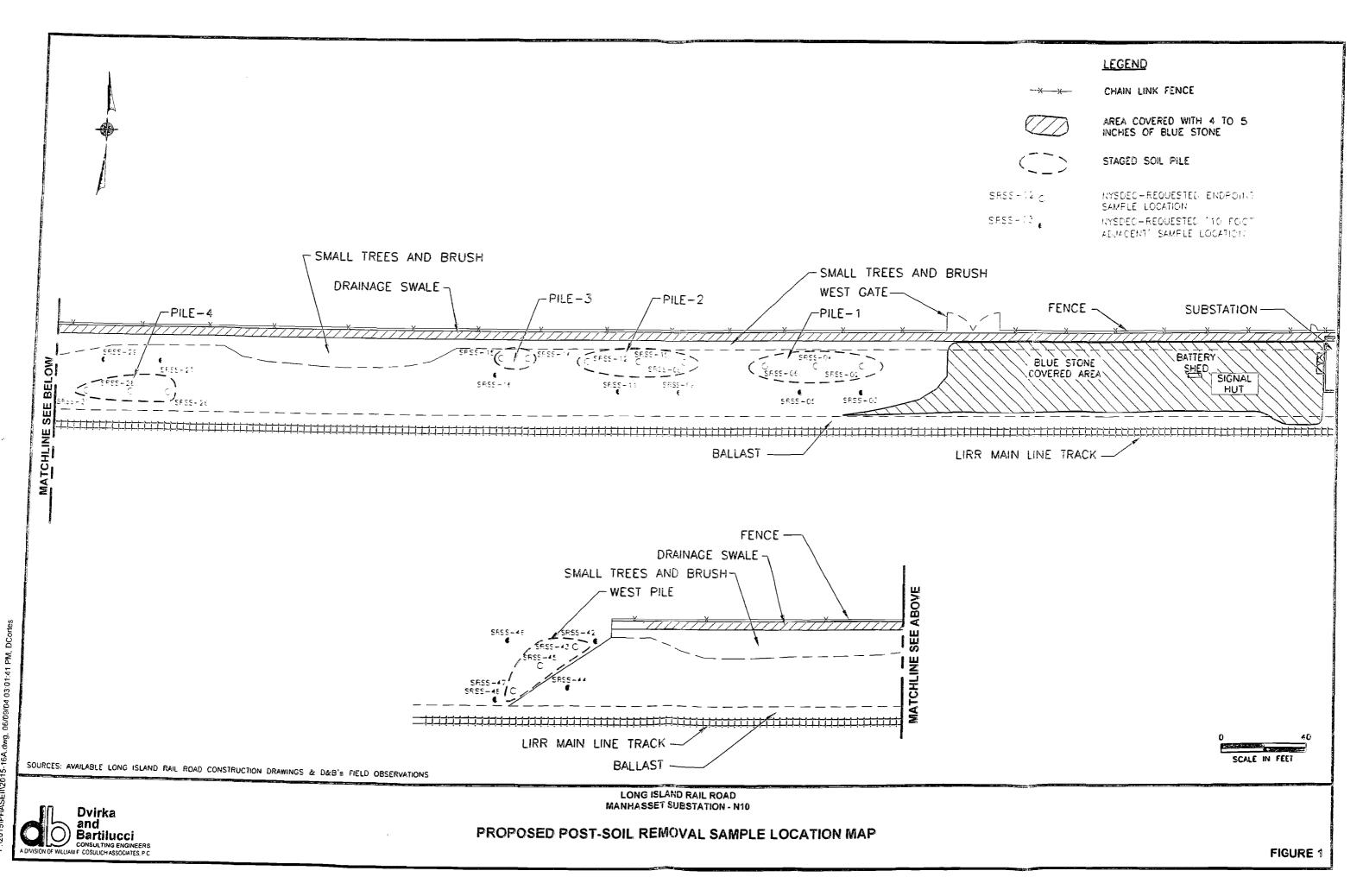
Very muly yours.

Lewis D. Wunderlich Environmental Engineer

LDW/ASA(t)/abj Attachments cc: G. Bobersky (NYSDEC) R. Mitchell (NYSDOH) C. Channer (MTA) W. Keenan (LIRR) C. Komandis (LIRR) R. Walka (D&B) T. Fox (D&B) • 2015LDW07084TLK.doc(R07) **ATTACHMENT 1** 

SOIL PILE AND SAMPLE LOCATION MAP

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ATTACHMENT 2

NONHAZARDOUS WASTE MANIFESTS

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•2015\LDW07084TLK.doc(R03)

G. PENZA & SONS, INC.	DATE: Sept.9, 2004	JOB NO:		
457 Brook Avenue • Deer Park, NY 11729 Tel. 631-242-5115 • Fax 631-242-4146	ATTENTION: Paul Dietlin			
	RE: LIRR Contrac	t# 5840		
TO: Long Island Rail Road	Drainage Improvements			
90-27 Sutphin Blvd.				
Jamaica, NY 11435				

## GENTLEMEN:

WE ARE SENDING YOU	C Attached	Under separate	cover via	_the following items:
□ Shop Drawings	Prints	Plans	□ Samples	Specifications
Copy of Letter	🗆 Change	Order 🛛 Manife	sts	

COPIES	DATE	NO.	DESCRIPTION	
2			Material Manifests (Manhasset Substation)	
	_			

## THESE ARE TRANSMITTED as checked below:

<ul> <li>For approval</li> <li>For your use</li> <li>As requested</li> <li>For review and comment</li> </ul>	<ul> <li>Approved as submitted</li> <li>Approved as noted</li> <li>Returned for corrections</li> </ul>		copies for approval copies for distribution corrected prints
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REMARKS:			

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COPY TO:\_\_\_\_\_

SIGNED: Michael Esopa





# Letter of Transmittal

From:	Paul Dietlin			Date:	09/13/2004	Job No.:		
	Project Manage	er, Capital	Program Management	Attn.:	Lew Wunde	rlich		
To:	Lew Wunderlic			Re:	PN-36 ROW	/ Drainage		
	Environmental	Engineer -	System Safety		Manhasset	Substation Soil		
	Mailcode 3147			_				
Transm	itted Herewith:		X Attached:	Under	a Separate C	ov <b>er Via</b> :		
	Shop Drawi	ngs	Change Order	90% Design				
	Copy of Lett	er	Plans	🔲 30 % D	esign	100% Design		
	Prints		Samples	60% De	esign	Other <u>Manifest / Certs.</u>		
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	X For Your Us	e	As Information					
	For Bids Du		—	Returni	ing Borrowed	Prints		
Romarl	cs / Comments	Should you	have any questions please	contact me o	r Ted Dogonni	ick 631-261-5395		
	<u>807-0755.</u>							
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	File			v	- <del>f</del>	Paul Dietlin		
MTA Lor	ng Island Rail Road i	is an agency	of the Metropolitan Transportati	ion Authority, S	tate of New York	ROWTransmittalmanhassetsoil.XLS MFS/mfs		

## G. PENZA & SONS, INC.

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457 Brook Avenue Deer Park, NY 11729 (631) 242-5115 • Fax (631) 242-4146

## FAX TRANSMITTAL

Fax:261-5396	Date:	9-10-04	
From:       Michael Esopa         Pages including this cover sheet:       3         Comments:       3         RE: Contract # 5840; Drainage improvements	To:	LIRR	
From:       Michael Esopa         Pages including this cover sheet:       3         Comments:       3         RE: Contract # 5840; Drainage improvements	Attn:	Paul Dietlin	
Comments: RE: Contract # 5840; Drainage improvements	Fax:	261-5396	
Comments: RE: Contract # 5840; Drainage improvements	From:	Michael Esopa	
RE: Contract # 5840; Drainage improvements	Pages includ	g this cover sheet: <u>3</u>	
	RE: Con	ct # 5840; Drainage improvements	

Should there be any problem with this transmission or should you have any questions, please call the above telephone number. Thank you.

Cloan Earth of Castoret, Inc. 24 Middleson Avenue, Carboret, NI

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Phone: 732-541-890) Fax: 732-541-810;5

#### Clean Earth of Carteret, Inc. 24 Middlesex Avenue Carteret, NJ 07008 (732) 541-8909 Certificate of Recycling

This is to certify that the soil delivered to Clean Earth of Carteret from the site described in the contaminated soil profile sheet that was issued the Approval Number listed below, has been duly treated and rendered safe for beneficial reuse in accordance with the permit to operate issued to Clean Earth of Carteret, Inc. by the New Jersey Department of Environmental Protection.

Authorized Signature

C. David Morse, Technical Operations Manager 10 September 2004

Approval #: Generator: Site Location:

Total Tons This Certificate: Total Tickets This Certificate: Treatment Date or Dates: 240521 Long Island Railroad Manhasset Substation Manhasset, NY

243.58 8 6/3/04

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Clean Earth of Carteret, Inc.

24 Middlesex Avonue, Carteret, NJ

1



Phone: 732-541-890! Fax: 732-541-810!

#### Clean Earth of Carteret, Inc. 24 Middlesex Avenue Carteret, NJ 07008 (732) 541-8909 Certificate of Recycling

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Authorized Signature

C. David Morse, Technical Operations Manager 10 September 2004

Approval #: Generator: Site Location:

Total Tons This Certificate: Total Tickets This Certificate: Treatment Date or Dates: 240521 Long Island Railroad Manhasse: Substation Manhasset, NY

91.72 4 6/4/04

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FAX NO.

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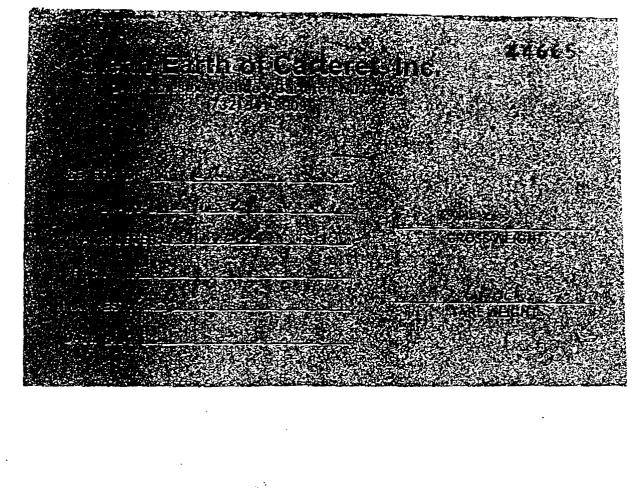


Middlesex Avenue Carteret, NJ 07008 (732) 541-8909

# TREATMENT INVOICE LOAD LIST

invoice#	A-11123	
Approval#	240521	
Generator	LIRR	

4+6+9 $45826$ $6/3/04$ 1 $28.98$ N/A $4+667$ $45842$ $6/3/04$ 3 $33.15$ N/A $4+667$ $45844$ $6/3/04$ 3 $31.00$ N/A $4+658$ $45851$ $6/3/04$ 2 $31.25$ N/A $4+658$ $45851$ $6/3/04$ 2 $31.25$ N/A $4+674$ $45857$ $6/3/04$ 4 $30.82$ N/A $4+674$ $45861$ $6/3/04$ 6 $27.75$ N/A $4+714$ $45926$ $6/4/04$ 7 $29.38$ N/A $4+7474$ $45926$ $6/4/04$ 7 $29.38$ N/A $4+7474$ $45927$ $6/4/04$ 8 $22.65$ N/A $4+7477$ $45931$ $6/4/04$ 9 $22.80$ N/A	TICKET #	Load#	Rec. Date B/L	<u>Manifest#</u>	Net Tons Si	urcharge
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41030 $45857$ $6/3/04$ $4$ $30.82$ $N/A$ $44676$ $45861$ $6/3/04$ $5$ $31.25$ $N/A$ $44714$ $45888$ $6/3/04$ $6$ $27.75$ $N/A$ $44714$ $45926$ $6/4/04$ $7$ $29.38$ $N/A$ $44714$ $45927$ $6/4/04$ $8$ $22.65$ $N/A$	4469	45844	6/3/04	3	31.00	N/A
14676     45861     6/3/04     5     31.25     N/A       14676     45888     6/3/04     6     27.75     N/A       14771     45926     6/4/04     7     29.38     N/A       14771     45926     6/4/04     7     29.38     N/A       14774     45927     6/4/04     8     22.65     N/A	44658	45851	6/3/04	2	31.25	N/A
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ALLIEU ENVIKUNMENTAL G	ROUP. INC. 2
2163 MERRICK AVE., MERRICK, NY 11568 • TEL: 1-800-969-E	DIRT • FAX: 516-867-6480
NON-HAZARDOUS MATERIA	AL MANIFEST
GEN	IERATOR
Generator Name L.T. R.R. Manhausel Substation	Shipping Location Same
Address	Address
Harahausel, NX	
Phone No	
Description of Material	Codes Gross Weight
Approval Number 240,521 Destined For Recycling	Tare Weight Net Weight (Tons)
24052/ Veslined For Recycling	9 Net Weight
and accurately described above, classified, packaged applicable regulations.	CFR Part 172 or any applicable state law, has been fully and is in proper condition for transportation according to <u>Shipment Date</u> Shipment Date
Transporter Name Rainbow	Driver Name (Print) Leonardo ArisTizaba/
Address Network NJ	Vehicle License No./State AH 471 R
	Truck Number 804
State Permit #	
I hereby certify that the above named material was picked up at the generator site listed above. Λ	I hereby certify that the above named material was delivered without incident to the destination listed below.
Leonardo Arilighe 6-3-04 Driver Signature Shipment Date	florende Dreifeit 6-3-04 Driver Signature Delivery Date
	TINATION
Site Name <u>Clean Earth of CarTerel</u> 24 Middlesex Ave Address <u>CarTerel</u> MI	Phone No. 1201-96 State-Permit # 0001-2
I hereby certify that the above named material has been is true and accurate.	accepted and to the best of my knowledge the foregoing
• • • • • • • • • • • • • • • • • • • •	nators Receipt Date

GENERATOR	LIRR			
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DATE:	1/1-1		16.06	$  \Delta $
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Phone No	_ Phone I	No	1 Flurie.	
	Codes	Gross Weight	]	
Approval Number Non HAZAHONS PER	ROL		Net Maishe (Toro)	
CONTRATION SOL		Tare Weight	Net Weight (Tons)	
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	and is i grature NSPOR Driver Vehici	In proper condition for tr 4// Shi TER	anaportation according to <u> <u> <u> </u> <u> </u></u></u>	
I hereby certify that the above named material was picked up at the generator site listed above.		aby certify that the above i and without incident to the		
Driver Signature Shipment Date	• .	r signature ON	6-4/04 Delivery Date	•
Address CARTERET NJ			201-96-0001-	2
I hereby certify that the above named material has been is true and accurate.		) –	· · · · · ·	
Name of Authorized Agent Sig	neture COMPAN	n NAT	Recsipt Date	

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MANIFEST #: DATE: 1.14/04			TARE WEIGHT
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				Log Number	
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2163 MEARICK AVE	., MERRICK, NY 1156	6 • TEL: 1-800-969-DIRT	• FAX: 516-887-6480		
NOI	N-HAZARDOL	US MATERIAL	MANIFEST		· · · · · · · · · · · · · · · · · · ·
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Approval Number	Nonthay	Anors PETROL	Tare Weight	ÍNe	t Weight (Tons)
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APPROVAL #: 240521	1475016 STOSE GROSS WEIGHT
TRUCK : KI SII	·
MANIFEST #:	

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	Transporter Name Address <u>167</u> <u>Marker</u> State Permit # <u>1</u> I hereby certify the picked up at the g <u>C. M. 19</u> Driver Signature Site Name <u>Gree</u>	AN FAR	Der Constant Der Constant De	TRANSPOR TRANSPOR Drive L 12D Vehic S Vehic Truck Truck Truck Truck DESTINAT RTERST	RTER or Name (Print) <u>/</u> cle License No./Sta k Number <u>8</u> reby certify that the ered without incide <u>7</u> or Signature HON Phone No.	$\frac{\sqrt{15}}{1} \frac{P}{1}$	$\frac{24 \ C \ M^2}{24 \ C \ M^2}$ I material was nation listed below. $\frac{06 - 04 - 01}{2000}$
	Transporter Name Address <u>167</u> <u>Marker</u> State Permit # <u>1</u> I hereby certify the picked up at the g <u>C. M. 19</u> Driver Signature Site Name <u>Gree</u>	AN FAR	Der Constant Der Constant De	TRANSPOR TRANSPOR Drive L 12D Vehic S Vehic Truck Truck Truck Truck DESTINAT RTERST	RTER or Name (Print) <u>/</u> cle License No./Sta k Number <u>8</u> reby certify that the ered without incide <u>7</u> or Signature HON Phone No.	$\frac{\sqrt{15}}{1} \frac{P}{1}$	$\frac{24 \times 2}{24 \times 2}$ I material was mation listed below. $\frac{26 - 24 - 01}{2}$
	Transporter Name Address <u>167</u> <u>How IK</u> State Permit # <u>C</u> I hereby certify the picked up at the <u>C</u> <u>C</u> Driver Signature Site Name <u>CLE</u> Address <u>CA</u>	$\frac{72 \circ 10}{54 m^{3} + 5}$ $\frac{54 m^{3} + 5}{58}$ $\frac{58}{5}$ $58$	Deve C. Deve Market named material v listed above. C.G J Shipman TH OK CA TH OK CA TH OK CA	TRANSPOR TRANSPOR Truck Tru	RTER or Name (Print) <u>/</u> cle License No./Sta k Number <u>8</u> reby certify that the ered without incide <u>7</u> or Signature HON Phone No.	$\frac{\sqrt{15}}{1} \frac{P}{1}$	$\frac{24 \ C \ M^{-1}}{2}$ I material was nation listed below. $\frac{06 - 04 - 01}{2}$ Delivery Date
	Transporter Name Address <u>/ 6</u> 7 <u>1</u> <u>Harch</u> State Permit # <u>C</u> I hereby certify the picked up at the g <u>C</u> Driver Signature Site Name <u>C</u> <u>Address <u>C</u> I hereby certify th</u>	$\frac{72 \circ 10}{54 m^{3} + 5 + 5}$ $\frac{54 m^{3} + 5 + 5}{58}$ $\frac{58}{5}$ $\frac{58}{5$	Deve C. Deve Market named material v listed above. C.G J Shipman TH OK CA TH OK CA TH OK CA	TRANSPOR TRANSPOR Truck Tru	TER In Name (Print) // cle License No/Sta k Number reby certify that the reby certify that the red without incide  Incide  Incide	$\frac{\sqrt{15}}{1} \frac{P}{1}$	$\frac{24 \ C \ M^{-1}}{2}$ I material was nation listed below. $\frac{06 - 04 - 01}{2}$ Delivery Date

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Generator Author Transporter Nam	ized Agent Name	si Tran	Driver   Vehicle	Name (Print) License No./S	Ship Alward State_AG	(abrzdzz
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Generator Author Transporter Nam Address State Permit # I hereby certify th	ized Agent Name e <u>Rain(500</u>	Sig TRAN	ISPORT Driver I Vehicle Truck I	Name (Print) License No./ Number	Ship Alwarz State <u>AG</u> 817 the above n	(abrzdzz
Generator Author Transporter Nam Address State Permit # I hereby certify th	ized Agent Name e <u>Rain(500</u> 2+ <u>con</u> N nat the above name generator site listed	Site TRAN	ISPORT Driver I Vehicle Truck I	Name (Print) License No./ Number	Ship Alwarz State <u>AG</u> 817 the above n	emed material was
Generator Author Transporter Nam Address State Permit # I hereby certify th	ized Agent Name e <u>Rain(500</u> 2+ <u>con</u> N nat the above name generator site listed	Sig TRAN	ISPORT Driver I Vehicle Truck I I heret deliver	Name (Print) License No./ Number	Ship Alwarz State <u>AG</u> 817 the above n	emed material was
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Generator Author Transporter Nam Address State Permit # I hereby certify the picked up at the Driver Signature Site Name Address	EVAN EARCT	Sh TRAN TRAN TRAN TRAN Comparison Shipment Data DEST HOF CANTER TANK CAN	I heret deliver	Name (Print) License No./S Number by certify that the d without include Signature IN Phone N \$\begin{pmatrix}     State Print	Ship Alvari State_AG 8172 the above n Ident to the No	the mention base $\frac{2}{2} \frac{(60n2dt2)}{(50n2dt2)}$
Generator Author Transporter Nam Address State Permit # I hereby certify the picked up at the Driver Signature Site Name Address	EVAN EARCT 4 MIDOLFSA hat the above name	Sh TRAN TRAN TRAN TRAN Comparison Shipment Data DEST HOF CANTER TANK CAN	I heret deliver	Name (Print) License No./S Number by certify that the d without include Signature IN Phone N \$\begin{pmatrix}     State Print	Ship Alvari State_AG 8172 the above n Ident to the No	when t Date (60n 2dt 2) (50n 2
Generator Author Transporter Nam Address State Permit # I hereby certify the Driver Signature Site Name Address I hereby certify the	ized Agent Name $e \underline{Rain(bounds)}$ $e \underline{Rain(bounds)}$ a + con i not	Sh TRAN TRAN TRAN TRAN Shipment Data DEST HOF CANTER AND Shipment Data DEST HOF CANTER Shipment Data DEST HOF CANTER Shipment Data DEST HOF CANTER Shipment Data DEST	I heret deliver	Name (Print) License No./S Number by certify that the d without include Signature IN Phone N \$\begin{pmatrix}     State Print	Ship Alvari State_AG 8172 the above n Ident to the No	the present Date (60n2dt2) (50n2dt2)

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	Clean Earth of Carteret, I 24 Middlesex Avenue + Carteret, NJ 07008 (732) 541-8909	nc. 44748
		TN
	GENERATOR: LIKK	Les marker &
	APPROVAL #: 240521	7125011: 37/65
	TRANSPORTER: KHINGOL	GROSS WEIGHT
	TRUCK # ES FIL	· · · · · · · · · · · · · · · · · · ·
	MANIFEST #:	ZS755
· .	DATE: 6/4/04	
		· · · ·

Log Number ALLIED ENVIRONMENTAL GROUP. INC. F 2163 MERRICK AVE., MERRICK, NY 11566 • TEL: 1-800-969-DIRT • FAX: 518-867-5480 NON-HAZARDOUS MATERIAL MANIFEST GENERATOR Generator Name LIRR SUBSTATION Shipping Location AME MANHASSET Address Address : } •• Phone No. Phone No. Gross Weight Codes Description of Material Approval Non HAZARDUUS PERCU Number Net Weight (Tons) Tare Weight CONTANISATO SAIL 4052 DESTING FOR Net Weight YLLIN I hereby certify that the above named material does not contain free liquid as defined by 40 CFR Part 250.10 or any applicable state law, is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, is not a DOT hazardous substance as defined by 49 CFR Part 172 or any applicable state law, has been fully and accurately described above, classified, packaged and is in proper condition for transportation according to applicable regulations SGONNINCK Generator Authorized Agent Name Signature Shipment Date TRANSPORTER face Briver Name (Print) NG r TW Transporter Name 2 te Address 167 Vehicle License No./State\_\_\_ 431/a Truck Number State Permit # 🧹 I hereby certify that the above named material was I hereby certify that the above named material was picked up at the generator site listed above. delivered without incident to the destination listed below Driver Signatute -Driver Signature Shioment Date **Delivery** Date DESTINATION · Site Name CLEAN EARTH OF CONTENET Phone No. State Permit # 1201-#-96-0001-7 100 ASAIN Address I hereby certify that the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate. Name of Authorized Agent Signature lecélot Date TRUCKING COMPANY -..-.

APPROVAL #: 240524 915016 store TRANSPORTER: BALA 2014 GROSS WEIGHT TRUGK#		Clean Earth of Carteret, In 24 Middlesex Avenue • Carteret, NJ 07008 (732) 541-8909	
MANIFEST #: 2 MANIFEST #: 2 DATE: 6/3/11 BATE: 6/3/11		APPROVAL #: 140 TZ1	9115016 aross
MANIFEST #: 2 DATE: $\frac{2965}{7}$ DATE: $\frac{13}{11}$ DATE: $\frac{13}{11}$		TRANSPORTER: SHIN 2014	GROSS WEIGHT
		MANIFEST #:	
		and the second	<u> </u>
	: -		

Clean Earth of Cartere 24 Middlesex Avenue • Carteret, NJ. 0 (732) 541-8909	
GENERATOR: LIKIL APPROVAL #: 240521	265//6:
TRANSPORTER: RHIGHLICH	GROSS WEIGHT
MANTFEST # 3 DATE: 6/3/04	TARE WEIGHT UU

# ALLIED ENVIRONMENTAL GROUP, INC.

2163 MERRICK AVE., MERRICK, NY 11568 . TEL: 1-800-969-DIRT . FAX: 518-867-8480

## NON-HAZARDOUS MATERIAL MANIFEST

### GENERATOR

Generator Name LIRR MANHASSAT SUBSTATIO	-Shioping	Location	
		SAME	
MANHASSET NY	-		
Phone No.	_ Phone N	lo	
Description of Material	Codes	Gross Weight	
Approval . Number 2110521 Contaning So.	12	Tare Weight	Net Weight (Tons)
24052 DESTINGO FOR RECYCL	ume	Net Weight	L
I hereby certify that the above named material does a any applicable state law, is not a hazardous waste a is not a DOT hazardous substance as defined by 49 and accurately described above, classified, packaged applicable regulations.	is defined CFR Pai	by 40 CFR Part 261 or an t 172 or any applicable at	ny applicable state law, late law, has been fully
Generator Authorized Agent Name	20-7-	and 36	and 2000
Generator Authorized Agent Name	Ignature	Shipm	ent Date
Transporter Name RAIMbow Address Net Cung NO	Vehicle	Name (Print)AAH444) License No/StateH411	l CiciA MP
State Permit #	Truck	Number 70-P	
I hereby certify that the above named material was picked up at the generator site listed above.		by certily that the above name ad without incident to the de	
Alli- 6/3/01	Ar	1	6/3/01
Driver Signature Shipment Date		Signature	/ Delivery Uate
Site Name CLEAN EARTH OF CALIFORNES		Phone No	
Address 29 Minoplaser Are Constant N	$\left  \cdot \right $		1-96 0001-\$2
I hereby certify that the above named material has been is true and accurate.	accepted	and to the best of my know	viedge the foregoing
	raturé CILITY	<del>'U</del>	Receipt Date

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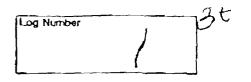
Clean Earth of Carteret 24 Middlesex Avenue • Carteret, NJ 07 (732) 541-8909	44676
GENERATOR: LIKA	
APPROVAL # 240521	3001010 gross
TRANSPORTER: Spin Pow	GROSS WEIGHT
NAMITEST #	27500
DATE: 6/3/04	TARE WEIGHT

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GENERATOR: LIK 2	
APPROVAL #: 24072	Stevel aross
TRUCK # BT SHOL	GROSS WEIGHT
MANIFEST #:	TARE WEIGHT
DATE: 6/3/07	

# ALLIED ENVIRONMENTAL GROUP, INC.



2163 MERRICK AVE., MERRICK, NY 11566 . TEL: 1-800-969-DIRT . FAX: 516-867-6480

### NON-HAZARDOUS MATERIAL MANIFEST

#### GENERATOR

Generator Name LIAR Manhasset Supplation	Shipping Location
Address Thompson Shore Rd	AddressGAMe
MANhasset New York	
Phone No	Phone No
•	Codes Gross Weight
Description of Material	
Approval Number   Nou HAZARdous Retzol Contaninated Goll	Tare Weight Net Weight (Tons)
240521 Destined for Recycling	
	Net Weight
any applicable state law, is not a hazardoue waste as is not a DOT hazardous substance as defined by 49 and accurately described above, classified, packaged applicable regulations.	ot contain free liquid as defined by 40 CFR Part 260.10 or a defined by 40 CFR Part 261 or any applicable state law, CFR Part 172 or any applicable state law, has been fully and is in proper condition for transportation according to
<u>FREESCHOL</u> Agent Name LIRR 7 Generator Authorized Agent Name Sig	-DOGONNICK 3 VINE2009
	Inature Shipment Date
Transporter Name Bulk Transport Express	
	Vehicle License No./State AHIZLEL New Jepsey
Nelcong, New Jessy	Truck Number 602 4151
State Permit #	
I hereby certify that the above named material was picked up at the generator site listed above.	I hereby certify that the above named material was delivered without incident to the destination listed below.
Jul Sol 6/3/04	La PCL 6/3/04
Drive/Signature Shipment Date	Driver Signature Delivery Date
site Name (KAN) FARTH of CARTERCE	Phone No. 1201-96
Address IH Middleser Acome Carteret, New	Jessey State Permit # 0001-2_
I hereby certify that the above named material has been is true and accurate.	accepted and to the best of my knowledge the foregoing
	all lable
	nature Receipt Date
/ FX	XUIX

Flass Fouth of Conta	44671
24 Middlesex Avenue + Carteret, I	
(732) 541-8909	
GENERATOR: LILL	_
APPROVAL #:	999501b 3ross
TRANSPORTER: RAINICL	GROSS WEIGHT
TRUCK # 1ST 235	_
MANIFEST #:	2.7200
	TARE WEIGHT
OATE: 613/64	

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NON-HAZARDOUS	S'MATERIAL MI	ANIFEST	,	
	GENERAT			<del>.</del>
enerator Name LIRR Manhas	of Substation	ion Location	SAME	
The second se	Addre			
Manhesset N)				
none No	Phon	e No.	······	<b></b>
Description of Mi		Gross Weight		
Approval Number Contaminates restinal	ors Petrol. I soil for recycling	Tare Weight	Net Weigh	t (Tons)
		Net Weight		•
T. Doconniucic	T. Hogo Signatur TRANSPO	RTER	3 June	(172)
A accurately described above, class oplicable regulations. T. Doctowninclic enerator Authorized Agent Name ansporter Name <u>BTExpress</u> Metcong N	T. Horso Signatur TRANSPO	RTER	3 June Shipmont Date	2012)
enerator Authorized Agent Name	TRANSPO	RTER	3 June Shipmont Date	2012)
ansporter Name <u>BTExpress</u> ansporter Name <u>BTExpress</u> dress <u>VEtcong</u> ate Permit # ereby certify that the above named model ate Details at the generator site listed above Details at the g	TRANSPO	PRTER Per Name (Print) Pricle License No./State ck Number Preby certify that the at ivered without incident	3 June Shipmont Date Man Totaru AH HOOR	Kas
ansporter Name <u>BTExpfess</u> ansporter Name <u>BTExpfess</u> dress <u>Netcong</u> N ate Permit # wereby certify that the above named m cked up at the generator site listed above there Signature	TRANSPO	PRTER Per Name (Print) Note: License No./State ck Number Preby certify that the ak ivered without incident  ver Signature	3 June Shipmont Date Man Totaru AH HOOR	Kas
ansporter Name <u>BTExpfess</u> ansporter Name <u>BTExpfess</u> dress <u>Netcong</u> N ate Permit # rereby certify that the above named m cked up at the generator site listed above there Signature	TRANSPO	PRTER Per Name (Print) Note: License No./State ck Number Preby certify that the ak ivered without incident  ver Signature	3 June Shipment Date Gan Terro AH-470R	was $4 \frac{3}{04}$
ansporter Name <u>BIExpress</u> ansporter Name <u>BIExpress</u> dress <u>Netcong</u> ate Permit # mereby certify that the above named m cked up at the generator site listed above the Name <u>Clem Employer</u> 24 Middleser Am	TRANSPO	PRTER Per Name (Print) Name (Print) Previous No./State Ck Number State Ck Number State	3 June Shipment Date Gan To Faro AH-HOOR hove named material to the destination list	Was bed below. 6/3/04) Delivery Date
policable regulations.	$\frac{1}{1} \frac{1}{1} \frac{1}$	PRTER Per Name (Print) sicle License No./State ck Number preby certify that the at ivered without incident //or Signature TKON Phone No State Permit	3 June Shipment Date <u>Cian ToTario</u> <u>AH HOOR</u> Nove named material to the destination list <u>a</u> - 1201 000	Was bed below. 6/3/04) Delivery Date

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## ATTACHMENT 3

### PRE-SOIL REMOVAL PHOTOGRAPHS

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Pile 1 (looking northwest).



Eastern side of Pile 2 (looking north).



Western side of Pile 2 (looking northwest).



Pile 3 (looking northwest).



Eastern side of Pile 4 (looking southwest).



Western side of Pile 4 (looking west southwest).



7

Soil and miscellaneous debris spread over grade (looking east northeast).

Miscellaneously strewn soil in the foreground and Pile 4 in the background (looking west).





9 Soil which was spread on top of grade at the extreme western side of the site (looking northwest).

### **ATTACHMENT 4**

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#### **POST-SOIL REMOVAL PHOTOGRAPHS**

2015\LDW07084TLK.doc(R03)





Former location of Piles 1 and 2 (looking west).





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Former location of Piles 3 and 4 (looking west).





Former location of Piles 1, 2, and 3 (looking east).

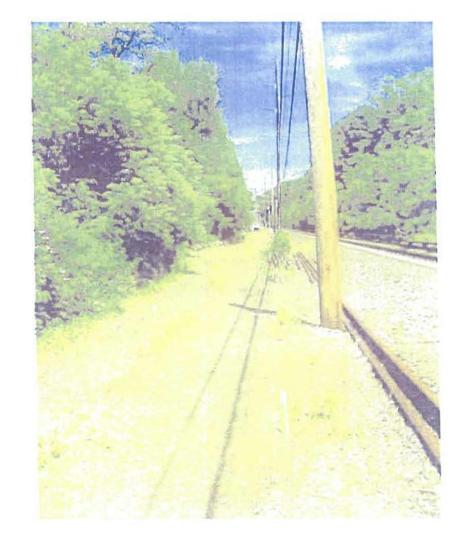




Former location of Pile 4 and miscellaneous soil spread at grade (looking west).

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Former location of Pile 4 (in foreground) and Piles 1, 2 and 3 (in background) (looking east).

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# **ATTACHMENT 5**

# ANALYTICAL SUMMARY TABLES

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### TABLE 1

#### LONG ISLAND RAIL ROAD MANHASSET SUBSTATION SOIL REMOVAL ACTIVITIES SURFACE SOIL SAMPLING RESULTS

#### MERCURY SAMPLING

SAMPLE ID SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLIDS	SRSS-01 (0-2) 6/7/04 87.0	SRSS-07 (0-2) 6/7/04 96.0	SRSSS-13 (0-2) 6/7/04 88.0	SRSS-17 (0-2) 6/7/04 86.0	SRSS-18 (0-2) 6/7/04 89.0	SRSS-19 (0-2) 6/7/04 84.0	SRSS-20 (0-2) 6/7/04 85.0	SRSS-21 (0-2) 6/7/04 85.0	instrument Detection Limits	NYSDEC TAGM 4046 Appendix A Comparison Criteria	Background Concentration Range	Background Average Concentration
UNITS	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(ug/l)	mg/kg	(mg/kg)	(mg/kg)
Mercury	1.2	0.073	1.1	0.44	0.89	1.4	0.077	0.85	0.1	0.1	0.026 - 0.031	0.0285

SAMPLÉ ID SAMPLE DEPTH (IN) DATE OF COLLECTION PERCENT SOLIDS	SR\$S-22 (0-2) 6/7/04 83.0	SRSS-23 (0-2) 6/7/04 87,0	8R8\$-24 (0-2) 6/7/04 83.0	\$R\$8-25 (0-2) 6/7/04 88.0	\$R\$8-31 (0-2) 6/7/04 81.0	SRSS-32 (0-2) 6/7/04 63.0	SRS\$-33 (0-2) 6/7/04 83.0	SRS\$-34 (0-2) 6/7/04 84.0	Instrument Detection Limits	NYSDEC TAGM 4046 Appendix A Comparison Criteria	Background Concentration Range	Background Average Concentration
UNITS	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(ug/l)	mg/kg	(mg/kg)	(mg/kg)
Mercury	1.3	1.1	0.24	0.97	7.5	3.3	0.50	0.42	0.1	0.1	0.026 - 0.031	0.0285

		(0-2) //7/04 83.0	(0-2) 6/7/04 82.0	(0-2) 6/7/04 75.0	(0-2) 6/7/04 79.0	(0-2) 6/7/04 89.0	(0-2) 6/7/04 85.0	Detection Limits	NYSDEC TAGM 4046 Appendix A Comparison Criteria	Concentration Range	Average Concentration
UNITS (mg	g/kg) (n	ng/kg) (	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(ug/l)	mg/kg	(mg/kg)	(mg/kg)
Mercury 0.	0.29	0.22	0.17	0.45	0.36	0.43	0.13	0.1	0.1	0.026 - 0.031	0.0285

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Notes:

: Result exceeds Comparison Value.

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#### TABLE 2

#### LONG ISLAND RAILROAD MANHASSET SUBSTATION SOIL REMOVAL ACTIVITIES SURFACE SOIL SAMPLING RESULTS

#### TARGET ANALYTE LIST (TAL) METALS

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SAMPLE ID	SRSS-02	SRSS-03	SRSS-04	SRSS-05	SRSS-06	SRSS-08	SRSS-09	SRSS-10	SRSS-11	SRSS-12	Instrument	NYSDEC TAGM	Background	Background
DATE OF COLLECTION	6/7/04	6/7/04	6/7/04	6/7/04	6/7/04	6/7/04	6/7/04	6/7/04	6/7/04	6/7/04	Detection	4046 Appendix A	Concentration	Average
PERCENT SOLIDS	87.0	90.0	86.0	93.0	89.0	84.0	87.0	89.0	84.0	88.0	Limits	Criteria	Range	Concentration
UNITS	(mg/kg)	ug/l	(mg/kg)	(mg/kg)	(mg/kg)									
Aluminum	6560	3320	6600	1820	6220	5990	7810	6860	8390	8490	13	SB	1,790 - 2,620	1,705.0
Antimony	υ	U	U	U	U	υ	U	U	U	U	8	SB	0.52 - 0.57	0.540
Arsenic	41.0	11.4	29.2	4.7	35.0	17.2	20.0	20.4	35.4	24.4	3	7.5 or SB	3.4 - 3.6	3.5
Barium	43.3	20.5	42.6	10.3	40.6	50.4	48.8	53.4	67.5	54.3	1	300 or SB	10.9 - 20.5	15.7
Beryllium	0.54	0.27 B	0.52	0.13 B	0.48	0.46	0.56	0.52	0.66	0.62	1	0.16 or SB	0.072 - 0.15	0.111
Cadmium	υ	U	U	υ	U	U	Ų	U	0.046 U	0.042 U	1	10*	U	U
Calcium	1810	1110	1520	345	1300	3880	2660	2020	3270	2850	8	SB	184 - 225	204.5
Chromium	13.4	5.7	12.4	2.9	12.3	12.2	14.8	19.0	13.2	14.8	1	50*	7.2 - 11	9.1
Cobalt	5.5	2.6	5.4	1.4 B	5.2	5.0	5.7	5.4	8.4	6.3	2	30 or SB	1.7 - 2.8	30.0
Copper	84.8	25.9	63.2	12.9	63.6	72.7	63.5	63.5	93.4	78.3	1	25 or SB	81.7 - 155	118.4
Iron	24000	8400	16400	3870	18700	15100	19800	16800	23300	20300	20	2,000 or SB	10,900 - 14,200	12,550.0
Lead	72.4	25.2	67.6	17.1	62.5	87.7	87.1	86.8	82.4	96.3	2	400	39.7 - 47.5	43.6
Magnesium	1710	1140	1740	552	1700	1950	2330	1800	2570	2250	8	SB	536 - 616	576.0
Manganese	284	112	250	63.3	227	256	285	322	432	310	4	SB	95.4 - 114	104.7
Mercury	0.60	0.14	0.40	0.069	0.37	3.9	0.61	0.35	0.63	0.83	0.2	0.1	0.026 - 0.031	0.0285
Nickel	14.8	6.4	13.4	2.9	12.3	12.6	14.4	12.4	14.6	14.8	2	13 or SB	7.5 - 8.3	7.9
Potassium	670	343	702	178	697	761	716	633	814	784	20	SB	231 - 325	278.0
Selenium	1.6 B	1.1 B	1.1 B	U	1.3 B	1.4 B	1.5 B	1.6	1.5 B	1.4 B	4	2 or SB	1.9 - 2.1	2.0
Silver	2.5	1.1 B	1.8	0.52 B	1.7	1.5 B	1.7	1.8	2.0	1.8	1	SB	1.4 - 1.7	1.6
Sodium	62.8	64.4	62.3	23.5 B	55.9	146	99.0	73.2	162	94.1	9	SB	11.8 - 15.9	13.9
Thallium	1.4	1.2	1.9	0.50 B	1.9	1.8	1.2	1.6	1.5	1.8	5	SB	U	υ
Vanadium	21.0	11.4	19.4	5.4	18.6	21.8	23.0	22.0	26.2	24.7	1	150 or SB	11.7 - 15.2	150.0
Zine	86.2	32.7	85.2	24.1	72.3	125	117	111	108	124	1	20 or SB	23.5 - 25.9	24.7

#### OUALIFIERS: U: Compound analyzed for but not detected

#### NOTES: SB: Site background

B: Compound concentration is less than the CRDL

but greater than the IDL.

----; not established

\*: as per proposed 4/95 NYSDEC TAGM

Indicates value exceeds the NYSDEC TAGM 4046 Comparison Criteria

#### TABLE 2 (continued)

#### LONG ISLAND RAILROAD MANHASSET SUBSTATION SOIL REMOVAL ACTIVITIES SURFACE SOIL SAMPLING RESULTS

#### TARGET ANALYTE LIST (TAL) METALS

SAMPLE ID	SRSS-14	SRSS-15	SRSS-16	SRSS-26	SRSS-27	SRSS-28	SRSS-29	SRSS-30	SRSS-42	SRSS-43	Instrument	NYSDEC TAGM	Background	Background
DATE OF COLLECTION	6/7/04	6/7/04	6/7/04	6/7/04	6/7/04	6/7/04	6/7/04	6/7/04	6/7/04	6/7/04	Detection	4046 Appendix A	Concentration	Average
PERCENT SOLIDS	89.0	87.0	<b>89</b> .0	81.0	87.0	88.0	86.0	85.0	86.0	86.0	Limits	Criteria	Range	Concentration
UNITS	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	ug/l	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	8600	10400	7590	6130	6160	4930	7420	5110	6440	5060	13	SB	1,790 - 2,620	1,705.0
Antimony	0.33 B	U	U	0.59 B	0.16 B	0.52 B	0.58 B	0.44 B	0.33 B	0.34 B	8	8B	0.52 - 0.57	0.540
Arsenic	24.4	20.6	20.7	72.0	58.9	36.0	50.2	36.4	26.3	30.8	3	7.5 or SB	3.4 - 3.6	3.5
Barium	50.1	69.6	48.1	49.8	48.5	44.1	51.8	48.0	54.9	39.2	1	300 or SB	10.9 - 20.5	15.7
Beryllium	0.60	0.74	0.54	0.66	0.66	0.58	0.72	0.58	0.61	0.50	1	0.16 or SB	0.072 - 0.15	0.111
Cadmium	U	U	U	U	U	υ		U	0.041 U	0.043 U	1	10*	U	υ
Calcium	2450	2040	2110	2220	1670	1340	2570	1440	2740	2420	8	SB	184 - 225	204.5
Chromium	14.0	18.4	13.8	19.9	14.9	16.0	16.9	16.3	15.4	13,3	1	50*	7.2 - 11	9.1
Cobalt	6.2	7.4	5.6	6.9	6.1	5.0	7.2	5.5	6.5	5.0	2	30 or SB	1.7 - 2.8	30.0
Copper	67.4	66.1	62.4	159	105	101	104	133	83.2	79.9	1	25 or SB	81.7 - 155	118.4
Iron	19700	21600	17900	27600	27900	20900	27600	24900	22000	18400	20	2,000 or SB	10,900 - 14,200	12,550.0
Lead	84.1	80.7	68.8	120	73.8	88.3	84.7	105	92.8	102	2	400	39.7 - 47.5	43.6
Magnesium	2300	2520	2150	1900	1660	1240	2250	1080	2390	1550	8	SB	536 - 616	576.0
Manganese	298	340	264	346	268	200	297	222	249	205	4	SB	95.4 - 114	104.7
Mercury	0.89	0.75	0.44	1.3	0.36	0.36	0.84	0.68	1.4	0.97	0.2	0.1	0.026 - 0.031	0.0285
Nickel	14.5	16,7	12.8	17.4	14.3	12.7	15.6	14.8	15.4	11.7	2	13 or SB	7.5 - 8.3	7.9
Potassium	791	1020	772	957	956	811	1010	570	1430	738	20	SB	231 - 325	276.0
Selenium	1.6 B	0.72 B	1.1 B	2.3	2.7	2.3	1.8	2.4	2.3	1.8	4	2 or SB	1.9 - 2.1	2.0
Silver	1,9	1.7	1.5 B	U	U	U	U	U	0.10 U	0.11 U	1	SB	1.4 - 1.7	1.6
Sodium	71.8	97.4	70.3	115	60.4	80.1	77.9	87.5	92.2	76.1	9	SB	11.8 - 15.9	13.9
Thallium	2	2.5	2.0	1.2	1.3	1.1	1.1 B	1.1	1.1	0.82 B	5	SB	U	υ
Vanadium	24.4	27.7	21.6	26.9	23.1	22.5	27.6	24.6	24.1	19.8	1	150 or SB	11.7 - 15.2	150.0
Zinc	127	133	106	124	81.0	68.8	85.2	80.4	124	112	1	20 or SB	23.5 - 25.9	24.7

#### OUALIFIERS: U: Compound analyzed for but not detected

but greater than the IDL.

B: Compound concentration is less than the CRDL

#### <u>NOTES:</u> SB: Site background

----: not established

\*: as per proposed 4/95 NYSDEC TAGM

Indicates value exceeds the NYSDEC TAGM 4046 Comparison Criteria

#### TABLE 2 (continued)

#### LONG ISLAND RAILROAD MANHASSET SUBSTATION SOIL REMOVAL ACTIVITIES SURFACE SOIL SAMPLING RESULTS

#### TARGET ANALYTE LIST (TAL) METALS

SAMPLE ID	SRSS-44	SRSS-45	SRSS-46	SRSS-47	SRSS-48		· · · · · ·		Instrument	NYSDEC TAGM	Background	Background
DATE OF COLLECTION	6/7/04	6/7/04	6/7/04	6/7/04	6/7/04				Detection	4046 Appendix A	Concentration	Average
PERCENT SOLIDS	88.0	86.0	83.0	85.0	82.0			)	Limits	Criteria	Range	Concentration
UNITS	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)				ug/i	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	7690	5750	7230	8710	8520	 			13	ŚB	1,790 - 2,620	1,705.0
Antimony	0.57 B	0.53 B	0.32 B	0.73 B	0.23 B			1	8	SB	0.52 - 0.57	0.540
Arsenic	38.5	36.2	27.1	48.6	7.9				3	7.5 or SB	3.4 - 3.6	3.5
Barium	50.6	39.5	54.4	55.2	59.9				1	300 or SB	10.9 - 20.5	15.7
Beryllium	0.75	0.60	0.69	0.85	0.88		]		1	0.16 or SB	0.072 - 0.15	0.111
Cadmium	υ	- U	U	U	<u> </u>				1	10*	υ	U
Calcium	5640	1940	2190	2110	2900				8	SB	184 - 225	204.5
Chromium	20.4	14.1	17.0	20.9	23.3		•		1	50°	7.2 - 11	9.1
Cobalt	8.5	5.5	5.6	8.3	5.1			ì	2	30 or SB	1.7 - 2.8	30.0
Copper	107	69,3	65.4	99.7	57.5				1	25 or SB	81.7 - 155	118.4
Iron	32200	21500	17100	30300	14700				20	2,000 or SB	10,900 - 14,200	12,550.0
Lead	95.9	59.2	66.7	85.2	81.5		i		2	400	39.7 - 47.5	43.6
Magnesium	3740	1840	1910	2440	1940				6	SB	536 - 616	576.0
Manganese	298	229	218	328	162				4	SB	95.4 - 114	104.7
Mercury	0.48	0.44	0.45	1.0	0.11		1		0.2	0.1	0.026 - 0.031	0.0285
Nickel	18.2	12.1	12.9	17.1	16.2				2	13 or SB	7.5 - 8.3	7.9
Potassium	1060	885	912	1430	676				20	SB	231 - 325	278.0
Seienium	2.4	2.0	1.9	2.5	1.7 B		1		4	2 or SB	1.9 - 2.1	2.0
Silver	υ	U	U	U	υ				1	SB	1.4 - 1.7	1.6
Sodium	172	53.2 B	59.4	87.6	53.0 B				9	SB	11.8 - 15.9	13.9
Thallium	1.4	1.0 <b>B</b>	0.81 8	1.3	0.62 B			1	5	SB	U	U
Vanadium	30.8	20.5	23.2	27,9	24.5			l	1 1	150 or SB	11.7 - 15.2	150.0
Zinc	110	67.7	78.8	101	125		I		1	20 or SB	23.5 - 25.9	24.7

#### **OUALIFIERS**: U: Compound analyzed for but not detected

NOTES:

B: Compound concentration is less than the CRDL

but greater than the IDL.

#### SB: Site background

----: not established

\*: as per proposed 4/95 NYSDEC TAGM

Indicates value exceeds the NYSDEC TAGM 4046 Comparison Criteria

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#### TABLE 3

# LONG ISLAND RAIL ROAD MANHASSET SUBSTATION SOIL REMOVAL ACTIVITIES SURFACE SOIL SAMPLING RESULTS

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#### POLYCYCLIC AEROMATIC HYDROCARBONS (PAHs)

SAMPLE ID DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS	SRSS-02 6/7/04 1 87,0	SRSS-03 6/7/04 1 90.0	SRSS-04 6/7/04 1 86.0	SRSS-05 6/7/04 1 93.0	SRSS-06 6/7/04 1 89.0	SRSS-08 6/7/04 1 84,0	SRSS-09 6/7/04 1 87.0	SRSS-10 6/7/04 1 89,0	SRSS-11 6/7/04 1 84.0	LABORATORY LIMITS	NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives		Background Average Concentration
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)								
Phanol	υ	υ	U	U	υ	U	U	υ	U	330	30	U	υ
Naphthalene	Ŭ	U	U	U	Ū	U	Ū	U	Ū	330	13,000	υ	U
2-Methyinaphthalene	U	υ	υ	υ	υ	U	υ	U	U	330	36,400	U	U
Acenaphthylene	140 J	Ų	100 J	U	110 J	230 J	170 J	120 J	120 J	330	41,000	210 - 290	250
Acenaphthene	) U	Ŭ	υ	U	υ	υ	υ	υ	U	330	50,000	υ	U
Dibenzofuran	. ບ	υ	υ	υ	U	υ	υ	U	υ	330	6,200	υ	U
Fluorena	U	υ	υ	U	υ	50 J	50 J	38 J	U	330	50,000	U	U
Pentachiorophenol	U	U	U	U	U	U	U	U	U	330	1,000	υ	U
Phenanthrene	300 J	120 J	300 J	120 J	290 J	490	900	440	380 J	330	50,000	1,400 - 2,600	2,000
Anthracene	210 J	63 J	150 J	37 J	200 J	370 J	350 J	230 J	200 J	330	. 50,000	220 - 310	265
Fluorenthene	\$00	290 J	720	U	740	1,400	2,200	1,100	970	330	\$0,000	4,100 - 5,600	4,850
Pyrene	820	280 J	680	V	710	1300	2000	950	980	330	\$0,000	2,800 - 4,200	4,000
Benzo(a)enthracene	430	140 J	410	V	440	750	760	610	530	330	224	330 - 650	490
Chrysene	890	310 J	820	υ	760	1400	1700	1100	970	330	400	1,400 - 2,200	1,800
Benzo(b)fluoranthene	1,000	310 J	760	150 J	730	1,400	1,400	1,200	1,100	330	1,100	1,500 - 2,500	2,000
Benzo(k)fluoranthene	350 J	110 J	370 J	71 J	350 J	590	680	470	360 J	330	1,100	590 - 920	755
Banzo(a)pyrana	550	180 J	480	υ	460	870	880	750	640	330	61	350 - 550	450
Indeno(1,2,3-cd)pyrene	420	130 J	350 J	61 J	330 J	620	680	490	440	330	3,200	250 - 390	320
Dibenzo(a,h)anthracene	140 J	39 J	110 J	U	100 J	200 J	200 J	170 J	150 J	330	14	U U	υ
Benzo(g,h,i)perylene	460	140 J	380 J	68 J	370 J	680	700	530	490	330	50,000	210 - 330	270
Total PAHs	6510	2112	5630	507	5590	10350	12670	8198	7330		100,000	14,560 - 19,340	17,450
Total CaPAHs	3780	1219	3300	282	3170	5830	6300	4790	4190		10,000	4,420 - 7,210	5,815

OUALIFIERS: U: Compound analyzed for but not detected. J: Compound found at a concentration below the detection limit.

NOTES: : Not Available ---

: Concentration exceeds NYSDEC TAGM 4046 Appendix A Criteria.

#### TABLE 3 (Continued)

# LONG ISLAND RAIL ROAD MANHASSET SUBSTATION SOIL REMOVAL ACTIVITIES SURFACE SOIL SAMPLING RESULTS

#### POLYCYCLIC AEROMATIC HYDROCARBONS (PAHs)

SAMPLE ID DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS	SRSS-12 6/7/04 1 88.0	SRSS-14 6/7/04 1 89.0	SRSS-15 6/7/04 1 87.0	SRSS-16 6/7/04 1 89.0	SRSS-26 6/7/04 1 81.0	SRSS-27 6/7/04 1 87.0	SRSS-28 6/7/04 1 88.0	SRSS-29 6/7/04 1 86.0	SRSS-30 6/7/04 1 85.0	LABORATORY LIMITS	NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives	Background Concentration Range	Background Average Concentration
UNITS	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)								
Phenol	U	U	U	U	U	U	U	Ū	U	330	30	U	U
Naphthalene	U	U	υ	U	U	U U	υ	υ	υ	330	13,000	U	U
2-Methylnaphthalene	υ	Ū	U	U	U	υ	39 J	υ	Ι υ	330	36,400	υ	U U
Acenaphthylene	140 J	Ú	L	110 J	170 J	Ĵ	150 J	Ū	130 J	330	41,000	210 - 290	250
Acenaphthene	U	Ŭ,	U	68 J	U	U U	U	υ	U U	330	50,000	U	U
Dibenzofuran	υ	U	U U	81 J	U	U U	U	υ [	U U	330	6,200	υ	υ
Fluorene	52 J	38 J	U U	85 J	U	U U	42 J	υ	U	330	50,000	U	U U
Pentachtorophenol	υ	V	U U	U	U	U U	U	U	790 U	<b>3</b> 30	1,000	U	U U
Phenanthrene	670	480	410	1500	370 J	280 J	820	210 J	250 J	330	50,000	1,400 - 2,600	2,000
Anthracene	330 J	200 J	200 J	220 J	320 J	200 J	400	150 J	240 J	330	50,000	220 - 310	265
Fluoranthene	1,500	1000	1000	1800	1000	610	1400	580	800	330	50,000	4,100 - 5,600	4,850
Pyrene	1500	1100	980	1500	1000	610	1500	580	800	330	50,000	2,800 - 4,200	4,000
Benzo(a)anthracene	780	570	500	\$70	540	330 J	790	310 J	350 J	330	224	330 - 650	490
Chrysene	1400	1000	1100	1200	1200	710	1500	620	1100	330	400	1,400 - 2,200	1,800
Benzo(b)fluoranthene	1500	1000	1100	1200	1300	710	1500	690	1200	330	1,100	1,500 - 2,500	2,000
Benzo(k)fluoranthene	540	470	420	400	610	290 J	500	230 J	410	330	1,100	590 - 920	755
Benzo(a)pyrene	900	660	680	690	610	400	770	400	400	330	. 61	350 - 550	450
Indeno(1,2,3-cd)pyrene	630	450	460	490	480	360 J	530	280 J	350 J	330	3,200	250 - 390	320
Dibenzo(a,h)anthracene	210 J	150 J	160 J	150 J	160 J	130 J	190 J	90 J	120 J	330	14	U	U U
Benzo(g,h,i)perylene	690	510	520	530	490	350 J	560	300 J	350 J	330	50,000	210 - 330	270
Total PAHs	10842	7628	7530	10594	8250	4960	10691	4440	6500		100,000	14,560 - 19,340	17,450
Total CaPAHs	5960	4300	4420	4700	4900	2930	5780	2620	3930		10,000	4,420 - 7,210	5,815

NOTES:

OUALIFIERS: U: Compound analyzed for but not detected. J: Compound found at a concentration below the detection limit.

: Not Available : Concentration exceeds NYSDEC TAGM 4046 Appendix A Criteria.

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#### TABLE 3 (Continued)

# LONG ISLAND RAIL ROAD MANHASSET SUBSTATION SOIL REMOVAL ACTIVITIES SURFACE SOIL SAMPLING RESULTS

#### POLYCYCLIC AEROMATIC HYDROCARBONS (PAHs)

SAMPLE ID DATE OF COLLECTION DILUTION FACTOR PERCENT SOLIDS	SRSS-42 6/7/04 1 86.0	SRSS-43 6/7/04 1 86.0	SRSS-44 6/7/04 1 88.0	SRSS-45 6/7/04 1 86.0	SRSS-46 6/7/04 1 83,0	SRSS-47 6/7/04 1 85.0	SRSS-48 6/7/04 I 82.0			LABORATORY LIMITS	NYSDEC TAGM 4046 Recommended Soli Cleanup Objectives	Background Concentration Range	Background Average Concentration
UNITS	(ug/kg)			(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)						
Phanol	U U	U	U	U	U U	U	Ų V			330	30	Ŭ	U
Naphthelene	U U	υ	U	υ	U	U	U		ļ	330	13,000	U	υ
2-Methylnaphthelena	) U	υ	υ	ບ	υ	υ	U			330	36,400	U	U
Acenaphthylene	93 J	110 J	140 J	68 J	87 J	160 J	140 J			330	41,000	210 - 290	250
Acenaphthene	U U	U	U	U	U U	U	[ U			330	\$0,000	U	U
Dibenzofuran	U U	U U	ן ט	U	U U	U U	U			330	6,200	U	U
Fluorene	υ	71 J	U U	υ	U	U U	56 J		1	330	50,000	υ	U
Pentachlorophenol	U	U U	U U	υ	U	U U	) U			330	1,000	υ	υ
Phenanthrene	420	800	450	260 J	270 J	350 J	690			330	50,000	1,400 - 2,600	2,000
Anthracene	160 J	3200	210 J	99 J	120 J	250 J	260 J			330	50,000	220 - 310	265
Fluoranthene	1400	5300	1500	880	780	990	1300		Í	330	50,000	4,100 - 5,600	4,850
Pyrene	1 <u>600</u>	5300	1800	820	1000	1000	1300			330	50,000	2,800 - 4,200	4,000
Benzo(a)anthracene	700	2000	870	390	520	580	750			330	224	330 - 650	490
Chrysene	1600	3200	1800	730	910	970	1100			330	400	1,400 - 2,200	1,800
Benzo(b)fluoranthene	1500	2300	2000	870	1000	1100	1200			330	1,100	1,500 - 2,500	2,000
Benzo(k)fluorenthene	800	1100	960	320 J	840	430_	450			330	1,100	590 - 920	755
Benzo(s)pyrene	880	1200	1100	440	590	660	790			330	61	350 - 550	450
Indeno(1,2,3-cd)pyrene	460	560	600	260 J	360 J	480	490			330	3,200	250 - 390	320
Dibenzo(a,h)anthracene	160 J	190 J	190 J		120 J	160 J	150 J	1	í	330	14	U	U
Benzo(g.h,l)perviens	540	600	650	290 J	410	510	510			330	\$0,000	210 - 330	270
Total PAHs	10313	25931	12270	5315	7007	7640	9186				100,000	14,560 - 19,340	17,450
Total CaPAHs	6100	10550	7520	3098	4340	4380	4930				10,000	4,420 - 7,210	5,815

NOTES:

OUALIFIERS: U: Compound analyzed for but not detected. J: Compound found at a concentration below the detection limit.

# : Not Available

; Concentration exceeds NYSDEC TAGM 4046 Appendix A Criteria.

Appendix G

# APPENDIX G

# LONG ISLAND RAIL ROAD PROCEDURE/INSTRUCTION EE03-001, EXCAVATING SOILS AT RAILROAD LOCATIONS

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# Procedure/Instruction: EE03-001 EXCAVATING SOILS AT RAILROAD LOCATIONS

# Effective DATE: August 11, 2003

# A. Introduction:

At existing railroad shops, yards, substations, right-of-ways and other locations, past operations may have resulted in the chance of soils containing very low levels of chemical substances. Examples may include; trace levels of metals around old painted structures, oils and greases around train yards and repair locations, greasy or sooty compounds left from coal ash ("clinker").

This Procedure/Instruction has been prepared to eliminate any risk that may be posed to LIRR workers who must dig in these locations. It is to be applied on a case by case basis, with any questions referred to Department Management and System Safety.

# B. Required Steps/Actions:

- The first step of any LIRR excavation, regarding the soil composition and possible presence of contaminates, is to review the current System Safety Environmental Audit Map. This map includes all LIRR sites with documented soil contaminates. If your site appears on the map in red it may have soil concerns that could affect your project, contact System Safety before proceeding. If your site is not shown or is shown in black (does not have soil concerns) proceed to Step 2 as follows;
- 2. When digging at an existing railroad facility, the recommended procedures include:
  - a. Wherever possible excavate with mechanical means, such as backhoes, ditch-witches or excavators.
  - b. Wash facilities must be available for use by workers at the end of the task, before breaks, before meals, or at the end-of-shift. For field operations, wet-wipes are acceptable for fulfilling this requirement.
  - c. Where hand digging must be used, workers must be instructed to brush soil from clothing and shoes. Disposable coveralls, shoe coverings and gloves should be made available upon workers request. Work clothing should be laundered.
  - d. All equipment should be cleaned before leaving the worksite. The preferred method is hosing down with water, removing any clumps of dirt and soil. If water is not available equipment should be brushed clean of any dirt and soil using a broom or stiff brush. Disposable items can be placed in the trash, no special disposal is necessary.
- 3. Where evidence of soil contamination is found, such as an odor, a stain or visible contaminant, the soil feels greasy, or results from laboratory analysis indicate a contaminant;
  - a. Stop any excavation work or only excavate by mechanical means and
  - b. Immediately Contact System Safety (information below) to assess the situation.
- C. Regulations or Policy References: LIRR Corporate Environmental Policy; Section IV, B, 5

D. System Safety Contacts:	Environmental Engineer; Environmental Field Engineer;	718-558-3252 718-558-3081

E. Forms & Attachments: None.

Appendix H

APPENDIX H

# MERCURY VAPOR RESULTS FOR SURFACE SOIL SAMPLES

# Table H-1

# Long Island Rail Road Delineation Phase 2 Site Assessment Mercury Vapor Measurement Results at Surface Soil Sample Locations Manhasset Substation - N10

	Surface Soil Sample	Sample Depth	Mercury Vapor Analyzer
Sample Date	D .	(inches)	Reading (mg/m <sup>3</sup> Hg)
1/15/2003	MHSS-14	0 to 2	NA
1/15/2003	MHSS-15	0 to 2	NA
1/15/2003	MHSS-16	0 to 2	NA
1/15/2003	MHSS-17	0 to 2	0.014
1/15/2003	MHSS-18	0 to 2	0.007
1/16/2003	MHSS-19	0 to 2	0.005
1/16/2003	MHSS-20	0 to 2	0.005
1/16/2003	MHSS-20 MHSS-21	0 to 2	0.003
1/16/2003	MHSS-22	0 to 2	0.000
1/16/2003	MHSS-22 MHSS-23	0 to 2	0.003
1/16/2003	MHSS-24	0 to 2	0.000
		0 to 2	0.000
1/16/2003	MHSS-25		
1/16/2003	MHSS-26	0 to 2	0.000
1/16/2003	MHSS-27	0 to 2	0.094
1/16/2003	MHSS-28	0 to 2	0.000
1/16/2003	MHSS-29	0 to 2	0.006
1/16/2003	MHSS-30	0 to 2	0.008
1/16/2003	MHSS-31	0 to 2	0.006
8/12/2004	MHSS-32	0 to 2	0.000
8/12/2004	MHSS-33	0 to 2	0.000
8/12/2004	MHSS-34	0 to 2	0.000
8/12/2004	MHSS-35	0 to 2	0.000
8/12/2004	MHSS-36	0 to 2	0.074
8/12/2004	MHSS-37	0 to 2	0.039
8/12/2004	MHSS-38	0 to 2	0.057
8/12/2004	MHSS-39	0 to 2	0.009
8/12/2004	MHSS-40	0 to 2	0.000
8/12/2004	MHSS-41	0 to 2	0.000
8/12/2004	MHSS-42	0 to 2	0.012
8/12/2004	MHSS-43	0 to 2	0.000
8/11/2004	MHSS-44	0 to 2	0.000
8/16/2004	MHSS-44	2 to 12	0.000
8/11/2004	MHSS-45	0 to 2	0.000
8/16/2004	MHSS-45	2 to 12	0.000
8/11/2004	MHSS-46	0 to 2	0.000
8/16/2004	MHSS-46	2 to 12	0.000
8/11/2004	MHSS-47	0 to 2	0.000
8/16/2004	MHSS-47	2 to 12	0.000
8/11/2004	MHSS-48	0 to 2	0.000
8/16/2004	MHSS-48	2 to 12	0.000
8/11/2004	MHSS-49	0 to 2	0.000
8/16/2004	MHSS-49	2 to 12	0.000
8/11/2004	MHSS-50	0 to 2	0.000
8/16/2004	MHSS-50	2 to 12	0.000
8/11/2004	MHSS-51	0 to 2	0.000
8/16/2004	MHSS-51	2 to 12	0.000
8/11/2004	MHSS-52	0 to 2	0.000
8/16/2004	MHSS-52	2 to 12	0.000

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# Table H-1 (continued)Long Island Rail RoadDelineation Phase 2 Site AssessmentMercury Vapor Measurement Results at Surface Soil Sample LocationsManhasset Substation - N10

	Surface Soil Sample	Sample Depth	Mercury Vapor Analyzer
Sample Date	D	(inches)	Reading (mg/m <sup>3</sup> Hg)
8/11/2004	MHSS-53	0 to 2	0.000
8/16/2004	MHSS-53	2 to 12	0.000
8/11/2004	MHSS-54	0 to 2	0.000
8/16/2004	MHSS-54 MHSS-54	2 to 12	0.000
8/11/2004	MHSS-54 MHSS-55	0 to 2	0.000
8/16/2004	MHSS-55 MHSS-55	2 to 12	0.000
8/11/2004	MHSS-56	0 to 2	0.000
8/16/2004	MHSS-56	2 to 12	0.000
8/11/2004	MHSS-50 MHSS-57	0 to 2	0.000
8/16/2004	MHSS-57 MHSS-57	2 to 12	0.000
8/11/2004	MHSS-58	0 to 2	0.000
8/16/2004	MHSS-58 MHSS-58	2 to 12	0.000
		0 to 2	0.000
8/19/2004	MHSS-59	2 to 12	0.000
8/16/2004	MHSS-59	0 to 2	
8/19/2004	MHSS-60		0.000
8/16/2004	MHSS-60	2 to 12	0.000
8/16/2004	MHSS-61	0 to 2	0.000
8/16/2004	MHSS-61	2 to 12 0 to 2	0.000
8/16/2004	MHSS-62		0.000
8/16/2004	MHSS-62	2 to 12	0.000
8/16/2004	MHSS-63	0 to 2	0.000
8/16/2004	MHSS-63	2 to 12	0.000
8/16/2004	MHSS-64	0 to 2	0.000
8/16/2004	MHSS-64	2 to 12	0.000
8/13/2004	MHSS-65	0 to 2	0.000
8/13/2004	MHSS-65	2 to 12	0.000
8/13/2004	MHSS-66	0 to 2	0.000
8/13/2004	MHSS-66	2 to 12	0.000
8/13/2004	MHSS-67	0 to 2	0.000
8/13/2004	MHSS-67	2 to 12	0.000
8/13/2004	MHSS-68	0 to 2	0.000
8/13/2004	MHSS-68	2 to 12	0.000
8/13/2004	MHSS-69	0 to 2	0.000
8/13/2004	MHSS-69	2 to 12	0.000
8/13/2004	MHSS-70	0 to 2	0.000
8/13/2004	MHSS-70	<u>2 to 12</u>	0.000
8/13/2004	MHSS-71	0 to 2	0.000
8/13/2004	MHSS-71	2 to 12	0.000
8/13/2004	MHSS-72	0 to 2	0.000
8/13/2004	MHSS-72	2 to 12	0.000
8/16/2004	MHSS-73	0 to 2	0.005
8/16/2004	MHSS-73	2 to 12	0.000
8/16/2004	MHSS-74	0 to 2	0.000
8/16/2004	MHSS-74	2 to 12	0.005
8/16/2004	MHSS-75	0 to 2	0.004
8/16/2004	MHSS-76	0 to 2	0.000
8/16/2004	MHSS-77	0 to 2	0.003
8/16/2004	MHSS-78	0 to 2	0.000

# Table H-1 (continued)Long Island Rail RoadDelineation Phase 2 Site AssessmentMercury Vapor Measurement Results at Surface Soil Sample LocationsManhasset Substation - N10

Sample Date	Surface Soil Sample ID	Sample Depth (inches)	Mercury Vapor Analyzer Reading (mg/m <sup>3</sup> Hg)
8/16/2004	MHSS-79	0 to 2	0.004
8/16/2004	MHSS-80	0 to 2	0.000
1/15/2003	MHSB-13	0 to 2	0.010
1/15/2003	MHSB-14	0 to 2	0.000
1/15/2003	MHSB-15	0 to 2	0.000
1/15/2003	MHSB-16	0 to 2	0.000
1/16/2003	MHSB-17	0 to 2	0.006
1/16/2003	MHSB-18	0 to 2	0.004
1/16/2003	MHSB-19	0 to 2	0.009

Notes:

NA : Not available due to equipment malfunction.

# Table H-2

# Long Island Rail Road Delineation Phase 2 Site Assessment Mercury Vapor Measurement Results at Surface Soil Sample Locations Massapequa Substation - S15

	Surface Soil Sample	Sample Depth	Mercury Vapor Analyzer
Sample Date	ID	(inches)	Reading (mg/m <sup>3</sup> Hg)
8/10/2004	MSSS-07A	0 to 2	0.000
8/10/2004	MSSS-08	0 to 2	0.009
8/10/2004	MSSS-09	0 to 2	0.000
8/10/2004	MSSS-10	0 to 2	0.000
8/10/2004	MSSS-11	0 to 2	0.000
8/10/2004	MSSS-12	0 to 2	0.000
8/10/2004	MSSS-13	0 to 2	0.000
8/10/2004	MSSS-14	0 to 2	0.000
8/10/2004	MSSS-15	0 to 2	0.000
8/10/2004	MSSS-16	0 to 2	0.000
8/10/2004	MSSS-17	0 to 2	0.003
8/10/2004	MSSS-18	0 to 2	0.000
8/10/2004	MSSS-19	0 to 2	0.000
8/10/2004	MSSS-20	0 to 2	0.000
2/4/2003	MSSB-06A	0 to 2	0.000
2/4/2003	MSSB-09	0 to 2	0.000
2/4/2003	MSSB-10	0 to 2	0.000
2/4/2003	MSSB-11	0 to 2	0.000
2/4/2003	MSSB-12	0 to 2	0.000
2/3/2003	MSSB-13	0 to 2	0.000
2/4/2003	MSSB-14	0 to 2	0.000
2/4/2003	MSSB-15	0 to 2	0.000
2/4/2003	MSSB-16	0 to 2	0.000
2/4/2003	MSSB-17	0 to 2	0.000
2/4/2003	MSSB-18	0 to 2	0.000
2/4/2003	MSSB-19	0 to 2	0.000
2/4/2003	MSSB-20	0 to 2	0.000
2/3/2003	MSSB-21	0 to 2	0.000
2/4/2003	MSSB-22	0 to 2	0.000
2/4/2003	MSSB-23	0 to 2	0.000
2/4/2003	MSSB-24	0 to 2	0.000
2/3/2003	MSSB-25	0 to 2	0.006
2/3/2003	MSSB-26	0 to 2	0.000
2/3/2003	MSSB-27	0 to 2	0.000
2/3/2003	MSSB-28	0 to 2	0.004
2/3/2003	MSSB-29	0 to 2	0.003
2/4/2003	MSSB-30	0 to 2	0.000
2/3/2003	MSSB-31	0 to 2	0.003
2/4/2003	MSSB-32	0 to 2	0.000
2/4/2003	MSSB-33	0 to 2	0.000
2/4/2003	MSSB-34	0 to 2	0.000
2/3/2003	MSSB-38	0 to 2	0.000
2/4/2003	MSSB-39	0 to 2	0.000

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# Table H-3

# Long Island Rail Road Delineation Phase 2 Site Assessment Mercury Vapor Measurement Results at Surface Soil Sample Locations Island Park Substation - L03

	Surface Soil Sample	Sample Depth	Mercury Vapor Analyzer
Sample Date	ID -	(inches)	Reading (mg/m <sup>3</sup> Hg)
1/28/2003	IPSS-05	0 to 2	0.000
1/28/2003	IPSS-06	0 to 2	0.003
1/27/2003	IPSB-12	0 to 2	0.008
1/29/2003	IPSB-13	0 to 2	0.025
1/29/2003	IPSB-14	0 to 2	0.010
1/29/2003	IPSB-15	0 to 2	0.014
1/30/2003	IPSB-18	0 to 2	0.008
1/27/2003	IPSB-19	0 to 2	0.005
1/29/2003	IPSB-22	0 to 2	0.005
1/29/2003	IPSB-23	0 to 2	0.021
1/29/2003	IPSB-24	0 to 2	0.024
1/29/2003	IPSB-25	0 to 2	0.210
1/30/2003	IPSB-26	0 to 2	0.008
1/30/2003	IPSB-27	0 to 2	0.008
1/30/2003	IPSB-28	0 to 2	0.013
1/28/2003	IPSB-29	0 to 2	0.000

# **APPENDIX I**

# DATA VALIDATOR RESUME

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# **ROBBIN A. PETRELLA**

# **QUALITY ASSURANCE OFFICER**

# **EDUCATION**

SUNY at Buffalo, B.S. (Chemical Engineering) - 1986

# **PROFESSIONAL EXPERIENCE**

Ms. Petrella's professional quality assurance/quality control (QA/QC) experience spans 18 years. During this time, she served as a Sample and Data Analyst for two large environmental laboratories. Ms. Petrella was responsible, as Data Review Group Leader, for supervision of data validation and QA/QC coordination between the laboratory and its clients. Her technical experience includes both the analysis and review of environmental samples using numerous protocols, including those developed by the United States Environmental Protection Agency (USEPA), New York State Department of Environmental Conservation (NYSDEC), and New Jersey Department of Environmental Protection (NJDEP).

Since joining the firm, Ms. Petrella has been responsible for preparing Quality Assurance/Quality Control Plans and Waste Analysis Plans for a number of large private sector clients. These include Chemical Waste Disposal Corporation, the International Business Machines Corporation and Northrop Grumman Corporation. She also has prepared overall QA/QC programs for Northrop Grumman's on-site laboratories.

Ms. Petrella has prepared QA/QC Plans and data validation/usability reports for remedial investigation and feasibility studies conducted at numerous New York State Registry Sites, including those in the Towns of Cheektowaga, Schodack, and North Tonawanda, as well as the Villages of Croton-on-Hudson and Brentwood, New York. These tasks involved evaluation of the laboratory data to determine compliance with NYSDEC Analytical Services Protocols (ASP), as well as to determine the usability of the data particularly if it was not consistent with ASP requirements.

Ms. Petrella has assisted in the preparation and performance of air sampling programs for remedial investigation/feasibility studies (RI/FS) conducted at landfill/Superfund sites in Wallkill, New York and East Northport, New York. She has also performed water supply sampling for an RI/FS in Rensselaer County, New York, and a surface and subsurface water and soil sampling program as part of an RI/FS in Elmira, New York.

Ms. Petrella has acted as the QA/QC officer, and prepared and performed field audits for Superfund site investigations in Tonawanda, New York; Owego, New York; Brookhaven, New York; and Hornell, New York, and for a major railroad facility in New York City. She also has assisted in the preparation of laboratory contracts for analytical services for hazardous waste studies in Schodack, New York; Jamaica, New York; and the New York State Superfund Standby contract.

Ms. Petrella is responsible for performing laboratory audits on all laboratories having contracts with the firm as part of the New York State Superfund Program. She has been certified by the USEPA in both organic and inorganic data validation by successfully completing courses authorized by the USEPA. These certifications have also been accepted by the NYSDEC.

Ms. Petrella is responsible for the data validation of all data packages from ongoing hydrogeologic investigation and landfill closure investigations in Brookhaven and Hauppauge, New York. She also is responsible

A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

# **DVIRKA AND BARTILUCCI**

# **ROBBIN A. PETRELLA**

for validation of all data collected during field investigations for a large aerospace corporation, a major utility on Long Island, and manufactured gas plants across Long Island.

Ms. Petrella has acted as Project Manager for a standby project with the NYSDEC and a groundwater treatment project located in New Jersey.

Ms. Petrella has been instrumental in the design and implementation of the firm's GIS/Key Database system. In that role, she is responsible for the maintenance of the system and training of personnel in its use. She also is responsible for all updates to the GIS/Key program and communicates on a regular basis with the GIS/Key venders with regard to system improvements and network administration. Currently, there are seven ongoing projects that use GIS/Key, five of which are MGP sites. Ms. Petrella is responsible for entering and reporting of all chemistry data from GIS/Key.

Ms. Petrella also has conducted indoor and outdoor air sampling programs as part of MGP site field investigations. She has conducted interviews with homeowners as part of the air sampling program. She also is responsible for data validation of all the data from the air sampling programs.

Ms. Petrella has performed multimedia compliance audits for several hospitals in both New York and New Jersey. She also has prepared audit reports and EPA disclosure reports based on the compliance audits

Ms. Petrella presently is the Quality Assurance/Quality Control officer for the firm and responsible for reviewing all work relating to Quality Assurance/Quality Control for hazardous waste, hazardous substance, manufactured gas plant and solid waste projects undertaken by the firm. She also is responsible for preparation and maintenance of the Corporate Quality Assurance Manual, and for inventory and maintenance of the firm's field/sampling and monitoring equipment. As the QA/QC Officer, she reports directly to the Principal-in-Charge of the Environmental Remediation Division.

DVIRKA AND BARTILUCCI

APPENDIX J

# **REVISED/QUALIFIED DATA SUMMARY SHEETS**

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## EPA SAMPLE NO.

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1A VOLATILE ORGANICS ANALYSIS DATA SHEET

SB221820 Lab Name: MITKEM CORPORATION Contract: Lab Code: MITKEM Case No.: SAS No.: SDG No.: B0076 Matrix: (soil/water) SOIL Lab Sample ID: B0076-02B Sample wt/vol: 5.1 (g/mL) G Lab File ID: V1F2047 Level: (low/med) LOW Date Received: 01/15/03 % Moisture: not dec. 0 Date Analyzed: 01/21/03 GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0 Soil Aliquot Volume: \_\_\_\_\_(uL) Soil Extract Volume: \_\_\_\_(mL) CONCENTRATION UNITS:

CAS NO. COMPOUND

(ug/L or ug/Kg) UG/KG

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	75-71-8Dichlorodifluoromethane		ប	
ł	74-87-3Chloromethane		ប	
	75-01-4Vinyl Chloride		ប	
1	74-83-9Bromomethane	5	υ	
ł	75-00-3Chloroethane	5	υ	
I	75-69-4Trichlorofluoromethane	5 5	U	l
I	75-35-41,1-Dichloroethene	5	U	1
I	67-64-1Acetone	11		
	74-88-4Iodomethane	5	U	. 1
	75-15-0Carbon Disulfide	5	n.	IPP
	75-09-2Methylene Chloride	5	BU	<i> </i> ~'
	156-60-5trans-1,2-Dichloroethene	5	บ	
Į	1634-04-4Methyl tert-butyl ether	5 5	U	
	75-34-31,1-Dichloroethane	5	U	1
	108-05-4Vinyl acetate		U	
	78-93-32-Butanone		U	
	156-59-2cis-1,2-Dichloroethene	5	υ	
	590-20-72,2-Dichloropropane	. 5	U	
	74-97-5Bromochloromethane	. 5	υ	
	67-66-3Chloroform	5	U	
	71-55-61,1,1-Trichloroethane	5	U	
	563-58-61,1-Dichloropropene	5	U	ļ
ł	56-23-5Carbon Tetrachloride	5	U	
	107-06-21,2-Dichloroethane	5	U	
	71-43-2Benzene	5	U	
	79-01-6Trichloroethene	2	J	
	78-87-51, 2-Dichloropropane	5	U	
	74-95-3Dibromomethane	5	υ	
	75-27-4Bromodichloromethane	5	U	
	10061-01-5cis-1,3-Dichloropropene	5	U	
	108-10-14-Methyl-2-pentanone	5	υ	1
	108-88-3Toluene	5	υ	
	10061-02-6trans-1,3-Dichloropropene	5	U	
	79-00-51,1,2-Trichloroethane	5	Ū	
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#### 1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

SB221820 Lab Name: MITKEM CORPORATION Contract: Lab Code: MITKEM Case No.: SAS No.: SDG No.: B0076 Matrix: (soil/water) SOIL Lab Sample ID: B0076-02B Sample wt/vol: 5.1 (g/mL) G Lab File ID: V1F2047 Level: (low/med) LOW Date Received: 01/15/03 % Moisture: not dec. 0 Date Analyzed: 01/21/03 GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0 Soil Aliquot Volume: (uL) Soil Extract Volume: \_\_\_\_\_ (mL) CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) UG/KG Q

142,20,0,1,2 Dichloropropos	F	Ū
142-28-91,3-Dichloropropane	5	
591-78-62-Hexanone	5	U
	5	U
124-48-1Dibromochloromethane	5	
106-93-41,2-Dibromoethane	5	
108-90-7Chlorobenzene	5	
630-20-61,1,1,2-Tetrachloroethane	5	
100-41-4Ethylbenzene	5	
m,p-Xylene	5	U
95-47-6o-Xylene	5	U
1330-20-7Xylene (Total)	5	U
100-42-5Styrene	5	U
75-25-2Bromoform	5	U
98-82-8Isopropylbenzene	5 5 5	U
79-34-51,1,2,2-Tetrachloroethane	5	υ
108-86-1Bromobenzene	5	U
96-18-41,2,3-Trichloropropane	5	U
103-65-1n-Propylbenzene	5	U
95-49-82-Chlorotoluene	5	U
108-67-81,3,5-Trimethylbenzene	5	U
106-43-44-Chlorotoluene	5	U
98-06-6tert-Butylbenzene	5	υ
95-63-61,2,4-Trimethylbenzene	1	J
135-98-8sec-Butylbenzene	5	Ū
99-87-64-Isopropyltoluene	5	Ū
541-73-11,3-Dichlorobenzene	5	Ū
106-46-71,4-Dichlorobenzene	5	υ
104-51-8n-Butylbenzene	5	U
95-50-11,2-Dichlorobenzene	5	Ū
96-12-81, 2-Dibromo-3-chloropropane	5	Π
120-82-11,2,4-Trichlorobenzene	5	U
87-68-3Hexachlorobutadiene	5	U
	2	J
91-20-3Naphthalene	5	U U
87-61-61,2,3-Trichlorobenzene	5	10
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FORM I VOA

OLM03.0

## 1E VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Number TICs found: 0

Lab Name: MITKEM CORPORATION	Contract: SB221820
Lab Code: MITKEM Case No.:	SAS No.: SDG No.: B0076
Matrix: (soil/water) SOIL	Lab Sample ID: B0076-02B
Sample wt/vol: 5.1 (g/mL)	G Lab File ID: V1F2047
Level: (low/med) LOW	Date Received: 01/15/03
<pre>% Moisture: not dec. 0</pre>	Date Analyzed: 01/21/03
GC Column: DB-624 ID: 0.25 (mm	n) Dilution Factor: 1.0
Soil Extract Volume: (mL)	Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/Kg

EPA SAMPLE NO.

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	
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EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET SB222426 Lab Name: MITKEM CORPORATION Contract: Lab Code: MITKEM SAS No.: SDG No.: B0076 Case No.: Matrix: (soil/water) SOIL Lab Sample ID: B0076-03B Sample wt/vol: 5.1 (g/mL) G Lab File ID: V1F2048 Level: (low/med)LOW Date Received: 01/15/03 % Moisture: not dec. 2 Date Analyzed: 01/21/03 GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0 Soil Aliquot Volume: (uL) Soil Extract Volume: \_\_\_\_(mL) CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) UG/KG 0 75-71-8-----Dichlorodifluoromethane 5 U 74-87-3----Chloromethane 5 U 75-01-4----Vinyl Chloride 5 U 74-83-9----Bromomethane 5 U 5 75-00-3-----Chloroethane U | 5 U 5 U 5 U 5 U 5 U 5 U 75-69-4-----Trichlorofluoromethane 75-35-4----1,1-Dichloroethene 67-64-1-----Acetone RF 74-88-4----Iodomethane 75-15-0----Carbon Disulfide 75-09-2-----Methylene Chloride Æ 4 5 156-60-5-----trans-1,2-Dichloroethene U 1634-04-4-----Methyl tert-butyl ether 75-34-3----1,1-Dichloroethane 108-05-4-----Vinyl acetate 78-93-3----2-Butanone 156-59-2----cis-1,2-Dichloroethene 590-20-7-----2, 2-Dichloropropane 74-97-5-----Bromochloromethane 67-66-3-----Chloroform 71-55-6-----1,1,1-Trichloroethane 563-58-6-----1,1-Dichloropropene 56-23-5-----Carbon Tetrachloride 107-06-2----1,2-Dichloroethane 71-43-2----Benzene 79-01-6-----Trichloroethene 78-87-5-----1,2-Dichloropropane 74-95-3-----Dibromomethane 75-27-4-----Bromodichloromethane 10061-01-5----cis-1,3-Dichloropropene 108-10-1-----4-Methyl-2-pentanone 5 108-88-3-----Toluene U

10061-02-6----trans-1, 3-Dichloropropene

79-00-5-----1,1,2-Trichloroethane

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EPA SAMPLE NO.

1A VOLATILE ORGANICS ANALYSIS DATA SHEET

SB222426

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Lab Name: MITKEM CORPORATION	Contract:
Lab Code: MITKEM Case No.:	SAS No.: SDG No.: B0076
Matrix: (soil/water) SOIL	Lab Sample ID: B0076-03B
Sample wt/vol: 5.1 (g/mL) G	Lab File ID: V1F2048
Level: (low/med) LOW	Date Received: 01/15/03
<pre>% Moisture: not dec. 2</pre>	Date Analyzed: 01/21/03
GC Column: DB-624 ID: 0.25 (mm)	Dilution Factor: 1.0
Soil Extract Volume:(mL)	Soil Aliquot Volume:(uL)

CAS NO. COMPOUND CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

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OLM03.0

## 1E VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Number TICs found: 0

SB222426 Lab Name: MITKEM CORPORATION Contract: Lab Code: MITKEM Case No.: SAS No.: SDG No.: B0076 Matrix: (soil/water) SOIL Lab Sample ID: B0076-03B Sample wt/vol: 5.1 (g/mL) G Lab File ID: V1F2048 Level: (low/med) LOW Date Received: 01/15/03 % Moisture: not dec. 2 Date Analyzed: 01/21/03 GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0 Soil Aliquot Volume: \_\_\_\_\_(uL) Soil Extract Volume: \_\_\_\_(mL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/Kg

EPA SAMPLE NO.

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

SB22810 Lab Name: MITKEM CORPORATION Contract: Lab Code: MITKEM SDG No.: B0076 Case No.: SAS No.: Matrix: (soil/water) SOIL Lab Sample ID: B0076-01B Sample wt/vol: 5.2 (g/mL) G Lab File ID: V1F2046 Level: (low/med) LOW Date Received: 01/15/03 % Moisture: not dec. 11 Date Analyzed: 01/21/03 GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0 Soil Extract Volume: (mL) Soil Aliquot Volume: (uL) CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) UG/KG Q 1 . .

	Dichlorodifluoromethane	5	U	
74-87-3	Chloromethane		υ	
75-01-4	Vinyl Chloride		ប	
74-83-9	Bromomethane		U	
75-00-3	Chloroethane	5	Ū	
75-69-4	Trichlorofluoromethane	5		
75-35-4	1,1-Dichloroethene	5	υ	
67-64-1	Acetone	5	Ū I	~
74-88-4		5 5	π	of
	Carbon Disulfide	5		P
	Methylene Chloride	5		·
156-60-5	trans-1,2-Dichloroethene	5	U	
	Methyl tert-butyl ether	5	υ	
	1,1-Dichloroethane	5	Ŭ	
	Vinyl acetate	5	υ	
78-93-3		5		
	cis-1,2-Dichloroethene	5		
590-20-7	2,2-Dichloropropane	5		
74-97-5	Bromochloromethane	5		
67-66-3		5		
71-55-6	1,1,1-Trichloroethane	5		
563-58-6	1,1-Dichloropropene	5	υ	
56-23-5	Carbon Tetrachloride	5	Ŭ	
	1,2-Dichloroethane	5	Ŭ.	
71-43-2		5	Ū	
	Trichloroethene	5	υ	
	1,2-Dichloropropane	5	Ŭ	
74-95-3	Dibromomethane	5	Ŭ	
	Bromodichloromethane	5		
	cis-1,3-Dichloropropene	5		
	4-Methyl-2-pentanone	5	υ	
108-88-3		5	-	
	trans-1,3-Dichloropropene	5	σ	
	1,1,2-Trichloroethane	5	U U	l
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EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

SB22810 Lab Name: MITKEM CORPORATION Contract: Lab Code: MITKEM Case No.: SAS No.: SDG No.: B0076 Matrix: (soil/water) SOIL Lab Sample ID: B0076-01B Sample wt/vol: 5.2 (g/mL) G Lab File ID: V1F2046 Level: (low/med)LOW Date Received: 01/15/03 % Moisture: not dec. 11 Date Analyzed: 01/21/03 GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0 Soil Extract Volume: \_\_\_\_(mL) Soil Aliquot Volume: (uL) CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) UG/KG Q

142-28-91,3-Dichloropropane	5	U
127-18-4Tetrachloroethene		Ŭ
591-78-62-Hexanone	5	-
124-48-1Dibromochloromethane	5	Ŭ
106-93-41,2-Dibromoethane	5	Ŭ
108-90-7Chlorobenzene	5	Ŭ
630-20-61,1,1,2-Tetrachloroethane		Ŭ
100-41-4Ethylbenzene	5 5	Ŭ
m,p-Xylene	5	ΰ
95-47-6o-Xylene	5	Ŭ
1330-20-7Xylene (Total)	5	
100-42-5Styrene	5	
75-25-2Bromoform	5	
98-82-8Isopropylbenzene	5	U U
79-34-51,1,2,2-Tetrachloroethane	5	Ŭ
108-86-1Bromobenzene	5	Ŭ
96-18-41,2,3-Trichloropropane	5	Ŭ
103-65-1n-Propylbenzene	5	Ŭ
95-49-82-Chlorotoluene	5	Ū
108-67-81,3,5-Trimethylbenzene	5	Ŭ
106-43-44-Chlorotoluene	5	Ū
98-06-6tert-Butylbenzene	5	Ū
95-63-61,2,4-Trimethylbenzene	5	Ŭ
135-98-8sec-Butylbenzene	5	Ŭ
99-87-64-Isopropyltoluene	5	Ŭ
541-73-11, 3-Dichlorobenzene	5	Ū
106-46-71, 4-Dichlorobenzene	5	Ŭ
104-51-8n-Butylbenzene	5	Ŭ
95-50-11,2-Dichlorobenzene	5	Ŭ
96-12-81, 2-Dibromo-3-chloropropane	5	Ū
120-82-11,2,4-Trichlorobenzene	5	U
87-68-3Hexachlorobutadiene	5	Ū
91-20-3Naphthalene	5	Ū
87-61-61,2,3-Trichlorobenzene	5	σ
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	SB22810
Lab Name: MITKEM CORPORATION	Contract:
Lab Code: MITKEM Case No.:	SAS No.: SDG No.: B0076
Matrix: (soil/water) SOIL	Lab Sample ID: B0076-01B
Sample wt/vol: 5.2 (g/mL) G	Lab File ID: V1F2046
Level: (low/med) LOW	Date Received: 01/15/03
<pre>% Moisture: not dec. 11</pre>	Date Analyzed: 01/21/03
GC Column: DB-624 ID: 0.25 (mm)	Dilution Factor: 1.0
Soil Extract Volume:(mL)	Soil Aliquot Volume:(uL)
Number TICs found: 0	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg
CAS NUMBER COMPOUND N	IAME RT EST. CONC. Q
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1E VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

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EPA SAMPLE NO.

1A VOLATILE ORGANICS ANALYSIS DATA SHEET		EPA SAMPLE NO.		
Lab Name	: MITKEM	CORPORATION	Contract:	SB211012
Lab Code	: MITKEM	Case No.:	SAS No.:	SDG No.: B0082

Matrix: (soil/water) SOIL

Sample wt/vol: 5.1 (g/mL) G

Level: (low/med) LOW

% Moisture: not dec. 9

GC Column: DB-624 ID: 0.25 (mm)

Soil Extract Volume:\_\_\_\_(mL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

Lab File ID:

19:	
G/KG	

Q

Soil Aliquot Volume: \_\_\_\_\_(uL)

V1F2052

Lab Sample ID: B0082-04B

Date Received: 01/16/03

Date Analyzed: 01/21/03

Dilution Factor: 1.0

75-71-8	Dichlorodifluoromethane	5	U	
	Chloromethane	5	U	
	Vinyl Chloride	5	U	
	Bromomethane	5	U	
	Chloroethane	5	U	
75~69-4	Trichlorofluoromethane	5	υ	
75-35-4	1,1-Dichloroethene		U	
	Acetone	5 5 5 5	σ	0
	Iodomethane	5	υ	OP
75-15-0	Carbon Disulfide	5	BU	μ
75-09-2	Methylene Chloride	7	BUC	
	trans-1,2-Dichloroethene	.5	U	
1634-04-4-	Methyl tert-butyl ether	5	U	
75-34-3	1,1-Dichloroethane		U	
108-05-4	Vinyl acetate	5	U	
78-93-3	2-Butanone	5	ש	
156-59-2	cis-1,2-Dichloroethene	5	U	
	2,2-Dichloropropane	5	U	
74-97-5	Bromochloromethane	5 5 5 5 5 5 5	U	1
67-66-3	Chloroform	5	U	
71-55-6	1,1,1-Trichloroethane	5	σ	
563-58-6	1,1-Dichloropropene	5	U	
56-23-5	Carbon Tetrachloride	5	σ	(
107-06-2	1,2-Dichloroethane	5	U	
71-43-2	Benzene	5	U	
79-01-6	Trichloroethene	5	U	
78-87-5	1,2-Dichloropropane	5	U	ļ –
74-95-3	Dibromomethane	5	U	
75-27-4	Bromodichloromethane	5	U	
10061-01-5	cis-1, 3-Dichloropropene	5	U	
	4-Methyl-2-pentanone	5	U	ļ
	Toluene	5	U	
	trans-1, 3-Dichloropropene	5	U	
	1,1,2-Trichloroethane	5	U	
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EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

SB211012 Lab Name: MITKEM CORPORATION Contract: SDG No.: B0082 Lab Code: MITKEM Case No.: SAS No.: Matrix: (soil/water) SOIL Lab Sample ID: B0082-04B Sample wt/vol: 5.1 (g/mL) G Lab File ID: V1F2052 Level: (low/med) LOW Date Received: 01/16/03 % Moisture: not dec. 9 Date Analyzed: 01/21/03 GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0 Soil Aliquot Volume: (uL) Soil Extract Volume: \_\_\_\_(mL) CONCENTRATION UNITS:

CAS NO. COMPOUND

(ug/L or ug/Kg) UG/KG

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142-28-91,3-Dichloropropane	5	บ
127-18-4Tetrachloroethene	5	υ
591-78-62-Hexanone	5	U
124-48-1Dibromochloromethane	5 5	υ
106-93-41,2-Dibromoethane		-
	5	ប
108-90-7Chlorobenzene	5	U
630-20-61,1,1,2-Tetrachloroethane	5	U
100-41-4Ethylbenzene	5	υ
m,p-Xylene	5	U
95-47-6o-Xylene	5 5	U
1330-20-7Xylene (Total)	5	U
100-42-5Styrene	5	U
75-25-2Bromoform	5 5 5	U
98-82-8Isopropylbenzene		U
79-34-51,1,2,2-Tetrachloroethane	5	U
108-86-1Bromobenzene	5	U
96-18-41,2,3-Trichloropropane	5	U
103-65-1n-Propylbenzene	5	U
95-49-82-Chlorotoluene	5	υ
108-67-81,3,5-Trimethylbenzene	5	σ
106-43-44-Chlorotoluene	5	σ
98-06-6tert-Butylbenzene	5	U
95-63-61,2,4-Trimethylbenzene	5.	U
135-98-8sec-Butylbenzene	5	U
99-87-64-Isopropyltoluene	5	U
541-73-11, 3-Dichlorobenzene	5	U
106-46-71, 4-Dichlorobenzene	5	Ū
104-51-8n-Butylbenzene	5	Ū
95-50-11, 2-Dichlorobenzene	5	Ū
96-12-81,2-Dibromo-3-chloropropane	5	Ŭ
120-82-11,2,4-Trichlorobenzene	5	Ŭ
87-68-3Hexachlorobutadiene	5	υ
91-20-3Naphthalene	5	UU
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87-61-61,2,3-Trichlorobenzene	5	0
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FORM I VOA

## 1E VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: MITKEM CORPORATION	Contract:
Lab Code: MITKEM Case No.:	SAS No.: SDG No.: B0082
Matrix: (soil/water) SOIL	Lab Sample ID: B0082-04B
Sample wt/vol: 5.1 (g/mL) G	Lab File ID: V1F2052
Level: (low/med) LOW	Date Received: 01/16/03
<pre>% Moisture: not dec. 9</pre>	Date Analyzed: 01/21/03
GC Column: DB-624 ID: 0.25 (mm)	Dilution Factor: 1.0
Soil Extract Volume:(mL)	Soil Aliquot Volume:(uL)
	CONCERNMENT DELCON TRAILERO

Number TICs found: 0

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/Kg

EPA SAMPLE NO.

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET SB2124 Lab Name: MITKEM CORPORATION Contract: Lab Code: MITKEM Case No.: SAS No.: SDG No.: B0082 Lab Sample ID: B0082-01B Matrix: (soil/water) SOIL 5.1 (g/mL) G Sample wt/vol: Lab File ID: V1F2049 Date Received: 01/16/03 Level: (low/med) LOW % Moisture: not dec. 9 Date Analyzed: 01/21/03 GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0 Soil Extract Volume: (mL) Soil Aliquot Volume: \_\_\_\_\_(uL) CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) UG/KG Q 75-71-8-----Dichlorodifluoromethane 74-87-3-----Chloromethane 75-01-4-----Vinyl Chloride 74-83-9----Bromomethane 75-00-3-----Chloroethane 75-69-4-----Trichlorofluoromethane 75-35-4-----1,1-Dichloroethene 67-64-1-----Acetone in u pt 74-88-4----Iodomethane 75-15-0-----Carbon Disulfide 75-09-2-----Methylene Chloride 156-60-5-----trans-1,2-Dichloroethene 1634-04-4-----Methyl tert-butyl ether 75-34-3-----1, 1-Dichloroethane 108-05-4-----Vinyl acetate 5 U 78-93-3----2-Butanone 5 U 156-59-2----cis-1,2-Dichloroethene 5 590-20-7-----2,2-Dichloropropane U 5 74-97-5-----Bromochloromethane U 5 67-66-3-----Chloroform U 5 71-55-6-----1,1,1-Trichloroethane U 5 5 563-58-6-----1, 1-Dichloropropene U 56-23-5-----Carbon Tetrachloride υ 5 107-06-2----1, 2-Dichloroethane U 5 71-43-2----Benzene U 5 79-01-6----Trichloroethene υ

78-87-5-----1,2-Dichloropropane 74-95-3----Dibromomethane 75-27-4-----Bromodichloromethane 10061-01-5----cis-1, 3-Dichloropropene 108-10-1-----4-Methyl-2-pentanone 108-88-3----Toluene 10061-02-6----trans-1, 3-Dichloropropene 79-00-5-----1,1,2-Trichloroethane

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EPA SAMPLE NO.

1A VOLATILE ORGANICS ANALYSIS DATA SHEET

SB2124

Lab Name: MITKEM CORPORATION	Contract:	
Lab Code: MITKEM Case No.:	SAS No.: SDG No.: B0082	
Matrix: (soil/water) SOIL	Lab Sample ID: B0082-01B	
Sample wt/vol: 5.1 (g/mL) G	Lab File ID: V1F2049	
Level: (low/med) LOW	Date Received: 01/16/03	
<pre>% Moisture: not dec. 9</pre>	Date Analyzed: 01/21/03	
GC Column: DB-624 ID: 0.25 (mm)	Dilution Factor: 1.0	
Soil Extract Volume:(mL)	Soil Aliquot Volume:(uL)	
CAS NO. COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG Q	
142-28-91,3-Dichloropropane5       5         127-18-4Tetrachloroethene5       5         591-78-62-Hexanone5       5         124-48-1Dibromochloromethane5       5         106-93-41,2-Dibromoethane5       5         108-90-7Chlorobenzene       5         630-20-61,1,1,2-Tetrachloroethane5       5         100-41-4Bthylbenzene5       5        m,p-Xylene5       5         95-47-6		

I	630-20-61,1,1,2-Tetrachloroethane	5	U
I	100-41-4Ethylbenzene	5	U
	m,p-Xylene	5	U
	95-47-6o-Xylene	5	U
	1330-20-7Xylene (Total)	5	U
	100-42-5Styrene	5	U
	75-25-2Bromoform	5	U
1	98-82-8Isopropylbenzene	5	U
	79-34-51,1,2,2-Tetrachloroethane	5	U
	108-86-1Bromobenzene	5	U
ł	96-18-41,2,3-Trichloropropane	5	U
	103-65-1n-Propylbenzene	5	U
	95-49-82-Chlorotoluene	5	
	108-67-81,3,5-Trimethylbenzene	5	U
	106-43-44-Chlorotoluene	5	-
	98-06-6tert-Butylbenzene	5	
	95-63-61,2,4-Trlmethylbenzene	5	
	135-98-8sec-Butylbenzene	-	U
	99-87-64-Isopropyltoluene		U
	541-73-11,3-Dichlorobenzene	5	
	106-46-71,4-Dichlorobenzene	5	
	104-51-8n-Butylbenzene	5	U
	95-50-11,2-Dichlorobenzene	-	
	96-12-81,2-Dibromo-3-chloropropane		U
	120-82-11,2,4-Trichlorobenzene	5	
	87-68-3Hexachlorobutadiene	5	
	91-20-3Naphthalene	5	
	87-61-61,2,3-Trichlorobenzene	5	U

FORM I VOA

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EPA	SAMPLE	NO.

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# VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

TENTATIVELY IDENTIFIE	
Lab Name: MITKEM CORPORATION	Contract:
Lab Code: MITKEM Case No.:	SAS No.: SDG No.: B0082
Matrix: (soil/water) SOIL	Lab Sample ID: B0082-01B
Sample wt/vol: 5.1 (g/mL) G	Lab File ID: V1F2049
Level: (low/med) LOW	Date Received: 01/16/03
<pre>% Moisture: not dec. 9</pre>	Date Analyzed: 01/21/03
GC Column: DB-624 ID: 0.25 (mm)	Dilution Factor: 1.0
Soil Extract Volume:(mL)	Soil Aliquot Volume (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/Kg

COMPOUND NAME CAS NUMBER  $\mathbf{RT}$ EST. CONC. Q \_\_\_\_\_\_\_\_\_ ===== 1.\_ 2.\_\_\_\_ 3.\_\_\_\_ 4.\_\_\_\_ 5.\_\_\_\_ 6.\_\_\_\_ 7.\_\_\_\_ 8.\_\_\_\_ 9.\_\_\_\_ 10.\_\_\_\_ 11.\_\_\_\_ 12.\_\_\_\_ 13.\_\_\_\_ 14.\_\_\_\_ 15.\_\_\_\_ 16.\_\_\_\_ 17.\_\_\_\_\_ 18.\_\_\_\_\_ • 19.\_\_\_\_ 20. 21.\_\_\_\_ 22.\_\_\_\_ 23.\_\_\_\_ 24.\_\_\_\_ 25.\_\_\_\_ 26.\_\_\_\_ 27.\_\_\_\_ 28.\_\_\_ 29.\_\_\_\_\_ 30.\_\_\_\_\_

Number TICs found: 0

VOLATILE O	1A DRGANICS ANALYSIS	DATA SHEET	EPA SAMPLE NO.
Lab Name: MITKEM CORPO	RATION C	ontract:	SB2146
Lab Code: MITKEM Ca	se No.:	SAS No.: SD	G NO.: B0082
Matrix: (soil/water) S	OIL	Lab Sample I	D: B0082-02B
Sample wt/vol:	5.0 (g/mL) G	Lab File ID:	V1F2050
Level: (low/med) L	WO.	Date Receive	d: 01/16/03
<pre>% Moisture: not dec. 1</pre>	.3	Date Analyze	d: 01/21/03
GC Column: DB-624 I	D: 0.25 (mm)	Dilution Fac	tor: 1.0 🕈
Soil Extract Volume:	(mL)	Soil Aliquot	Volume:(uL)
CAS NO.	COMPOUND	CONCENTRATION UNIT (ug/L or ug/Kg) UG	

75-71-8-----Dichlorodifluoromethane 6 U 74-87-3-----Chloromethane 6 U 6 75-01-4-----Vinyl Chloride U 6 74-83-9----Bromomethane U 999999 75-00-3-----Chloroethane U 75-69-4-----Trichlorofluoromethane U U 75-35-4-----1, 1-Dichloroethene U 67-64-1-----Acetone el U 74-88-4-----Iodomethane U 75-15-0-----Carbon Disulfide 7 B 75-09-2-----Methylene Chloride 156-60-5-----trans-1, 2-Dichloroethene 6 U 6 U 1634-04-4-----Methyl tert-butyl ether 6 75-34-3-----1,1-Dichloroethane U 108-05-4-----Vinyl acetate 6 U 78-93-3----2-Butanone 6 U 156-59-2----cis-1,2-Dichloroethene 6 U 590-20-7-----2,2-Dichloropropane 6 U 74-97-5-----Bromochloromethane 6 U 67-66-3-----Chloroform 6 U 71-55-6-----1,1,1-Trichloroethane б U 563-58-6-----1,1-Dichloropropene 6 U 56-23-5-----Carbon Tetrachloride 6 U U 107-06-2-----1,2-Dichloroethane 6 U 71-43-2----Benzene 6 υ 79-01-6-----Trichloroethene 6 U 6 78-87-5-----1,2-Dichloropropane U 6 74-95-3----Dibromomethane U 6 75-27-4----Bromodichloromethane U 10061-01-5----cis-1, 3-Dichloropropene 6 U 6 108-10-1-----4-Methyl-2-pentanone 108-88-3----Toluene 6 U 10061-02-6----trans-1, 3-Dichloropropene U 6

FORM I VOA

79-00-5-----1,1,2-Trichloroethane

OLM03.0

6 U

# 1A VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

- 1

VOLATILE ORGANICS ANALYSIS DATA SHEET		
Lab Name: MITKEM CORPORATION	SB2146	
Lab Code: MITKEM Case No.:	SAS No.: SDG No.: B0082	
Matrix: (soil/water) SOIL	Lab Sample ID: B0082-02B	
Sample wt/vol: 5.0 (g/mL) G	Lab File ID: V1F2050	
Level: (low/med) LOW	Date Received: 01/16/03	
% Moisture: not dec. 13	Date Analyzed: 01/21/03	
GC Column: DB-624 ID: 0.25 (mm)	Dilution Factor: 1.0	
Soil Extract Volume:(mL)	Soil Aliquot Volume:(uL)	)
CAS NO. COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG Q	

142-28-91,3-Dichloropropane	6	υ
127-18-4Tetrachloroethene	6	ט ט
591-78-62-Hexanone	6	U
124-48-1Dibromochloromethane	6	U
106-93-41,2-Dibromoethane	6	U
108-90-7Chlorobenzene	6	U
630-20-61,1,1,2-Tetrachloroethane	6	U I
100-41-4Ethylbenzene	6	U
m,p-Xylene	6	ט ו
95-47-6	6	U
1330-20-7Xylene (Total)	6	U
100-42-5Styrene	6	U
75-25-2Bromoform	6	U U
98-82-8Isopropylbenzene	6	U U
79-34-51,1,2,2-Tetrachloroethane	6	U
108-86-1Bromobenzene	6	
96-18-41,2,3-Trichloropropane	6	U
103-65-1n-Propylbenzene		ט ו
95-49-82-Chlorotoluene	6	U
108-67-81,3,5-Trimethylbenzene	6	U U
106-43-44-Chlorotoluene	6	ש I
98-06-6tert-Butylbenzene	6	ប
95-63-61,2,4-Trimethylbenzene	6	U
135-98-8sec-Butylbenzene	-	0
99-87-64-Isopropyltoluene	-	ט
541-73-11,3-Dichlorobenzene		ט
106-46-71,4-Dichlorobenzene		U
104-51-8n-Butylbenzene		U
95-50-11,2-Dichlorobenzene	6	ប
96-12-81,2-Dibromo-3-chloropropane	6	U
120-82-11,2,4-Trichlorobenzene	6	U .
87-68-3Hexachlorobutadiene	6	U
91-20-3Naphthalene	6	ប
87-61-61,2,3-Trichlorobenzene	6	U .

FORM I VOA

1E		
VOLATILE ORGANICS ANALYSIS	DATA	SHEET
TENTATIVELY IDENTIFIED	COMPO	JUNDS

Number TICs found: 0

EPA SAMPLE NO.

TENTATIVELY IDENTIFIE	
Lab Name: MITKEM CORPORATION	Contract:
Lab Code: MITKEM Case No.:	SAS No.: SDG No.: B0082
Matrix: (soil/water) SOIL	Lab Sample ID: B0082-02B
Sample wt/vol: 5.0 (g/mL) G	Lab File ID: V1F2050
Level: (low/med) LOW	Date Received: 01/16/03
% Moisture: not dec. 13	Date Analyzed: 01/21/03
GC Column: DB-624 ID: 0.25 (mm)	Dilution Factor: 1.0
Soil Extract Volume:(mL)	Soil Aliquot Volume:(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				=====
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20.				
<i>6</i> , , , , , , , , , , , , , , , , , , ,				
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FORM I VOA-TIC

### 1A VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB2168

SDG No.: B0082

Soil Aliquot Volume: (uL)

Q

V1F2051

Lab Sample ID: B0082-03B

Date Received: 01/16/03

Date Analyzed: 01/21/03

Dilution Factor: 1.0

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.:

SAS No.:

de: MIREN Case No.:

Matrix: (soil/water) SOIL

Sample wt/vol: 5.0 (g/mL) G

Level: (low/med) LOW

% Moisture: not dec. 8

GC Column: DB-624 ID: 0.25 (mm)

Soil Extract Volume: \_\_\_\_(mL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

Lab File ID:

75-71-8-----Dichlorodifluoromethane 5 U 74-87-3-----Chloromethane 5 U 75-01-4-----Vinyl Chloride 5 U 74-83-9-----Bromomethane 5 U 75-00-3-----Chloroethane 5 U 5 75-69-4-----Trichlorofluoromethane U 5 75-35-4-----1, 1-Dichloroethene U 5 67-64-1-----Acetone U pp 74-88-4-----Iodomethane 5 U IJB U 5 75-15-0-----Carbon Disulfide 75-09-2-----Methylene Chloride 4 156-60-5-----trans-1,2-Dichloroethene 5 U 1634-04-4-----Methyl tert-butyl ether 5 U 75-34-3-----1,1-Dichloroethane 5 U 108-05-4-----Vinyl acetate 5 U 78-93-3-----2-Butanone 5 U 156-59-2----cis-1,2-Dichloroethene 5 υ 590-20-7-----2,2-Dichloropropane 5 U 74-97-5-----Bromochloromethane 5 U 67-66-3-----Chloroform 5 U 71-55-6-----1,1,1-Trichloroethane 5 υ 563-58-6-----1,1-Dichloropropene 5 U 56-23-5-----Carbon Tetrachloride 5 U 107-06-2-----1,2-Dichloroethane 5 υ 71-43-2----Benzene 5 U 79-01-6-----Trichloroethene 5 U 78-87-5-----1,2-Dichloropropane 5 υ 74-95-3-----Dibromomethane 5 σ 75-27-4-----Bromodichloromethane 5 υ 10061-01-5----cis-1, 3-Dichloropropene 5 U 108-10-1-----4-Methyl-2-pentanone 5 U 108-88-3----Toluene 5 บ 10061-02-6----trans-1, 3-Dichloropropene 5 U

79-00-5-----1,1,2-Trichloroethane

5 U

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### 1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET SB2168 Lab Name: MITKEM CORPORATION Contract: SDG No.: B0082 Lab Code: MITKEM Case No.: SAS No.: Matrix: (soil/water) SOIL Lab Sample ID: B0082-03B 5.0 (g/mL) G Sample wt/vol: Lab File ID: V1F2051 (low/med)Date Received: 01/16/03 Level: LOW Date Analyzed: 01/21/03 % Moisture: not dec. 8 GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0 Soil Extract Volume: \_\_\_\_\_(mL) Soil Aliquot Volume: (uL) CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) UG/KG 0 142-28-9-----1, 3-Dichloropropane 5 U 127-18-4-----Tetrachloroethene 5 U 591-78-6----2-Hexanone 5 U 124-48-1-----Dibromochloromethane 5 U 5 U 106-93-4----1,2-Dibromoethane 5 U 108-90-7----Chlorobenzene 630-20-6-----1,1,1,2-Tetrachloroethane 5 U 100-41-4----Ethylbenzene 5 U -----m,p-Xylene 5 U 95-47-6----o-Xylene 1330-20-7-----Xylene (Total)\_ 100-42-5----Styrene 75-25-2----Bromoform 98-82-8-----Isopropylbenzene 79-34-5-----1,1,2,2-Tetrachloroethane 108-86-1----Bromobenzene 96-18-4-----1,2,3-Trichloropropane 103-65-1----n-Propylbenzene . 95-49-8-----2-Chlorotoluene 108-67-8-----1,3,5-Trimethylbenzene 106-43-4----4-Chlorotoluene 98-06-6-----tert-Butylbenzene U 95-63-6-----1,2,4-Trimethylbenzene 5 U 135-98-8----sec-Butylbenzene 5 U 99-87-6-----4-Isopropyltoluene 5 541-73-1-----1,3-Dichlorobenzene U 5 106-46-7-----1,4-Dichlorobenzene U 5 104-51-8----n-Butylbenzene U 5 95-50-1-----1,2-Dichlorobenzene ΰ 5 96-12-8-----1, 2-Dibromo-3-chloropropane U 5 U 120-82-1-----1,2,4-Trichlorobenzene 5 87-68-3-----Hexachlorobutadiene U 5 91-20-3-----Naphthalene U 87-61-6-----1,2,3-Trichlorobenzene 5 U

FORM I VOA

### 1E VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Number TICs found: 0

EPA SAMPLE NO.

SB2168

Lab Name: MITKEM CORPORATION	Contract:
Lab Code: MITKEM Case No.:	SAS No.: SDG No.: B0082
Matrix: (soil/water) SOIL	Lab Sample ID: B0082-03B
Sample wt/vol: 5.0 (g/mL) G	Lab File ID: V1F2051
Level: (low/med) LOW	Date Received: 01/16/03
% Moisture: not dec. 8	Date Analyzed: 01/21/03
GC Column: DB-624 ID: 0.25 (mm)	Dilution Factor: 1.0
Soil Extract Volume:(mL)	Soil Aliquot Volume:(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

CAS NUMBER RT EST. CONC. COMPOUND NAME Q 1. 2.\_\_ 3. 4. 5. 6. 7.\_ 8.\_ 9.\_ 10.\_\_\_\_ 11.\_ 12. 13.\_\_ 14.\_\_ 15. 16.\_\_ 17. 18.\_\_\_ 19. 20.\_ 21.\_ 22. 23. 24.\_\_\_ 25. 26. 27. 28. 29.\_\_ 30.

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FORM I VOA-TIC

# 1B SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

		·····
Lab Name: MITKEM CORPO	RATION Contract:	SB211012
Lab Code: MITKEM Ca	se No.: SAS No.:	SDG No.: B0082
Lab coue. MITALM Ca		5103 NO D0082
Matrix: (soil/water) S	OIL	Lab Sample ID: B0082-04A
Sample wt/vol:	30.3 (g/mL) G	Lab File ID: S2D1424
Level: (low/med) L	,OW	Date Received: 01/16/03
* Moisture: 9 d	lecanted: (Y/N) N	Date Extracted:01/17/03
Concentrated Extract V	olume: 1000(uL)	Date Analyzed: 01/29/03
Injection Volume:	1.0(uL)	Dilution Factor: 1.0
GPC Cleanup: (Y/N) N	рн:	

CAS NO.

COMPOUND

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/KG

Q

		I
108-95-2Phenol	360	U I
111-44-4bis(2-Chloroethyl)Ether	360	-
95-57-82-Chlorophenol	360	U
541-73-11, 3-Dichlorobenzene	360	Ū
106-46-71, 4-Dichlorobenzene	360	Ū I
95-50-11, 2-Dichlorobenzene	360	Ū I
95-48-72-Methylphenol	360	Ū
108-60-12,2'-oxybis(1-Chloropropane)	360	U
106-44-54-Methylphenol	360	U
621-64-7N-Nitroso-di-n-propylamine	360	υ
67-72-1Hexachloroethane	360	ប
98-95-3Nitrobenzene	360	σ
78-59-1Isophorone	360	U
88-75-52-Nitrophenol	360	U
105-67-92,4-Dimethylphenol	360	υ
120-83-22, 4-Dichlorophenol	360	υ
120-82-11,2,4-Trichlorobenzene	360	U
91-20-3Naphthalene	360	υ
106-47-84-Chloroaniline	360	U
111-91-1bis(2-Chloroethoxy)methane	360	U
87-68-3Hexachlorobutadiene	360	U
59-50-74-Chloro-3-Methylphenol	360	U
91-57-62-Methylnaphthalene	360	U
77-47-4Hexachlorocyclopentadiene	360	U I
88-06-22,4,6-Trichlorophenol	360	U
95-95-42,4,5-Trichlorophenol	730	U
91-58-72-Chloronaphthalene	360	U
88-74-42-Nitroaniline	730	U
131-11-3Dimethylphthalate	360	U
208-96-8Acenaphthylene	360	U
606-20-22,6-Dinitrotoluene	360	U
99-09-23-Nitroaniline	730	U
83-32-9Acenaphthene	360	υ

# FORM I SV-1

OLM03.0

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### 1C SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

	TRUCKOTO DITTT	UNDUX .	
Lab Name: MITKEM CORPORATION	Contract:		SB211012
		•	
Lab Code: MITKEM Case No.:	SAS No.:	SDG	No.: B0082
Matrix: (soil/water) SOIL		Lab Sample ID:	B0082-04A
Sample wt/vol: 30.3 (g/mL	ı) G	Lab File ID:	S2D1424
Level: (low/med) LOW		Date Received:	01/16/03
<pre>% Moisture: 9 decanted: (</pre>	Y/N) N	Date Extracted	l:01/17/03
Concentrated Extract Volume:	1000 (uL)	Date Analyzed:	01/29/03
Injection Volume: 1.0(uL)		Dilution Facto	or: 1.0
GPC Cleanup: (Y/N) N pH	I:		

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

Q

			r——
51-28-5	2,4-Dinitrophenol	730	U
100-02-7	4-Nitrophenol	730	U
132-64-9	Dibenzofuran	360	U
	2,4-Dinitrotoluene	360	U
	Diethylphthalate	360	U
	4-Chlorophenyl-phenylether	360	Ū
86-73-7		360	
	4-Nitroaniline	730	Ū
	4,6-Dinitro-2-methylphenol	730	Ū
	N-Nitrosodiphenylamine (1)	360	Ū
	4-Bromophenyl-phenylether	360	Ū
	Hexachlorobenzene	360	Ū
	Pentachlorophenol	730	Ū
	Phenanthrene	360	Ū
120-12-7	Anthracene	360	Ū
	Carbazole	360	U
84-74-2	Di-n-butylphthalate	360	
206-44-0	Fluoranthene	360	
129-00-0		360	1
	Butylbenzylphthalate	360	Ū
	3,3'-Dichlorobenzidine	360	Ū
	Benzo(a)anthracene	360	U
	Chrysene	360	Ū
	bis(2-Ethylhexyl)phthalate	360	
	Di-n-octylphthalate	360	Ū
	Benzo(b)fluoranthene	360	-
	Benzo(k)fluoranthene	360	-
	Benzo (a) pyrene	360	_
	Indeno(1,2,3-cd)pyrene	360	-
	Dibenzo(a,h)anthracene	360	_
191-24-2	Benzo(g,h,i)perylene	360	-

(1) - Cannot be separated from Diphenylamine

EPA SAMPLE NO.

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### 1F SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

1 EJN 17	ALLVELI IDENLIFIE	ED COMPOUNDS	SB211012
Lab Name: MITKEM CORI	PORATION	Contract:	56211012
Lab Code: MITKEM (	Case No.:	SAS No.: SD	G No.: B0082
Matrix: (soil/water)	SOIL	Lab Sample I	D: B0082-04A
Sample wt/vol:	30.3 (g/mL) G	Lab File ID:	S2D1424
Level: (low/med)	LOW	Date Receive	d: 01/16/03
<pre>% Moisture: 9</pre>	decanted: (Y/N)	N Date Extract	ed:01/17/03
Concentrated Extract	Volume: 1000	(uL) Date Analyze	d: 01/29/03
Injection Volume:	1.0 (uL)	Dilution Fac	tor: 1.0:
GPC Cleanup: (Y/N)	N pH:		

Number TICs found: 1

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	
1.	UNKNOWN	8.60	940	
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FORM I SV-TIC

EPA SAMPLE NO.

1B SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SB2124 Lab Name: MITKEM CORPORATION Contract: Lab Code: MITKEM Case No.: SAS No.: SDG No.: B0082 Matrix: (soil/water) SOIL Lab Sample ID: B0082-01A Sample wt/vol: 30.2 (g/mL) G Lab File ID: S2D1425 Date Received: 01/16/03 Level: (low/med) LOW % Moisture: 13 decanted: (Y/N) N Date Extracted:01/17/03 Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/29/03 Dilution Factor: 1.0 Injection Volume: 1.0(uL) GPC Cleanup: (Y/N) N рН: \_\_\_

CAS NO. COMPOUND

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/KG

Q

108-95-2	-Phenol	380	U
111-44-4	-bis(2-Chloroethyl)Ether	380	U
95-57-8	-2-Chlorophenol	380	υ
	-1,3-Dichlorobenzene	380	U
106-46-7	-1,4-Dichlorobenzene	380	U
95-50-1	-1,2-Dichlorobenzene	380	U
95-48-7	-2-Methylphenol	380	U
108-60-1	-2,2'-oxybis(1-Chloropropane)	380	υ
106-44-5	-4-Methylphenol	380	U
621-64-7	-N-Nitroso-di-n-propylamine	380	U
	-Hexachloroethane	380	U
98-95-3		380	U
78-59-1	-Isophorone	380	U
88-75-5	-2-Nitrophenol	380	U
105-67-9	-2,4-Dimethylphenol	380	
	-2,4-Dichlorophenol	380	
120-82-1	-1,2,4-Trichlorobenzene	380	U
91-20-3	-Naphthalene	380	U
	-4-Chloroaniline	380	U
111-91-1	-bis(2-Chloroethoxy)methane	380	U
	-Hexachlorobutadiene	380	U
	-4-Chloro-3-Methylphenol	380	U
91-57-6	-2-Methylnaphthalene	380	ប
77-47-4	-Hexachlorocyclopentadiene	380	U
88-06-2	-2,4,6-Trichlorophenol	380	U
95-95-4	-2,4,5-Trichlorophenol	760	U
91-58-7	-2-Chloronaphthalene	380	U.
88-74-4	-2-Nitroaniline	760	U
131-11-3	-Dimethylphthalate	380	U
208-96-8	-Acenaphthylene	160	J
	-2,6-Dinitrotoluene	380	U
	-3-Nitroaniline	760	U
83-32-9	-Acenaphthene	78	J

# FORM I SV-1

#### EPA SAMPLE NO. 1CSEMIVOLATILE ORGANICS ANALYSIS DATA SHEET SB2124 Lab Name: MITKEM CORPORATION Contract: Lab Code: MITKEM Case No.: SAS No.: SDG No.: B0082 Lab Sample ID: B0082-01A Matrix: (soil/water) SOIL Lab File ID: Sample wt/vol: 30.2 (g/mL) G S2D1425 Level: (low/med)LOW Date Received: 01/16/03 % Moisture: 13 decanted: (Y/N) N Date Extracted:01/17/03 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 01/29/03 Injection Volume: 1.0(uL) Dilution Factor: 1.0 GPC Cleanup: (Y/N) N рН: \_\_\_\_

CAS NO. COMPOUND

(ug/L or ug/Kg) UG/KG

(

Q

CONCENTRATION UNITS:

· · · · · · · · · · · · · · · · · · ·		<b></b>	1
51-28-52,4-Dinitrophenol	760	U	
100-02-74-Nitrophenol	760	U	
132-64-9Dibenzofuran	380	U	
121-14-22,4-Dinitrotoluene	380	lu	
84-66-2Diethylphthalate	380	Ū	
7005-72-34-Chlorophenyl-phenylether	380	Ū	
86-73-7Fluorene	78		
100-01-64-Nitroaniline	220	J	]
534-52-14,6-Dinitro-2-methylphenol	760		
86-30-6N-Nitrosodiphenylamine (1)	380	-	
101-55-34-Bromophenyl-phenylether	380		
118-74-1Hexachlorobenzene	380		
87-86-5Pentachlorophenol	760		
85-01-8Phenanthrene	5500		
120-12-7Anthracene	960		00
86-74-8Carbazole	72	J	
84-74-2Di-n-butylphthalate	380		1
206-44-0Fluoranthene	5600	· ·	
129-00-0Pyrene	9400	E-12	000 D
85-68-7Butylbenzylphthalate	380	υ	
91-94-13,3'-Dichlorobenzidine	380	Ū	
56-55-3Benzo(a) anthracene	6100		
218-01-9Chrysene	7000	E-72	100 D
117-81-7bis(2-Ethylhexyl)phthalate	320		·
117-84-0Di-n-octylphthalate	460		
205-99-2Benzo (b) fluoranthene	_6300	EUS	bo D
207-08-9Benzo(k) fluoranthene	2800	· · · -	-
50-32-8Benzo (a) pyrene	5000		1
193-39-5Indeno (1, 2, 3-cd) pyrene	1200		
53-70-3Dibenzo (a, h) anthracene	440		
191-24-2Benzo(q, h, i) perylene	1300		
	-		

(1) - Cannot be separated from Diphenylamine

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## 1F SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: MITKEM CORPORATI	CON Contract	SB2124
Lab Code: MITKEM Case N	IO.: SAS NO.	SDG No.: B0082
Matrix: (soil/water) SOIL		Lab Sample ID: B0082-01A
Sample wt/vol: 30.2	: (g/mL) G	Lab File ID: S2D1425
Level: (low/med) LOW		Date Received: 01/16/03
% Moisture: 13 decar	ted: (Y/N) N	Date Extracted:01/17/03
Concentrated Extract Volum	e: 1000 (uL)	Date Analyzed: 01/29/03
Injection Volume: 1.0	uL)	Dilution Factor: 1.0
GPC Cleanup: (Y/N) N	рн:	

Number TICs found: 17

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

1.       UNKNOWN         2. 610-48-0       ANTHRACENE, 1-METHYL-         3. 613-12-7       ANTHRACENE, 2-METHYL-         4.       UNKNOWN         5. 610-48-0       ANTHRACENE, 1-METHYL-         6. 84-65-1       9,10-ANTHRACENE, 1-METHYL-         7. 3674-65-5       PHENANTHRENE, 2,3-DIMETHYL-         8. 5737-13-3       CYCLOPENTA (DEF) PHENANTHRENON         9. 2381-21-7       PYRENE, 1-METHYL-         10. 2381-21-7       PYRENE, 1-METHYL-         11. 2381-21-7       PYRENE, 1-METHYL-         12. 3353-12-6       PYRENE, 1-METHYL-         13. 2381-21-7       PYRENE, 1-METHYL-         14. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         15. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         16. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         17. 3351-28-8       CHRYSENE, 1-METHYL-	13.54 19.29 19.35 19.52 19.57	2700 2000	J
3. 613-12-7       ANTHRACENE, 2-METHYL-         4.       UNKNOWN         5. 610-48-0       ANTHRACENE, 1-METHYL-         6. 84-65-1       9,10-ANTHRACENEDIONE         7. 3674-65-5       PHENANTHRENE, 2,3-DIMETHYL-         8. 5737-13-3       CYCLOPENTA (DEF) PHENANTHRENON         9. 2381-21-7       PYRENE, 1-METHYL-         10. 2381-21-7       PYRENE, 1-METHYL-         11. 2381-21-7       PYRENE, 1-METHYL-         12. 3353-12-6       PYRENE, 1-METHYL-         13. 2381-21-7       PYRENE, 1-METHYL-         14. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         15. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         16. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         17. 3351-28-8       CHRYSENE, 1-METHYL-	19.29 19.35 19.52	2000	-
3. 613-12-7       ANTHRACENE, 2-METHYL-         4.       UNKNOWN         5. 610-48-0       ANTHRACENE, 1-METHYL-         6. 84-65-1       9,10-ANTHRACENEDIONE         7. 3674-65-5       PHENANTHRENE, 2,3-DIMETHYL-         8. 5737-13-3       CYCLOPENTA (DEF) PHENANTHRENON         9. 2381-21-7       PYRENE, 1-METHYL-         10. 2381-21-7       PYRENE, 1-METHYL-         11. 2381-21-7       PYRENE, 1-METHYL-         12. 3353-12-6       PYRENE, 1-METHYL-         13. 2381-21-7       PYRENE, 1-METHYL-         14. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         15. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         16. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         17. 3351-28-8       CHRYSENE, 1-METHYL-	19.35 19.52		
4.       UNKNOWN         5. 610-48-0       ANTHRACENE, 1-METHYL-         6. 84-65-1       9,10-ANTHRACENEDIONE         7. 3674-65-5       PHENANTHRENE, 2,3-DIMETHYL-         8. 5737-13-3       CYCLOPENTA (DEF) PHENANTHRENON         9. 2381-21-7       PYRENE, 1-METHYL-         10. 2381-21-7       PYRENE, 1-METHYL-         11. 2381-21-7       PYRENE, 1-METHYL-         12. 3353-12-6       PYRENE, 1-METHYL-         13. 2381-21-7       PYRENE, 4-METHYL-         14. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         15. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         16. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         17. 3351-28-8       CHRYSENE, 1-METHYL-	19.52		ŊĴ
6. 84-65-1       9,10-ANTHRACENEDIONE         7. 3674-65-5       PHENANTHRENE, 2,3-DIMETHYL-         8. 5737-13-3       CYCLOPENTA (DEF) PHENANTHRENON         9. 2381-21-7       PYRENE, 1-METHYL-         10. 2381-21-7       PYRENE, 1-METHYL-         11. 2381-21-7       PYRENE, 1-METHYL-         12. 3353-12-6       PYRENE, 1-METHYL-         13. 2381-21-7       PYRENE, 1-METHYL-         14. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         15. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         16. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         17. 3351-28-8       CHRYSENE, 1-METHYL-	10 57	2300	J
7. 3674-65-5       PHENANTHRENE, 2,3-DIMETHYL-         8. 5737-13-3       CYCLOPENTA (DEF) PHENANTHRENON         9. 2381-21-7       PYRENE, 1-METHYL-         10. 2381-21-7       PYRENE, 1-METHYL-         11. 2381-21-7       PYRENE, 1-METHYL-         12. 3353-12-6       PYRENE, 4-METHYL-         13. 2381-21-7       PYRENE, 1-METHYL-         14. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         15. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         16. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         17. 3351-28-8       CHRYSENE, 1-METHYL-	/	2000	NJ
8. 5737-13-3 CYCLOPENTA (DEF) PHENANTHRENON 9. 2381-21-7 PYRENE, 1-METHYL- 10. 2381-21-7 PYRENE, 1-METHYL- 11. 2381-21-7 PYRENE, 1-METHYL- 12. 3353-12-6 PYRENE, 1-METHYL- 13. 2381-21-7 PYRENE, 1-METHYL- 14. 82-05-3 7H-BENZ [DE] ANTHRACEN-7-ONE 15. 82-05-3 7H-BENZ [DE] ANTHRACEN-7-ONE 16. 82-05-3 7H-BENZ [DE] ANTHRACEN-7-ONE 17. 3351-28-8 CHRYSENE, 1-METHYL-	19.95	2600	NJ
8. 5737-13-3 CYCLOPENTA (DEF) PHENANTHRENON 9. 2381-21-7 PYRENE, 1-METHYL- 10. 2381-21-7 PYRENE, 1-METHYL- 11. 2381-21-7 PYRENE, 1-METHYL- 12. 3353-12-6 PYRENE, 1-METHYL- 13. 2381-21-7 PYRENE, 1-METHYL- 14. 82-05-3 7H-BENZ [DE] ANTHRACEN-7-ONE 15. 82-05-3 7H-BENZ [DE] ANTHRACEN-7-ONE 16. 82-05-3 7H-BENZ [DE] ANTHRACEN-7-ONE 17. 3351-28-8 CHRYSENE, 1-METHYL-	20.43	2100	ŊJ
10. 2381-21-7       PYRENE, 1-METHYL-         11. 2381-21-7       PYRENE, 1-METHYL-         12. 3353-12-6       PYRENE, 4-METHYL-         13. 2381-21-7       PYRENE, 1-METHYL-         14. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         15. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         16. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         17. 3351-28-8       CHRYSENE, 1-METHYL-	20.60	1800	NJ
11. 2381-21-7       PYRENE, 1-METHYL-         12. 3353-12-6       PYRENE, 4-METHYL-         13. 2381-21-7       PYRENE, 1-METHYL-         14. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         15. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         16. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         17. 3351-28-8       CHRYSENE, 1-METHYL-	21.69	480	ŊJ
12. 3353-12-6       PYRENE, 4-METHYL-         13. 2381-21-7       PYRENE, 1-METHYL-         14. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         15. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         16. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         17. 3351-28-8       CHRYSENE, 1-METHYL-	21.86	740	
13. 2381-21-7       PYRENE, 1-METHYL-         14. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         15. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         16. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         17. 3351-28-8       CHRYSENE, 1-METHYL-	22.13	580	ŊJ
14. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         15. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         16. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         17. 3351-28-8       CHRYSENE, 1-METHYL-	22.32	470	NJ
15. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         16. 82-05-3       7H-BENZ [DE] ANTHRACEN-7-ONE         17. 3351-28-8       CHRYSENE, 1-METHYL-	22.38	460	
16. 82-05-3 7H-BENZ [DE] ANTHRACEN-7-ONE 17. 3351-28-8 CHRYSENE, 1-METHYL-	22.96	620	
17. 3351-28-8 CHRYSENE, 1-METHYL-	23.18	570	
	23.40	500	
	24.54	510	NJ
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FORM I SV-TIC

### 1B SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB2146 Lab Name: MITKEM CORPORATION Contract: Lab Code: MITKEM Case No.: SAS No.: SDG No.: B0082 Matrix: (soil/water) SOIL Lab Sample ID: B0082-02A Sample wt/vol: 30.4 (g/mL) G Lab File ID: S2D1426 Level: (low/med) LOW Date Received: 01/16/03 % Moisture: 13 decanted: (Y/N) N Date Extracted:01/17/03 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 01/29/03 Injection Volume: 1.0(uL) Dilution Factor: 1.0 GPC Cleanup: (Y/N) N pH:

COMPOUND

CAS NO.

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/KG

Q

108-95-2Phenol	81	J
111-44-4bis (2-Chloroethyl) Ether	370	υ
95-57-82-Chlorophenol	370	
541-73-11,3-Dichlorobenzene	370	υ
106-46-71, 4-Dichlorobenzene	370	
95-50-11,2-Dichlorobenzene	370	υ
95-48-72-Methylphenol	370	Ū
108-60-12, 2'-oxybis (1-Chloropropane)	370	U
106-44-54-Methylphenol	370	Ū
621-64-7N-Nitroso-di-n-propylamine	370	
67-72-1Hexachloroethane	370	Ū
98-95-3Nitrobenzene	370	
78-59-1Isophorone	370	Ū
88-75-52-Nitrophenol	370	Ū
105-67-92,4-Dimethylphenol	370	Ū
120-83-22, 4-Dichlorophenol	370	U
120-82-11,2,4-Trichlorobenzene	370	U
91-20-3Naphthalene	370	Ū
106-47-84-Chloroaniline	370	-
111-91-1bis (2-Chloroethoxy) methane	370	Ū
87-68-3Hexachlorobutadiene	370	-
59-50-74-Chloro-3-Methylphenol	370	Ū
91-57-62-Methylnaphthalene	370	Ū
17-47-4Hexachlorocyclopentadiene	370	Ū
88-06-22,4,6-Trichlorophenol	370	l <del>õ</del>
95-95-42,4,5-Trichlorophenol	760	Ŭ
91-58-72-Chloronaphthalene	370	-
88-74-42-Nitroaniline	760	-
131-11-3Dimethylphthalate	370	-
208-96-8Acenaphthylene	160	-
606-20-22,6-Dinitrotoluene	370	
99-09-23-Nitroaniline	760	
83-32-9Acenaphthene	81	-

FORM I SV-1

1C SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET EPA SAMPLE NO.

SB2146 Lab Name: MITKEM CORPORATION Contract: Lab Code: MITKEM SAS No.: SDG No.: B0082 Case No.: Lab Sample ID: B0082-02A Matrix: (soil/water) SOIL Lab File ID: Sample wt/vol: 30.4 (g/mL) G S2D1426 Date Received: 01/16/03 Level: (1ow/med)LOW % Moisture: 13 decanted: (Y/N) N Date Extracted:01/17/03 Date Analyzed: 01/29/03 Concentrated Extract Volume: 1000(uL) Injection Volume: Dilution Factor: 1.0 1.0(uL) GPC Cleanup: (Y/N) N рН: \_\_\_\_ CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG CAS NO. COMPOUND Q 51-28-5-----2,4-Dinitrophenol\_ 100-02-7-----4-Nitrophenol\_ 760 U 760 U

	100-02-7	,00		
	132-64-9Dibenzofuran	370	U	
	121-14-22,4-Dinitrotoluene	370	ប	
	84-66-2Diethylphthalate	370	υ	
	7005-72-34-Chlorophenyl-phenylether	370	U	
	86-73-7Fluorene	68	J	
i	100-01-64-Nitroaniline	600	J	
	534-52-14, 6-Dinitro-2-methylphenol	760	U	
	86-30-6N-Nitrosodiphenylamine (1)	370	U	
	101-55-34-Bromophenyl-phenylether	370	U	
	118-74-1Hexachlorobenzene	370	U	
	87-86-5Pentachlorophenol	760	ប	
	85-01-8Phenanthrene	3100		-
	120-12-7Anthracene	700		$\neg l$
	86-74-8Carbazole	58	J	E
	84-74-2Di-n-butylphthalate	370	υ	,
1	206-44-0Fluoranthene	4300	0	TO N
	129-00-0Pyrene	7.600	E 73	DO D
	85-68-7Butylbenzylphthalate	370	υ	
	91-94-13,3'-Dichlorobenzidine	370	U	
- [	56-55-3Benzo(a) anthracene	5200	:	
	218-01-9Chrysene	5600		
	117-81-7bis(2-Ethylhexyl)phthalate	230	J	
	117-84-0Di-n-octylphthalate	330	J	
	205-99-2Benzo(b) fluoranthene	5500		
	207-08-9Benzo(k) fluoranthene	2300		
	50-32-8Benzo (a) pyrene	4000		
	193-39-5Indeno(1,2,3-cd)pyrene	1000		
l	53-70-3Dibenzo(a,h)anthracene	370	J	
	191-24-2Benzo(q,h,i)perylene	1000		
(1	- Cannot be separated from Diphenylamine	·	•	-

(1) - Cannot be separated from Diphenylamine

FORM I SV-2

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### 1F SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: MITKEM CORPORATION Contract: Lab Code: MITKEM Case No.: SAS No.: SDG No.: B0082 Lab Sample ID: B0082-02A Matrix: (soil/water) SOIL Sample wt/vol: 30.4 (g/mL) G Lab File ID: S2D1426 Level: (low/med) LOW Date Received: 01/16/03 % Moisture: 13 decanted: (Y/N) N Date Extracted:01/17/03 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 01/29/03 Injection Volume: 1.0(uL) Dilution Factor: 1.0 GPC Cleanup: (Y/N) N pH: \_\_\_\_

Number TICs found: 17

# CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

CAS NUMBER COMPOUND NAME RT EST. CONC. 0 \_\_\_\_\_\_ ======= ========================= 13.77 1. UNKNOWN 2600 J 2. 610-48-0 3. 613-12-7 ANTHRACENE, 1-METHYL-ANTHRACENE, 2-METHYL-19.29 1400 NJ 19.35 2100 NJ 4. UNKNOWN 19.51 2000 J 5. 613-12-7 6. 84-65-1 7. 3674-66-6 8. 57-11-4 9. 238-84-6 10. 2381-21-7 ANTHRACENE, 2-METHYL-19.56 1300 NJ 1600 NJ 9,10-ANTHRACENEDIONE 19.94 PHENANTHRENE, 2,5-DIMETHYL-OCTADECANOIC ACID 20.43 21.00 1400 NJ 1800 NJ 1600 NJ 11H-BENZO [A] FLUORENE 21.68 PYRENE, 1-METHYL-PYRENE, 1-METHYL-2500 NJ 21.86 11. 2381-21-7 22.12 2000 NJ PYRENE, 4-METHYL-PYRENE, 1-METHYL-12. 3353-12-6 1400 NJ 22.32 13. 2381-21-7 22.38 1600 NJ 2100 NJ 14. 3351-28-8 CHRYSENE, 1-METHYL-22.96 15. UNKNOWN 23.18 2100 J 16. 82-05-3 7H-BENZ [DE] ANTHRACEN-7-ONE 1600 NJ 23.39 5200 J 17. UNKNOWN 24.85 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30.

# FORM I SV-TIC

OLM03.0

### EPA SAMPLE NO.

SB2146

EPA SAMPLE NO.

 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

 Lab Name: MITKEM CORPORATION
 Contract:

 Lab Code: MITKEM Case No.:
 SAS No.:
 SDG No.: B0076

 Matrix: (soil/water) SOIL
 Lab Sample ID: B0076-02ARE

 Sample wt/vol:
 30.0 (g/mL) G
 Lab File ID: S2D1565

Level: (low/med) LOW % Moisture: 0 decanted: (Y/N) N

Concentrated Extract Volume: 1000(uL)

COMPOUND

Injection Volume: 1.0(uL)

CAS NO.

GPC Cleanup: (Y/N) N pH: \_\_\_\_

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/KG

Date Received: 01/15/03

Date Extracted:02/01/03

Date Analyzed: 02/05/03

Dilution Factor: 1.0

Q

108-95-2Phenol	330	U
111-44-4bis(2-Chloroethyl)Et	ther 330	U
95-57-82-Chlorophenol	330	U
541-73-11,3-Dichlorobenzene	330	U
106-46-71, 4-Dichlorobenzene	330	U
95-50-11, 2-Dichlorobenzene	330	U
95-48-72-Methylphenol	330	U
108-60-12, 2'-oxybis (1-Chlore	propane) 330	U
106-44-54-Methylphenol	330	U
621-64-7N-Nitroso-di-n-propy	vlamine 330	U
67-72-1Hexachloroethane	330	υ
98-95-3Nitrobenzene	330	U
78-59-1Isophorone	330	υ
88-75-52-Nitrophenol	330	υ
105-67-92, 4-Dimethylphenol	330	U
120-83-22,4-Dichlorophenol	330	υ
120-82-11,2,4-Trichlorobenze	ene 330	U
91-20-3Naphthalene	88	J
106-47-84-Chloroaniline	330	U
111-91-1bis(2-Chloroethoxy)	methane 330	U
87-68-3Hexachlorobutadiene	330	U
59-50-74-Chloro-3-Methylph	enol 330	U
91-57-62-Methylnaphthalene	140	J
77-47-4Hexachlorocyclopenta		U
88-06-22,4,6-Trichlorophene		U
95-95-42,4,5-Trichlorophene	670	υ
91-58-72-Chloronaphthalene	330	U
88-74-42-Nitroaniline	670	U
131-11-3Dimethylphthalate	330	U
208-96-8Acenaphthylene	160	J
606-20-22,6-Dinitrotoluene	330	U
99-09-23-Nitroaniline	670	1
83-32-9Acenaphthene	400	

FORM I SV-1

1C

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SB221820 Lab Name: MITKEM CORPORATION Contract: Lab Code: MITKEM Case No.: SAS No.: SDG No.: B0076 Matrix: (soil/water) SOIL Lab Sample ID: B0076-02ARE Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2D1565 Level: (low/med) LOW Date Received: 01/15/03 % Moisture: 0 decanted: (Y/N) N Date Extracted:02/01/03 Concentrated Extract Volume: Date Analyzed: 02/05/03 1000 (uL) Injection Volume: 1.0(uL) Dilution Factor: 1.0 GPC Cleanup: (Y/N) N pH:

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

Q

		<u> </u>		
51-28-5	2,4-Dinitrophenol	670	<u>บ</u>	
	4-Nitrophenol	670	-	
	Dibenzofuran	74		
	2,4-Dinitrotoluene	330	Ū	
	Diethylphthalate	330		
	4-Chlorophenyl-phenylether	330	-	
	Fluorene	410	-	
	4-Nitroaniline	670	U	
	4,6-Dinitro-2-methylphenol	670	U	$\cap$
	N-Nitrosodiphenylamine (1)	330	Ū	I NY
	4-Bromophenyl-phenylether	330		R I
	Hexachlorobenzene	330	-	
	Pentachlorophenol	670	1	( )
	Phenanthrene	5400		$\mathcal{O}\mathcal{L}$
	Anthracene	1400	'	
86-74-8	Carbazole	160	J	
84-74-2	Di-n-butylphthalate	330	υ,	
	Fluoranthene	5800	E 46	boD
129-00-0		10000	E 90	TOO D
	Butylbenzylphthalate	330		
91-94-1	3,3'-Dichlorobenzidine	330	τ	
	Benzo(a) anthracene	6000	E 45	po D
	Chrysene	5600	E-46	00 D
	bis(2-Ethylhexyl)phthalate	330		
117-84-0	Di-n-octylphthalate			6
	Benzo(b)fluoranthene	5400	U 37	po D
	Benzo(k)fluoranthene	2500		
	Benzo (a) pyrene	4400		
	Indeno(1,2,3-cd)pyrene	1300		
53-70-3	Dibenzo (a, h) anthracene	390	·	
	Benzo(q,h,i)perylene	1100		
			1	1

(1) - Cannot be separated from Diphenylamine

FORM I SV-2

OLM03.0

1F

EPA SAMPLE NO.

1

# SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: MITKEM CORPORATION	Contract: SB221820RE
Lab Code: MITKEM Case No.:	SAS No.: SDG No.: B0076
Matrix: (soil/water) SOIL	Lab Sample ID: B0076-02ARE
Sample wt/vol: 30.0 (g/mL) G	Lab File ID: S2D1565
Level: (low/med) LOW	Date Received: 01/15/03
<pre>% Moisture: decanted: (Y/N)</pre>	Date Extracted:02/01/03
Concentrated Extract Volume: 1000	(uL) Date Analyzed: 02/05/03
Injection Volume: 1.0(uL)	Dilution Factor: 1.0
GPC Cleanup: (Y/N) N pH:	

Number TICs found: 19

# CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

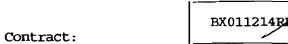
CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	~
1. 779-02-2	ANTHRACENE, 9-METHYL-	19.03	1000	
2. 613-12-7	ANTHRACENE, 2-METHYL-	19.10		
3.	UNKNOWN	19.27		
4. 613-12-7	ANTHRACENE, 2-METHYL-	19.31		
5. 35465-71-5	2-PHENYLNAPHTHALENE	19.65		
6.84-65-1	9,10-ANTHRACENEDIONE	19.70	1100	ŊJ
7. 5737-13-3	CYCLOPENTA (DEF) PHENANTHRENON	20.35	600	NJ
8. 781-73-7	2-ACETYLFLUORENE	20.79	190	NJ
9. 243-17-4	11H-BENZO [B] FLUORENE	21.43	270	NJ
10. 243-17-4	11H-BENZO [B] FLUORENE	21.61	190	NJ
11. 243-17-4	11H-BENZO [B] FLUORENE	21.66	440	NJ
12. 243-17-4	11H-BENZO [B] FLUORENE	21.80	180	NJ
13. 2381-21-7	PYRENE, 1-METHYL-	21.87	460	NJ
14. 2381-21-7	PYRENE, 1-METHYL-	22.07	220	
15. 243-17-4	11H-BENZO [B] FLUORENE	22.12	340	NJ
16. 82-05-3	7H-BENZ [DE] ANTHRACEN-7-ONE	22.70	230	NJ
17. 239-35-0	BENZO [B] NAPHTHO [2, 1-D] THIOPH	22.93	280	NJ
18. 195-19-7	BENZO [C] PHENANTHRENE	23.00	190	NJ
19. 82-05-3	7H-BENZ [DE] ANTHRACEN-7-ONE	23.14	260	NJ
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FORM I SV-TIC

### **1B** SEMIVOLATILE ORGANICS ANALYSIS DATA SHKET

EPA SAMPLE NO.

SDG No.: B0220



Lab Name: MITKEM CORPORATION

Lab Code: MITKEM Case No.:

Matrix: (soil/water) SOIL

Sample wt/vol: 30.2 (g/mL) G

Level: (low/med) LOW

**% Moisture:** 15 decanted: (Y/N) N

Concentrated Extract Volume: 1000(uL)

Injection Volume: 1.0(uL)

GPC Cleanup: (Y/N) Nрн: \_\_\_\_

SAS No.:

Lab Sample ID: B0220-37ARE

Lab File ID: S2D2114

Date Received: 02/07/03

Date Extracted: 02/25/03

Date Analyzed: 02/27/03

Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

Q

	<b>,</b>	
108-95-2Phenol	380	lu
111-44-4bis(2-Chloroethyl)Ether	380	Ū
95-57-82-Chlorophenol	380	U
541-73-11,3-Dichlorobenzene	380	U
106-46-71, 4-Dichlorobenzene	380	U
95-50-11, 2-Dichlorobenzene	380	U
95-48-72-Methylphenol	380	U
108-60-12,2'-oxybis(1-Chloropropane)	380	U
106-44-54-Methylphenol	380	U
621-64-7N-Nitroso-di-n-propylamine	380	ט
67-72-1Hexachloroethane	380	U
98-95-3Nitrobenzene	380	U
78-59-1Isophorone	380	υ
88-75-52-Nitrophenol	380	ប
105-67-92,4-Dimethylphenol	380	υ
120-83-22,4-Dichlorophenol	380	U
120-82-11,2,4-Trichlorobenzene	380	U
91-20-3Naphthalene	380	U
106-47-84-Chloroaniline	380	-
111-91-1bis(2-Chloroethoxy)methane	380	-
87-68-3Hexachlorobutadiene	380	-
59-50-74-Chloro-3-Methylphenol	380	-
91-57-62-Methylnaphthalene	380	
77-47-4Hexachlorocyclopentadiene	380	-
88-06-22,4,6-Trichlorophenol	380	U
95-95-42,4,5-Trichlorophenol	780	U
91-58-72-Chloronaphthalene	380	υ
88-74-42-Nitroaniline	780	ប
131-11-3Dimethylphthalate	380	U
208-96-8Acenaphthylene	380	ប
606-20-22,6-Dinitrotoluene	380	υ
99-09-23-Nitroaniline	780	U
83-32-9Acenaphthene	380	U

FORM I SV-1

EPA SAMPLE NO.

1C SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

BX011214R Lab Name: MITKEM CORPORATION Contract: SDG No.: B0220 Lab Code: MITKEM Case No.: SAS No.: Lab Sample ID: B0220-37ARE Matrix: (soil/water) SOIL Sample wt/vol: 30.2 (g/mL) G Lab File ID: S2D2114 Date Received: 02/07/03 Level: (low/med) LOW Date Extracted:02/25/03 % Moisture: 15 decanted: (Y/N) N Concentrated Extract Volume: 1000(uL) Date Analyzed: 02/27/03 Injection Volume: Dilution Factor: 1.0 1.0(uL)GPC Cleanup: (Y/N) N рН: \_\_\_\_

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

Q

		1
51-28-52,4-Dinitrophenol	780	U
100-02-74-Nitrophenol		U
132-64-9Dibenzofuran		່ປ
121-14-22,4-Dinitrotoluene		U
84-66-2Diethylphthalate	380	U
7005-72-34-Chlorophenyl-phenylether		
86-73-7Fluorene		U
100-01-64-Nitroaniline	780	U
534-52-14,6-Dinitro-2-methylphenol		υ
86-30-6N-Nitrosodiphenylamine_(1)		U
101-55-34-Bromophenyl-phenylether		U
118-74-1Hexachlorobenzene	380	U
87-86-5Pentachlorophenol	780	U
85-01-8Phenanthrene	380	U
120-12-7Anthracene		U
86-74-8Carbazole		U
84-74-2Di-n-butylphthalate		U
206-44-0Fluoranthene		U
129-00-0Pyrene	380	U
85-68-7Butylbenzylphthalate		U
91-94-13,3'-Dichlorobenzidine	380	
56-55-3Benzo(a) anthracene		U
218-01-9Chrysene	380	U
117-81-7bis (2-Ethylhexyl) phthalate	380	U
117-84-0Di-n-octylphthalate	380	υ
205-99-2Benzo(b)fluoranthene	380	U
207-08-9Benzo(k)fluoranthene	380	U
50-32-8Benzo (a) pyrene	380	
193-39-5Indeno(1,2,3-cd)pyrene	- 380	υ
53-70-3Dibenzo(a,h)anthracene	380	
191-24-2Benzo(g,h,i)perylene	380	

(1) - Cannot be separated from Diphenylamine

FORM I SV-2

### 1F SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: MITKEM CORPORATION Contract: Lab Code: MITKEM Case No.: SAS No.: Matrix: (soil/water) SOIL Sample wt/vol: 30.2 (q/mL) G Level: (1ow/med)LOW % Moisture: 15 decanted: (Y/N) NConcentrated Extract Volume: 1000(uL) Injection Volume: 1.0(uL) GPC Cleanup: (Y/N) N рн: \_\_\_\_

BX011214RE BX011214RE SDG No.: B0220 Lab Sample ID: B0220-37ARE Lab File ID: S2D2114 Date Received: 02/07/03 Date Extracted:02/25/03 Date Analyzed: 02/27/03 Dilution Factor: 1.0

Number TICs found: 1

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

CAS NUMBER COMPOUND NAME RT EST. CONC. 0 \_\_\_\_\_\_ \_\_\_\_\_\_ \_\_\_\_\_\_ \_\_\_\_\_ ===== 1. 310 J UNKNOWN 23.68 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30.

FORM I SV-TIC

EPA SAMPLE NO.

EPA SAMPLE NO. **1B** SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET BX0268R Lab Name: MITKEM CORPORATION Contract: SAS No.: SDG No.: B0220 Lab Code: MITKEM Case No.: Matrix: (soil/water) SOIL Lab Sample ID: B0220-23ARE Sample wt/vol: 30.3 (g/mL) G Lab File ID: S2D2113 Date Received: 02/07/03 (low/med)Level: LOW Date Extracted: 02/25/03 decanted: (Y/N) N % Moisture: 2 Date Analyzed: 02/27/03 Concentrated Extract Volume: 1000(uL) Dilution Factor: 1.0 Injection Volume: 1.0(uL) GPC Cleanup: (Y/N) N pH: \_\_\_\_

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

Q

108-95-2Phenol	330	TT
111-44-4bis (2-Chloroethyl) Ether	330	-
95-57-82-Chlorophenol	330	-
541-73-11, 3-Dichlorobenzene	330	-
106-46-71,4-Dichlorobenzene	330	
95-50-11,2-Dichlorobenzene	330	
95-48-72-Methylphenol	330	1
108-60-12,2'-oxybis(1-Chloropropane)	330	-
106-44-54-Methylphenol	330	-
621-64-7N-Nitroso-di-n-propylamine	330	-
67-72-1Hexachloroethane	330	-
98-95-3Nitrobenzene	330	-
78-59-1Isophorone	330	-
88-75-52-Nitrophenol	330	-
105-67-92,4-Dimethylphenol	330	-
120-83-22,4-Dichlorophenol	330	-
120-83-2	330	-
91-20-3Naphthalene	330	-
106-47-84-Chloroaniline	330	
111-91-1bis (2-Chloroethoxy) methane	330	-
87-68-3Hexachlorobutadiene	330	
59-50-74-Chloro-3-Methylphenol	330	-
91-57-62-Methylnaphthalene	330	
77-47-4Hexachlorocyclopentadiene	330	
88-06-22,4,6-Trichlorophenol	330	-
95-95-42,4,5-Trichlorophenol	680	-
91-58-72-Chloronaphthalene	330	-
88-74-42-Nitroaniline	680	
131-11-3Dimethylphthalate	330	-
208-96-8Acenaphthylene	330	-
606-20-22,6-Dinitrotoluene	330	-
99-09-23-Nitroaniline	680	
83-32-9Acenaphthene	330	U

BPA SAMPLE NO. 1C SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET BX0268PE Lab Name: MITKEM CORPORATION Contract: Lab Code: MITKEM Case No.: SAS NO.: SDG No.: B0220 Matrix: (soil/water) SOIL Lab Sample ID: B0220-23ARE Lab File ID: S2D2113 Sample wt/vol: 30.3 (g/mL) G Date Received: 02/07/03 Level: (low/med)LOW % Moisture: 2 decanted: (Y/N) N Date Extracted: 02/25/03 Date Analyzed: 02/27/03 Concentrated Extract Volume: 1000(uL) Injection Volume: Dilution Factor: 1.0 1.0(uL)GPC Cleanup: (Y/N) N pH:

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

Q

51-28-5	2,4-Dinitrophenol	680	υ
100-02-7	4-Nitrophenol	680	U
132-64-9	Dibenzofuran	330	U
121-14-2	2,4-Dinitrotoluene	330	U
84~66-2	Diethylphthalate	330	U
	4-Chlorophenyl-phenylether	330	U
86-73-7	Fluorene	330	U
	4-Nitroaniline	680	U
534-52-1	4,6-Dinitro-2-methylphenol	680	U
86-30-6	N-Nitrosodiphenylamine (1)	330	U
101-55-3	4-Bromophenyl-phenylether	330	U
118-74-1	Hexachlorobenzene	330	U
87-86-5	Pentachlorophenol	680	U
	Phenanthrene	330	U
	Anthracene	330	U
86-74-8	Carbazole	330	U
84-74-2	Di-n-butylphthalate	330	U
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	330	U
56-55-3	Benzo (a) anthracene	330	U
218-01-9	Chrysene	330	U
117-81-7	bis(2-Ethylhexyl)phthalate	330	U
117-84-0	Di-n-octylphthalate	330	υ
205-99-2	Benzo (b) fluoranthene	330	U
207-08-9	Benzo(k)fluoranthene	330	U
50-32-8	Benzo(a)pyrene	330	U
193-39-5	Indeno(1,2,3-cd)pyrene	330	U
53-70-3	Dibenzo(a,h)anthracene	330	U
191-24-2	Benzo(g,h,i)perylene	330	U

(1) - Cannot be separated from Diphenylamine

FORM I SV-2

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SEMIVOLATILE	ORGANICS	ANALYSIS	DATA	SHEET
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TENT.	ATIVELY IDENTIFIE	a compounds		BX0268RE
Lab Name: MITKEM COR	PORATION	Contract:		
Lab Code: MITKEM	Case No.:	SAS No.:	SDG	No.: B0220
Matrix: (soil/water)	SOIL	Lab	Sample ID:	B0220-23ARE
Sample wt/vol:	30.3 (g/mL) G	Lab	File ID:	S2D2113
Level: (low/med)	LOW	Dat	e Received:	02/07/03
<pre>% Moisture: 2</pre>	decanted: (Y/N)	N Dat	e Extracted	:02/25/03
Concentrated Extract	Volume: 1000(	uL) Dat	e Analyzed:	02/27/03
Injection Volume:	1.0(uL)	Dil	ution Facto	r: 1.0
GPC Cleanup: (Y/N)	N pH:	_		

Number TICs found: 1

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	
1.	UNKNOWN	23.68	300	
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EPA SAMPLE NO.

EPA SAMPLE NO.

**1B** SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET BX06688# Lab Name: MITKEM CORPORATION Contract: SDG No.: B0220 Lab Code: MITKEM Case No.: SAS No.: Matrix: (soil/water) SOIL Lab Sample ID: B0220-21ARE Lab File ID: Sample wt/vol: 30.2 (g/mL) G S2D2112 Level: (low/med) LOW Date Received: 02/07/03 % Moisture: 4 decanted: (Y/N) N Date Extracted: 02/25/03 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 02/27/03 Injection Volume: 1.0(uL)Dilution Factor: 1.0 GPC Cleanup: (Y/N) NpH: \_\_\_\_

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

Q

108-95-2Phenol	340	U
111-44-4bis (2-Chloroethyl) Ether	340	U
95-57-82-Chlorophenol	340	U
541-73-11,3-Dichlorobenzene	340	ט
106-46-71,4-Dichlorobenzene	340	U
95-50-11,2-Dichlorobenzene	340	U
95-48-72-Methylphenol	340	U
108-60-12,2'-oxybis(1-Chloropropane)	340	U
106-44-54-Methylphenol	340	U
621-64-7N-Nitroso-di-n-propylamine	340	U
67-72-1Hexachloroethane	340	U
98-95-3Nitrobenzene	340	
78-59-1Isophorone	340	U
88-75-52-Nitrophenol	340	U
105-67-92,4-Dimethylphenol	340	
120-83-22,4-Dichlorophenol	340	U
120-82-11,2,4-Trichlorobenzene	340	U
91-20-3Naphthalene	340	U
106-47-84-Chloroaniline	340	U
111-91-1bis (2-Chloroethoxy) methane	340	υ
87-68-3Hexachlorobutadiene	340	U
59-50-74-Chloro-3-Methylphenol	340	U
91-57-62-Methylnaphthalene	340	U
77-47-4Hexachlorocyclopentadiene	340	
88-06-22,4,6-Trichlorophenol	340	U
95-95-42,4,5-Trichlorophenol	690	U
91-58-72-Chloronaphthalene	340	υ
88-74-42-Nitroaniline	690	υ
131-11-3Dimethylphthalate	340	
208-96-8Acenaphthylene	340	ប
606-20-22,6-Dinitrotoluene	340	· ·
99-09-23-Nitroaniline	690	
83-32-9Acenaphthene	340	-

# FORM I SV-1

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1C SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET EPA SAMPLE NO.

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Lab Name: MITKEM CON	RPORATION	Contract	:	<b>вхо668ре</b> ()
Lab Code: MITKEM	Case No.:	SAS NO.	: SDG	No.: B0220
Matrix: (soil/water)	SOIL		Lab Sample ID:	B0220-21ARE
Sample wt/vol:	30.2 (g/m	L) G	Lab File ID:	S2D2112
Level: (low/med)	LOW		Date Received:	02/07/03
% Moisture: 4	decanted:	(Y/N) N	Date Extracted	l:02/25/03
Concentrated Extract	: Volume:	1000 (uL)	Date Analyzed:	02/27/03
Injection Volume:	1.0(uL)		Dilution Facto	or: 1.0
GPC Cleanup: (Y/N)	N p	H:		
		<b>CONT</b>		

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

Q

			]
	2,4-Dinitrophenol	690	
100-02-7		690	
132-64-9		340	
121-14-2	2,4-Dinitrotoluene	340	-
84-66-2	Diethylphthalate	340	
	4-Chlorophenyl-phenylether	340	
86-73-7		340	-
100-01-6		690	
534-52-1	4,6-Dinitro-2-methylphenol	690	U
86-30-6	N-Nitrosodiphenylamine (1)	340	U
101-55-3	4-Bromophenyl-phenylether	340	U
118-74-1	Hexachlorobenzene	340	U
87-86-5	Pentachlorophenol	690	U
85-01-8	Phenanthrene	340	U
120-12-7		340	U
86-74-8		340	U
84-74-2	Di-n-butylphthalate	54	J
206-44-0	Fluoranthene	340	U
129-00-0	Pyrene	340	U
85-68-7	Butylbenzylphthalate	340	υ
91-94-1	3,3'-Dichlorobenzidine	340	υ
56-55-3	Benzo (a) anthracene	340	U
218-01-9	Chrysene	340	U
117-81-7	bis(2-Ethylhexyl)phthalate	340	U
117-84-0	Di-n-octylphthalate	340	
205-99-2	Benzo(b)fluoranthene	340	-
207-08-9	Benzo(k)fluoranthene	340	
50-32-8	Benzo(a) pyrene	340	-
193-39-5	Indeno(1,2,3-cd)pyrene	340	
53-70-3	Dibenzo (a, h) anthracene	340	
191-24-2	Benzo(g,h,i)perylene	340	Ū

(1) - Cannot be separated from Diphenylamine

FORM I SV-2

### 1F SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: MITKEM COR	PORATION	Contract:	
Lab Code: MITKEM	Case No.:	SAS NO.: SDG	No.: B0220
Matrix: (soil/water)	SOIL	Lab Sample ID:	B0220-21ARE
Sample wt/vol:	30.2 (g/mL) G	Lab File ID:	S2D2112
Level: (low/med)	LOW	Date Received:	02/07/03
<pre>% Moisture: 4</pre>	decanted: (Y/N) N	Date Extracted	1:02/25/03
Concentrated Extract	Volume: 1000 (u	L) Date Analyzed:	02/27/03
Injection Volume:	1.0(uL)	Dilution Facto	or: 1.0
GPC Cleanup: (Y/N)	N pH:		

Number TICs found: 1

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	BST. CONC.	
1.	UNKNOWN	23.68	260	
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EPA SAMPLE NO.

BX0668PE
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