Long Island Rail Road

Delineation Phase II
Site Assessment Remedial Action Work Plan
Valley Stream Substation: Site No. V00404-1

October 2014

Dvirka and Bartilucci Consulting Engineers
A Division of D&B Engineers and Architects, P.C.

METROPOLITAN TRANSPORTATION AUTHORITY
LONG ISLAND RAIL ROAD

DELINEATION PHASE II SITE ASSESSMENT
FOR
VALLEY STREAM SUBSTATION

REMEDIAL ACTION WORK PLAN

Prepared for:

METROPOLITAN TRANSPORTATION AUTHORITY
LONG ISLAND RAIL ROAD

Prepared by:

DVIRKA AND BARTILUCCI CONSULTING ENGINEERS
WOODBURY, NEW YORK

OCTOBER 2014

CERTIFICATIONS

I, Brian Veith, certify that I am currently a New York State registered professional engineer licensed by the State of New York. I certify that this Remedial Action Work Plan (RAWP) was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the New York State Department Environmental Conservation (NYSDEC) Division of Environmental Remediation (DER) Technical Guidance for Site Investigation and Remediation (DER-10) and 6NYCRR Part 375.

	10/24/2014	Brian Veith
NYS Professional Engineer #	Date	Signature

LONG ISLAND RAIL ROAD
DELINEATION PHASE II SITE ASSESSMENT FOR
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1.0 INTRODUCTION

The Long Island Rail Road (LIRR) has entered into a Voluntary Cleanup Agreement (VCA) with the New York State Department of Environmental Conservation (NYSDEC) in order to investigate and remediate potential mercury contamination associated with the operation and subsequent decommissioning and removal of mercury-containing rectifiers at the Valley Stream Electric Substation.

Between 1999 and 2000, the LIRR conducted environmental assessments at 20 of its electric substations which were identified as having previously utilized mercury-containing rectifiers. Among the substations investigated was the Valley Stream Substation, at which mercury was detected at concentrations above NYSDEC recommended cleanup objectives in soil at the facility. In order to further delineate and remediate impacted soil at the 20 substations, the LIRR agreed to undertake and complete what is referred to as "Delineation Phase II Site Assessments" under the NYSDEC's Voluntary Cleanup Program (VCP). As part of this Delineation Phase II Site Assessment program, an investigation was undertaken at the Valley Stream Substation between November 2005 and August 2006. Additional follow-up investigative work was also completed in June and July 2010 in areas exhibiting the greatest mercury concentrations. The results of these investigations were documented in a report prepared by D&B entitled, "Delineation Phase II Site Assessment Investigation Report for the Valley Stream Substation," dated November 2012.

This Remedial Action Work Plan (RAWP) has been prepared by Dvirka and Bartilucci Consulting Engineers (D&B), under contract with the LIRR, to address mercury and arsenic contamination identified in several areas of the Valley Stream Substation, as documented in the November 2012 "Delineation Phase II Site Assessment Investigation Report."

As an agency under the Metropolitan Transportation Authority (MTA), the LIRR operates under the auspices of the Public Authorities Law. Section 1266, paragraph 11 of this law exempts the LIRR from the requirements of the State Environmental Quality Review Act (SEQRA) for projects, "which will not change in a material respect the general character of such

prior transportation use." With this in mind, the LIRR is proceeding with the remediation of contaminated soil at the Valley Stream Substation without SEQRA evaluation.

1.1 Project Background

The LIRR initiated the operation of electric substations with mercury rectifiers from approximately the early 1930's through 1951. The 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. Based on a detailed review of its operating records, the LIRR identified 20 substations located throughout Queens, Nassau and Suffolk Counties (including the Valley Stream Substation) 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, maintenance and decommissioning 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.

As mentioned above, between 1999 and 2000, the LIRR conducted environmental assessments at 20 of its electric substations, which previously utilized mercury-containing rectifiers. The results of these assessments were documented in a report prepared by 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, including the Valley Stream Substation, at concentrations above NYSDEC recommended cleanup objectives. In order to further delineate and remediate impacted soil at the 20 substations, the LIRR agreed to undertake and complete Delineation Phase II Site Assessments under the NYSDEC's VCP. In support of this VCP, the LIRR completed

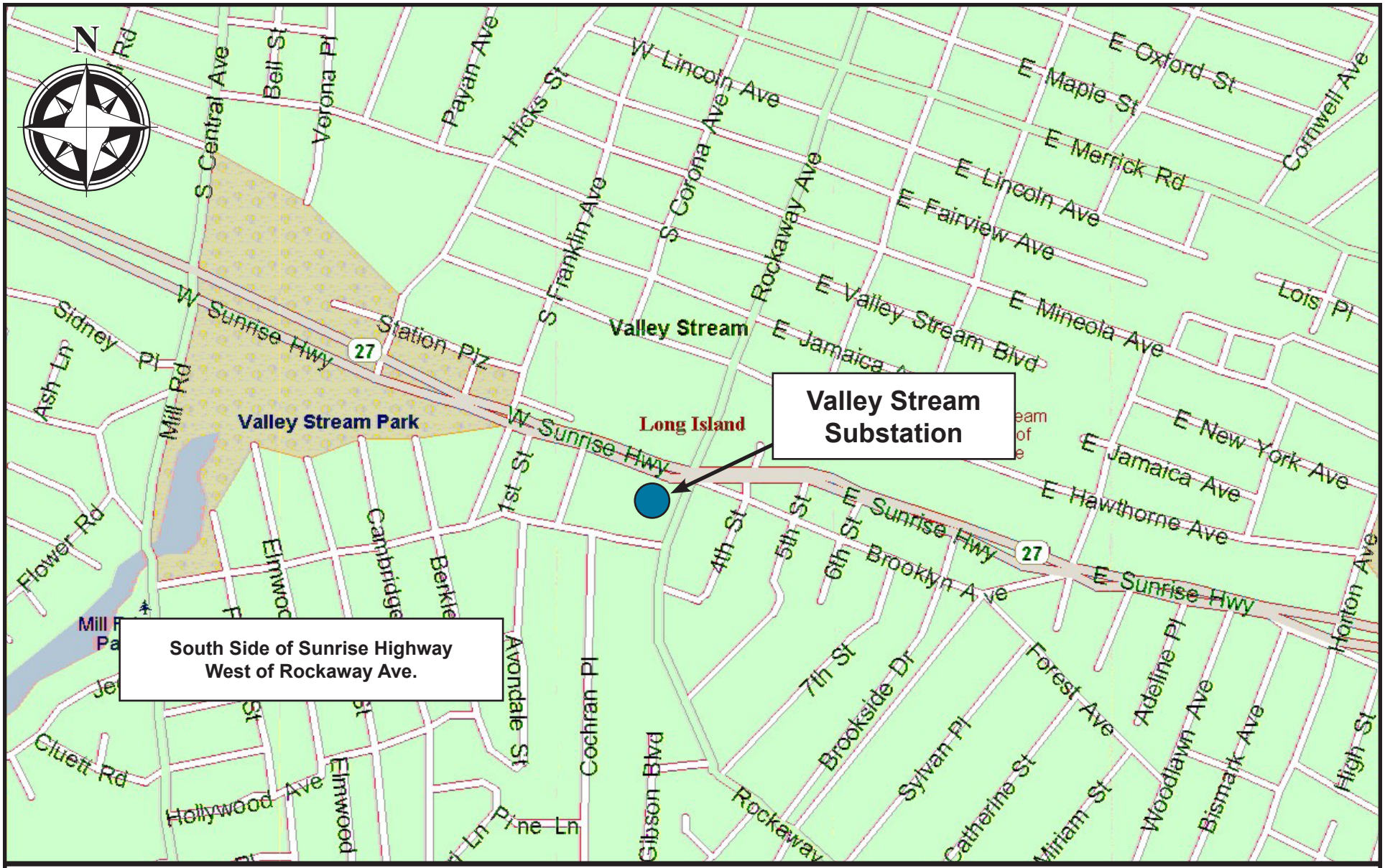
Delineation Phase II Site Assessment activities at the Valley Stream Substation by July 2010. Section 1.3 provides a summary of key findings associated with this investigation.

1.2 Site Description

The Valley Stream Substation site is located in Valley Stream, Nassau County, New York (see Figure 1-1). The substation building will be decommissioned as part of an overall substation redevelopment project and will be utilized for storage. Note that a new solid-state transformer equipped substation building has been installed to the north of the Valley Stream Substation property, which is presently utilized to convert alternating current to direct current for the LIRR electrified railway.

The existing substation consists of an approximately 25-foot by 25-foot one-story brick building, as shown on Figure 1-2. An approximately 275-foot by 30-foot transformer yard is located adjacent to the substation to the south and is enclosed by a chain-link fence. The areas surrounding the south and west of the substation property are currently utilized as commercial parking areas, and the area to the immediate east of the substation property is currently utilized as a commercial parking area for a fast food restaurant. The northern side of the Valley Stream Substation abuts a pedestrian sidewalk and Sunrise Highway.

The Valley Stream Substation was not equipped with a basement or any sanitary or office facilities at the time of the site investigations. The interior of the substation was observed to consist of one active solid-state rectifier located over a pit that once serviced a mercury-containing rectifier. The substation was also equipped with a second pit covered by a metal utility plate, referred to as a "water trough" on LIRR construction drawings. A steel plate-covered water meter pit with a concrete solid bottom is located in the northeast corner of the substation; a steel plate-covered conduit pit with a solid bottom is located off the southwest corner of the substation building; a negative feed manhole is located along the west side of the substation building; and a solid bottom positive feed manhole is located along the west side of the substation building. In addition, a discharge pipe extending through the south side of the



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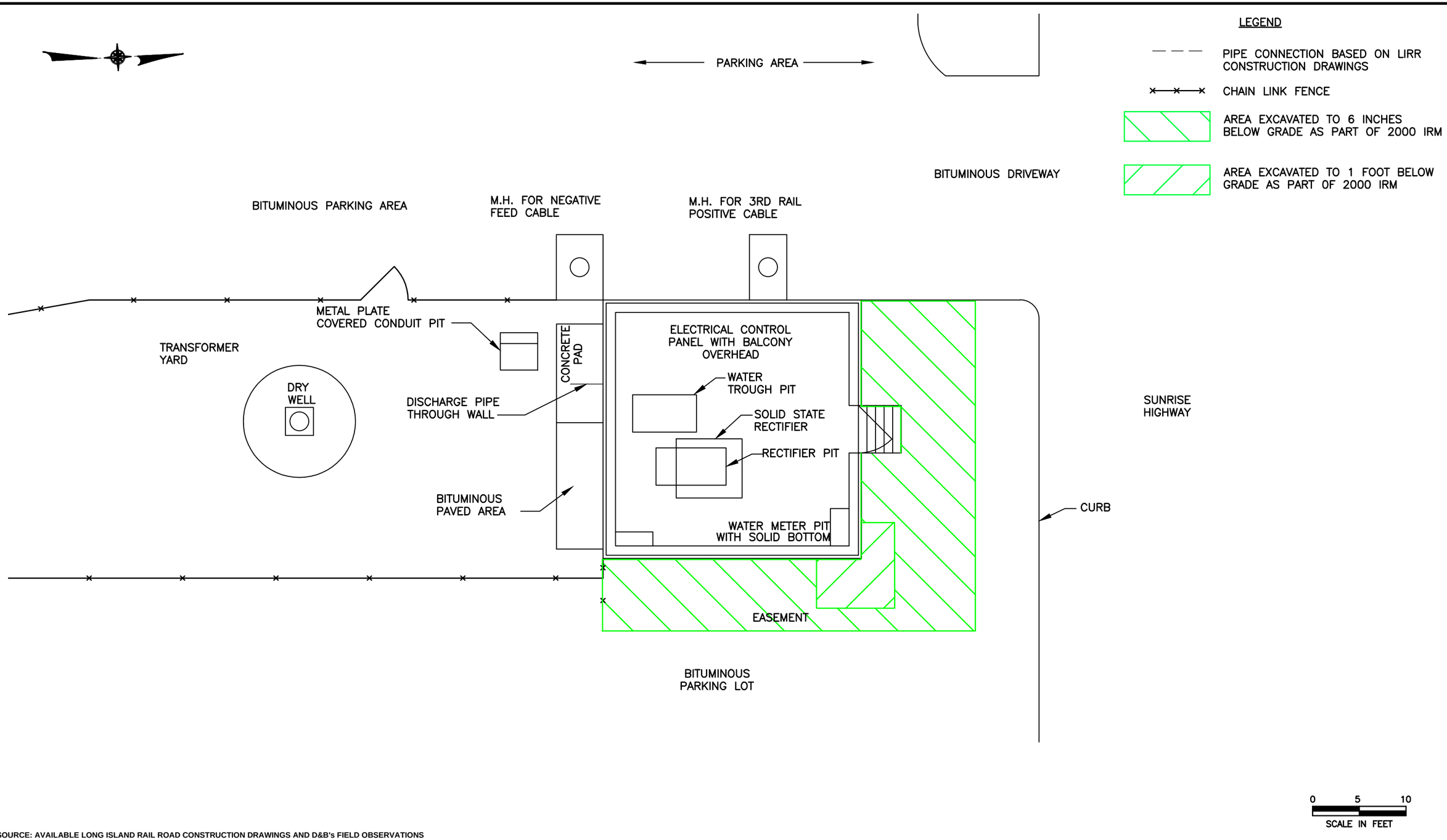
LONG ISLAND RAIL ROAD
REMEDIAL ACTION WORK PLAN

SITE LOCATION MAP
VALLEY STREAM SUBSTATION (V00404-1)

Not to Scale

FIGURE 1-1



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LONG ISLAND RAIL ROAD
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SITE PLAN
VALLEY STREAM SUBSTATION (V00404-1)

FIGURE 1-2

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substation building which appears to discharge onto a concrete pad located in the transformer yard, is located to the south of the substation building. This discharge pipe did not appear to be connected to a drainage feature within the substation at the time of the inspection.

Floor drains were not present in the substation building during any site inspection. As a result, discharge testing at the Valley Stream Substation was not conducted. However, a dry well was observed located in the transformer yard approximately 27 feet south of the substation building. According to available LIRR construction drawings, this dry well was once connected to the rectifier and water trough pits located within the substation building.

Based on the results of the completed Delineation Phase II Site Assessment, the depth to groundwater at the site is approximately 10 feet below grade.

1.3 Summary of Prior Investigations

The LIRR completed an Initial Site Assessment of the Valley Stream Substation in July 1999, as documented in the report entitled, "Site Assessment of 20 Substations for Mercury Contamination," dated December 2000. Investigation methods utilized during the Initial Site Assessment included a site inspection, mercury vapor measurements and drainage determinations. In addition, samples of various environmental media were collected at the site for laboratory analysis. Samples collected for laboratory analysis included two surface soil samples, 12 subsurface soil samples and two concrete core samples.

As discussed in Section 1.1 and subsequent to the Initial Site Assessment, a Delineation Phase II Site Assessment was completed in July 2010. As part of this investigation, a total of 53 surface soil samples, 153 subsurface soil samples and three groundwater samples were collected for chemical analysis. In addition, two below grade structures were investigated for Underground Injection Control (UIC) applicability.

Based on the results of the completed investigations at the Valley Stream Substation, the contaminants of potential concern (COPCs) are mercury and arsenic. Elevated concentrations of

mercury and arsenic were detected in surface and subsurface soil surrounding the substation building, in the dry well located to the south of the substation building and in the negative feed cable pit located adjacent to the west side of the substation building.

All surface and subsurface soil samples were compared to the NYSDEC 6NYCRR Subpart 375 Soil Cleanup Objectives for Industrial (fenced areas) and Commercial (non-fenced areas) sites. Soil samples collected from Underground Injection Control (UIC) features were compared to the Technical and Administrative Guidance Memorandum (TAGM) 4046 SCOs. However, as detailed in Section 2.1, the sample data associated with non-fenced areas has been re-evaluated and compared to the Residential SCOs based on direction from the NYSDEC in a February 15, 2013 letter, and all samples collected from UIC features have been re-evaluated and compared to the Industrial SCOs for the purposes of this RAWP. Analytical data summary tables for this re-evaluated data are provided in Appendix A, for reference purposes for the purposes of this RAWP. Groundwater sample results are compared to the Class GA Groundwater Standards/Guidance Values listed in the NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1.

The most significant mercury concentrations identified on the substation property were detected in subsurface soil located to the northeast of the substation building, with a maximum mercury concentration of 198 mg/kg. In addition, elevated concentrations of arsenic were detected in subsurface soil to the south of the substation building, with a maximum arsenic concentration of 71.8 mg/kg. Note that the Residential SCO for mercury is 0.81 mg/kg and the Industrial SCO for mercury is 5.7 mg/kg. The Industrial SCO for arsenic is 16.0 mg/kg.

The depth to groundwater beneath the Valley Stream Substation is approximately 10 feet below ground surface. Mercury was not detected at concentrations in exceedance of its Class GA Standard in any of the three collected filtered or unfiltered groundwater samples.

The three below grade structures investigated for UIC applicability during the Phase II Delineation Site Assessment included the dry well located approximately 27 feet south of the substation building, a negative feed cable pit located adjacent to the west side of the substation

building and a positive cable manhole located adjacent to the west side of the substation building. Below is a discussion of the investigation of the above-referenced below grade structures.

Dry Well

In order to further investigate the dry well located approximately 27 feet south of the substation building, one subsurface soil boring (VSSB-01A) was advanced in the dry well and five subsurface soil samples were collected from approximately 12 feet below ground surface (the dry well bottom) to approximately 22 feet below ground surface, in 2-foot continuous intervals for UIC parameter analysis, and were initially compared to the TAGM SCOs. These sample data have been re-evaluated and compared to the Industrial SCOs.

Arsenic was detected in exceedance of its Industrial SCO of 16.0 mg/kg in two of the five collected subsurface soil samples, ranging in concentration from 19.7 mg/kg to 43.0 mg/kg. The greatest subsurface arsenic concentration was detected in subsurface soil sample VSSB-01A (18 to 20 feet). No other analyte was detected at a concentration exceeding its respective TAGM SCO in any sample.

Negative Feed Cable Pit

In order to investigate the negative feed cable pit located adjacent to the west side of the substation building, one surface soil sample (VSSS-10) was collected from the sediment accumulated in the pit, and compared to the Industrial SCOs. Note that discharge piping was not present in this structure and the pit was observed to have been constructed with a solid bottom. As such, the negative feed cable pit is not classified as a UIC structure. In addition, subsurface soil samples were not collected from this structure.

No analyte was detected at concentrations exceeding its respective Industrial SCO in surface soil sample VSSS-10, with the exception of arsenic. Arsenic was detected in exceedance of its Industrial SCO of 16.0 mg/kg, at a concentration of 65.6 mg/kg.

Additional details regarding the above findings are presented in the Site Assessment of 20 Substations for Mercury Contamination, submitted to the NYSDEC in December 2000 and the Delineation Phase II Site Assessment Report for the Valley Stream Substation, submitted to the NYSDEC in November 2012.

Positive Cable Manhole

The positive cable manhole was investigated during the Phase II Delineation Site Assessment. The positive cable manhole was found to contain a solid bottom and no sediment was observed within this structure. Therefore, no samples were collected from this structure. In addition, as no discharge piping was present within this structure, the positive cable manhole is not classified as a UIC structure.

IRM

In April 2000, the LIRR conducted an Interim Remedial Measure (IRM), consisting of the removal of six inches of contaminated soil and replacement with poly sheeting and crushed stone in targeted areas to the north and east of the Valley Stream Substation in order to reduce the potential for exposure to mercury in surface soil in these areas. In addition, due to the presence of visible mercury beading noted in soil located adjacent to the northeast corner of the substation building, this area was excavated to a depth of 1-foot below ground surface. The IRM area is depicted on Figure 1-2.

As part of the IRM activities, five post excavation soil samples were collected from the excavated areas. All endpoint soil samples were collected from outside the limits of the fenced-in transformer yard, and as such, were initially compared to the Commercial SCOs. All five post excavation soil samples exhibited detectable concentrations of mercury in exceedance of the Residential SCO for mercury of 0.81 mg/kg, ranging in concentration from 206 mg/kg to a maximum concentration of 4,060 mg/kg. The maximum concentration of mercury was detected in VSEP-04, collected approximately 3 feet off the northeast corner of the substation building.

Mercury Vapor Evaluation

Note that a mercury vapor survey, consistent with the NYSDOH's Soil Vapor Intrusion Guidance (SVIG), was completed in the existing substation building in July 1999. Results of the survey are included in Appendix A. The mercury vapor evaluation consisted of a 29-point mercury vapor survey with 23 points collected surrounding the exterior of the substation building and 6 vapor sample locations collected from within the existing substation building. All vapor samples were collected with a Jerome 431X mercury vapor analyzer (MVA) and have been re-evaluated and compared to the Public Employee Safety and Health (PESH) 8-hour time-weighted average (TW) concentration of 0.050 mg/m^3. Mercury vapor was detected in six vapor samples collected surrounding the exterior of the substation building ranging in concentration from 0.010 mg/m^3 to 0.660 mg/m^3. Note that three of the mercury vapor concentrations exceeded the PESH limit of 0.050 mg/m^3. A table summarizing the mercury vapor measurement results is provided in Appendix B.

1.4 Summary of Environmental Conditions at the Site

This section briefly describes the current and future conditions of the Valley Stream Substation. As described in Section 1.2, the Valley Stream Substation will be decommissioned and will be utilized for storage. A new solid-state transformer equipped substation has been constructed to the north of the existing Valley Stream Substation property and Sunrise Highway.

The Valley Stream Substation is surrounded by commercial properties to the east, west and south, and by Sunrise Highway to the north. The majority of the property is unfenced; however, the transformer yard portion of the property located to the south of the substation building is fenced and is only accessible to authorized LIRR personnel and their contractors, limiting public access to the property. In addition, the majority of the transformer yard, located to the south of the existing substation building is covered with approximately two inches of crushed stone. The areas immediately surrounding the substation building are partially covered by crushed stone to the north, east and south, and asphalt to the west. The substation is not occupied

by LIRR personnel on a continuous or full-time basis. Under normal operating conditions, the substation property is only accessed when equipment requires monitoring, maintenance or repair. The substation building is locked at all times and all associated outside electrical equipment (i.e., transformers) are secured by a locked fence.

As part of the LIRR's overall system upgrade in response to increased ridership, the Valley Stream Substation will be decommissioned and utilized for storage. Decommissioning activities will include the removal of all on-site electrical equipment and equipment racks. After decommissioning and remediation of the substation property, the LIRR will not be disturbing or excavating in the Valley Stream Substation property for the foreseeable future.

While elevated concentrations of mercury and arsenic have been detected in surface and subsurface soil surrounding the substation building, in the dry well located to the south of the substation building and in the negative feed cable pit located adjacent to the west side of the substation building, 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 or contaminated soil without undertaking appropriate health and safety measures.

The Valley Stream Substation is serviced by public water and on-site groundwater is not used for any purpose.

Based on the results of the Delineation Phase II Site Assessment Report, twelve areas of the substation property will require remediation. Due to an irregular distribution of mercury and arsenic in site soil and as described in the following sections, the remedial areas have been divided into five 1-foot excavation areas, three 2-foot excavation areas, one 3-foot excavation area, two 4-foot excavation areas and one 6-foot excavation area.

In addition, the dry well located approximately 27 feet south of the substation building, the negative feed cable pit located adjacent to the west of the substation building and the rectifier and water trough pits located within the substation building will be properly remediated.

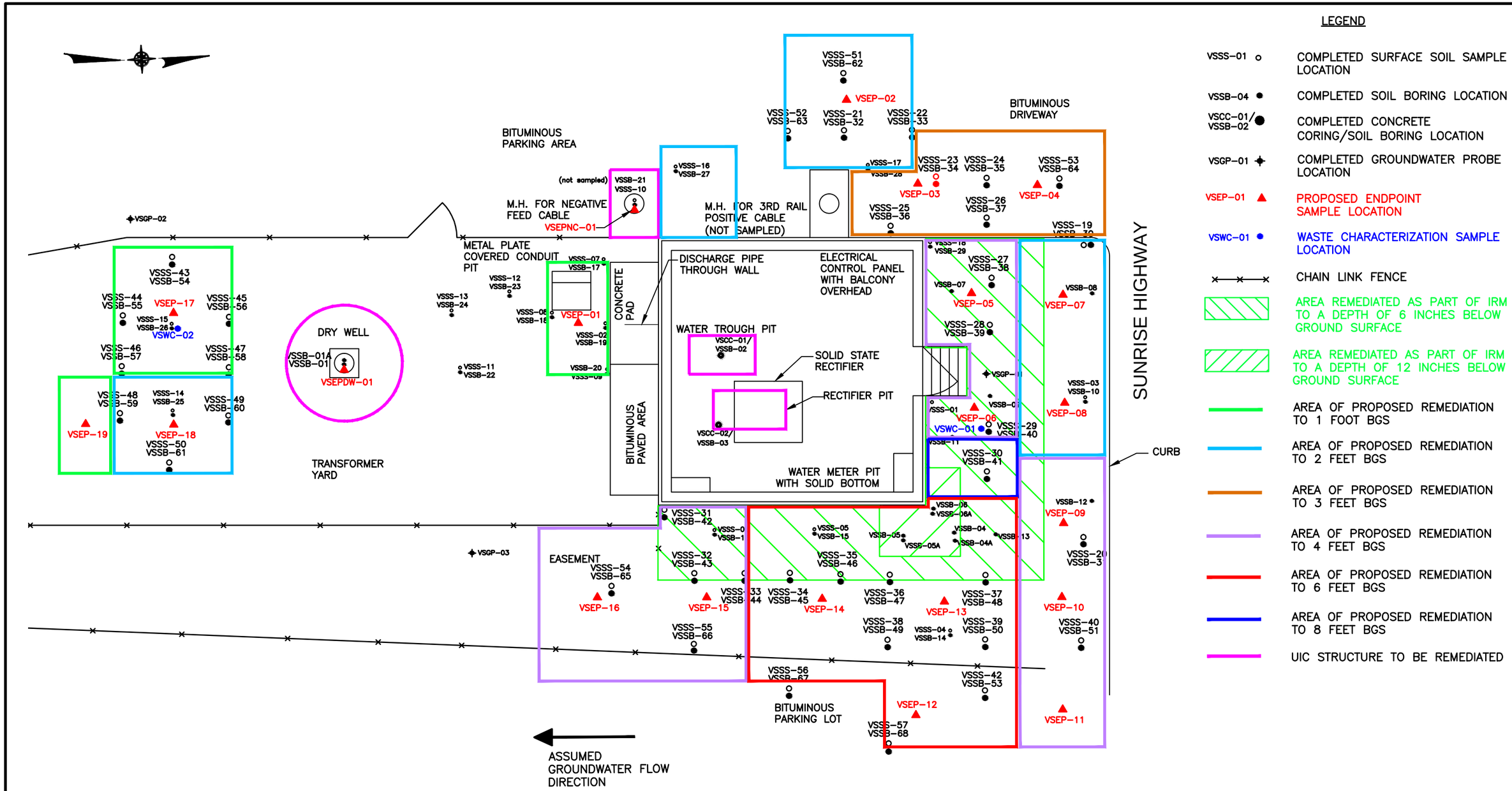
The areas and below grade structures requiring remediation are depicted on Figure 1-3 in a "conceptual fashion" and are described in the NYSDEC-approved Initial Site Assessment dated December 2000 and the NYSDEC-approved "Delineation Phase II Site Assessment Investigation Report for the Valley Stream Substation," dated November 2012. Specific details regarding the soil excavation and below grade structure removal will be included in the plans and specifications prepared for implementation of the remedy.

1.5 Contemplated Use of the Site

As part of the LIRR's overall system upgrade in response to increased ridership, the Valley Stream Substation will be decommissioned and utilized for storage. A new substation building including solid-state transformers has already been installed to the north of the existing substation building and Sunrise Highway. All decommissioned electrical transformers and equipment will be removed from the site. Note that the existing substation building is not occupied on a continuous basis at any time.

The remediation of contaminated soil on-site will consist of excavation and replacement with clean fill. All remedial excavation activities will be overseen by a LIRR representative and will be completed in accordance with the Contractor's Construction Health and Safety Plan (CHASP) as detailed in Section 5.0. In addition, full-time air monitoring will be performed by the remedial contractor in accordance with the CHASP and the Community Air Monitoring Plan (CAMP), as detailed in Appendix C. Specific details regarding remedial activities will be included in the plans and specifications.

As the new substation building was not constructed on the existing substation property, a mercury evaluation of the new substation building is not warranted. Once remedial activities are completed, the LIRR will not be disturbing or excavating in the existing Valley Stream Substation property for the foreseeable future. As a result, future exposure to residual contamination, if any, is not expected.



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LONG ISLAND RAIL ROAD
REMEDIAL ACTION WORK PLAN

ENDPOINT SAMPLE LOCATIONS AND REMEDIAL AREAS
VALLEY STREAM SUBSTATION (V00404-1)

FIGURE 1-3

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2.0 REMEDIAL ACTION SELECTION

The purpose of this section is to provide an engineering evaluation of the selected remedial alternative to address the surface and subsurface soil contamination in the 12 areas of the Valley Stream Substation property, the dry well located approximately 27 feet south of the substation building, the negative feed cable pit located adjacent to the west of the substation building and the rectifier and water trough pits located within the substation building, as defined in the Delineation Phase II Site Assessment Investigation Report. The goal of this evaluation is to demonstrate how the selected remedy would meet the remedial goals and remedial action objectives presented in NYSDEC's DER-10 Section 4.1(c)2 and NYCRR Part 375 Section 1.10(c)2, as detailed below.

2.1 Remedial Goals and Remedial Action Objectives

Per the requirements outlined in NYSDEC's DER-10 Section 4.1(c)2, remedial action objectives (RAOs) are goals developed for the protection of human health and the environment, and definition of these objectives requires an assessment of the media of concern, migration pathways, exposure routes and potential receptors. Typically, remedial goals are established based on standards, criteria and guidelines (SCGs) to protect human health and the environment. SCGs for the site, which were developed in the Site Assessment Investigation Report, include New York Codes, Rules and Regulations Title 6 (6NYCRR), Part 375 Environmental Remediation Programs. Within Part 375, Soil Cleanup Objectives (SCOs) for Industrial Use, Commercial Use and Residential Use are presented, and are typically applied to a site based on the current, intended and reasonably anticipated future use of the site. Site-specific cleanup levels were not necessary to implement at the site.

Note that the Delineation Phase II Site Assessment utilized the Commercial SCOs to define contamination in areas located outside the fenced limits of the substation property, as commercial businesses exist in these areas. However, based on NYSDEC direction provided in a February 15, 2013 comment letter, all samples collected from areas not owned by the LIRR, which are located outside the fenced limits of the substation property, will be compared to the

Residential SCOs. As such, the Industrial and Residential SCOs have been utilized to define the extents and concentrations of soil contamination exceeding these applicable SCOs and would therefore require remediation at the site. Groundwater sampling did not identify contaminant concentrations in groundwater which would warrant remedial activities.

Typically, the Industrial SCOs are used to define areas requiring remediation in the fenced areas of the site as the site is utilized as an industrial property; however, since areas exhibiting elevated concentrations of mercury have been identified outside of the fenced areas of the site, these areas, which are generally not owned by the LIRR, will be compared to the Residential SCOs. Data tables comparing all Phase II Delineation data to the Industrial and Residential SCOs, as appropriate, are provided in Appendix A for reference purposes. Sample locations are provided on Figure 1-3. The areas not currently fenced will be isolated by temporary fencing during the implementation of the remedy. In addition, as per the USEPA, all soil samples collected from or associated with UIC structures are compared to the Industrial SCOs.

Mercury and arsenic was detected in surface and subsurface soil surrounding the substation building, including the dry well located to the south of the substation building and in the negative feed cable pit located adjacent to the west side of the substation building. The most significant mercury concentrations detected on the substation property were identified in subsurface soil located northeast of the substation building, with a maximum mercury concentration of 198 mg/kg. Note that the Residential SCO for mercury is 0.81 mg/kg and the Industrial SCO for mercury is 5.7 mg/kg.

In addition, elevated concentrations of arsenic were detected in subsurface soil to the south of the substation building, with a maximum arsenic concentration of 71.8 mg/kg. Note that the Industrial SCO for arsenic is 16.0 mg/kg.

Areas where elevated mercury and arsenic have been detected in exceedance of their respective Industrial and Residential SCOs are generally covered with crushed stone and asphalt, limiting actual or potential receptor exposure and contaminant mobility. However, direct

exposure to site contamination of LIRR workers and subcontractors (on-site receptors) who are required to periodically enter the site for equipment maintenance and repair is possible in uncovered areas. The areas to the north, east and west of the substation are accessible to the public, as these areas are not currently fenced; however, the area to the west of the substation building is covered in asphalt and the substation is not occupied by LIRR personnel on a continuous or full-time basis. In addition, LIRR workers, subcontractors and the public (off-site receptors) could be potentially exposed to this contaminant source during excavation activities or possibly during periods of high wind, as the result of dermal contact and inhalation of windblown dust.

The existing Valley Stream Substation building will be decommissioned and utilized for storage. The substation building is locked at all times and all associated outside electrical equipment (i.e., transformers) are secured by a locked fence. As described above, a new substation building including solid-state transformers has already been installed to the north of the existing substation building and Sunrise Highway.

While elevated concentrations of mercury and arsenic have been detected in surface and subsurface soil surrounding the substation building, 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 or contaminated soil without undertaking appropriate health and safety measures.

Based on the nature of the contaminants associated with the site and the findings of the exposure assessment, the RAOs of this RAWP include the following:

RAOs for Public Health Protection

- Mitigate ingestion/direct contact with contaminated soil and dust.
- Mitigate inhalation of or exposure to contaminants volatilizing from soil.

RAOs for Environmental Protection

- Mitigate migration of contaminants that would result in groundwater or surface water contamination.

- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

2.2 Summary of Remedy

The approximate locations and limits of areas requiring remediation are depicted on Figure 1-3. The 13 proposed excavation areas are approximately 2,446 square feet in total area.

As shown on Figure 1-3, the areas to be excavated include the following:

- Three areas to the south of the substation building will be excavated to a depth of 1 foot below ground surface. These areas are approximately 184 square feet in area and will require the removal of approximately 7 cubic yards of soil.

- Four areas to the north, south and west of the substation building will be excavated to a depth of 2 feet below ground surface. These areas are approximately 569 square feet in area and will require the removal of approximately 42 cubic yards of soil.

- One area to the northwest of the substation building will be excavated to a depth of 3 feet below ground surface. This area is approximately 253 square feet in area and will require the removal of approximately 28 cubic yards of soil.

- Three areas to the north, northeast and southeast of the substation building will be excavated to a depth of 4 feet below ground surface. These areas are approximately 785 square feet in area and will require the removal of approximately 116 cubic yards of soil.

- One area to the northeast of the substation building will be excavated to a depth of 6 feet below ground surface. This area is approximately 600 square feet in area and will require the removal of approximately 133 cubic yards of soil.

- One area to the north of the substation building will be excavated to a depth of 8 feet below ground surface. this area is approximately 55 square feet in area and will require the removal of approximately 16 cubic yards of soil.

As part of site remediation, a total of approximately 342 cubic yards of soil will be removed from these remedial areas surrounding the substation property and properly disposed of off-site. The excavated soil will be replaced with clean fill from an off-site approved source which will meet the requirements of the Commercial SCOs within the fenced areas and the Residential SCOs within the non-fenced areas, at a minimum.

In addition, the LIRR intends to remediate soil associated with the dry well located approximately 27 feet south of the substation building, the negative feed cable pit located adjacent to the west of the substation building, and the rectifier and water trough pits located within the substation building, as described below:

Dry Well

The LIRR recommends that soil be removed from this structure to a depth of 22 feet below ground surface, or as deep as is safely possible. Note that the bottom of the dry well is approximately twelve feet below ground surface. As part of the UIC closure, the top support ring and cover will be removed and disposed of and the discharge pipe extending from the substation building will be plugged with a concrete cap.

Assuming a dry well diameter of 12 feet and all proposed soil is able to be safely removed to a depth of 22 feet below grade, it is calculated that up to 92 cubic yards of soil may be removed in association with the remediation and closure of the dry well. Upon completion of soil removal, one post excavation soil sample will be collected for UIC parameter analysis and the remaining dry well structure will be backfilled with clean fill to grade.

Negative Feed Cable Pit

The LIRR recommends that all sediment be removed from this structure. It is anticipated that a negligible amount of sediment will be removed from this structure. As the negative feed cable pit is a solid-bottom structure, the collection of post remediation soil samples following sediment removal is not warranted.

Rectifier Pit

The LIRR recommends that soil be removed from this structure to a depth of 4 feet below the pit bottom. In order to remove the soil within the structure, an approximate 2-foot by 2-foot perimeter will be saw cut around the rectifier pit drain and associated concrete around the drain will be demolished and removed. Guzzler extraction or a similar technology will be used to remove soil to a depth of 4 feet below the rectifier pit bottom. It is anticipated that approximately 8 cubic feet of soil will be removed from this structure.

As subsurface soil samples were previously collected and documented at concentrations below the Industrial SCOs at a depth of 4 to 6 feet below the pit bottom, the collection of post-excavation samples from the rectifier pit is not warranted. The 2-foot by 2-foot saw cut areas will be backfilled to the pit bottom with clean fill. In addition, in order to isolate on-site receptors from the elevated mercury concentrations detected in rectifier pit concrete, the LIRR intends to seal the rectifier pit drain with concrete.

Water Trough Pit

The LIRR recommends that soil be removed from this structure to a depth of 4 feet below the pit bottom. An approximately 2-foot by 2-foot perimeter will be saw cut around the water trough pit drain and associated concrete around the drain will be demolished and removed. Guzzler extraction will be used to remove soil to a depth of 4 feet below the water trough bottom. It is anticipated that approximately 8 cubic feet of soil will be removed from this structure.

As subsurface soil samples were previously collected and documented at concentrations below the Industrial SCOs at a depth of 4 to 6 feet below the pit bottom in this structure, the collection of post-excavation samples is not warranted. The 2-foot by 2-foot saw cut area will be backfilled to the pit bottom with clean fill. In addition, in order to isolate on-site receptors from

the elevated mercury concentrations detected in water trough pit concrete, the LIRR intends to seal the water trough pit drain with concrete.

Generation of dust during the implementation of the remedy will be monitored by utilizing a digital dust monitor and, if necessary, dust controls will be implemented in accordance with the CHASP. Air monitoring is discussed further in Section 5.0 of this report.

Endpoint samples (VSEP-01 through VSEP-19) will be collected from the excavation areas to determine the characteristics of the remaining soil prior to site restoration. The proposed location of each endpoint sample is shown on Figure 1-3. All endpoint soil samples will be sampled for mercury. In addition, and due to the arsenic exceedances detected south of the substation building, endpoint soil samples VSEP-01 and VSEP-17 through VSEP-19 will also be analyzed for arsenic. Endpoint samples collected from the fenced portions of the substation property will be compared to the Industrial Use SCOs and endpoint samples collected from the non-fenced areas not owned by the LIRR will be compared to the Residential Use SCOs. Endpoint sample results will be provided to the NYSDEC and the New York State Department of Health (NYSDOH) for review. Based on the results of the endpoint sampling, determination will be made between the LIRR and the NYSDEC with regard to the need for additional excavation. In addition, institutional controls in the form of a deed restriction and/or environmental controls will be implemented to maintain the industrial nature of the property.

2.3 Evaluation of Remedy

The following discussion presents the engineering evaluation of the remedy against the remedial goals, remedial action objectives and remedy selection criteria outlined in 6NYCRR Part 375. In accordance with NYSDEC draft VCP Guide, the following discussion evaluates the remedy against the factors presented in 6NYCRR 375-1.10(c), with the exception of cost effectiveness and community acceptance, which will be evaluated by the NYSDEC.

Protection of Human Health and the Environment

As described above, implementation of the remedy will include mitigation of the potential for the direct exposure to contaminated soil through the excavation and off-site transportation and disposal of soil exceeding Part 375 SCOs for Industrial Use within the fenced portions of the Valley Stream Substation property and for Residential Use within the non-fenced areas not owned by the LIRR. The remedy will meet the RAOs for the site through the removal of contaminated soil and mitigating potential impacts to human health through removal of the potential for exposure through ingestion, direct contact and/or inhalation. The remedy will also meet the RAOs through the implementation of a CHASP that will provide protection of on-site workers and surrounding community during implementation of the remedy. This RAWP also provides information on proper management of contaminated soil and generated waste to mitigate impacts to surrounding community during implementation of the remedy. Therefore, this remedy will provide for the protection of human health and the environment.

Standards, Criteria and Guidance

The selected remedy will comply with applicable regulatory SCGs developed for the site. Applicable regulatory SCGs are considered minimum performance specifications for the remedy. The following is a list of major SCGs that apply to the site:

- 6NYCRR Part 364 - Waste Transporter Permits
- 6NYCRR Part 370 - Hazardous Waste Management Systems
- 6NYCRR Part 375 - Environmental Remediation Programs
- CP-51 – Soil Cleanup Guidance
- 6NYCRR Part 376 - Land Disposal Restrictions
- 29 CFR Part 1910.120 - Hazardous Waste Operations and Emergency Response (HAZWOPER) Standard
- 29 CFR Part 1926 - Safety and Health Regulations for Consideration

- NYSDEC DER-10 – Technical Guidance for Site Investigations and Remediation
- NYSDOH Generic CAMP
- NYSDEC draft VCP Guide - May 2002

As described above, since the remedy will remove soil exhibiting contaminants above the Part 375 SCOs for Industrial Use within the fenced portions of the Valley Stream Substation property and for Residential Use within the non-fenced areas not owned by the LIRR, and will be implemented in accordance with the above standards and guidelines, the remedy will meet the SCGs for the site.

Short-term Effectiveness and Impacts

Evaluation of short-term effectiveness and impacts includes defining potential health and environmental risks likely to exist during implementation of the remedy and the ability to control the risks during implementation. Excavation and off-site disposal of soil exhibiting exceedances of the applicable SCOs from the surface and subsurface of the site will pose a low risk to health and the environment. Generation of dust during excavation will be monitored and controlled through dust suppression techniques, if necessary. Considering the volume of soil requiring excavation and off-site disposal, the remedy will be completed in approximately 3 weeks; however, the schedule will be coordinated with the upgrade of the substation. Remedial activities will only occur during normal business hours and noise levels will be maintained to meet local noise ordinances.

Since the majority of the property is unfenced at the Valley Stream Substation, the majority of the substation property is accessible to the public. However, the transformer yard located to the south of the substation building is fenced and is only accessible by authorized LIRR personnel and their contractors, limiting public access to the property. In addition, the majority of the transformer yard is covered with approximately two inches of crushed stone and the areas immediately surrounding the substation building are partially covered by crushed stone to the north, east and south, and asphalt to the west. Under normal operating conditions, the substation property is only accessed when equipment requires monitoring, maintenance or repair

and the substation building is locked at all times and all associated outside electrical equipment (i.e., transformers) are secured by a locked fence. In addition, all remedial areas will be isolated by temporary fencing during the implementation of the remedy.

Impacts to the on-site workers and off-site receptors would include exposure to contaminated soil, vapors and dust; however, these impacts would be minimized through the implementation of the CHASP. Implementation of appropriate storm water management, soil erosion and sediment control techniques during construction will be designed to minimize the potential for migration of contaminated soil off-site. In addition, vehicles used to transport contaminated soil will be tarped before departing the site and equipment contacting contaminated soil would be properly decontaminated as per the CHASP prior to moving off-site, also minimizing the potential for off-site migration of contaminated soil and impacts to the community.

Long-term Effectiveness and Permanence

Excavation and off-site disposal of soil exceeding the Part 375 SCOs for Industrial Use within fenced portions and for Residential Use within non-fenced areas not owned by the LIRR will be a long-term permanent and effective remedy for the site. The potential for exposure to this contaminated soil at the site in the future will be eliminated. Although it is anticipated that a majority of the soil exceeding the Part 375 SCOs for Industrial Use within fenced portions and for Residential Use within non-fenced areas not owned by the LIRR will be removed from the site, the results of endpoint sampling will be evaluated to determine the need for additional excavation. Institutional controls in the form of a deed restriction and/or environmental easement will be implemented to maintain the industrial nature of the property.

Reduction of Toxicity, Mobility or Volume

Removal of the identified and delineated contaminated soil from the site will effectively reduce the toxicity, mobility and volume of contamination at the site. The contaminated soil will

be disposed of at a permitted off-site disposal facility, which would minimize the potential for mobility of the contaminants.

Implementability

Excavation and off-site disposal of contaminated soil at the site can be completed with standard equipment. Since the remedy will be implemented in conjunction with the redevelopment of the site, all utilities and structures in the area of the contaminated soil will be removed and, therefore, there will not be any impacts to existing utilities or structures. All necessary labor, equipment and supplies are readily available. This remedy will require coordination with the NYSDEC, which is not expected to impact implementation.

Land Use

The current, intended and reasonably anticipated future use of the Site will continue to be for industrial purposes as a LIRR substation and the surrounding areas will continue to be utilized for commercial purposes by commercial businesses.

As described above, the excavation and disposal of soil exceeding the Part 375 SCOs for Industrial and Residential sites and replacement with clean fill meeting the Part 375 SCOs for Commercial and Residential sites, respectively, at a minimum, meets the objectives of the remedial goals, remedial action objectives and remedy selection criteria, as defined in the draft VCP Guide and NYSDEC's 6NYCRR Part 375 Program.

3.0 REMEDIAL CONSTRUCTION

As detailed in Section 2.0, the LIRR has identified 13 areas at the Valley Stream Substation requiring remediation and four below grade structures requiring proper remediation. This section describes the activities to be undertaken to complete the implementation of the remedy. Specific details regarding soil excavation will be included in the plans and specifications prepared for the implementation of the remedy.

Endpoint soil samples will be collected following remedial activities to ensure that remediation has been successfully completed.

3.1 Mobilization

Site mobilization activities by the remediation contractor will occur prior to initiation of the implementation of the site remediation. Staging areas for construction equipment and excavated material storage and handling, decontamination areas and temporary facilities will be established in the area of the existing substation as directed by LIRR.

Equipment and personnel decontamination facilities will be described in detail in the CHASP to be provided by the contractor. All equipment exposed to contaminated soil will be decontaminated on-site in accordance with the CHASP and removed at the conclusion of remedial activities.

All personnel and visitors will be required to sign in and sign out upon arrival and departure. Personnel and visitors entering the site will be required to have 40-hour HAZWOPER training and participate in a medical surveillance program.

Prior to the initiation of the remedial activities, utilities will be identified and located by the contractor in coordination with the LIRR in accordance with local and state requirements.

3.2 Excavation and Material Handling

The approximate areas of surface and subsurface soil to be excavated as part of the remedial measures presented as part of this RAWP are presented in Figure 1-3. The actual limits of the areas to be remediated will be staked and marked by a land surveyor in the field prior to excavation.

Air monitoring will be performed by the remedial contractor throughout the duration of the remedy and will dictate actions required to control emissions. A detailed air-monitoring program including action levels will be included in the CHASP. If dust is generated during implementation of the remedy at levels that exceed minimum action levels, standard dust suppression techniques will be employed. Standard dust suppression techniques that may be employed during excavation activities, as well as any other material handling activities include:

- Application of wetting agents to soil, stockpiles, buckets and equipment; and
- Covering/tarping of containers, excavations and stockpiles.

If dust suppression techniques do not lower the particulate concentrations to an acceptable level, work will be suspended until acceptable corrective measures are implemented. As part of the CHASP, the contractor will prepare a CAMP prior to mobilization. The contractor will be responsible for implementing the CAMP. The plan will comply with the requirements of the NYSDOH Generic CAMP included in Appendix C.

3.3 Soil Characterization

Pre-characterization sampling of the soil surrounding the existing substation building was completed as part of the Site Assessment Investigation phase of the project to characterize the soil to be excavated and removed. A total of four soil samples were selected for waste characterization analysis. All samples were analyzed for full Toxicity Characteristic Leaching Procedure (TCLP) parameters and resource conservation and recovery act (RCRA) waste characteristics (ignitability, reactivity and corrosivity). The results of the pre-characterization

sample analysis are provided in Appendix D. All RCRA waste characterization results were compared to the appropriate criteria and no exceedances of these criteria were identified for any sample collected.

The results of this laboratory analysis are provided for reference purposes only. The remedial contractor will be required to collect and analyze waste characterization samples from the areas to be excavated prior to performance of the remedial work. The samples shall conform to the requirements of the permitted off-site LIRR approved disposal facility.

3.4 Waste Transportation and Disposal

As discussed above, prior to the off-site transportation of the excavated material, the remedial contractor will need to obtain confirmation from the disposal facility that the contaminated soil will be accepted at the facility. Permitted transporters approved by the LIRR will transport the soil to permitted off-site LIRR approved disposal facilities. All trucks will have functional intact tarps to cover their loads.

LIRR will be the generator of record. Soil will not be transported for disposal without prior approval from the LIRR. Documentation of transportation and disposal of all materials will be maintained in the project files.

3.5 Endpoint Sampling

Upon reaching the final excavation depth, samples will be collected by the contractor from the base of each excavation to determine the characteristics of the remaining soil prior to site restoration. Figure 1-3 provides the proposed location of each endpoint sample location (VSEP-01 through VSEP-19). Although the draft NYSDEC VCP Guide does not provide guidance regarding endpoint sampling, the NYSDEC Draft DER-10 Technical Guidance recommends sampling from the bottom of the excavation every 900 square feet. However, in order to minimize the total amount of extra soil that would need to be removed in the event the

endpoint samples exceed the SCOs, additional endpoint samples have been proposed. The proposed endpoint sample locations are shown on Figure 1-3.

Endpoint soil samples VSEP-01 through VSEP-19 will be analyzed for mercury. In addition, due to the elevated arsenic concentrations detected to the south of the substation building, endpoint soil samples VSEP-01 and VSEP-17 through VSEP-19 will also be analyzed for arsenic. Expedited 2-day turnaround analysis will be performed to determine the characteristics of remaining soil prior to completion of site redevelopment and site restoration. The Industrial Part 375 SCOs will be used to screen the endpoint samples collected from the excavations within the fenced portions of the Valley Stream Substation property and the Part 375 SCOs for Residential sites will be used to screen endpoint samples collected from the non-fenced areas not owned by the LIRR.

The actual need for additional remediation will be determined by the LIRR in consultation with the NYSDEC. When available, the LIRR will transmit the data to the NYSDEC for review, along with a sample location map. The NYSDEC will be available for a conference call with the LIRR to discuss the provided data and to determine if additional remediation is necessary within 1 day of receipt of the endpoint sample analysis data. Field sampling procedures and quality assurance protocols will be conducted in accordance with the Quality Assurance/Quality Control (QA/QC) Plan prepared by the remedial contractor.

3.6 Below Grade Structure Remediation

As shown on Figure 1-3, four below grade structures, including the dry well located approximately 27 feet south of the substation building, the negative feed cable pit located adjacent to the west of the substation building, and the rectifier and water trough pits located within the substation building will be properly remediated as part of the planned remediation of the existing substation property.

Dry Well

Due to arsenic concentrations ranging from 12.0 mg/kg to 43.0 mg/kg detected from 14 to 22 feet below ground surface, the LIRR recommends that soil be removed from this structure to a depth of 22 feet below ground surface, or as deep as is safely possible. Note that the bottom of the dry well is approximately twelve feet below ground surface. As part of the UIC closure, the top support ring and cover will be removed and disposed of and the discharge pipe extending from the substation building will be plugged with a concrete cap.

Assuming a dry well diameter of 12 feet and all proposed soil is able to be safely removed to a depth of 22 feet below grade, it is calculated that up to 92 cubic yards of soil may be removed in association with the remediation and closure of the dry well. Upon completion of soil removal, one post excavation soil sample will be collected for UIC parameter analysis and the remaining dry well structure will be backfilled with clean fill to grade.

Negative Feed Cable Pit

Due to an arsenic concentration of 65.5 mg/kg detected in the sediment accumulated in the negative feed cable pit located adjacent to the west of the substation building, the LIRR recommends that all sediment be removed from this structure. It is anticipated that a negligible amount of soil will be removed from this structure.

Rectifier Pit

Due to a mercury concentration of 103 mg/kg detected in soil from 2 to 4 feet below the rectifier pit located inside the substation building during the Initial Site Assessment, the LIRR recommends that soil be removed from this structure to a depth of 4 feet below the pit bottom. In order to remove the soil within the structure, an approximate 2-foot by 2-foot perimeter will be saw cut around the rectifier pit drain and associated concrete around the drain will be demolished and removed. Guzzler extraction, or a similar technology, will be used to remove soil to a depth

of 4 feet below the rectifier pit bottom. It is anticipated that approximately 8 cubic feet of soil will be removed from this structure.

As subsurface soil samples were previously collected and documented at concentrations below the Industrial SCOs at a depth of 4 to 6 feet below the pit bottom, the collection of post-excavation samples from the rectifier pit is not warranted. The 2-foot by 2-foot saw cut areas will be backfilled to the pit bottom with clean fill. In addition, in order to isolate on-site receptors from the elevated mercury concentrations detected in rectifier pit concrete, the LIRR intends to seal the rectifier pit drain with concrete.

Water Trough Pit

Due to a mercury concentration of 22.7 mg/kg detected in soil from 2 to 4 feet below the water trough pit located inside the substation building during the Initial Site Assessment, the LIRR recommends that soil be removed from this structure to a depth of 4 feet below the pit bottom. An approximately 2-foot by 2-foot perimeter will be saw cut around the water trough pit drain and associated concrete around the drain will be demolished and removed. Guzzler extraction, or a similar technology, will be used to remove soil to a depth of 4 feet below the water trough pit bottom. It is anticipated that approximately 8 cubic feet of soil will be removed from this structure.

As subsurface soil samples were previously collected and documented at concentrations below the Industrial SCOs at a depth of 4 to 6 feet below the pit bottom of this structure, the collection of post-excavation soil samples is not warranted. The 2-foot by 2-foot saw cut area will then be backfilled to the pit bottom with clean fill. In addition, in order to isolate on-site receptors from the elevated mercury concentrations detected in water trough pit concrete, the LIRR intends to seal the water trough pit drain with concrete.

All waste generated as part of the above-described remediation activities will be characterized as per all NYSDEC regulations and disposed off-site by the remedial contractor at a State regulated disposal facility.

3.7 Backfill

Backfill material utilized during the remediation of the Valley Stream Substation will be from an off-site source approved by LIRR. The fill will consist of clean sand meeting the Commercial SCOs in fenced areas of the substation property and the Residential SCOs in non-fenced areas not owned by the LIRR, containing no organic material, rubbish or debris and being capable of being compacted to a relative compaction of 90 percent.

The fill material will be accompanied by a Certificate of Clean Fill certifying that the area from which the fill originated was never used for industrial purposes and that the fill is free of contaminants. Details regarding backfill requirements will be included in the plans and specifications. The Certificate of Clean Fill will be submitted with the name of the supplier, the source of fill, and the history of the location where the fill was obtained for approval by the LIRR prior to use of the fill. Upon receipt, the LIRR will review the information provided regarding the backfill and shall determine the acceptability of the material and its source. Copies of the Certificates of Clean Fill will be submitted in the Final Engineering Report.

3.8 Site Restoration

The excavated areas will be backfilled with clean sand as detailed in Section 3.7. Areas outside the excavation area disturbed during implementation of the remedy will be restored as necessary to coincide with site redevelopment.

3.9 Erosion Controls

Storm water management, soil erosion and sediment control will be performed in accordance with New York State Guidelines for Urban Erosion and Sediment Controls. The contractor will be responsible for preventing off-site migration of storm water during implementation of the remedy.

If it will be necessary to stockpile contaminated soil, it will be placed on bermed plastic liners and covered with plastic tarps to prevent erosion. Stockpiles of clean fill will also be placed on bermed liners and covered. Liners will be secured in place with stakes or concrete.

4.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

A Construction QA/QC Plan will be prepared by the contractor for review by the LIRR and review and acceptance by the NYSDEC. The plan will identify procedures to be utilized to ensure the quality of the work performed meets the objectives of this RAWP. The QA/QC plan will include, at a minimum, the following:

- A description of the quality control organization including a chart showing the lines of authority;
- The names, qualifications, duties and responsibilities of each person assigned a QC function;
- Procedures for scheduling and managing submittals including those from subcontractors;
- The location, number and type of each sample to be collected and analysis to be performed for all samples to be collected, including waste characterization and endpoint sampling requirements;
- Description of sample collection methods for each sample matrix including sample containers, sample custody, sample packaging, storage and shipping procedures;
- The analytical protocols to be utilized;
- Quality control methods and procedures for each specific test to be used during construction;
- The name, address and qualifications of each proposed testing laboratory and the intended project-specific function;
- A description of all instrumentation and equipment to be used for testing on-site, as well as operating and calibration procedures;
- Reporting procedures for quality assurance activities including proposed reporting formats; and
- Method for notification of changes.

The contractor will be responsible for implementing the QA/QC plan.

5.0 HEALTH AND SAFETY

The remedial contractor will prepare a CHASP. Site personnel performing remedial work will be required to read and comply with the requirements of the CHASP.

The CHASP will be submitted to LIRR and NYSDEC for review and acceptance prior to initiation of the project and associated remedial activities. The CHASP will be required to address all the appropriate federal, state and local regulatory requirements necessary to undertake and successfully complete implementation of the remedy. The CHASP will be prepared in accordance with 29 CFR 1910.129 and will include the following items:

- Health and safety organization, including résumés of personnel responsible for health and safety;
- Project site description and hazard assessment;
- Training requirements;
- Medical surveillance requirements;
- Project site control procedures;
- Standard operating procedures and engineering controls;
- Personnel protective equipment requirements;
- Personnel hygiene and decontamination protocols;
- Equipment decontamination procedures;
- Air monitoring requirements;
- Emergency equipment/first aid requirements;
- Emergency responses/contingency procedures;
- Heat and cold stress procedures;
- Record keeping requirements; and
- Community protection plan.

The contractor will be responsible for ensuring that the CHASP and all work associated with the implementation of the remedy is performed in accordance with safe working practices including all Occupational Safety and Health Administration (OSHA) requirements. All site personnel will be trained and certified in the proper use of personal protective equipment and will have knowledge and understanding of construction standards. Certifications regarding training and expertise will be required prior to the start of work.

As part of the CHASP, the remedial contractor will prepare a CAMP prior to mobilization. The remedial contractor will be responsible for implementing the CAMP. The plan will comply with the requirements of the NYSDOH Generic CAMP included as Appendix C.

6.0 REPORTING AND DOCUMENTATION

The remedial contractor will be required to prepare progress reports each week during implementation of the remedy. Each report will include information on the work completed during the week, the anticipated schedule for the following weeks and a description of any problems encountered which will impact project progress and their resolution. Progress reports will be available for regulatory agency review.

Throughout implementation of the remedy, records will be maintained by the remedial contractor and engineer performing construction inspection to document activities completed on-site. Records that will be maintained include the following:

- Daily field activity reports
- Visitor sign-in/sign-out logs
- Construction photographs
- Instrument calibration logs
- Waste manifests/bills of lading and disposal facility receipts
- Waste characterization sampling results and waste treatment/ disposal facility prequalification forms
- Chain-of-custody forms
- Air monitoring forms
- Contractor submittals
- Measurements of material quantities for progress payments
- Incident/accident reports
- Meeting minutes
- Endpoint sampling results

Following completion of the remedy, and in accordance with the draft VCP Guide, within 90 days of completion of the remedy, a Final Engineering Report (FER) will be prepared. This report will include the following:

- Description of remedial actions performed;
- Deviations from the RAWP, if any;
- Copies of records maintained during the remediation;
- Problems encountered during construction and their resolution;

- A discussion on the quantification and listing of soil removed from the site;
- Detailed "as-built" drawings showing limits of the excavation and the locations of documentation samples;
- Copies of the Certificates of Clean Fill;
- Copies of all records documenting off-site disposal of soil; and
- Endpoint sampling results.

Also in accordance with the draft VCP Guide and the NYSDEC's DER-10 Guidance document, the FER will include a certification by a Professional Engineer registered in New York State, stating that the work was implemented and construction activities were completed in substantial conformance with this RAWP.

In addition, the FER will include a Sit Management Plan (SMP) that will include, but not be limited to the following components:

- An institutional and engineering control (IC/EC) plan that will include a description of all ICs and ECs for the site and the requirements necessary to ensure these controls remain in-place and effective.
- A monitoring plan describing the measures for monitoring the effectiveness of the selected site remedy.
- A soil management plan detailing the procedures for the safe implementation of any future excavation and handling of excavated soil at the site.
- A Site management reporting plan detailing the necessary components and required frequency of Periodic Review Report preparation for the site.

7.0 PROJECT MANAGEMENT

7.1 Key Participants and Responsibilities

Key participants involved in the remediation of the LIRR Valley Stream Substation site under the VCP include the following:

Key Participants	Primary Responsibilities
Volunteer: Long Island Rail Road	Oversee planning, implementation and reporting for remedial construction in accordance with approved RAWP, including procuring and directing contractors and consultants for design, remedial construction and site development in accordance with approved RAWP.
Regulatory Agencies: New York State Department of Environmental Conservation and New York State Department of Health	Regulatory oversight.
Remedial Engineer: Dvirka and Bartilucci Consulting Engineers	Construction inspection, record keeping, reporting and preparation of the Final Engineering Report.
Remedial Contractor: [to be determined]	Furnish labor, material, supplies, etc. for remedial construction in accordance with approved plans.

7.2 Project Communication and Management

Throughout the project, project meetings will be held to discuss work progress, plan upcoming activities for the week and discuss any unanticipated site conditions encountered. The remedial contractor's superintendent, as well as LIRR's Project Manager, will be required to attend the project meetings. Representatives of NYSDEC and NYSDOH will be made aware of the schedule for project meetings. Following an initial pre-construction meeting, project meetings will be held once per week at the site during the remediation.

During remedial construction, D&B will provide full-time on-site inspection of the work, engage in day-to-day communications with the remedial contractor's superintendent and maintain records and prepare reports as described in Section 6.0.

8.0 PROJECT SCHEDULE AND KEY MILESTONES

A preliminary schedule for implementation of the remedy is provided below. Key milestones are identified in order to monitor work progress. Upon the LIRR's approval of the remedial schedule, a detailed schedule of remedial activities will be provided to the NYSDEC prior to the initiation of remedial activities.

Schedule Milestone	Estimated Days to Completion from Submittal of Draft Remedial Action Plan
• Submittal of Draft RAWP for NYSDEC Review	0
• Receive Comments from NYSDEC	20
• Submittal of Final RAWP	35
• Complete Preparation of Specifications for Remedial Contractor	50
• NYSDEC to issue Fact Sheet	50
• Solicitation/Selection of Contractor	110
• Mobilization	140
• Completion of Remedial Measures	170
• Submit Remediation Report to NYSDEC	250

APPENDIX A

PHASE II DELINEATION SITE ASSESSMENT
ANALYTICAL DATA TABLES

TABLE 1
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSS-03 VSSS-03 11/22/2005	VSSS-04 VSSS-04 11/22/2005	VSSS-05 VSSS-05 11/22/2005	VSSS-06 VSSS-06 11/22/2005	VSSS-16 VSSS-16 11/18/2005	VSSS-17 VSSS-17 11/18/2005	VSSS-18 VSSS-18 11/18/2005
Mercury	(mg/kg)	0.81	0.204	0.068 B	95.1	6.7	1.7	283	231

mg/kg: Milligrams per kilogram.
U: Not detected.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 1
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSS-19 VSSS-19 8/10/2006	VSSS-20 VSSS-20 8/10/2006	VSSS-21 VSSS-21 6/24/2010	VSSS-22 VSSS-22 6/24/2010	VSSS-23 VSSS-23 6/24/2010	VSSS-24 VSSS-24 6/24/2010	VSSS-25 VSSS-25 6/24/2010
Mercury	(mg/kg)	0.81	2.5	51.2	1.8	0.765	7.0	1.5	38.8

mg/kg: Milligrams per kilogram.
U: Not detected.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 1
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSS-26 VSSS-26 6/24/2010	VSSS-27 VSSS-27 6/23/2010	VSSS-28 VSSS-28 6/23/2010	VSSS-29 VSSS-29 6/24/2010	VSSS-30 VSSS-30 6/23/2010	VSSS-31 VSSS-31 6/23/2010	VSSS-32 VSSS-32 6/23/2010
Mercury	(mg/kg)	0.81	**4.5**	0.53	**9.9**	0.021 U	0.685	**4.3**	**24.4**

mg/kg: Milligrams per kilogram.
U: Not detected.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 1
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSS-33 VSSS-33 6/24/2010	VSSS-34 VSSS-34 6/24/2010	VSSS-35 VSSS-35 6/24/2010	VSSS-36 VSSS-36 6/24/2010	VSSS-37 VSSS-37 6/24/2010	VSSS-38 VSSS-38 6/24/2010	VSSS-39 VSSS-39 6/24/2010
Mercury	(mg/kg)	0.81	**20.1**	**39.6**	**86.5**	**99.0**	0.642	**11.3**	**23.9**

mg/kg: Milligrams per kilogram.
U: Not detected.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 1
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSS-40 VSSS-40 7/8/2010	VSSS-42 VSSS-42 6/24/2010	VSSS-51 VSSS-51 6/24/2010	VSSS-52 VSSS-52 6/24/2010	VSSS-53 VSSS-53 7/8/2010	VSSS-54 VSSS-54 6/23/2010	VSSS-55 VSSS-55 6/24/2010
Mercury	(mg/kg)	0.81	**96.8**	0.286	**17.3**	**1.7**	**2.1**	**6.4**	**11.3**

mg/kg: Milligrams per kilogram.
U: Not detected.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 1
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSS-56 VSSS-56 6/24/2010	VSSS-57 VSSS-57 6/24/2010
Mercury	(mg/kg)	0.81	0.76	0.17

mg/kg: Milligrams per kilogram.
U: Not detected.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.

Boxed and shaded exceed standard

TABLE 6
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SUBSURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSB-04A VSSB-04A(6-8) 11/18/2005	VSSB-04A VSSB-04A(8-10) 11/18/2005	VSSB-05A VSSB-05A(6-8) 11/22/2005	VSSB-05A VSSB-05A(8-10) 11/22/2005	VSSB-06A VSSB-06A(6-8) 11/18/2005	VSSB-06A VSSB-06A(8-10) 11/18/2005	VSSB-07 VSSB-07(2-4) 11/18/2005
Mercury	(mg/kg)	0.81	0.007 U	0.007 U	0.065 U	0.070 U	0.007 B	0.007 U	7.3

mg/kg: Milligrams per kilogram.
U: Not detected.
J: Estimated value.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 6
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SUBSURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSB-07 VSSB-07(4-6) 11/18/2005	VSSB-07 VSSB-07(6-8) 11/18/2005	VSSB-07 VSSB-07(8-10) 11/18/2005	VSSB-08 VSSB-08(1-2) 8/10/2006	VSSB-08 VSSB-08(2-4) 8/10/2006	VSSB-08 VSSB-08(4-6) 8/10/2006	VSSB-08 VSSB-08(6-8) 8/10/2006
Mercury	(mg/kg)	0.81	0.033	0.007 U	0.007 U	3.2	0.1	0.006 U	0.007 U

mg/kg: Milligrams per kilogram.
U: Not detected.
J: Estimated value.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 6
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SUBSURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSB-08 VSSB-08(8-10) 8/10/2006	VSSB-09 VSSB-09(2-4) 11/18/2005	VSSB-09 VSSB-09(4-6) 11/18/2005	VSSB-09 VSSB-09(6-8) 11/18/2005	VSSB-09 VSSB-09(8-10) 11/18/2005	VSSB-10 VSSB-10(1-2) 8/10/2006	VSSB-10 VSSB-10(2-4) 8/10/2006
Mercury	(mg/kg)	0.81	0.007 U	14.5	0.010 B	0.108	0.006 U	3.5	0.010 B

mg/kg: Milligrams per kilogram.
U: Not detected.
J: Estimated value.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 6
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SUBSURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSB-10 VSSB-10(4-6) 8/10/2006	VSSB-10 VSSB-10(6-8) 8/10/2006	VSSB-10 VSSB-10(8-10) 8/10/2006	VSSB-11 VSSB-11(2-4) 11/18/2005	VSSB-11 VSSB-11(4-6) 11/18/2005	VSSB-11 VSSB-11(6-8) 11/18/2005	VSSB-11 VSSB-11(8-10) 11/18/2005
Mercury	(mg/kg)	0.81	0.012	0.007 U	0.066 U	2.5	0.019	0.006 U	0.007 U

mg/kg: Milligrams per kilogram.
U: Not detected.
J: Estimated value.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 6
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SUBSURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSB-12 VSSB-12(1-2) 8/10/2006	VSSB-12 VSSB-12(2-4) 8/10/2006	VSSB-12 VSSB-12(4-6) 8/10/2006	VSSB-12 VSSB-12(6-8) 8/10/2006	VSSB-12 VSSB-12(8-10) 8/10/2006	VSSB-13 VSSB-13(2-4) 11/22/2005	VSSB-13 VSSB-13(4-6) 11/22/2005
Mercury	(mg/kg)	0.81	6.2	4.8	0.075 B	0.065 U	0.068 U	28.4	0.425

mg/kg: Milligrams per kilogram.
U: Not detected.
J: Estimated value.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 6
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SUBSURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSB-13 VSSB-13(6-8) 11/22/2005	VSSB-13 VSSB-13(8-10) 11/22/2005	VSSB-14 VSSB-14(2-4) 11/22/2005	VSSB-14 VSSB-14(4-6) 11/22/2005	VSSB-14 VSSB-14(6-8) 11/22/2005	VSSB-14 VSSB-14(8-10) 11/22/2005	VSSB-15 VSSB-15(2-4) 11/22/2005
Mercury	(mg/kg)	0.81	0.086 B	0.076 B	1.5	13.7	0.065 U	0.069 U	66.2

mg/kg: Milligrams per kilogram.
U: Not detected.
J: Estimated value.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 6
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SUBSURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSB-15 VSSB-15(4-6) 11/22/2005	VSSB-15 VSSB-15(6-8) 11/22/2005	VSSB-15 VSSB-15(8-10) 11/22/2005	VSSB-16 VSSB-16(2-4) 11/22/2005	VSSB-16 VSSB-16(4-6) 11/22/2005	VSSB-16 VSSB-16(6-8) 11/22/2005	VSSB-16 VSSB-16(8-10) 11/22/2005
Mercury	(mg/kg)	0.81	0.064 U	0.066 U	0.068 U	1.8	0.075 U	0.079 U	0.072 U

mg/kg: Milligrams per kilogram.
U: Not detected.
J: Estimated value.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 6
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SUBSURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSB-27 VSSB-27(2-4) 11/18/2005	VSSB-28 VSSB-28(2-4) 11/18/2005	VSSB-29 VSSB-29(2-4) 11/18/2005	VSSB-30 VSSB-30(1-2) 8/10/2006	VSSB-30 VSSB-30(2-4) 8/10/2006	VSSB-30 VSSB-30(4-6) 8/10/2006	VSSB-30 VSSB-30(6-8) 8/10/2006
Mercury	(mg/kg)	0.81	0.892	0.007 U	3.3	4.7	0.027	0.010 B	0.007 U

mg/kg: Milligrams per kilogram.
U: Not detected.
J: Estimated value.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 6
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SUBSURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSB-30 VSSB-30(8-10) 8/10/2006	VSSB-31 VSSB-31(1-2) 8/10/2006	VSSB-31 VSSB-31(2-4) 8/10/2006	VSSB-31 VSSB-31(4-6) 8/10/2006	VSSB-31 VSSB-31(6-8) 8/10/2006	VSSB-31 VSSB-31(8-10) 8/10/2006	VSSB-32 VSSB-32(1-2) 6/24/2010
Mercury	(mg/kg)	0.81	0.007 U	49.0	3.6	0.067 U	0.068 U	0.084 B	2.3

mg/kg: Milligrams per kilogram.
U: Not detected.
J: Estimated value.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 6
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SUBSURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSB-33 VSSB-33(1-2) 6/24/2010	VSSB-34 VSSB-34(1-2) 6/24/2010	VSSB-35 VSSB-35(1-2) 6/24/2010	VSSB-36 VSSB-36(1-2) 6/24/2010	VSSB-37 VSSB-37(1-2) 6/24/2010	VSSB-38 VSSB-38(1-2) 6/23/2010	VSSB-38 VSSB-38(2-4) 6/23/2010
Mercury	(mg/kg)	0.81	0.117 U	0.062 J	0.088 J	5.7	0.18	7.9	0.086 J

mg/kg: Milligrams per kilogram.
U: Not detected.
J: Estimated value.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 6
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SUBSURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSB-38 VSSB-38(4-6) 6/23/2010	VSSB-39 VSSB-39(1-2) 6/23/2010	VSSB-39 VSSB-39(2-4) 6/23/2010	VSSB-39 VSSB-39(4-6) 6/23/2010	VSSB-40 VSSB-40(1-2) 6/24/2010	VSSB-40 VSSB-40(2-4) 6/24/2010	VSSB-40 VSSB-40(4-6) 6/24/2010
Mercury	(mg/kg)	0.81	0.069 J	1.7	0.315	0.207	0.806	0.068 J	0.646

mg/kg: Milligrams per kilogram.
U: Not detected.
J: Estimated value.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 6
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SUBSURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSB-41 VSSB-41(1-2) 6/23/2010	VSSB-41 VSSB-41(2-4) 6/23/2010	VSSB-41 VSSB-41(4-6) 6/23/2010	VSSB-41 VSSB-41(6-8) 6/23/2010	VSSB-42 VSSB-42(1-2) 6/23/2010	VSSB-43 VSSB-43(1-2) 6/23/2010	VSSB-44 VSSB-44(1-2) 6/24/2010
Mercury	(mg/kg)	0.81	1.3	0.992	2.5	1.7	0.104 J	4.4	5.7

mg/kg: Milligrams per kilogram.
U: Not detected.
J: Estimated value.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 6
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SUBSURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSB-45 VSSB-45(1-2) 6/24/2010	VSSB-45 VSSB-45(2-4) 6/24/2010	VSSB-46 VSSB-46(1-2) 6/24/2010	VSSB-46 VSSB-46(2-4) 6/24/2010	VSSB-46 VSSB-46(4-6) 6/24/2010	VSSB-47 VSSB-47(1-2) 6/24/2010	VSSB-47 VSSB-47(2-4) 6/24/2010
Mercury	(mg/kg)	0.81	0.44	**5.1**	**5.4**	**0.976**	0.695	**4.2**	0.283

mg/kg: Milligrams per kilogram.
U: Not detected.
J: Estimated value.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 6
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SUBSURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSB-47 VSSB-47(4-6) 6/24/2010	VSSB-47 VSSB-47(6-8) 6/24/2010	VSSB-48 VSSB-48(1-2) 6/24/2010	VSSB-48 VSSB-48(2-4) 6/24/2010	VSSB-48 VSSB-48(4-6) 6/24/2010	VSSB-48 VSSB-48(6-8) 6/24/2010	VSSB-49 VSSB-49(1-2) 6/24/2010
Mercury	(mg/kg)	0.81	0.022 J	0.127 U	1.1	0.019 U	0.022 U	0.021 U	1.5

mg/kg: Milligrams per kilogram.
U: Not detected.
J: Estimated value.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 6
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SUBSURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSB-49 VSSB-49(2-4) 6/24/2010	VSSB-49 VSSB-49(4-6) 6/24/2010	VSSB-49 VSSB-49(6-8) 6/24/2010	VSSB-50 VSSB-50(1-2) 6/24/2010	VSSB-50 VSSB-50(2-4) 6/24/2010	VSSB-50 VSSB-50(4-6) 6/24/2010	VSSB-50 VSSB-50(6-8) 6/24/2010
Mercury	(mg/kg)	0.81	16.5	0.112 U	0.131 U	4.6	0.686	0.652	0.114 U

mg/kg: Milligrams per kilogram.
U: Not detected.
J: Estimated value.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 6
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SUBSURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSB-51 VSSB-51 (1-2) 7/8/2010	VSSB-51 VSSB-51 (2-4) 7/8/2010	VSSB-53 VSSB-53(1-2) 6/24/2010	VSSB-53 VSSB-53(2-4) 6/24/2010	VSSB-53 VSSB-53(4-6) 6/24/2010	VSSB-53 VSSB-53(6-8) 6/24/2010	VSSB-62 VSSB-62(1-2) 6/24/2010
Mercury	(mg/kg)	0.81	167	198	1.4	4.1	0.139	0.116 J	1.7

mg/kg: Milligrams per kilogram.
U: Not detected.
J: Estimated value.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 6
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SUBSURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSB-63 VSSB-63(1-2) 6/24/2010	VSSB-64 VSSB-64(1-2) 7/8/2010	VSSB-65 VSSB-65(1-2) 6/23/2010	VSSB-66 VSSB-66(1-2) 6/24/2010	VSSB-66 VSSB-66(2-4) 6/24/2010	VSSB-66 VSSB-66(4-6) 6/24/2010	VSSB-67 VSSB-67(1-2) 6/24/2010
Mercury	(mg/kg)	0.81	0.986	3.4	1.5	0.205	0.295	1.1	0.616

mg/kg: Milligrams per kilogram.
U: Not detected.
J: Estimated value.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 6
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
SUBSURFACE SOIL SAMPLE RESULTS
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Residential Use SCOs	VSSB-67 VSSB-67(2-4) 6/24/2010	VSSB-67 VSSB-67(4-6) 6/24/2010	VSSB-67 VSSB-67(6-8) 6/24/2010	VSSB-68 VSSB-68(1-2) 6/24/2010	VSSB-68 VSSB-68(2-4) 6/24/2010	VSSB-68 VSSB-68(4-6) 6/24/2010	VSSB-68 VSSB-68(6-8) 6/24/2010
Mercury	(mg/kg)	0.81	0.464	0.087 J	0.023 U	0.321	0.11 J	1.4	0.157

mg/kg: Milligrams per kilogram.
U: Not detected.
J: Estimated value.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 13
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
DRYWELL SUBSURFACE SOIL SAMPLE RESULTS
INDUSTRIAL USE SOIL CLEANUP OBJECTIVES
MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Industrial Us SCOs	VSSB-01A VSSB-01A(12-14) 11/21/2005	VSSB-01A VSSB-01A(14-16) 11/21/2005	VSSB-01A VSSB-01A(16-18) 11/21/2005	VSSB-01A VSSB-01A(18-20) 11/21/2005	VSSB-01A VSSB-01A(20-22) 11/21/2005
Mercury	(mg/kg)	5.7	0.069 U	0.068 U	0.068 U	0.071 U	0.073 U

mg/kg: Milligrams per kilogram.
U: Not detected.

TABLE 14
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
DRYWELL SUBSURFACE SOIL SAMPLE RESULTS
INDUSTRIAL USE SOIL CLEANUP OBJECTIVES
RCRA METALS NOT INCLUDING MERCURY

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Industrial Use SCOs	VSSB-01A VSSB-01A(12-14) 11/21/2005	VSSB-01A VSSB-01A(14-16) 11/21/2005	VSSB-01A VSSB-01A(16-18) 11/21/2005	VSSB-01A VSSB-01A(18-20) 11/21/2005	VSSB-01A VSSB-01A(20-22) 11/21/2005
Arsenic	(mg/kg)	16	4.2	13.6	12.0	43.0	19.7
Barium	(mg/kg)	10000	3.4 B	8.53 B	6.32 B	2.490 B	2.080 B
Cadmium	(mg/kg)	60	0.039 U	0.038 U	0.038 U	0.040 U	0.042 U
Chromium	(mg/kg)	6800	4.01	5.32	3.31	3.37	2.9
Lead	(mg/kg)	3900	1.0	0.887	0.388 B	0.431 B	0.839
Selenium	(mg/kg)	6800	0.401 U	0.392 U	0.392 U	0.411 U	0.429 U
Silver	(mg/kg)	6800	0.093 U	0.091 U	0.091 U	0.095 U	0.099 U

mg/kg: Milligrams per kilogram.
U: Not detected.
--: No standard.
*: Maximum concentration for metropolitan areas.
B: Detected between IDL and CRDL.
IDL: Instrument detection limit.
CRDL: Contract required detection limit.
Boxed and shaded exceed standard

TABLE 15
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
DRYWELL SUBSURFACE SOIL SAMPLE RESULTS
INDUSTRIAL USE SOIL CLEANUP OBJECTIVES
VOLATILE ORGANIC COMPOUNDS

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Industrial Use SCOs	VSSB-01A VSSB-01A(12-14) 11/21/2005	VSSB-01A VSSB-01A(14-16) 11/21/2005	VSSB-01A VSSB-01A(16-18) 11/21/2005	VSSB-01A VSSB-01A(18-20) 11/21/2005	VSSB-01A VSSB-01A(20-22) 11/21/2005
1,1,1-Trichloroethane	(ug/kg)	1000000	0.50 U	0.49 U	0.49 U	0.51 U	0.52 U
1,1,2,2-Tetrachloroethane	(ug/kg)	--	0.37 U	0.37 U	0.37 U	0.38 U	0.39 U
1,1,2-Trichloroethane	(ug/kg)	--	0.79 U	0.78 U	0.78 U	0.81 U	0.83 U
1,1-Dichloroethane	(ug/kg)	480000	0.35 U	0.35 U	0.35 U	0.36 U	0.37 U
1,1-Dichloroethylene	(ug/kg)	1000000	0.32 U	0.32 U	0.32 U	0.33 U	0.34 U
1,2,4-Trichlorobenzene	(ug/kg)	--	0.68 U	0.67 U	0.67 U	0.70 U	0.72 U
1,2-Dichloroethane	(ug/kg)	60000	0.81 U	0.80 U	0.80 U	0.83 U	0.85 U
1,2-Dichloropropane	(ug/kg)	--	1.1 U	1.1 U	1.1 U	1.1 U	1.2 U
2-Hexanone	(ug/kg)	--	0.48 U	0.47 U	0.47 U	0.49 U	0.50 U
Acetone	(ug/kg)	1000000	0.46 U	0.45 U	0.45 U	0.47 U	0.48 U
Benzene	(ug/kg)	89000	0.37 U	0.36 U	0.36 U	0.37 U	0.38 U
Benzene, 1-methylethyl-	(ug/kg)	--	0.47 U	0.47 U	0.47 U	0.48 U	0.50 U
Bromodichloromethane	(ug/kg)	--	0.66 U	0.66 U	0.66 U	0.68 U	0.70 U
Bromoform	(ug/kg)	--	0.65 U	0.64 U	0.64 U	0.66 U	0.68 U
Carbon disulfide	(ug/kg)	--	3.4 U	3.3 U	3.3 U	3.4 U	3.5 U
Carbon tetrachloride	(ug/kg)	44000	4.3 U	4.2 U	4.2 U	4.4 U	4.5 U
Chlorobenzene	(ug/kg)	1000000	2.4 U	2.3 U	2.3 U	2.4 U	2.5 U
Chloroethane	(ug/kg)	--	4.0 U	4.0 U	4.0 U	4.1 U	4.2 U
Chloroform	(ug/kg)	700000	0.48 U	0.47 U	0.47 U	0.49 U	0.50 U
cis-1,2-Dichloroethylene	(ug/kg)	1000000	0.40 U	0.39 U	0.39 U	0.41 U	0.42 U
cis-1,3-Dichloropropene	(ug/kg)	--	0.37 U	0.36 U	0.36 U	0.38 U	0.39 U
Cyclohexane	(ug/kg)	--	2.4 U	2.4 U	2.4 U	2.5 U	2.5 U
DBCP	(ug/kg)	--	0.44 U	0.43 U	0.43 U	0.45 U	0.46 U
Dibromochloromethane	(ug/kg)	--	0.53 U	0.52 U	0.52 U	0.54 U	0.55 U
Dichlorodifluoromethane	(ug/kg)	--	0.43 U	0.43 U	0.43 U	0.44 U	0.45 U
EDB	(ug/kg)	--	2.5 U	2.5 U	2.5 U	2.6 U	2.7 U
trans- 1,2-dichloroethene	(ug/kg)	1000000	0.41 U	0.41 U	0.41 U	0.42 U	0.44 U

ug/kg: Micrograms per kilogram.
U: Not detected.
J: Estimated value.
--: No Standard.

TABLE 15
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
DRYWELL SUBSURFACE SOIL SAMPLE RESULTS
INDUSTRIAL USE SOIL CLEANUP OBJECTIVES
VOLATILE ORGANIC COMPOUNDS

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Industrial Use SCOs	VSSB-01A VSSB-01A(12-14) 11/21/2005	VSSB-01A VSSB-01A(14-16) 11/21/2005	VSSB-01A VSSB-01A(16-18) 11/21/2005	VSSB-01A VSSB-01A(18-20) 11/21/2005	VSSB-01A VSSB-01A(20-22) 11/21/2005
Ethylbenzene	(ug/kg)	780000	1.0 U	1.0 U	1.0 U	1.0 U	1.1 U
Freon 113	(ug/kg)	--	0.39 U	0.38 U	0.38 U	0.40 U	0.40 U
m-Dichlorobenzene	(ug/kg)	560000	0.27 U	0.27 U	0.27 U	0.28 U	0.29 U
Methyl Acetate	(ug/kg)	--	1.0 U	1.0 U	1.0 U	1.0 U	1.1 U
Methyl bromide	(ug/kg)	--	0.42 U	0.42 U	0.42 U	0.43 U	0.44 U
Methyl chloride	(ug/kg)	--	0.50 U	0.49 U	0.49 U	0.51 U	0.52 U
Methyl ethyl ketone	(ug/kg)	1000000	1.0 U	1.0 U	1.0 U	1.1 U	1.1 U
Methyl isobutylketone (MIBK)	(ug/kg)	--	0.44 U	0.43 U	0.43 U	0.45 U	0.46 U
Methylcyclohexane	(ug/kg)	--	0.50 U	0.49 U	0.49 U	0.51 U	0.52 U
Methylene chloride	(ug/kg)	1000000	2.2 U	2.1 U	4.9 U	2.2 U	25.0 U
Methyltert-butylether	(ug/kg)	1000000	0.55 U	0.54 U	0.54 U	0.56 U	0.57 U
o-Dichlorobenzene	(ug/kg)	1000000	0.87 U	0.86 U	0.86 U	0.89 U	0.91 U
o-Xylene	(ug/kg)	1000000	0.48 U	0.48 U	0.48 U	0.49 U	0.51 U
p-Dichlorobenzene	(ug/kg)	250000	0.37 U	0.36 U	0.36 U	0.38 U	0.38 U
m&p-Xylene	(ug/kg)	1000000	1.5 U	1.5 U	1.5 U	1.5 U	1.6 U
Styrene	(ug/kg)	--	0.98 U	0.97 U	0.97 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	(ug/kg)	--	0.39 U	0.38 U	0.38 U	0.40 U	0.41 U
Trichloroethylene	(ug/kg)	400000	0.39 U	0.39 U	0.39 U	0.40 U	0.41 U
Trichlorofluoromethane	(ug/kg)	--	1.0 U	1.0 U	1.0 U	1.1 U	1.1 U
Vinyl chloride	(ug/kg)	27000	0.46 U	0.45 U	0.45 U	0.47 U	0.48 U
Tetrachloroethylene	(ug/kg)	300000	0.43 U	0.43 U	0.43 U	0.44 U	0.45 U
Toluene	(ug/kg)	1000000	0.76 U	0.75 U	0.75 U	0.78 U	0.80 U
TOTAL VOLATILE ORGANICS	(ug/kg)	--	0	0	0	0	0

ug/kg: Micrograms per kilogram.
U: Not detected.
J: Estimated value.
--: No Standard.

TABLE 16
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
DRYWELL SUBSURFACE SOIL SAMPLE RESULTS
INDUSTRIAL USE SOIL CLEANUP OBJECTIVES
SEMIVOLATILE ORGANIC COMPOUNDS

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Industrial Use SCOs	VSSB-01A VSSB-01A(12-14) 11/21/2005	VSSB-01A VSSB-01A(14-16) 11/21/2005	VSSB-01A VSSB-01A(16-18) 11/21/2005	VSSB-01A VSSB-01A(18-20) 11/21/2005	VSSB-01A VSSB-01A(20-22) 11/21/2005
2,2-oxyblis (1-chloropropane)	(ug/kg)	--	63 U	62 U	62 U	65 U	67 U
2,4,5-Trichlorophenol	(ug/kg)	--	60 U	59 U	59 U	62 U	63 U
2,4,6-Trichlorophenol	(ug/kg)	--	58 U	57 U	57 U	59 U	61 U
2,4-Dichlorophenol	(ug/kg)	--	72 U	72 U	72 U	74 U	77 U
2,4-Dimethylphenol	(ug/kg)	--	62 U	61 U	61 U	64 U	66 U
2,4-Dinitrophenol	(ug/kg)	--	340 U	330 U	330 U	340 U	360 U
2,4-Dinitrotoluene	(ug/kg)	--	58 U	57 U	57 U	59 U	61 U
2,6-Dinitrotoluene	(ug/kg)	--	55 U	55 U	55 U	57 U	59 U
2-Chloronaphthalene	(ug/kg)	--	65 U	64 U	64 U	67 U	69 U
2-Chlorophenol	(ug/kg)	--	63 U	62 U	62 U	64 U	66 U
2-Methylnaphthalene	(ug/kg)	--	66 U	65 U	65 U	67 U	69 U
3,3-Dichlorobenzidine	(ug/kg)	--	67 U	66 U	66 U	69 U	71 U
4,6-Dinitro-o-cresol	(ug/kg)	--	76 U	75 U	75 U	78 U	81 U
4-Bromofluorobenzene	(ug/kg)	--	59 U	58 U	58 U	60 U	62 U
4-Chlorophenylphenyl ether	(ug/kg)	--	62 U	61 U	61 U	64 U	66 U
Acenaphthene	(ug/kg)	1000000	70 U	69 U	69 U	72 U	74 U
Acenaphthylene	(ug/kg)	1000000	64 U	63 U	63 U	65 U	67 U
Acetophenone	(ug/kg)	--	57 U	57 U	57 U	59 U	61 U
Anthracene	(ug/kg)	1000000	59 U	58 U	58 U	61 U	63 U
Atrazine	(ug/kg)	--	60 U	59 U	59 U	62 U	64 U
Benzaldehyde	(ug/kg)	--	80 U	79 U	79 U	83 U	85 U
Benzo(a)anthracene	(ug/kg)	11000	55 U	54 U	54 U	56 U	58 U
Benzo(a)pyrene	(ug/kg)	1100	63 U	62 U	62 U	64 U	66 U
Benzo(b)fluoranthene	(ug/kg)	11000	43 U	43 U	43 U	44 U	46 U
Benzo(ghi)perylene	(ug/kg)	1000000	65 U	64 U	64 U	67 U	69 U
Benzo(k)fluoranthene	(ug/kg)	110000	86 U	85 U	85 U	89 U	91 U

ug/kg: Micrograms per kilogram.
U: Not detected.
J: Estimated value.
B: Detected in associated blank
--: No Standard or not analyzed.
MDL: Method detection limit.

TABLE 16
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
DRYWELL SUBSURFACE SOIL SAMPLE RESULTS
INDUSTRIAL USE SOIL CLEANUP OBJECTIVES
SEMIVOLATILE ORGANIC COMPOUNDS

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Industrial Use SCOs	VSSB-01A VSSB-01A(12-14) 11/21/2005	VSSB-01A VSSB-01A(14-16) 11/21/2005	VSSB-01A VSSB-01A(16-18) 11/21/2005	VSSB-01A VSSB-01A(18-20) 11/21/2005	VSSB-01A VSSB-01A(20-22) 11/21/2005
Biphenyl	(ug/kg)	--	65 U	64 U	64 U	66 U	68 U
Bis(2-chloroethoxy)methane	(ug/kg)	--	64 U	64 U	64 U	66 U	68 U
Bis(2-chloroethyl)ether	(ug/kg)	--	62 U	61 U	61 U	64 U	66 U
Bis(2-ethylhexyl)phthalate	(ug/kg)	--	75 U	74 U	74 U	77 U	80 U
Butylbenzylphthalate	(ug/kg)	--	63 U	63 U	63 U	65 U	67 U
Caprolactam	(ug/kg)	--	63 U	62 U	62 U	65 U	67 U
Carbazole	(ug/kg)	--	60 U	59 U	59 U	61 U	63 U
Chrysene	(ug/kg)	110000	70 U	69 U	69 U	72 U	75 U
Dibenz(a,h)anthracene	(ug/kg)	1100	49 U	49 U	49 U	50 U	52 U
Dibenzofuran	(ug/kg)	1000000	65 U	64 U	64 U	67 U	69 U
Diethylphthalate	(ug/kg)	--	68 U	67 U	67 U	69 U	72 U
Dimethylphthalate	(ug/kg)	--	63 U	62 U	62 U	65 U	67 U
Di-n-butylphthalate	(ug/kg)	--	60 U	59 U	59 U	61 U	63 U
Di-n-octyl phthalate	(ug/kg)	--	67 U	66 U	66 U	68 U	71 U
Fluoranthene	(ug/kg)	1000000	58 U	58 U	58 U	60 U	62 U
Fluorene	(ug/kg)	1000000	66 U	65 U	65 U	68 U	70 U
Hexachlorobenzene	(ug/kg)	12000	63 U	62 U	62 U	64 U	66 U
Hexachlorobutadiene	(ug/kg)	--	60 U	60 U	60 U	62 U	64 U
Hexachlorocyclopentadiene	(ug/kg)	--	63 U	62 U	62 U	64 U	66 U
Hexachloroethane	(ug/kg)	--	67 U	66 U	66 U	68 U	71 U
Indeno(1,2,3-cd)pyrene	(ug/kg)	11000	50 U	49 U	49 U	51 U	53 U
Isophorone	(ug/kg)	--	59 U	58 U	58 U	60 U	62 U
3-Nitroaniline	(ug/kg)	--	51 U	50 U	50 U	52 U	54 U
Naphthalene	(ug/kg)	1000000	67 U	66 U	66 U	69 U	71 U
Nitrobenzene	(ug/kg)	140000	86 U	84 U	84 U	88 U	91 U
N-Nitrosodiphenylamine	(ug/kg)	--	65 U	64 U	64 U	66 U	68 U
N-Nitroso-di-n-propylamine	(ug/kg)	--	65 U	64 U	64 U	67 U	69 U

ug/kg: Micrograms per kilogram.
U: Not detected.
J: Estimated value.
B: Detected in associated blank
--: No Standard or not analyzed.
MDL: Method detection limit.

TABLE 16
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
DRYWELL SUBSURFACE SOIL SAMPLE RESULTS
INDUSTRIAL USE SOIL CLEANUP OBJECTIVES
SEMIVOLATILE ORGANIC COMPOUNDS

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Industrial Use SCOs	VSSB-01A VSSB-01A(12-14) 11/21/2005	VSSB-01A VSSB-01A(14-16) 11/21/2005	VSSB-01A VSSB-01A(16-18) 11/21/2005	VSSB-01A VSSB-01A(18-20) 11/21/2005	VSSB-01A VSSB-01A(20-22) 11/21/2005
2-Methylphenol	(ug/kg)	1000000	65 U	64 U	64 U	67 U	69 U
2-Nitroaniline	(ug/kg)	--	50 U	49 U	49 U	51 U	53 U
2-Nitrophenol	(ug/kg)	--	60 U	60 U	60 U	62 U	64 U
4-Chloroaniline	(ug/kg)	--	47 U	46 U	46 U	48 U	49 U
4-Chloro-3-methylphenol	(ug/kg)	--	54 U	53 U	53 U	56 U	57 U
Pentachlorophenol	(ug/kg)	55000	91 U	90 U	90 U	93 U	96 U
3-Methylphenol/4-Methylphenol	(ug/kg)	1000000	62 U	61 U	61 U	63 U	65 U
Phenanthrene	(ug/kg)	1000000	62 U	62 U	62 U	64 U	66 U
Phenol	(ug/kg)	1000000	59 U	59 U	59 U	61 U	63 U
4-Nitroaniline	(ug/kg)	--	67 U	66 U	66 U	69 U	71 U
4-Nitrophenol	(ug/kg)	--	49 U	48 U	48 U	50 U	51 U
Pyrene	(ug/kg)	1000000	69 U	68 U	68 U	71 U	73 U
Total Semivolatile Organics	(ug/kg)	--	0	0	0	0	0

ug/kg: Micrograms per kilogram.
U: Not detected.
J: Estimated value.
B: Detected in associated blank
--: No Standard or not analyzed.
MDL: Method detection limit.

TABLE 17
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
DRYWELL SUBSURFACE SOIL SAMPLE RESULTS
INDUSTRIAL USE SOIL CLEANUP OBJECTIVES
POLYCHLORINATED BIPHENYLS (PCBs)

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Industrial Use SCOs	VSSB-01A VSSB-01A(12-14) 11/21/2005	VSSB-01A VSSB-01A(14-16) 11/21/2005	VSSB-01A VSSB-01A(16-18) 11/21/2005	VSSB-01A VSSB-01A(18-20) 11/21/2005	VSSB-01A VSSB-01A(20-22) 11/21/2005
Aroclor 1016	(ug/kg)	--	3.0 U	2.9 U	2.9 U	3.0 U	3.1 U
Aroclor 1221	(ug/kg)	--	4.6 U	4.6 U	4.5 U	4.7 U	4.9 U
Aroclor 1232	(ug/kg)	--	6.9 U	6.8 U	6.8 U	7.1 U	7.3 U
Aroclor 1242	(ug/kg)	--	6.1 U	6.1 U	6.0 U	6.3 U	6.5 U
Aroclor 1248	(ug/kg)	--	3.0 U	2.9 U	2.9 U	3.1 U	3.1 U
Aroclor 1254	(ug/kg)	--	1.9 U	1.9 U	1.9 U	2.0 U	2.0 U
Aroclor 1260	(ug/kg)	--	4.9 U	4.9 U	4.9 U	5.1 U	5.2 U
Total PCBs (subsurface soil)	(ug/kg)	25000	0	0	0	0	0

ug/kg: Micrograms per kilogram.
U: Not detected.
--: No Standard.

TABLE 18
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
DRYWELL SUBSURFACE SOIL SAMPLE RESULTS
INDUSTRIAL USE SOIL CLEANUP OBJECTIVES
TOTAL PETROLEUM HYDROCARBONS (TPH)

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Part 375 Industrial Use SCOs	VSSB-01A VSSB-01A(12-14) 11/21/2005	VSSB-01A VSSB-01A(14-16) 11/21/2005	VSSB-01A VSSB-01A(16-18) 11/21/2005	VSSB-01A VSSB-01A(18-20) 11/21/2005	VSSB-01A VSSB-01A(20-22) 11/21/2005
TPH	(ug/kg)	--	7476 U	7335 U	7359 U	7617 U	7846 U

ug/kg: Micrograms per kilogram.
--: No Standard.

APPENDIX B

MERCURY VAPOR SURVEY RESULTS

TABLE 1

LONG ISLAND RAIL ROAD SUBSTATION INVESTIGATION
MERCURY VAPOR MEASUREMENT RESULTS - VALLEY STREAM

(July 16, 1999)

Measurement I.D.	MVA (mg/m^3 Hg)
VSMV-01	0.000
VSMV-02	0.000
VSMV-03	0.000
VSMV-04	0.010
VSMV-05	0.660
VSMV-06	0.190
VSMV-07	0.000
VSMV-08	0.060
VSMV-09	0.000
VSMV-10	0.000
VSMV-11	0.010
VSMV-12	0.000
VSMV-13	0.000
VSMV-14	0.000
VSMV-15	0.000
VSMV-16	0.020
VSMV-17	0.000
VSMV-18	0.000
VSMV-19	0.000
VSMV-20	0.000
VSMV-21	0.000
VSMV-22	0.000
VSMV-23	0.000
VSMV-24	0.000
VSMV-25	0.000
VSMV-26	0.000
VSMV-27	0.000
VSMV-28	0.000
VSMV-29	0.000

Notes:
MVA: Mercury vapor analyzer
Mg/m^3 Hg: Milligrams per meter cubed mercury vapor
Instrument detection limit is 0.003 mg/m^3

APPENDIX C

NEW YORK STATE DEPARTMENT OF HEALTH
GENERIC COMMUNITY AIR MONITORING PLAN

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

APPENDIX D

PRE-CHARACTERIZATION SOIL SAMPLING ANALYTICAL RESULTS

TABLE 25
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
WASTE CHARACTERIZATION SOIL SAMPLE RESULTS
TOXICITY CHARACTERISTIC LEACHING PROCEDURE

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Toxicity Characteristic Leaching Procedure	VSWC-01 VSWC-01(0-2) 6/24/2010	VSWC-01 VSWC-0-1(2-4) 6/24/2010	VSWC-02 VSWC-02(0-2) 6/23/2010	VSWC-02 VSWC-02(2-4) 6/23/2010
1,1-Dichloroethylene	(ug/l)	700	2.4 U	2.4 U	2.4 U	2.4 U
1,2-Dichloroethane	(ug/l)	500	2.4 U	2.4 U	2.4 U	2.4 U
Benzene	(ug/l)	500	1.6 U	1.6 U	1.6 U	1.6 U
Carbon tetrachloride	(ug/l)	500	3.1 U	3.1 U	3.1 U	3.1 U
Chlorobenzene	(ug/l)	100000	2.4 U	2.4 U	2.4 U	2.4 U
Chloroform	(ug/l)	6000	1.7 U	1.7 U	1.7 U	1.7 U
Tetrachloroethylene	(ug/l)	700	1.4 U	1.4 U	1.4 U	1.4 U
Trichloroethylene	(ug/l)	500	1.4 U	1.4 U	1.4 U	1.4 U
Vinyl chloride	(ug/l)	200	1.7 U	1.7 U	1.7 U	1.7 U
Methyl ethyl ketone	(ug/l)	200000	6.6 U	6.6 U	6.6 U	6.6 U
2,4,5-Trichlorophenol	(ug/l)	400000	4 U	4 U	4 U	4 U
2,4,6-Trichlorophenol	(ug/l)	2000	5.6 U	5.6 U	5.6 U	5.6 U
2,4-Dinitrotoluene	(ug/l)	130	10 U	10 U	10 U	10 U
Hexachlorobenzene	(ug/l)	130	1.8 U	1.8 U	1.8 U	1.8 U
Hexachlorobutadiene	(ug/l)	500	2.5 U	2.5 U	2.5 U	2.5 U
Hexachloroethane	(ug/l)	3000	2.5 U	2.5 U	2.5 U	2.5 U
Nitrobenzene	(ug/l)	2000	6.8 U	6.8 U	6.8 U	6.8 U
o-Cresol	(ug/l)	200000	2.4 U	2.4 U	2.4 U	2.4 U
PCP	(ug/l)	100000	17 U	17 U	17 U	17 U
p-Cresol	(ug/l)	200000	3.8 U	3.8 U	3.8 U	3.8 U
p-Dichlorobenzene	(ug/l)	7500	2 U	2 U	2 U	2 U
2,4-D	(ug/l)	10000	3.48 U	3.48 U	3.48 U	3.48 U
Chlordane	(ug/l)	30	3.1 U	3.1 U	3.1 U	3.1 U
Endrin	(ug/l)	20	0.058 U	0.058 U	0.058 U	0.058 U
Heptachlor	(ug/l)	8	0.069 U	0.069 U	0.069 U	0.069 U
Heptachlor epoxide	(ug/l)	8	0.067 U	0.067 U	0.067 U	0.067 U
Lindane	(ug/l)	400	0.055 U	0.055 U	0.055 U	0.055 U

ug/l: Micrograms per liter.
U: Not detected.
J: Estimated value.

TABLE 25
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
WASTE CHARACTERIZATION SOIL SAMPLE RESULTS
TOXICITY CHARACTERISTIC LEACHING PROCEDURE

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	Toxicity Characteristic Leaching Procedure	VSWC-01 VSWC-01(0-2) 6/24/2010	VSWC-01 VSWC-0-1(2-4) 6/24/2010	VSWC-02 VSWC-02(0-2) 6/23/2010	VSWC-02 VSWC-02(2-4) 6/23/2010
Methoxychlor	(ug/l)	10000	0.042 U	0.042 U	0.042 U	0.042 U
Pyridine	(ug/l)	5000	43 U	43 U	43 U	43 U
Toxaphene	(ug/l)	500	3.6 U	3.6 U	3.6 U	3.6 U
Silvex	(ug/l)	1000	1.51 U	1.51 U	1.51 U	1.51 U
Arsenic	(ug/l)	5000	42 U	42 U	42 U	42 U
Barium	(ug/l)	100000	137 J	107 J	229 J	146 J
Cadmium	(ug/l)	1000	5 U	5 U	45.9	5 U
Chromium	(ug/l)	5000	13 J	16.4 J	11 U	11 U
Lead	(ug/l)	5000	26 U	26 U	558	26 U
Mercury	(ug/l)	200	0.91 U	2.7	0.93 J	0.91 U
Selenium	(ug/l)	1000	48 U	48 U	48 U	48 U
Silver	(ug/l)	5000	15 U	15 U	15 U	15 U

ug/l: Micrograms per liter.
U: Not detected.
J: Estimated value.

TABLE 26
LONG ISLAND RAIL ROAD - 17 SUBSTATIONS
VALLEY STREAM SUBSTATION
WASTE CHARACTERIZATION SOIL SAMPLE RESULTS
RCRA CHARACTERISTICS

SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE	VSWC-01 VSWC-01(0-2) 6/24/2010	VSWC-01 VSWC-0-1(2-4) 6/24/2010	VSWC-02 VSWC-02(0-2) 6/23/2010	VSWC-02 VSWC-02(2-4) 6/23/2010
Corrosivity	(mg/kg)	6.98	6.37	6.47	6.04
Cyanide(reactive)	(mg/kg)	10 U	10 U	10 U	10 U
Ignitability	(mg/kg)	NI	NI	NI	NI
Sulfide	(mg/kg)	40 U	40 U	40 U	40 U

mg/kg: Milligrams per kilogram.
U: Not detected.
NI: Not ignitable.