INTERIM REMEDIAL MEASURES
WORK PLAN

20 W. CENTENNIAL CORP.
20 WEST CENTENNIAL AVENUE
ROOSEVELT, NEW YORK 11575

PREPARED FOR:

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LAW OFFICES OF DAVIDOFF HATCHER & CITRON LLP
200 GARDEN CITY PLAZA
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ON BEHALF OF 20 W. CENTENNIAL CORP.

SUBMITTED TO:

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AUGUST 27, 2012, REVISED APRIL 4, 2013
NYSDEC SITE CODE # 1-30-154
ORDER OF CONSENT # W1-1137-09-06
***LEA* PROJECT # 12-260**

LAUREL ENVIRONMENTAL ASSOCIATES, LTD.

NYSDEC Site Code # 1-30-154
Order of Consent # W1-1137-09-06
***LEA* Project # 12-260**

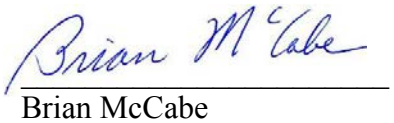
Report: Interim Remedial Measures Work Plan

Report Date: August 27, 2012
Revised: April 4, 2013

Subject Site: 20 West Centennial Avenue, Roosevelt, New York 11575
Located on the north side of West Centennial Avenue, 175 feet west of Nassau Road and 550 feet east of Elysian Terrace

Respondent: 20 W. Centennial Corp.

Study Prepared By:



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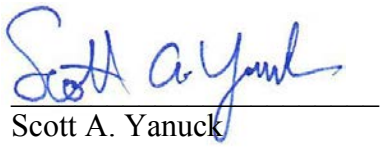

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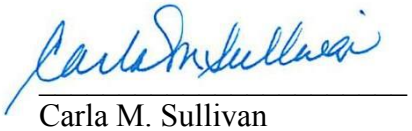

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April 4, 2013

Date

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ACRONYMS

ARARs	Applicable or Relevant and Appropriate Requirements
AS	Air Sparge
bgs	below ground surface
CAMP	Community Air Monitoring Program
C&D	Construction and Demolition (debris)
CEC	Cation Exchange Capability
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFM	cubic feet per minute
COC	Contaminate of Concern
COD	Chemical Oxygen Demand
CPC	Chemical of Potential Concern
DNAPL	Dense non-aqueous phase liquid
DO	Dissolved Oxygen
DOT	Department of Transportation
EISB	Enhanced *In-situ* Bioremediation
EPA	Environmental Protection Agency
eV	Electron Voltage
FWIA	Fish and Wildlife Impact Analysis
HASP	Health and Safety Plan
HP	Horsepower
HRA	Health Risk Assessment
HRC	Hydrogen Release Compound
GAC	Granulated Active Carbon
IHWS	Inactive Hazardous Waste Site
IIWA	Immediate Investigation Work Assignment
IRMs	Interim Remedial Measures
ISCO	In-Situ Chemical Oxidation
LBWD	Long Beach Water District
LEA	Laurel Environmental Associates Ltd
LDR	Land Disposal Restrictions
MNA	Monitored Natural Attenuation
MW	Monitoring Well
NCDH	Nassau County Department of Health
NCP	National Contingency Plan
NPL	National Priority List
NTUs	Nephelometric Turbidity Units
NYSDOH	New York State Department of Health
NYSDEC	New York State Department of Environmental Conservation
O&M	Operation and Maintenance
OSHA	Occupational Safety and Health Administration
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PCE	Perchloroethene (same as Tetrachloroethene or PERC)
PID	Photoionization detector
POTW	Publicly-Owned Treatment Works
ppb	parts per billion (µg/kg)
ppm	parts per million (mg/kg)
PRAP	Proposed Remedial Action Plan
RAGS	Risk Assessment Guidance for Superfund
RAP	Remedial Action Plan
RAO	Remedial Action Objective
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
ROI	Radius of Influence
RSCO	Recommended Soil Cleanup Objective (as per TAGM)
SARA	Superfund Amendments and Reauthorization Act
SCGs	Standards, Criteria, and Guidance Values
SSVMP	Stainless Steel Vapor Monitoring Points
SCO	Soil Cleanup Objective
SCG	Standards, Criteria and Guidance
SVE	Soil Vapor Extraction
SVI	Soil Vapor Intrusion
SVOCs	Semi Volatile Organic Compounds
TAGM	Technical and Administrative Guidance Memorandum
TCE	Trichloroethene
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TMV	Toxicity, Mobility, or Volume
TOC	Total Organic Compounds
USEPA	United States Environmental Protection Agency
UTS	Universal Treatment Standards
VOCs	Volatile Organic Compounds
W.C.	Water Column

1.0 INTRODUCTION

The Interim Remedial Measures (IRMs) proposed for this Site is a discrete set of planned actions that will be conducted prior to investigation and evaluation of a Remedial Investigation/Feasibility Study (RI/FS). The IRMs are designed so that it can be a permanent part of the final remedy. The IRMs are extremely adaptable and cover a variety of activities, large and small, to remediate an array of diverse, well-defined problems at the Site.

The IRMs discussed herein are designed to minimize the potential for public and environmental exposure to Site-related contamination. They are also intended to yield immediate reduction of contaminant levels.

The scope of work is based upon the findings of a "Draft Supplemental Remedial Investigation Report and Focused Feasibility Study" prepared by Dermody Consulting, dated May 2012 and the letter response from the New York State Department of Environmental Conservation (NYSDEC) to the above referenced document.

2.0 BACKGROUND INFORMATION

2.1 PHYSIOGRAPHIC SETTING, BUILDING LAYOUT, AND SITE HISTORY

Laurel Environmental Associates, Ltd. (***LEA***) was retained by 20 W. Centennial Avenue Corp., the current site owner, to prepare an Interim Remedial Measure (IRM) Work Plan for the property located at 20 West Centennial Avenue, Roosevelt, New York, hereafter referred to as the "South Building" or "the Site". The Site is designated on the Nassau County Tax Map as Section 55, Block 415, Lot 273. The physical location of the Site is at Latitude 40° 40' 36.85" North and Longitude 73° 35' 21.36" West. Please refer to Figure 1.0, Site Location.

The Site is in the southern portion of a glacial outwash plane with an elevation of 38 feet above mean sea level in the town of Roosevelt in the south central portion of Nassau County, Long Island. Regional topography is relatively flat. Surface run-off of storm water at the Site is controlled by the on-site drywells located in the parking lot and access drive.

According to Franke (1972), regionally, the near-surface sediments consist of the Upper Glacial deposits that are characterized by deposits of sand, gravel and silt. In the area, the Upper Glacial deposits have a maximum thickness of 100 feet. They are underlain by the Magothy, Raritan and Lloyd Formations. The Gardeners clay and the Jameco gravel separate the Upper Glacial deposits and the Magothy Formation in the area.

All local potable water supplies rely on the underlying groundwater, which is locally supplied by Long Island American Water. The supply well closest to the Site is located on Whitehouse Avenue, approximately 2,000 feet to the northwest and hydraulically up-gradient of the Site. Water from the wells

is monitored by the Long Island American Water as required of all public water supply companies in New York State. Please refer to Figure 4.0, Public Water Supply Well Locations. There are no existing public supply wells at or in the immediate vicinity of the Subject Property, nor is groundwater used for any purpose at the Site.

The Site is comprised of an irregular shaped parcel of land approximately 38,500 square feet in area and contains two buildings, referred to as the North Building and the South Building. The North Building is currently occupied by J. Ramos Woodworking, Inc. The South Building is currently vacant and is the subject of the IRM work plan. The southern building is a single story concrete block, slab-on-grade building constructed circa 1955. The south building is rectangular shaped with an area of 9,000 square feet and is situated in the southeast portion of the property. There is an access driveway along the west side of the south building providing access to an asphalt parking lot located between the north and south buildings. There are three storm water drywells located on the subject property, two are located in the parking lot on the north side of the south building and one located in the southern portion of the access driveway along the west side of the Site. The Site is surrounded by commercial properties to the north, and west. To the east of the Site are two church buildings. To the south of the Site is West Centennial Avenue and residential properties.

According to the documents provided to ***LEA*** by 20 W. Centennial Corp. and prepared by Dermody Consulting, the building in the southern portion of the property was constructed in 1955 and replaced a smaller building, usage of which is unknown. The current building was operated as a commercial laundry from 1955 to 1998 and, thereafter, has been vacant. The Site has been the subject of ongoing investigation since October 2002, and has had two additional environmental consultants contribute information utilized in the preparation of this IRM Work Plan. The two additional consultants are the Sear-Brown Group, and Malcolm Pirnie Consulting. Sear-Brown prepared a Phase I Environmental Site Assessment (Phase I) dated October 2002, and a Phase II Environmental Site Assessment (Phase II), dated December, 2002. Malcolm Pirnie conducted a Subsurface Remedial Investigation in April 2008. The reports prepared by Dermody Consulting summarized those investigations and have been incorporated into this report as side background and will be discussed in further detail in Section 2.2.

2.2 SUMMARY OF PREVIOUS INVESTIGATIONS

A total of four investigations have been performed at the Site. These investigations have been performed by Sear-Brown Group, Malcolm Pirnie Consulting and Dermody Consulting. ***LEA*** reviewed the following investigations in preparation of this IRM Work Plan:

1. **Phase I Environmental Site Assessment, Sear-Brown, October, 2002**
2. **Phase II Environmental Site Assessment Report, Sear-Brown, December 26, 2002**
3. **Subsurface Remedial Investigation, Malcolm Pirnie, April, 2008**
4. **Supplemental Remedial Investigation Report and Focused Feasibility Study, Dermody Consulting, May, 2012**

A full copy of the Supplemental Remedial Investigation Report and Focused Feasibility Study report that contained all of the information from the previous investigation, data tables and figures is provided in Appendix E.

2.2.1 Phase I Environmental Site Assessment

The Phase I indicated that the prior to 1955, there was a small structure located in the southern portion of the Site. After 1955, a large industrial building (Southern Building or "Site") was constructed. Between 1955 and 1998, the south building was operated as a commercial laundry by several different tenants. Ownership of the property also changed three times during that time frame.

An environmental database search report indicated that the Site was listed as a Resource Conservation and Recovery Act (RCRA) Large-Quantity Generator of hazardous waste for the prior occupant, Island Uniform Rental; as a NYSDEC Chemical Bulk Storage (CBS) site for the prior occupant Angela Coat, Apron & Towel, Inc.; and, as a NYSDEC Spill site under the prior occupant Amato Linen Corporation, for the release of diesel fuel to the soil during a tank removal. The CBS listing indicated that a 275-gallon AST for the storage of sodium hypochlorite (bleach) had been installed at the Site during October, 1989, however, the AST was reported to be removed in January, 1993. The Spill listed for the Site was opened on October 19, 1990 and was removed from active status on October 24, 1990.

The Town of Hempstead Building Department records show that a 2,000 gallon underground storage tank (UST) was installed along the southern portion of the Site in or about November 1968. Two USTs were reported to exist to the north of the south building; a potential gasoline UST to the northwest of the south building, and a potential fuel oil UST to the northeast of the south building.

The Phase I identified three active drywells throughout the asphalted parking area, and a trench drain abandoned with concrete within the south building.

2.2.2 Phase II Environmental Site Assessment

A Phase II ESA was performed at the Site by Sear-Brown to address areas of concern identified during the performance of the Phase I. The Phase II consisted of the following:

1. A geophysical survey was performed to verify the presence of USTs at the Site. One UST was identified in the southern portion of the Site.
2. Eight soil borings were installed at the Site, identified as GP-20-1 through GP-20-8. The soil borings were installed to a depth ranging from 8 to 28 feet below the ground surface. Of the eight soil borings, four were converted to permanent groundwater monitoring wells.

The results of the soil and groundwater sampling indicted the presence of tetrachloroethylene (PCE) and its degradation products, in various samples above their respective regulatory standards. The results of the Phase II are provided in Appendix E of this report.

2.2.3 Subsurface Remedial Investigation

In April and May of 2008 Malcolm Pirnie performed a Subsurface Remedial Investigation at the Site to further delineate the extent of impact. To this end, Malcolm Pirnie performed the following:

1. Collected liquid and sediment samples for the three storm water drywells.
2. Perform 19 soil borings, identified as SB-1 through SB-19. From the 19 borings, 33 soil samples were retained for laboratory analysis.
3. Collected two surface samples, identified as SS-1 and SS-2.
4. Collected 30 groundwater samples from various depths in four on-site locations and two off-site locations.

The soil and sediment samples collected were analyzed for the presence of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOC), and metals. The liquid collected from the drywells was analyzed for VOCs. All of the groundwater samples were analyzed for VOCs and SVOCs.

The analytical results indicated that there was no up-gradient component to the PCE being encountered at the Site. The soil samples indicated that impacted soil was present in the soil retained from the shallow depths within the central portion of the south building. The soil samples retained for analysis over the deeper interval (17-18) and (18-19) feet did not contain elevated levels of PCE with the exception of SB-8 which found elevated PCE in the 17' – 18' sample. The results of the groundwater analysis verified the presence of PCE at the water table within the south building's interior and along the access driveway to the west of the south building. Groundwater samples obtained to the south of the south building both on and off-site verified the presence of PCE, with highest concentration at the water table and with decreasing concentration within the water column. Off-site exceedances of the groundwater standard did not extend south of West Centennial Avenue. The sediment sample obtained from the storm water drywell did not contain PCE. However, elevated SVOCs were present at concentrations exceeding the Soil Cleanup Objective (SCO) provide in the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046.

2.2.4 Supplemental Remedial Investigation Report and Focused Feasibility Study

Dermody Consulting performed a Supplemental Remedial Investigation in November, 2010 and September, 2011, to further delineate the extent of soil and groundwater impact both on and off-site. The scope of work performed by Dermody included the following:

1. Performed a Ground Penetrating Radar (GPR) survey to evaluate the Site for the presence of USTs.
2. Performed soil borings in five locations identified as SB-22 through SB-26. Core samples were collected from 0 - 20 feet bgs. The core samples were field screened utilizing a photoionization detector PID. The samples with the highest PID reading and the sample directly above the water table were retained for analysis.
3. Collected six off-site groundwater samples utilizing a direct push sampler, identified as GW-28 through GW-33. Each groundwater sample was collected over three depth intervals; (24 - 26), (40 - 42) and (60 - 62) feet bgs.
4. Installed and sampled four off-site groundwater monitoring wells identified as MW-1S (20 - 25), MW-1D (47 - 50), MW-2S (20 - 25), and MW-2D (47 - 50). These wells were installed directly south of the Site on the north side of West Centennial Avenue.

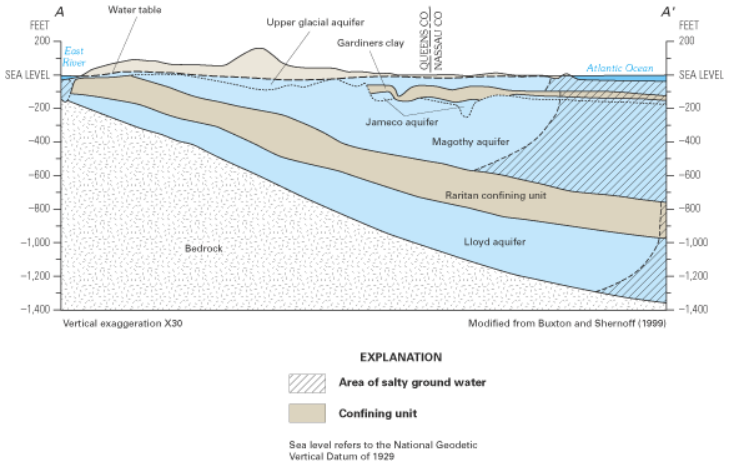
The results of the GPR survey confirmed the presence of the UST to the south of the south building and did not identify any anomalies consistent with USTs to the north of the Site. Soil samples were retained within the top three feet for all of the soil boring locations and from between 15 and 18 feet in boring locations SB-22 through SB-24. The analytical results from the soil borings confirmed that the PCE was present in the shallow soil in the central portion of the south building and in the corresponding area to the west of the south building in the access driveway. The off-site groundwater samples obtained through the direct push sampling confirmed the presence of low concentrations of PCE, but above NYSDEC Class GA Ambient Water Quality Standards in the water column to the south of the Site along the north side of West Centennial Avenue. The results of the groundwater samples collected along the two streets south of West Centennial Avenue indicated that groundwater was not impacted.

CONCLUSIONS

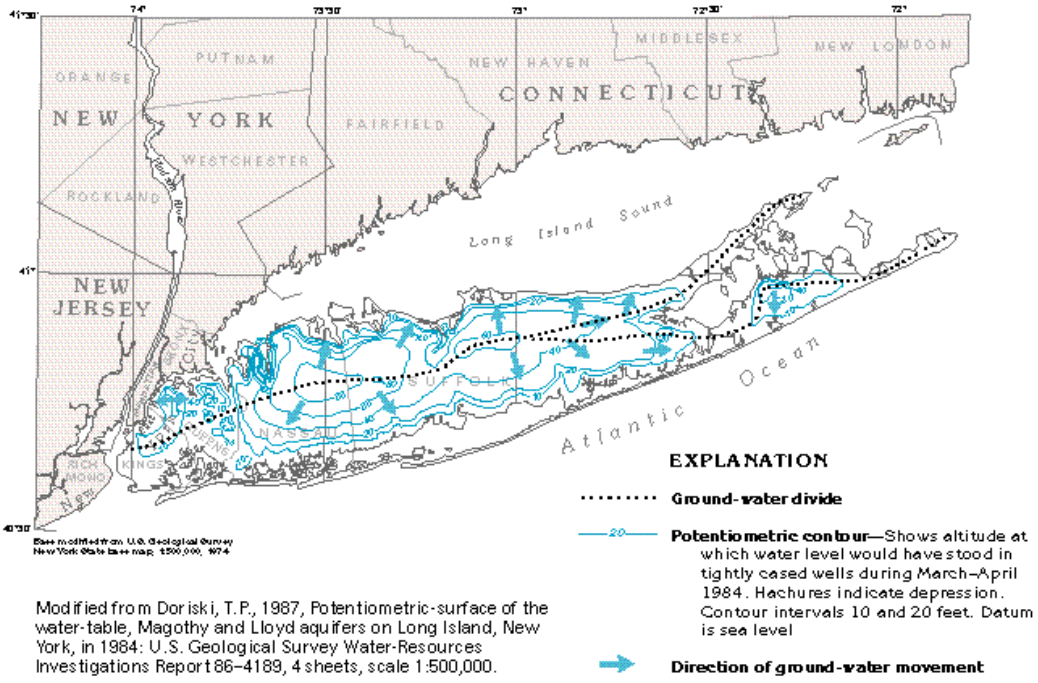
The four previous investigations found PCE impacted soil and groundwater present at the Site at concentrations exceeding NYSDEC Part 375 Soil Cleanup Objectives and NYSDEC Class AG Ambient Water Quality Standards. The soil contamination is primarily beneath the central portion of the Site (south building) and the central portion of the access driveway along the west side of the Site. Impacted groundwater is known to extend south of the Site. However, the PCE impact has not migrated beyond the north side of West Centennial Avenue. Concentrations of PCE in wells located on West Fulton Avenue, one block south West Centennial Avenue were below NYSDEC Class AG Ambient Water Quality Standards.

3.0 SITE HYDROGEOLOGY

Nassau County is located in the Atlantic Coastal Plain physiographic province that is characterized by low hills of unconsolidated sands, gravel, and silt. According to Franke (1972), regionally, the near-surface sediments consist of the Upper Glacial deposits that are characterized by southward sloping deposits of sand, gravel, and silt. The Upper Glacial deposits have a maximum thickness of 600 feet. They are underlain by the Magothy, Raritan, and Lloyd Formations. The Gardeners clay and the Jameco gravel separate the Upper Glacial deposits and the Magothy Formation along the southwest portion of Long Island. Due to less surfacial contamination and higher well yields, the Magothy aquifer is the main supply for drinking and industrial water. Consequently, the USEPA has identified it as a Sole Source Aquifer. The Site is in the Upper Glacial aquifer. Pump test data suggests hydraulic conductivity between the Magothy and Upper Glacial aquifers. However, discontinuous clay lenses may prevent this interaction in some areas.



According to groundwater contour maps provided by the NCDH and the NYSDEC, Topographic Quadrangles provided by the USGS, and previous work performed by ***LEA*** in the area, the subject property has an elevation of approximately 38 feet above mean sea level. Based on studies conducted by others, groundwater is 20 feet below grade at the subject property and flowing in a southerly direction, towards the Baldwin Bay. A site specific hydrogeologic study is warranted to confirm localized on-site groundwater flow direction, which is beyond the scope of this report.



Modified from Doriski, T.P., 1987, Potentiometric-surface of the water-table, Magothy and Lloyd aquifers on Long Island, New York, in 1984: U.S. Geological Survey Water-Resources Investigations Report 86–4189, 4 sheets, scale 1:500,000.

Figure 72. The potentiometric surface of the upper glacial aquifer slopes gently to the north and south from a central high, except in the western part of the island where ground-water withdrawals have lowered the water table and created cones of depression.

The most significant user of groundwater in the area is the Long Island American Water Corp. (LIAW). The LIAW operates seven production wells throughout the community, the closest of which is located approximately 2,000 feet to the northwest and hydraulically up-gradient of the Site. The LIAW production wells have no direct connection or influence on flow direction within the upper glacial aquifer present at 20 West Centennial Site. Groundwater recharge into the upper glacial aquifer is restricted within the vicinity of the Site due to the south building and pavement, and as recharge takes place elsewhere on the island.

4.0 ADDITIONAL INTERIM REMEDIAL MEASURES GOALS AND OBJECTIVES

The Interim Remedial Measures for the 20 West Centennial Avenue Site are consistent with the objectives of 6NYCRR Part 375. Based upon the results of the four investigations that were performed at the Site between 2002 and 2010, the Interim Remedial Action Objectives (IRAOs) for the Site are:

1) Collect groundwater samples from the existing four on-site and four off-site groundwater monitoring wells to establish the current groundwater quality on-site and in the immediate vicinity off-site. Groundwater sampling will be performed in accordance with EPA Region 1 guidance "low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells"- July 30, 1996, revised January 19, 2010. This sampling will be performed utilizing a bladder pump system.

2) Excavate contaminated soils from the three on-site storm water drywells (DW-1, DW-2 and DW-3). Excavation depth will be based on attaining soil that is both visually clean and free of significant VOC contamination (under 10 ppm) as determined by field analysis with a photoionization detector (PID). Soil samples will be collected from the base of each drywell (Endpoint Samples) and from just above the water table. Collect groundwater from one temporary groundwater monitoring well, just south of DW-2 (DW-2GW). The groundwater sample will be collected in accordance with the method referenced in the Item 1, above.

3) Collect two soil vapor samples in the grassy area between the south side of the south building and the sidewalk, in the vicinity of groundwater monitoring wells MW-1 and MW-2. Soil vapor points will be installed to a depth of eight (8) feet below the ground surface, which is the equivalent depth of the base of a basements in the area. The soil vapor implants will be installed utilizing direct push technology. The sampling points will be installed and the samples will be collected in accordance with the NYSDOH's Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006, (Section 2.7.1 of the Guidance), An evaluation of the data collected during this sampling event well be utilized in the design of the proposed remediation system.

4) Excavate and remove, to the extent practicable, heavily VOC impacted soil beneath the central portion of the concrete floor of the south building. Field screening will dictate the volume of soil to be removed, with an objective of soil removal where PID readings are over 50 ppm. Endpoint samples will be collected from the base and sides of the excavation to document the soil quality at the extents of the excavation. As part of the removal of the impacted material beneath the floor within the south building, the former floor drains will be removed allowing for the evaluation of the piping network and the possible determination of the former outfall of the piping.

5) Eliminate and control, to the extent practicable, migration of volatile organic compounds into adjoining and nearby buildings. The NYSDOH's Guidance for Evaluation of Soil Vapor Intrusion (Guidance) provides the following criteria for evaluating indoor air data: the results are compared to background levels of volatile chemicals in indoor air [Section 3.2.4 of the Guidance]; the NYSDOH's guidelines for volatile chemicals in air [Table 3.1 in the Guidance]; the NYSDOH's decision matrices [Section 3.4 of the Guidance] and; human health risks (i.e., cancer and non-cancer health effects) associated with exposure to the volatile chemical in air. .

6) Install a soil vapor extraction (SVE) system beneath the floor of the south building's interior and beneath the access driveway along the western portion of the Site. Based on the results of the groundwater sampling, it will be determined if an air sparging component will be required to address impacted groundwater at the Site.

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The proposed IRMs are protective of human health and the environment and comply with applicable or relevant and appropriate standards/criteria, and also comply with appropriate State and/or Federal guidance.

4.1 GROUNDWATER, SOIL AND VAPOR ANALYTICAL OBJECTIVES

The objectives of this IRM includes the sampling and evaluation of groundwater, soil and soil vapor at the site for the presence of volatile organic compounds. The site specific objective for each media is discussed below:

4.1.1 Based on the analytical results from the groundwater samples and comparison to the "NYSDEC TOGS Division of Water ambient water quality standards and guidance values and groundwater effluent limitations," a determination will be made as to whether an air sparging component to the remediation system will be required.

4.1.2 The site-specific objectives for the soils on-site is derived from two areas of concern.

a. The first area is the three on-site drywells (DW-1, DW-2, DW-3) located along the west and north sides of the south building. The soil within the drywells will be sampled for waste characterization/facility approval and subsequently excavated until clean soil is attained (under 10 ppm as measured by PID). Soil samples will be collected from the base of each remediated drywell and from just above the water table and analyzed for VOCs, SVOC, and Metals to evaluate the effectiveness of the remediation and determine whether contamination has extended deeper. The sampling procedure is discussed in Section 5.2 of this Workplan.

b. The second area of concern is the soil located beneath the floor in the central interior portion of the south building. The interior excavation and removal alternative is to excavate the vadose zone soils containing VOCs at concentrations exceeding the Standards, Criteria and Guidance (SCGs) for soils based on 6 NYCRR Subpart 375-6-Remedial Program Soil Cleanup Objectives (SCOs). Per NYSDEC recommendations, the protection of groundwater SCOs will be utilized for comparison purposes. Please refer to the table below for VOC contaminants and their corresponding SCGs (in brackets) that have been detected at concentrations above the SCGs.

4.1.3 The site-specific objective for the potential for soil vapor intrusion is to install and operate a soil vapor extraction system beneath the access driveway along the west side of the south building and beneath the central portion of the south building. Vapor sampling points will be installed through the floor along the south and east interior walls of the south building to facilitate the collection of pressure reading, perform soil vapor sampling on an as needed basis. Please refer to the table below for VOC contaminants and their corresponding SCGs.

Compound	Soil	Groundwater	Soil Vapor
*Tetrachloroethene (PCE)	[1,300 ppb]	[5 ppb]	See DOH Matrix 2
*Trichloroethene (TCE)	[470 ppb]	[5 ppb]	See DOH Matrix 1
*cis-1,2-Dichloroethene (cis-1,2,DCE)	[250 ppb]	[5 ppb]	See DOH Matrix 2

*Site related VOCs that are considered contaminates of concern (COC)

4.2 LIMITATIONS

Since the prior commercial laundry owner/operator has vacated the space and all associated commercial laundry equipment and components have been removed, interior excavation, within reason, is now feasible.

5.0 SCOPE OF WORK

The following section presents a scope of work for remedial technologies that are meant to address the remedial goals presented in Section 4.0.

The following is a summary of interim remedial measures to be completed at the 20 West Centennial Avenue Site:

1. Purge each existing groundwater monitoring well, collect and record groundwater quality data prior to the collection of groundwater samples. Groundwater sampling will be performed in accordance with EPA Region 1 guidance "low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells"- July 30, 1996 Revised January 19, 2010. This sampling will be performed utilizing a bladder pump system. Collect groundwater samples and submit for analysis for the presence of VOCs utilizing EPA Method 8260.

2. Excavate contaminated sludges and soils from each of the three on-site storm water drywells (DW-1, DW-2 and DW-3). Excavation depth will be based on attaining soil that is both visually clean and free of significant VOC contamination (under 10 ppm) as determined by field analysis with a photoionization detector (PID). Soil will be disposed of at a facility approved for this waste stream and based on required waste characterization analysis.

3. At DW-1, DW-2 and DW-3, soil samples will be collected at the base (endpoint samples) and from just above the water table.

4. Endpoint samples from DW-1, DW-2 and DW-3 will be analyzed for VOCs, SVOCs and metals.

5. Soil samples from just above the water table at DW-1, DW-2 and DW-3 will be analyzed for VOCs.

6. A groundwater sample will be collected from a temporary well set to the south of DW-2. This groundwater sample will be collected and analyzed in accordance with the sampling and analytical methods referenced above.

7. Two soil vapor samples will be collected in the grassy area between the south side of the south building and the sidewalk, in the vicinity of groundwater monitoring wells MW-1 and MW-2. This information will be utilized to establish a treatment zone at the south and east extents of the property for soil vapor contamination and will be used in the design of the Soil Vapor Extraction (SVE) system.

8. A soil vapor extraction pilot test will be performed to determine the radius of influence vapor extraction wells will have at the Site. This information will be utilized to design the SVE system.

9. Excavation of impacted vadose zone soils from beneath the floor in the central portion of the south building. The depth and lateral extent to which soil will be excavated shall be determined by field screening. Two confirmatory endpoint samples will be collected at the base of the excavation, and four sidewall samples will be collected from the excavation. Collected samples will be analyzed for the presence of VOCs utilizing EPA Method 8260.

10. Excavated soils will be transported to a pre-approved licensed facility for off-site treatment/disposal.

11. Backfilling excavated area with clean, imported soil.

12. Installation and operation of a proposed SVE system.

13. Potential to add air sparge component to system, if site conditions warrant.

14. The SVE system remains in operation until remedial goals are achieved. Thirty days after the SVE system is shut down, sampling of soil vapor and air to confirm that vapors have not migrated off-site.

Additional remedial actions may be deemed necessary by the NYSDEC and/or the NYSDOH.

Methodology:

Collection of groundwater samples from the existing on and off-site groundwater monitoring wells will allow for the determination of the current groundwater quality at the Site and will aid in the determination of whether an air sparging component is needed to address the levels of groundwater contamination at the Site.

Collection of endpoint samples and soil samples from just above the water table at the on-site storm water drywells will aid in determining whether historic discharge of chlorinated solvents into the drywells has occurred. A groundwater sample will be collected from a temporary well which will be installed to the south of DW-2.

Collection of two soil vapor samples in the grassy area between the south side of the south building and the sidewalk, in the vicinity of groundwater monitoring wells MW-1 and MW-2 will aid in the determination of southward and southeastward extent of any potential vapor migration from beneath the building. This information will be utilized in the design of the SVE system.

Excavation and off-site treatment/disposal would provide for an immediate reduction of PCE concentrations in vadose zone and shallow groundwater-saturated soils in the identified contamination zones. The excavations would also reduce the potential for further contamination of deeper groundwater and off-site migration of the contaminants of concern (COC).

All excavated areas will be backfilled and compacted with clean imported soils. Final re-surfacing of the access driveway and south building interior will be completed after installation of the SVE system. Concrete surfacing with epoxy coating will greatly reduce the risk for direct occupant exposure to residual vadose zone contamination and allow the SVE system to operate more effectively.

Operation of a SVE system would, in effect, produce the same benefit as a sub-slab depressurization system (SSDS) and prevent soil vapor intrusion that may impact the adjoining businesses and homes. The system would also provide for the continuous removal of residual vadose zone contamination in the soil beyond the limits of excavation.

The SVE system will operate until COC levels meet SCGs and/or shutdown is approved by the NYSDEC.

5.1 SAMPLING OF EXISTING GROUNDWATER MONITORING WELLS

Procedure:

All monitoring wells will be opened and evaluated for its current condition and gauged for the depth to water and for the presence of non-aqueous phase liquid (NAPL) utilizing a sonic interface probe. The diameter of the well, depth to water and the total depth of the well will be measured and recorded. The standing water column will be determined and the well volume will be calculated. Utilizing a down-hole submersible pump, three to five well volumes of water will be purged from each well. As the wells are screened at various depths the submersible pump will be placed one foot below the top of the water table. This will assure that the well will be recharging from the base of the screen and replacing the water being removed at the top of the riser, thus assuring the removal and replacement of all of the water within the well and casing. In the case of the shallow wells that are screened above and below the water table, the pumps will be moved vertically through the well screen to facilitate a complete and through exchange of groundwater within the well. After each well has been purged, groundwater quality reading will be collected and recorded. Three consecutive readings will be collected over a period of 15 minutes. Water quality measurement will consist of the following:

- Temperature, in degrees Celsius
- Dissolved Oxygen, in mg/L
- Conductivity, in µS/m
- pH
- ORP, in mV
- Turbidity in Nephelometric Turbidity Units

After water quality has been measured and recorded, groundwater samples will be collected utilizing a low flow bladder pump set at a flow rate of less than 50 ml/minute. The collected samples will be placed in laboratory issued glassware, placed on ice stored in a cooler and maintained at 4 ºC until transported to a New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP) certified laboratory for analysis. The samples will be analyzed for the presence of VOCs utilizing EPA Method 8260.

5.2 STORM WATER DRYWELL EXCAVATION AND SAMPLING

Procedure:

Excavate contaminated sludges and soils from each of the three on-site storm water drywells (DW-1, DW-2 and DW-3). Excavation depth will be based on attaining soil that is both visually clean and free of significant VOC contamination (under 10 ppm) as determined by field analysis with a photoionization detector (PID). Soil will be disposed of at a facility approved for this waste stream and based on required waste characterization analysis. To confirm that remediation was effective, an endpoint soil sample will be collected from the base of each drywell at the completion of excavation using a hand auger. In addition, three storm water drywells will be sampled utilizing a direct push sampling rig equipped with a five foot dual tube sampling equipment. Core samples will be collected in five foot intervals in the vertical dimension from the base of each drywell until groundwater is encountered. Each core sample will be visually evaluated and field screened utilizing a PID. The sample from just above the water table will be retained for laboratory analysis. A groundwater sample will be collected from a temporary "Pre-Pack" 1" PVC monitoring well installed to the south of DW-2. The groundwater sample will be collected in accordance with EPA Region 1 guidance "low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells"- July 30, 1996 Revised January 19, 2010. This sampling will be performed utilizing a bladder pump system. All soil and groundwater samples will be placed in laboratory issued glassware, placed on ice, stored in a cooler and maintained at 4 ºC until submitted for laboratory analysis. The soil sample collected from the base of the drywells will be analyzed for the presence of VOCs utilizing EPA Method 8260, SVOCs utilizing EPA Method 8270 and RCRA Metals, including hexavalent chromium. The samples collected from just above the water table will be analyzed for VOCs only, and will be analyzed in accordance with EPA Method 5035a. Groundwater will be analyzed for the presence of VOCs using EPA Method 8260.

5.3 SOIL VAPOR SAMPLING

Procedure:

Soil vapor sampling will follow protocols set forth in NYSDOH's Guidance for Evaluation of Soil Vapor Intrusion (Guidance) under Section 2 [2.71, 2.8, and 2.9]. Two soil vapor samples will be collected in the grassy area between the south side of the south building and the sidewalk, in the vicinity of groundwater monitoring wells MW-1 and MW-2. These samples will be collected to determine the potential southward and southeastward migration of COCs carried by groundwater moving beneath the site. The two vapor sampling points will be installed utilizing direct push technology. A Geoprobe 6610 DT ®, will be utilized to drive a two and one quarter inch diameter steel drive rod with an expendable tip to a depth of eight feet below the grounds surface. A sampling screen with dedicated polyethylene tubing will be inserted through the steel drive rod and threaded to the expendable tip. The steel drive rod will then be removed. As the steel drive rod is being removed the annular space around the sampling screen will be filled with inert glass beads, until the sampling screen is covered. A one foot bentonite seal will be added directly above sampling screen and glass beads. The remainder of the boring will be filled with clean backfill material. The top one foot of the sampling location will be backfilled with a concrete and bentonite mix. The integrity of the bentonite seals will be tested by creating a tracer gas atmosphere around the top of the bore hole, then utilizing an appropriate tracer gas meter, air will be drawn through the sampling screen and tested for the

presence of tracer gas. After the integrity of the seal around the sampling location is confirmed soil vapor samples will be collected. The samples will be collected by purging three well volumes from the sampling tube utilizing a photoionization detector, (PID) or a standard suction pump. After purging the sample tubing, a summa canister will be connected to the sampling tub and will be filled at a rate of less than 0.2 Liters per minute. The collected sample will be submitted for laboratory analysis at York Analytical Laboratories of Stratford, Connecticut to test for VOCs using USEPA Method TO 15. York is a NYSDOH, ELAP, approved laboratory and will be required to maintain this certification throughout the IRM. The analysis will meet NYSDOH required laboratory detection limits for soil vapor samples

5.4 SOIL VAPOR EXTRACTION PILOT TEST AND DESIGN

Procedure:

A soil vapor extraction pilot test will be performed to determine the radius of influence the vapor extraction wells will have at the Site. One two-inch diameter PVC vapor extraction pilot test well will be installed in the central portion of the south building's interior. This well will be constructed of two-inch diameter well screen and riser. The well will be installed to a depth of approximately fifteen feet and will consist of 10 feet of 0.020 inch slotted screen with a solid riser to two feet above grade. The annular space around the screened section of the well will be filled with #2 Morie filter sand. The first two feet above the screen will be sealed with bentonite, the remained of the riser will be filled with native material. Four one-inch diameter piezometer wells will be installed at varying distances (5, 10, 15, and 20) feet from the pilot test vapor extraction well. A vacuum will be applied to the vapor extraction well. Vacuum readings will be collected from each piezometer location at 10 minute intervals and recorded. After one hour, the amount of vacuum will be increased and all measurement will be re-collected. The data collected during the performance of the pilot test will be utilized to design a remediation system, determine the number of vapor extraction points and the volume of air required to assure the effective removal of residual PCE and degradation products from the soil beneath the Site. Upon completion of the remediation system design, an SVE System Workplan will be prepared and submitted to the NYSDEC and NYSDOH for review and approval prior to installation of the system.

5.5 INTERIOR EXCAVATIONS AND OFF-SITE TREATMENT/DISPOSAL

Procedure:

As a matter of protocol, the New York City and Long Island One Call Center will be contacted and a public utility markout will be requested a minimum of three business days prior to commencing work. A confirmatory Geophysical Survey will be conducted in the areas of the proposed excavations to aid in identifying subsurface utilities preceding excavation. Extra care will be taken during excavating activities to identify and safely address any discovered private and/or public utilities in the excavations. This would include tracing utilities to the point of origin/terminus, contacting the utility provider, decommissioning of the utility and/or halting excavation in the area of the utility until an alternate plan is formulated and accepted.

Using machine-assisted hand excavation of the most highly impacted vadose zone soils in the central portion of the south building, an area of approximately 15 feet by 25 feet, will be removed. Field screening

of soils using a PID, visual and olfactory methods will be conducted continuously. The anticipated depth of excavation will be four feet. Please refer to Figure 6.1, Excavation Plan.

According to the Town of Hempstead, excavation within the south building and access driveway will require a permit. Excavation activities will be conducted in a manner that will minimize the potential for:

- Undermining of the south building and adjoining structures
- Damage to existing monitoring wells. Should any wells be damaged during excavation, they will be replaced after the excavation is complete.
- Fugitive dust generation
- Excessive noise generation
- Disturbance to adjoining businesses and nearby residential properties

To avoid disrupting businesses or exposing employees of neighboring properties and the general public to low-level contaminants, health and safety monitoring will be conducted throughout the excavation activities in accordance with the established Health and Safety Plan. A qualified field representative will observe the excavation and screen soils as they are exposed using visual observations and photoionization detector (PID) measurements of soil headspace samples. At the conclusion of each workday, the excavations and drum/container staging areas will be fenced off and the Site will be secured. All work would be conducted in accordance with the Health and Safety Plan (HASP) and Community Air Monitoring Program (CAMP). Please refer to Appendix A and B.

Excavated soils will be placed into sealed and lined DOT approved roll-off containers.

1. Contaminated soils will be removed and immediately transferred to 15 to 20 cubic yard roll-off containers, or similar, and staged in either the rear parking area or along the access driveway on the east side of the south building. All necessary permits will be procured from the Town of Hempstead prior to staging of the containers.
2. No more than 48 hours after filling a container, the container will be removed from the Site for transport, treatment and disposal at Stablex Canada Inc. of Blainville, Québec, Canada (USEPA ID #NYF006000053) or a similar permitted facility under proper manifest procedures. The containers will be transported by Rollex Transport Ltd. of Varennes, Québec, Canada (USEPA ID #NYD980756415) or similar permitted transporter.

Prior to implementation of either off-site treatment/disposal method, approval will be obtained from the NYSDEC. All excavated soils will be managed in accordance with NYSDEC regulations and guidance as well as the requirements of soil disposal facilities where the soil is to be transported. The NYSDEC may require collection and analysis of additional soil samples prior to disposal of excavated soil off-site. Approval will be obtained from the NYSDEC, prior to disposal of excavated soils off-site.

At the end of each work day, the areas will be secured in accordance with the provisions of the HASP.

5.5.1 Investigation of Floor Drains

Procedure:

The abandoned floor drains within the south building will be excavated. The piping from the abandoned floor drains will be exposed to the extent possible. The exposed former floor drain piping network will be examined as a potential source of the contamination. The piping network will be traced in an effort to identify its former final discharge point. If a subgrade discharge point is identified and appears not to have been previously investigated, an endpoint soil sample will be collected and analyzed for the COCs.

5.5.2 Endpoint Sampling and Analysis

Procedure:

As set forth above, two endpoint samples and four sidewall samples will be collected from the excavation, in accordance with NYSDEC DER-10 protocol. The samples will be designated as endpoint sample (ES) followed by the sample's location, i.e.: Endpoint Sample - North Bottom (ES-NB). Quality Assurance/Quality Control samples will be analyzed as presented in the QA/QC Plan. These include collection and analysis of field and trip blanks, matrix spike/matrix spike duplicate and blind duplicate samples where appropriate. Depending on stability of the excavation and access, samples may be collected from the bucket of the machinery performing the excavation or by a direct grab sample with a hand auger or similar. Endpoint samples will be submitted for laboratory analysis at York Analytical Laboratories of Stratford, Connecticut to test for Target Compound List (TCL) VOCs using USEPA Method 8260. York is a NYSDOH, ELAP, approved laboratory and will be required to maintain this certification throughout the IRM. Please refer to Figure 6.2, Endpoint Sampling Plan. Sample collection and analysis will be conducted in accordance with the Sampling and Analysis Plan, included in Appendix C of this report. The NYSDEC may require collection and analysis of additional endpoint samples.

5.5.3 Backfilling and Restoration of the Excavation Areas

Upon completion, each excavation will be backfilled by hand with clean, imported soil. Representative soil samples will be collected in accordance with NYSDEC protocol from imported soils and analyzed prior to placement at the Site. Samples will be submitted for laboratory analysis at York Analytical Laboratories of Stratford, Connecticut to test for Target Compound List (TCL) VOCs, TCL SVOCs, pesticides, PCBs, TAL metals and cyanide. York is a NYSDOH, ELAP, approved laboratory and will be required to maintain this certification throughout the IRM. If imported soils are from independent sources, samples will be collected and analyzed from each source as described above. Clean soils imported from off-site will be acceptable for use as backfill material provided the all parameters meet the NYSDEC Recommended Soil Cleanup Objectives included in Table 375-6.8 (b). Sample collection, analysis and frequency will be conducted in accordance with the Sampling and Analysis Plan, included in Appendix C of this report.

The excavations will be compacted and left open pending installation of a SVE system, as described in Section 5.5 Soil Vapor Extraction. Upon completion of the SVE system, the floor within the south building will be finished with a 4-inch thick 3,000 psi concrete slab. Epoxy paint or similar will be applied to the

concrete floor to seal cracks and enhance the efficiency of the SVE system. Any monitoring wells that are destroyed during excavation will be replaced prior to paving and incorporated into the same.

All work would be conducted in accordance with manufacturer's recommendations, the HASP and CAMP. Please refer to Appendix A and B.

5.6 SOIL VAPOR EXTRACTION

Background Information:

Soil vapor extraction (SVE) is an *in-situ* soil remediation technology, to be used in the unsaturated (vadose) zone, in which a vacuum would be applied to the soil to induce the controlled flow of air and remove volatile contaminants such as PCE from the soil. The increased air flow through the subsurface can also stimulate biodegradation of the remaining contaminants, especially those that are less volatile. As gases leave the soil, they are recovered within granular activated carbon (GAC) drums. The radius of influence for the SVE wells is anticipated to be 20 feet. However, this radius will be confirmed through the performance of a SVE pilot test.

Procedure:

During ***LEA's*** IRM activities, 2-inch diameter PVC SVE wells will be installed in preparation to implement the SVE system. It is anticipated that up to three SVE wells will be installed along the access driveway along the east side of the south building and that up to six SVE wells will be installed within the interior of the south building. The wells will be set to approximately 15 feet below grade with 10 feet of .020" slot screen in the vadose zone. The exact number and location of the vapor extraction points will be determined based on the results of the pilot test. Sizing of the vapor extraction blower and piping layout will be included in the system design based on the data collected during the pilot test.

The SVE system will be installed as follows:

1. The SVE system will be constructed with flexibility to add additional SVE points and piping, if required.

2. Approximately nine 2-inch diameter PVC .020" slot screens will be installed to an anticipated depth of fifteen feet below grade at the Site. Approximately three will be installed in the access driveway along the west side of the south building and approximately six SVE wells will be installed in the central portion of the south building's interior. The exact locations will be determined by ***LEA*** staff and engineers based on the results of the pilot study and with input from the NYSDEC and NYSDOH.
3. The 2-inch schedule 40 PVC piping will run above and below grade to a dedicated blower. Each set of piping will have an adjustable ball valve and pressure gauge to fine-tune air flow from each extraction area for optimum system efficiency.

4. A Gast Regenair® regenerative blower, or equivalent (Horsepower to be determined by pilot test), with a variable frequency controller set at up to 60" H_2O with up to a 215 scfm flow rate will be used for the system.

5. The pump, blower, cooler, moisture knockout drum, and system gauges will be stored in an all-weather shed or within the south building interior for year-round, full-time operation.

6. Granular activated carbon (GAC) vessels will be located adjacent to the remediation shed or remediation area, as will the system headers and gauges. Six backup drums will be staged at the Site during the startup period.

7. Prior to full-time operation, the SVE system will be thoroughly tested by an experienced professional to ensure proper operation. The testing will be performed in accordance with the procedures described in Section 4.3 of the NYSDOH Soil Vapor Intrusion Guidance. Pressure testing and indoor air testing will be conducted as described in the Soil Vapor Intrusion Guidance, at a minimum, within the south building. A pressure field extension test will be conducted to confirm that a vacuum of at least 0.004" water column (w.c.) is produced within the treatment zone.

8. A dedicated power source for the system will be provided.

9. System startup monitoring will consist of system inspection and effluent sampling daily during the first week, then weekly for the first month, and monthly thereafter. The GACs will be replaced as monitoring indicates is necessary. An air permit will be obtained if required by the NYSDEC and/or NYSDOH. The compliance with the substantive requirements for air emission limits as stipulated in Title 6 of the NYCRR and Air Guide-1 must be achieved. The compliance with these aforementioned air emissions criteria will be demonstrated by collecting influent and effluent samples of the carbon treatment system and analyzing for VOCs by current EPA Method.

10. An electronic telemetry unit will be installed and will notify ***LEA*** staff, building management and/or maintenance staff in the event that a system failure occurs.

Performance testing

Upon start-up of the SVE system testing will be performed to determine the extent of the pressure field generated by the SVE system. This testing will be accomplished through the performance of a communication test. The communication test will consist of the five test points installed throughout the interior and exterior of the south building. It is anticipated that three points will be installed through the floor, along the east interior wall. Two test points will be installed to the south of the SVE wells. One test point will be below the floor along the south interior wall. The other test point will be in the grass area to the south of the south building. Vacuum readings will be collected and recorded in each of these points to verify that a negative pressure gradient has been achieved. This testing will be performed as part of the routine operation of the system. The specific details of the testing program will be provided in the SVE workplan. Two of the test points will be permanent, with gauges mounted on the south building wall for subsequent performance monitoring, allowing for confirmation of vacuum under the slab to the south building's eastern and southern extent.

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Please refer to Figures 6.1, Excavation Plan and 6.3, SVE Treatment System Conceptual Model.

5.7 POST IRM SOIL VAPOR INVESTIGATION

It is anticipated that the SVE system will be in continuous operation for a period of between one and two years. A post IRM soil vapor sample investigation (SVI) will be performed to demonstrate that the operation of the SVE system has reduced the level of the contaminants of concern to a point that the on-site building, the church buildings at the adjacent property to the east and the two homes to the south of West Centennial Avenue (numbers 17 and 21), are not being impacted. This post-mitigation testing will be completed after remedial goals have been met and the SVE system has been shut down for a period of at least 30 days. The test will take place during the heating season (November 1 to March 31).

Letters requesting access will be sent to the church and to the residences at 17 and 21 West Centennial Avenue in an effort to obtain permission to perform post-mitigation testing on these properties as part of the SVI. Sampling will consist of collecting sub-slab soil vapor samples and indoor air samples, with an outdoor ambient air sample. If access to the aforementioned properties is not granted, an alternative plan for post mitigation SVE will be implemented. This will consist of the installation of up to two vapor points on the Site property. The first point will be set along the south side of the property, the second point will be set through the floor along the east interior wall of the south building. The vapor sampling points in this scenario will be set to a depth of eight feet below grade (typical basement grade level). The vapor points will be installed and sampled in conformance with the NYSDOH October 2006 Final *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*.

If permission to access off-site properties is granted, the vapor points will be installed using a hammer drill for interior sub-slab samples (placing a steel vapor point just below the concrete slab). If not granted, then the vapor points will be installed using a Geoprobe on-site soil vapor sampling (placing a stainless steel vapor point at eight feet below grade). Glass beads will surround the screen of the vapor point and a bentonite seal will be placed above the screened area. The vapor point will be connected to the surface using disposable tubing. Sampling will be conducted using a Summa Canister with a flow controller set to draw the sample at less than 0.2 liters per minute. Helium tracer gas and a helium detector will be utilized to confirm a good seal and that the soil vapor sample has not been diluted by outdoor air. Indoor and ambient air samples will be collected using Summa Canisters. The samples will be analyzed for VOCs using USEPA Method TO-15. The results will be compared to the appropriate Matrix 1 and Matrix 2 tables found in the NYSDOH 2006 Guidance Document. Based on the results of this analysis, the SVE system will be permanently decommissioned if contaminants are below SCGs or it will re-started and operated until the remedial goals have been achieved. Post-mitigation testing will also be discussed as part of the SVE Workplan.

6.0 STANDARD OPERATING PROCEDURE

1. All sampling equipment, not considered disposable will be decontaminated using *Alconox*, a laboratory grade detergent, and rinsed with water before and after each use to ensure that cross-contamination of samples is eliminated.

2. All samples will be delivered, under strict chain of custody procedures to York Analytical Laboratory, a NYSDOH ELAP approved (#10854) laboratory. Each sample collected for analysis will be recorded on a Chain-of-Custody form. If an error is made while completing the multi-part form, a single line is drawn through the error and initialed by field personnel. A copy of the completed form is maintained by field personnel, once transfer of custody of the samples is documented by signing of release by field personnel. The Chain-of-Custody form accompanies the samples during shipment to the laboratory and each transfer of custody is documented. Further details pertaining to acceptable COC procedures are provided in the ASTM guidance document D4840-99; *Standard Guide for Sample Chain-of-Custody Procedures16.*

3. All groundwater samples will be collected after a minimum of three well volumes of liquid have been purged for each well or groundwater sampling point. Liquid will be purged, utilizing a down well submersible pump. The pump will be placed within the top five feet of the water table, thereby removing the standing water at the top of the well and causing the well to fill form the screened area and assuring that a full exchange of water takes place. Groundwater sampling will be performed in accordance with EPA Region 1 guidance "low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells"- July 30, 1996 Revised January 19, 2010. This sampling will be performed utilizing a bladder pump system.

4. All soil samples will be collected using En Core samplers or containers with pre-weighed methanol to follow USEPA 5035 sampling procedures for VOC sampling.

5. Dust production during the aforementioned activities will be minimal. However, the presence of VOCs will be evaluated using a PID equipped with a 10.6 eV lb. Air monitoring for VOCs and dust will be monitored at the downwind perimeter of the work area on a continual basis. If total VOC vapor levels exceed 5 parts per million (ppm) above background, work will be halted and the actions contained in the Vapor Emission Response Plan followed. Particulates will be monitored upwind, downwind, and within the work area. If downwind concentrations exceed 150 micrograms per cubic meter over that of the upwind concentrations, action will be taken to reduce particulates. Prior to undertaking field activities, ***LEA*** will complete monitoring of air quality at the Site. After the completion of the air monitoring survey and the assessment of air quality indicates work can proceed with Level D personnel protection, the investigation will continue. During all excavation and sampling operations, ***LEA*** personnel will monitor the working area, i.e. within the area of the excavation, using the MicroTip^{tm}, HNU^{tm}, Photovac, Raesystem, and/or MSA 261^{tm} (or equivalent) to ensure that air quality within the working area does not pose a hazard. If the air monitoring indicates a hazard, the area will be immediately evacuated. Please refer to the Community Air Monitoring Program (CAMP) in Appendix B.

6. The scope of work establishes the minimum level of personnel protection. Additional measures will be implemented if necessary to protect personnel involved in the work and the public at large.

7. Conditions at the Site are not expected to warrant either Level B or Level C protection during the IRM based on known site conditions. Regardless, all workers present on-site will be familiar with proper protection procedures.

8. Given the nature of this IRM, as well as the nature of the contaminants which have the potential of being on-site, there is very little, if any, potential of the surrounding community being negatively

impacted by activities which will be conducted during this investigation. However, ***Laurel Environmental Associates, Ltd.*** will take every possible step to avoid any type of negative impact.

9. Drill cuttings are not expected, but if generated, those that exhibit no obvious sign of contamination will be placed under plastic tarps after being screened with a Photoionization Detector to determine the presence of organic contamination. Drill Cuttings that appear to be contaminated, discolored, chemical odor etc., will be stored, transported and disposed of in DOT approved 55-gallon drums. If an emergency occurs during the IRM, which in any event may impact the surrounding community, all appropriate emergency resources listed under the Emergency Contingency Plan within the HASP will be immediately notified.

7.0 REPORT OF FINDINGS

An IRM Report will be prepared following the completion of fieldwork and laboratory analysis. The report will include the following items at a minimum:

1. Area/Site Location Map
2. Site Map/Site Sketch
3. Laboratory Data and Data Usability Summary Report (DUSR)
4. Table of analytical results highlighting any exceedance of applicable standards or guidelines
5. Summary of Findings and Recommendations

Regular progress reports will be submitted as per the Order on Consent.

8.0 HEALTH AND SAFETY PLAN

The purpose of the Health and Safety Plan (HASP) is to assign responsibilities, establish the minimum personnel protection standards and operating procedures and provide for contingencies that may arise while remediation or investigations are being performed at the subject property. The HASP is included in Appendix A of this report.

9.0 COMMUNITY AIR MONITORING PROGRAM

Due to the nature of known contaminates of concern and/or potential contaminants at the Site, real-time air monitoring for volatile organic compounds (VOCs) and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary during all ground intrusive activities. The Community Air Monitoring Plan (CAMP) regarding the subject property will involve VOC and particulate monitoring. Dust suppression with water mist will be utilized during excavation activities that are prone to release of dust. No other additional monitoring requirements should be necessary per consultation with appropriate NYSDEC/NYSDOH staff. Continuous monitoring will be completed 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. The CAMP is in included in Appendix B of this report.

10.0 PERSONNEL

Laurel Environmental Associates, Ltd. personnel are 40-Hour OSHA trained and certified to handle all aspects of the scope of work as presented. Scott Yanuck, ***LEA*** Hydrogeologist is the Project Manager, Carla Sullivan, ***LEA*** Senior Geologist is the site Health and Safety Officer, and the Quality Assurance/Quality Control Officer (QAO) for the project. ***LEA*** may or may not involve subcontractors to complete the aforementioned work. 20 W. Centennial Corp. is the owner of the subject property. The NYSDEC will be informed of any changes in personnel. Please refer to Appendix G of this report for resumes of the principal parties.

11.0 NOTIFICATION

The Project Manager will notify the NYSDEC and NYSDOH, via telephone and written electronic communiqué, prior to the initiation of any field activities at the Site. If necessary, a written notice will be sent to the adjacent property owners for the Site and other impacted or interested members of the public as well as to municipal officials of the municipality in which the Site is located, if the Site property is subject to this guidance. All notifications will include the following information:

1. Project Manager, name/address/phone number.
2. The name and address of the Site.
3. The valid Department site identification number.
4. A brief description of the current use and occupancy of the Site.
5. The nature of the sampling activities or remedial action to be performed.
6. The anticipated start date of the sampling activities or remedial action.

If required by the NYSDEC and/or the NYSDOH, ***LEA*** will prepare a fact sheet announcing the investigation to neighbors of the Site, community leaders and the media. Additional fact sheets about the investigation may be prepared and sent as the project proceeds.

If required by the NYSDEC a Citizen Participation Plan, that will includes a schedule for when ***LEA***, under the direction of the NYSDEC, anticipates issuing fact sheets, holding public meetings, etc., as well as information on site history, a glossary of terms, and other information pertaining to the project Site.

If there is significant interest in a project, and/or required by the NYSDEC, ***LEA*** may hold a public meeting before or during an investigation which may include representatives from the NYSDEC, NYSDOH and NCDH, attending the meeting to answer citizens' questions.

If appropriate, less formal meetings, such as availability sessions may be held to allow local citizens, neighboring property owner, etc., the opportunity to speak one-on-one with the engineers, geologists and health department staff involved with a site.

12.0 QUALITY ASSURANCE/QUALITY CONTROL - DUSR

A Quality Assurance/Quality Control (QA/QC) Program and Data Usability and Summary Report (DUSR) will be implemented to insure accuracy in sampling, analysis and reporting. A checklist will be utilized based on USEPA 330/9-81-003R, 1984, and used in conjunction with maintaining a field log, which will document all critical field activities and events. In addition, it will assure that procedures such as calibration of field instruments are completed. A copy of the completed quality assurance field audit check list along with completed data forms will be incorporated into the report. A detailed QA/QC –DUSR protocol is included in Appendix D of this report.

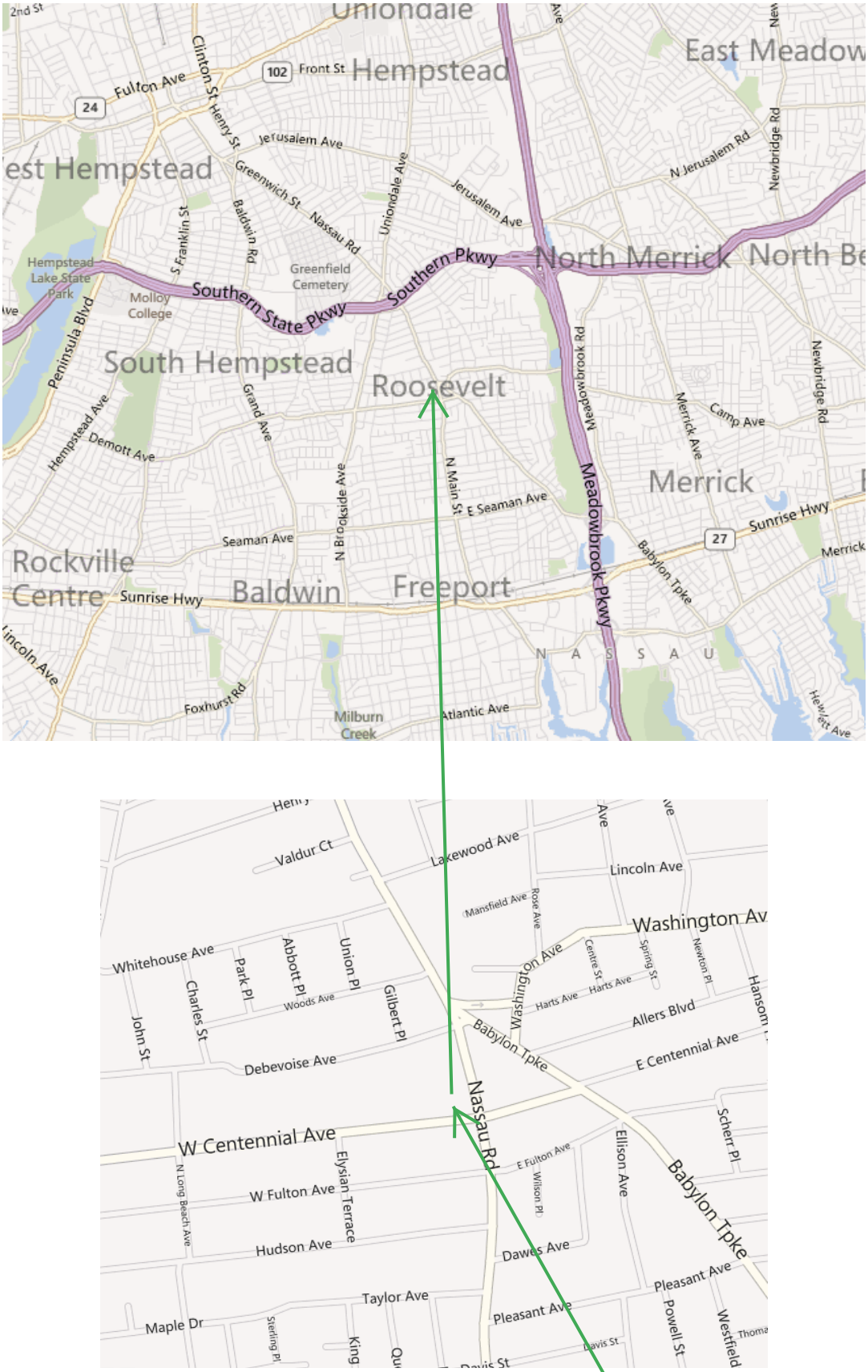
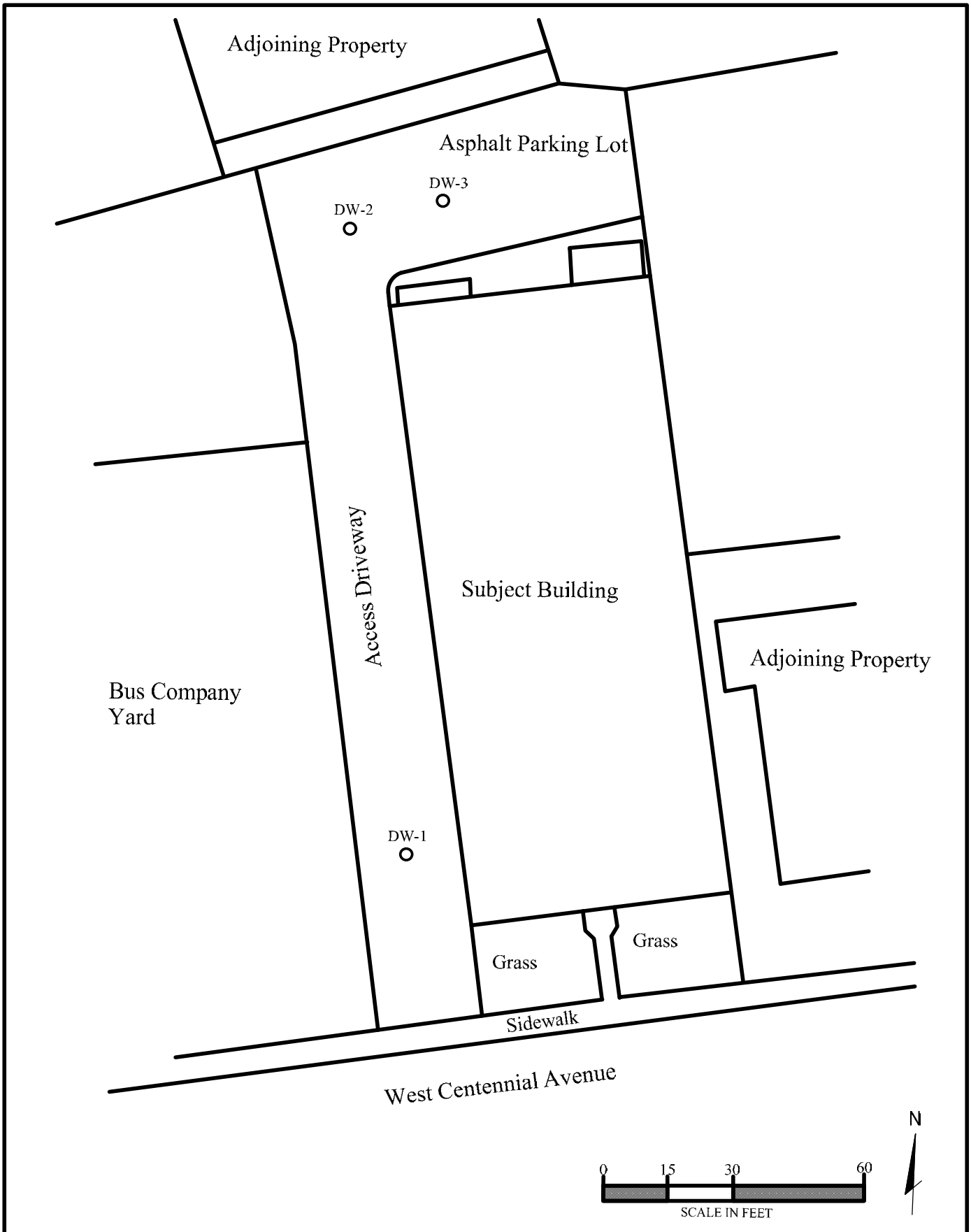


Figure 1.0 Site Location
20 West Centennial Avenue
Roosevelt, New York



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HUNTINGTON STATION, NY 11746

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FIGURE 2.0
SITE LAYOUT

20 WEST CENTENNIAL AVENUE
ROOSEVELT, NEW YORK

LEA makes no guarantees to the accuracy of this drawing and it should only be used for informational purposes

PROJECT NO.: 12-260	
DRAWING DATE: 8/24/12	
DRAWN BY: BMC	
CHECKED BY: THJ	
REVISIONS: 10/08/12	
REVISIONS:	
SCALE: 1 : 30	

LEGEND

= Fence

= open grate manhole

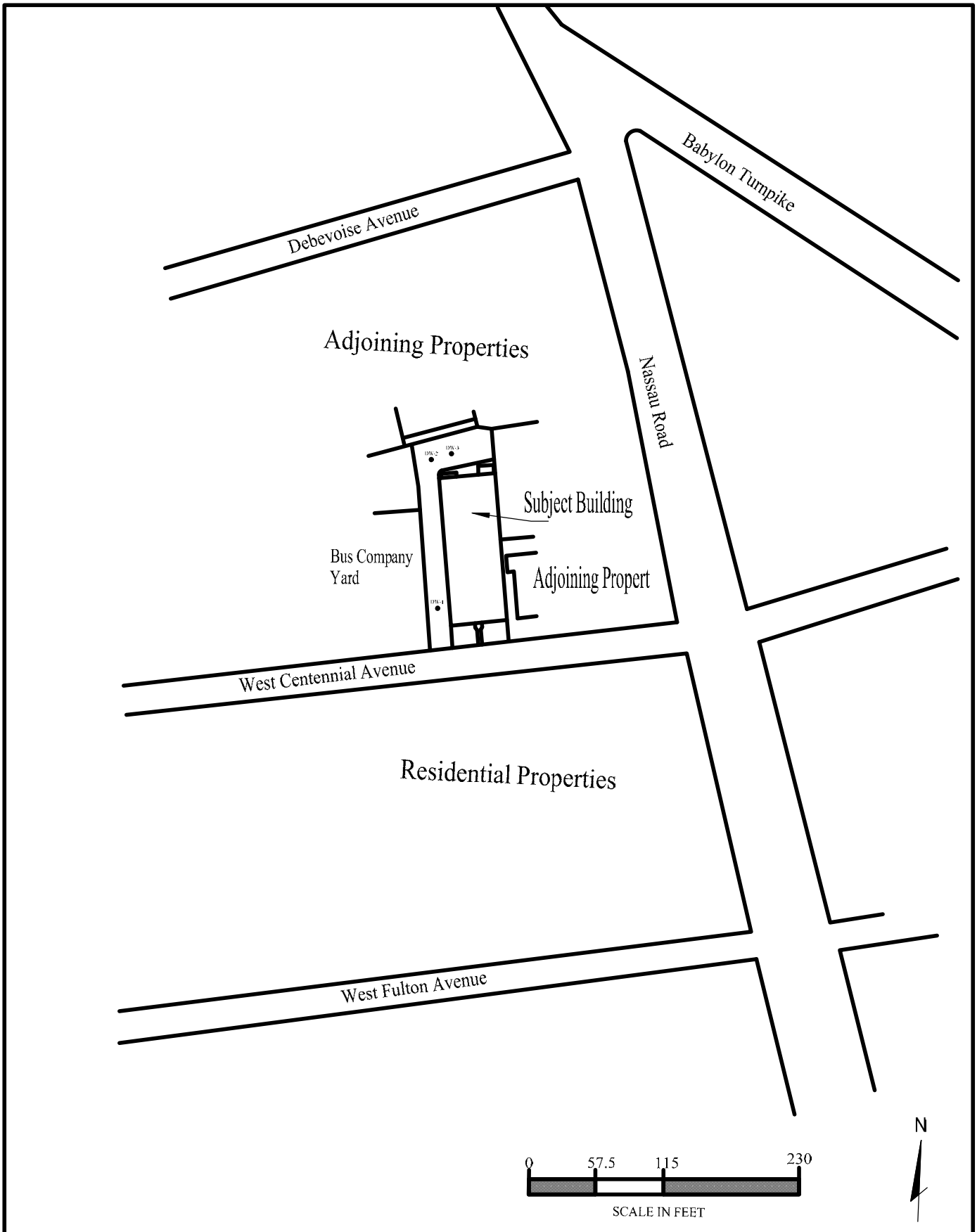

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FIGURE 3.0
SITE LAYOUT &
SURROUNDIGN PORPERTIES

20 WEST CENTENNIAL AVENUE
ROOSEVELT, NEW YORK

PROJECT NO.: 12-260
DRAWING DATE: 8/24/12
DRAWN BY: BMC
CHECKED BY: THJ
REVISIONS: 10/08/12
REVISIONS:
SCALE:1 : 115

LEGEND

○ = open grate dry wells

feet 2000
meters 600

Figure 4.0 Public Water Supply Well Locations
20 West Centennial Avenue
Roosevelt, New York

Site Location

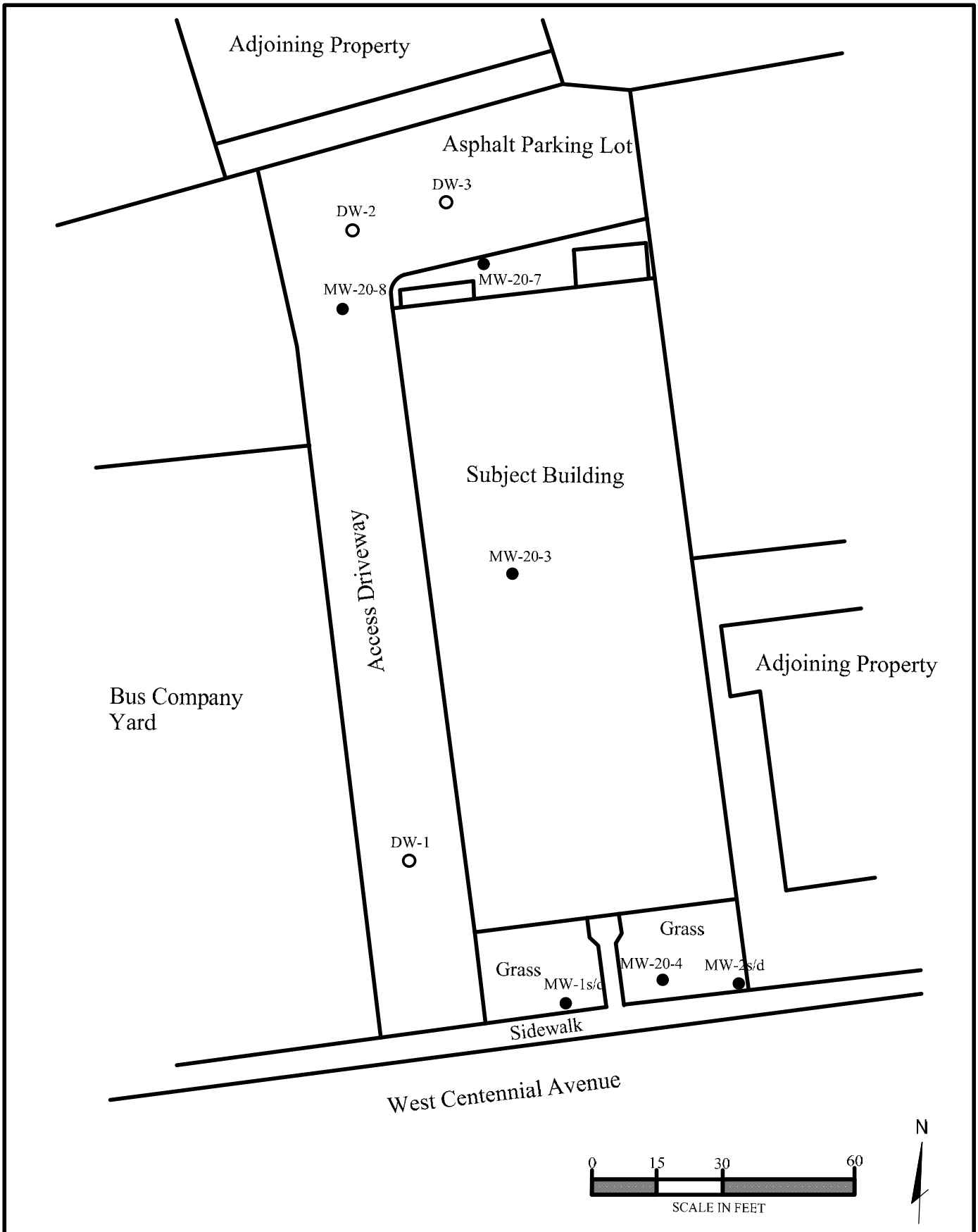

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FIGURE 5.0
MONITORING WELL LOCATIONS

20 WEST CENTENNIAL AVENUE
ROOSEVELT, NEW YORK

LEA makes no guarantees to the accuracy of this drawing and it should only be used for informational purposes

PROJECT NO.: 12-260	
DRAWING DATE: 8/24/12	
DRAWN BY: BMC	
CHECKED BY: THJ	
REVISIONS: 10/08/12	
REVISIONS:	
SCALE: 1 : 30	

LEGEND

= Fence

= open grate manhole

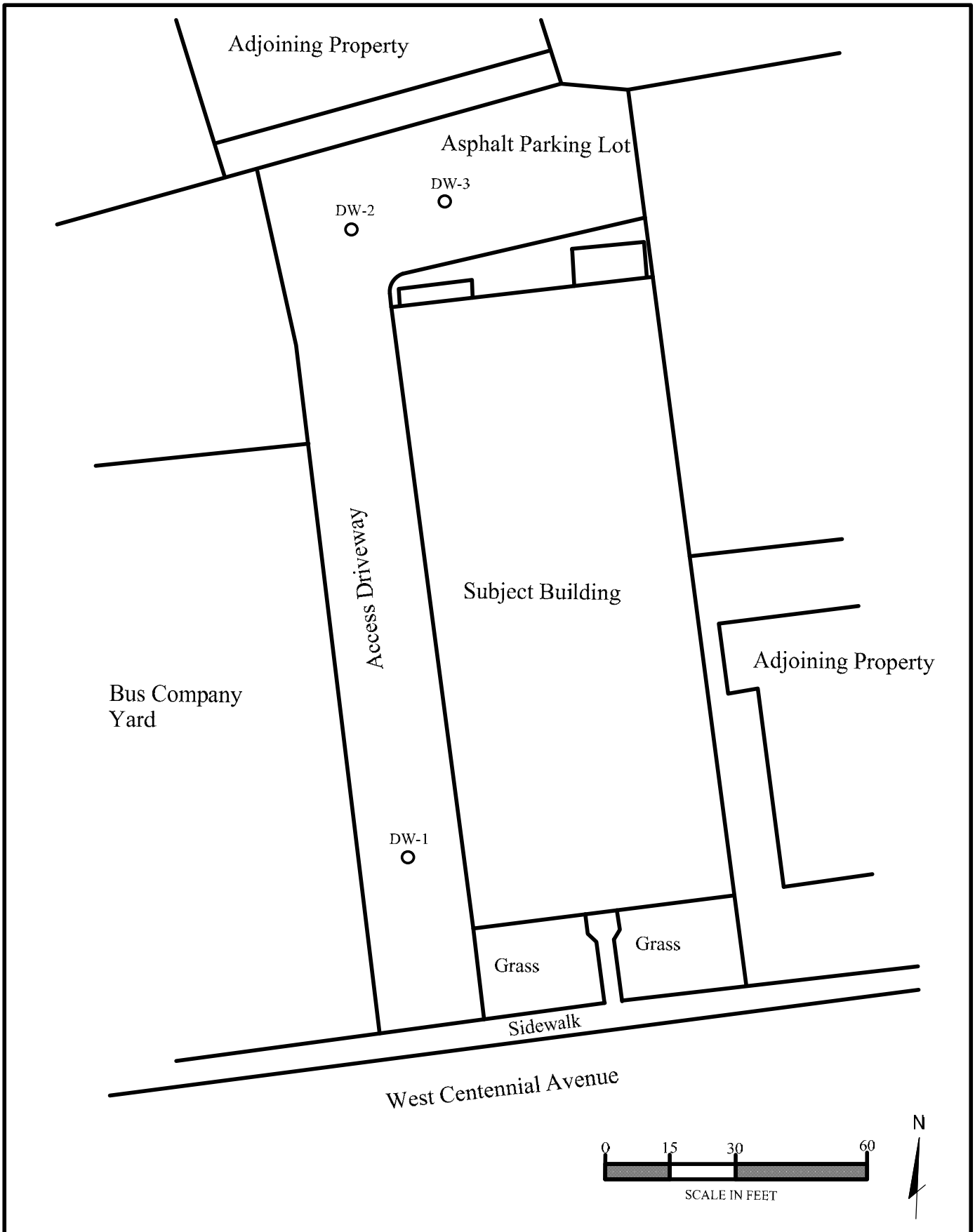

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FIGURE 6.0
INTERIM REMEDIAL MEASURE SITE PLAN

20 WEST CENTENNIAL AVENUE
ROOSEVELT, NEW YORK

PROJECT NO.: 12-260
DRAWING DATE: 8/24/12
DRAWN BY: BMC
CHECKED BY: THJ
REVISIONS: 10/08/12
REVISIONS:
SCALE: NOT TO SCALE

LEGEND

= Fence

= open grate manhole

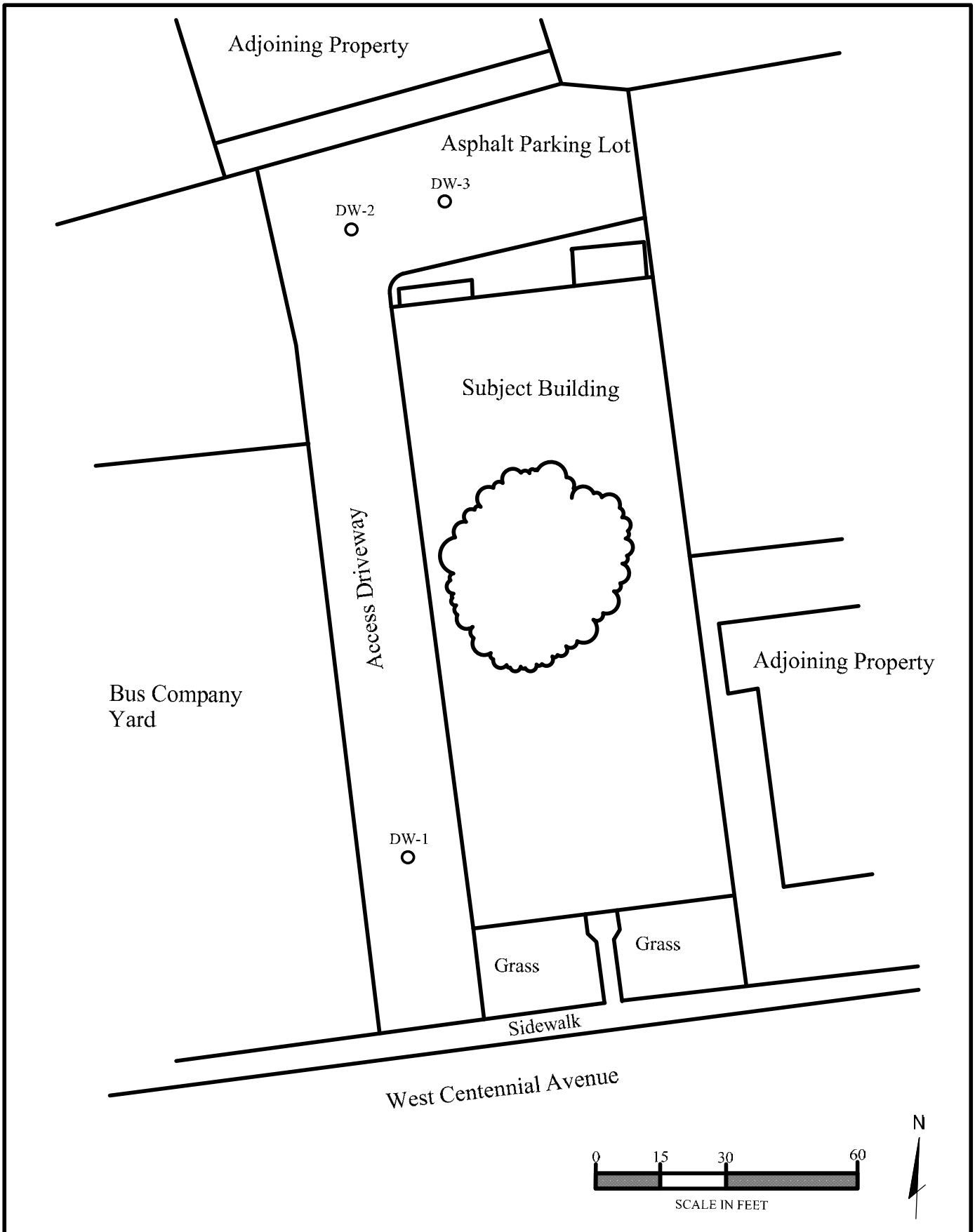

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FIGURE 6.1
EXCAVATION PLAN

20 WEST CENTENNIAL AVENUE
ROOSEVELT, NEW YORK

PROJECT NO.: 12-260	
DRAWING DATE: 8/24/12	
DRAWN BY: BMC	
CHECKED BY: THJ	
REVISIONS: 10/08/12	
REVISIONS:	
SCALE: 1 : 30	

LEGEND

= open grate manhole

= Excavation Area

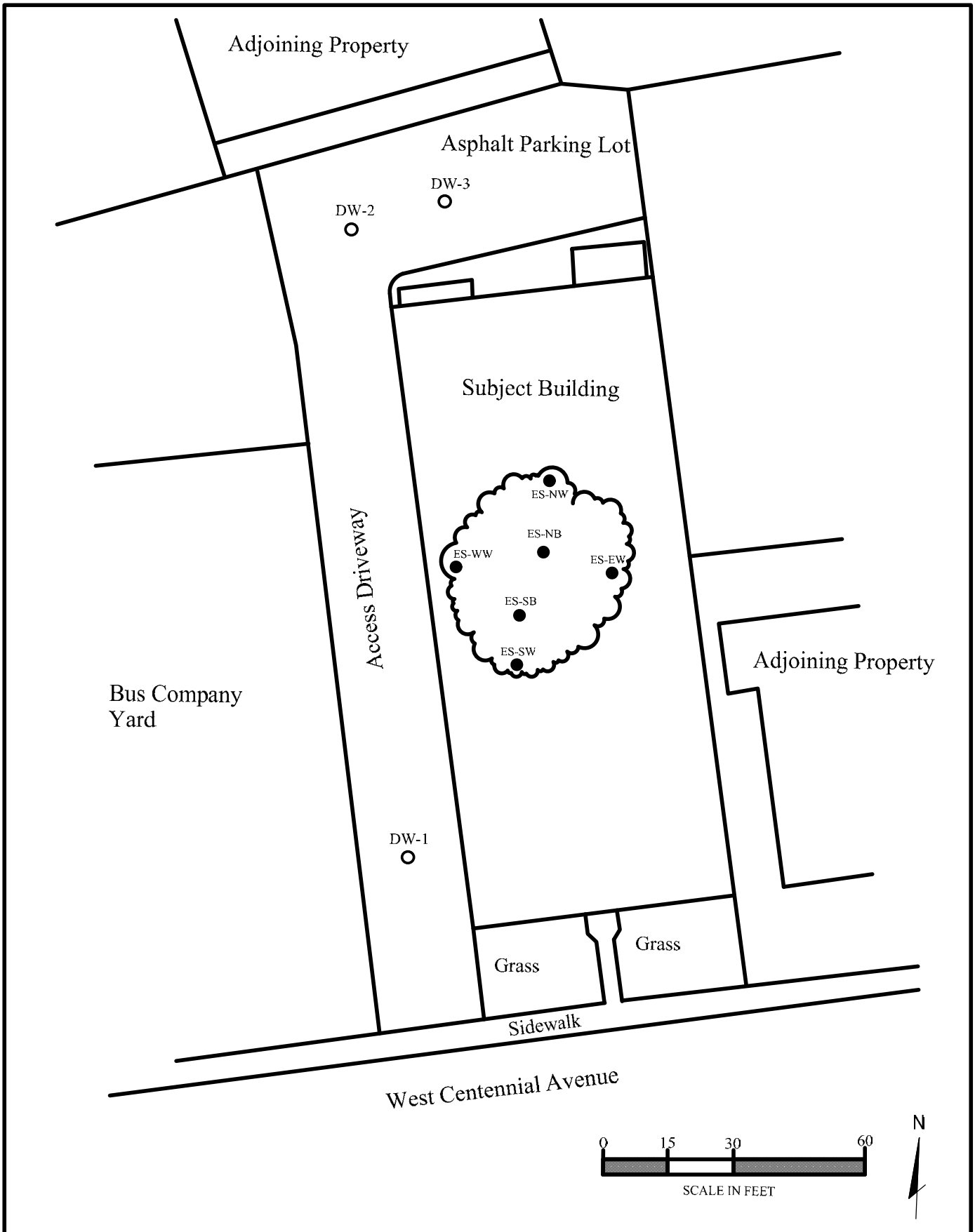

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FIGURE 6.2
ENDPOINT SAMPLING PLAN

20 WEST CENTENNIAL AVENUE
ROOSEVELT, NEW YORK

PROJECT NO.: 12-260	
DRAWING DATE: 8/24/12	
DRAWN BY: BMC	
CHECKED BY: THJ	
REVISIONS: 10/08/12	
REVISIONS:	
SCALE: 1 : 30	

LEGEND

= open grate manhole

= Excavation Area

= Endpoint Sampling

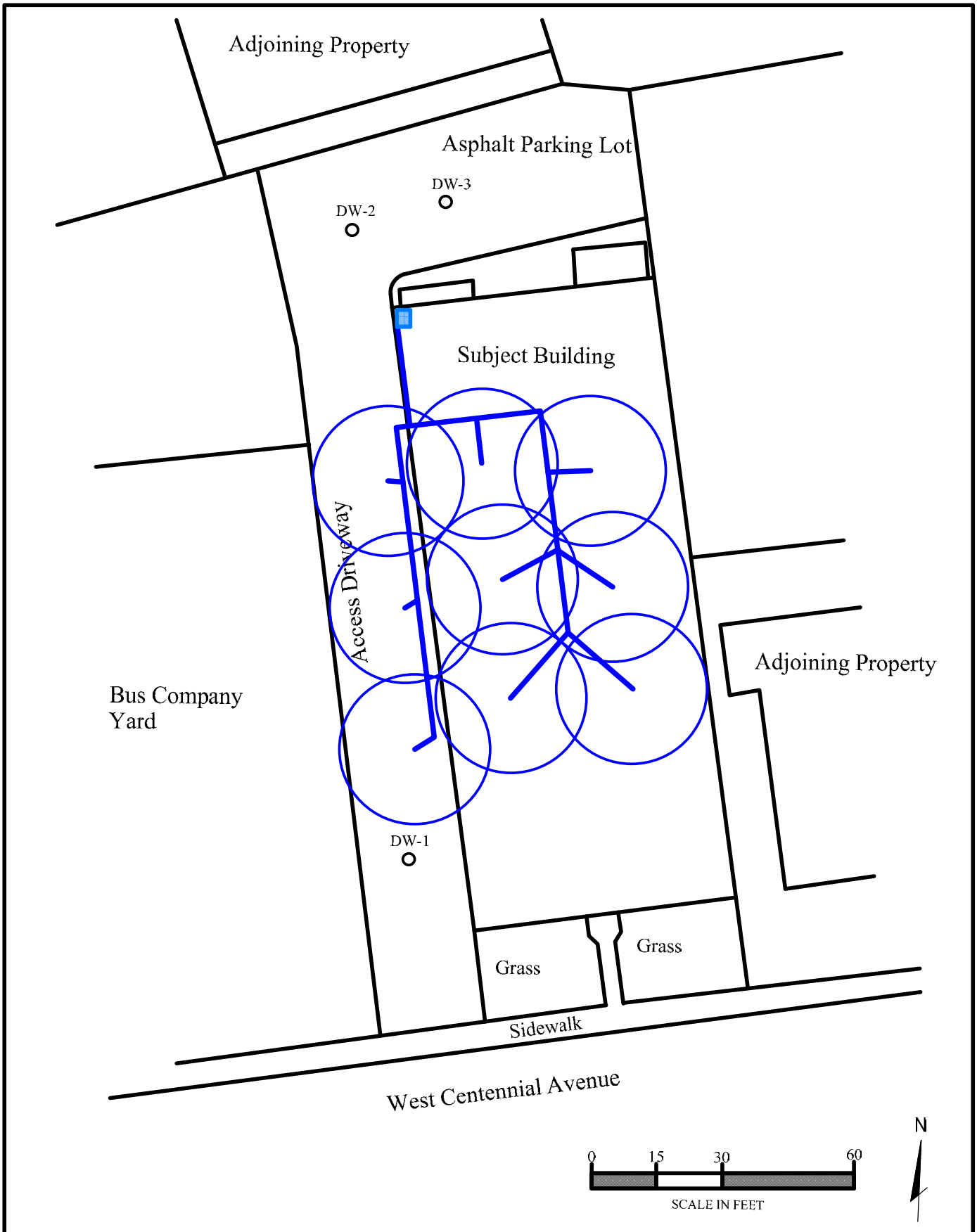

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FIGURE 6.3
SVE Treatment System
Conceptual Model

20 WEST CENTENNIAL AVENUE
ROOSEVELT, NEW YORK

PROJECT NO.: 12-260	
DRAWING DATE: 8/24/12	
DRAWN BY: BMC	
CHECKED BY: THJ	
REVISIONS: 11/28/12	
REVISIONS:	
SCALE: 1 : 30.00	

LEGEND

= SVE Piping
= open grate manhole
= Vapor Extraction Area
= Rendeiation System

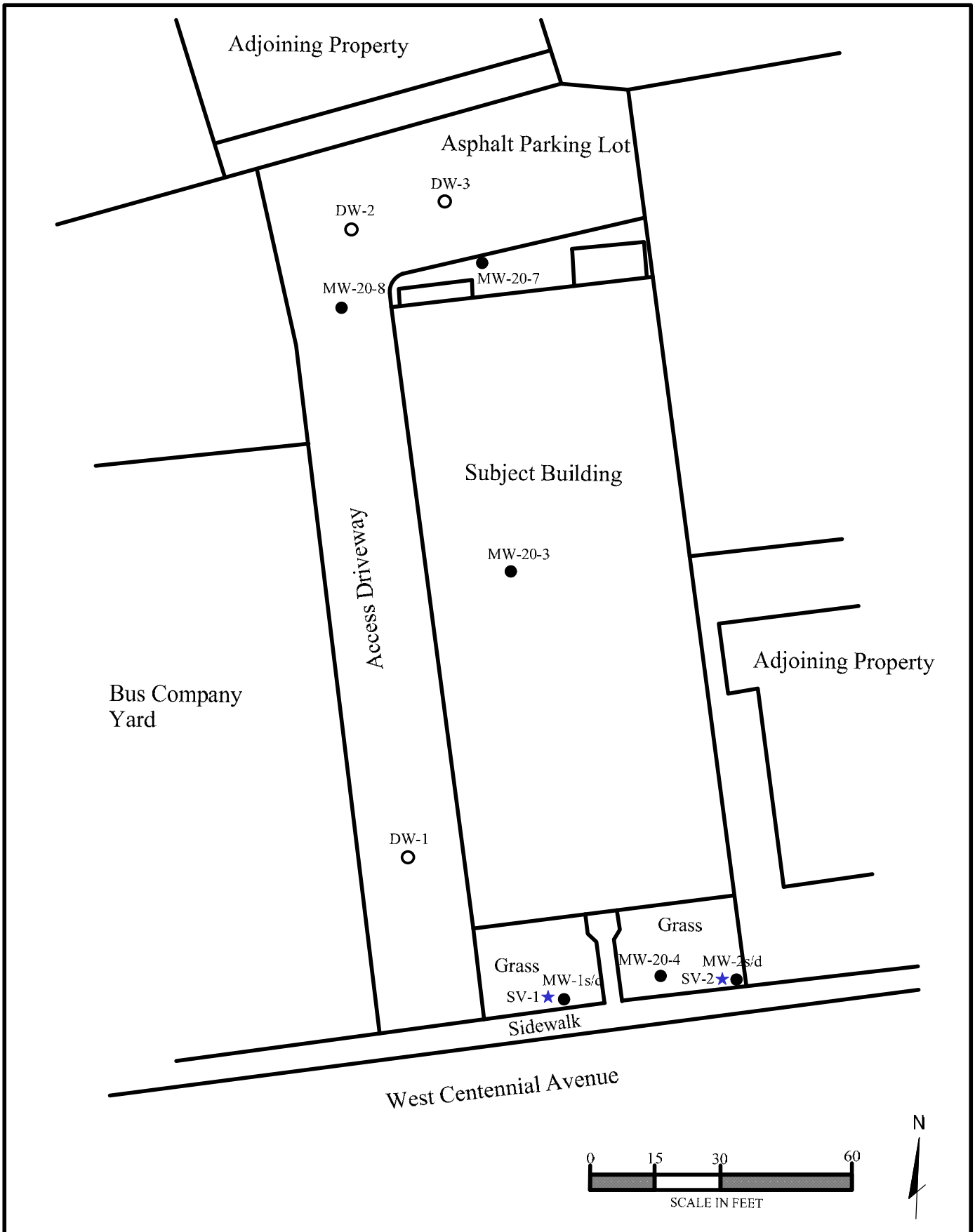

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FIGURE 6.4
SOIL VAPOR SAMPLING PLAN

20 WEST CENTENNIAL AVENUE
ROOSEVELT, NEW YORK

PROJECT NO.: 12-260
DRAWING DATE: 04/04/13
DRAWN BY: BMC
CHECKED BY: THJ
REVISIONS:
REVISIONS:
SCALE: 1 : 30

LEGEND

= Fence

= open grate manhole

= Proposed Soil Vapor Sampling Location

APPENDIX A

Health and Safety Plan

INTERIM REMEDIAL MEASURES
HEALTH AND SAFETY PLAN

20 W. CENTENNIAL CORP.
20 WEST CENTENNIAL AVENUE
ROOSEVELT, NEW YORK 11575

August 27, 2012
NYSDEC Site Code # 1-30-154
Order of Consent # W1-1137-09-06
***LEA* PROJECT # 12-260**

Carla Sullivan
Health and Safety Officer

TABLE OF CONTENTS

LAUREL Environmental Associates, Ltd. • 53 West Hills Rd, Suite 1 • Huntington Station, NY • 11746 • phone (631) 673-0612 • fax (631) 427-5323

HEALTH AND SAFETY PLAN
FOR USE DURING INTERIM REMEDIAL MEASURES

1.0 PURPOSE

The purpose of this Health and Safety Plan (HASP) is to assign responsibilities, establish minimum personnel protection standards and operating procedures and provide for contingencies that may arise while operations are being performed at the subject site, 20 West Centennial Avenue, Roosevelt, New York. The proposed Interim Remedial Measures (IRMs) will include the excavation and off-site treatment/disposal of impacted soils, collection of endpoint samples, restoration of the excavation and completion and upstart of a soil vapor extraction (SVE) system; all as described in the Work Plan.

Laurel Environmental Associates, Ltd. (LEA) and it subcontractors will be responsible for providing materials, equipment and labor required by the HASP. The protocols of the HASP will be followed by all personnel involved in the work, including employees and agents of Contractors, Subcontractors and Owner. Mr. Scott Yanuck, ***LEA*** Hydrogeologist is the Project Manager, Carla Sullivan is the Health and Safety Officer, and Carla Sullivan is the Quality Assurance/Quality Control Officer for the project.

This HASP establishes the minimum level of personnel protection. Additional measures will be implemented if necessary to protect personnel involved in the work and the public at large.

Conditions at the site are not expected to warrant either Level B or Level C protection during the IRM based on known site conditions. Regardless, all workers present on site will be familiar with proper protection procedures and the HASP. All personnel scheduled to work at the site are 40-hour OSHA HAZWOPER CFR 1910.120 trained, with 8-hour refreshers up to date.

Given the scope of the work, and the type of contaminants on-site, there is a low potential of the surrounding community being negatively impacted by activities which will be conducted during this investigation. ***Laurel Environmental Associates, Ltd.*** will take every possible step to avoid any type of negative impact.

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20 West Centennial Avenue, Roosevelt, New York is currently unoccupied. To avoid disrupting business or exposing employees of neighboring businesses and the general public to low level contaminants, excavated soils will be field screened with a Photoionization Detector (PID) to determine the presence of organic contamination. All excavated soils will be moved by covered container and placed into lined roll-off container staged along the street-side. If an emergency occurs during the measures, which in any event may impact the surrounding community, all appropriate emergency resources listed under the Emergency Contingency Plan Section of this plan will be immediately notified.

2.0 HAZARD EVALUATION

Elevated levels of volatile organic compounds (VOCs) in the atmosphere may occur during on-site activities. The presence of VOCs will be evaluated using a Photoionization Detector (PID). Additionally, elevated levels of particulate concentrations may occur during the activities. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10). Prior to undertaking field activities, ***LEA*** will complete monitoring of air quality at the site as discussed in the Community Air Monitoring Program (CAMP). Results from the air monitoring will determine if Level D personnel protection of workers is appropriate or a higher level of protection is required. Please refer to the CAMP for monitoring and appropriate actions guidelines.

During all activities, ***LEA*** personnel will monitor the area around the excavation using a PID to ensure that the appropriate worker protection is maintained for the level of pollutants found. If air monitoring indicates contaminant concentrations pose a risk to workers, the area will be immediately evacuated. Guidelines that will be followed before continuing are noted in Table 1 on the following page. If conditions warrant, Level B and C protection will be worn.

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Table 1
Atmospheric Hazard Guidelines

Hazard	Monitoring Equipment	Measured Level	Action
Explosive Atmosphere	Combustible Gas Indicator	<10% LEL	Continue investigation.
		10%-20% LEL	Continue on-site monitoring with extreme caution as higher levels are encountered.
		>20% LEL	Explosion hazard. Withdraw from area immediately.
Oxygen	Multi RAE	Oxygen conc.	
		<19.5%	Withdraw from area. NOTE: Combustible gas readings are not valid in atmosphere with oxygen levels of less than 19.5%
		19.5% - 23.5%	Continue investigation with caution.
		>23.5%	Fire hazard potential. Discontinue investigation. Withdraw from area.
Organic gases and vapors	PID	Background	Continue work
		5 ppm	Temporarily halt work until average readings drop below 5 ppm
		5 - 25 ppm	Halt work, identify and remedy or abate source Continue work once average readings drop below 5 ppm
		Above 15 ppm	Work must be shut down. Evaluate alternative approaches
Particulates	PM-10	Background	Continue work
		100 mcg/m3 above background	Implement dust suppression techniques Continue work if levels are below 150 mcg/m3 and no visible dust is migrating off-site
		above 150 mcg/m3	Stop work to re-evaluate suppression techniques

Notes:
1. LEL = Lower Explosive Limit

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3.0 SITE CONTROL

3.1 Site Work Locations:

Activities involving the air monitoring and excavation will be performed within the building. The work area is the locations in which the actual activities will occur. Workers entering these areas are required to be protected as defined below. Only authorized personnel, including personnel conducting the work activities involved, and specialized personnel such as subcontractors engaged in well installation and operation of heavy equipment, will be allowed in the work areas. Within the work areas, the levels of protection will be determined based on the degree of hazard present, as detected by the measurements obtained with the PID, and/or other activity-specific monitoring equipment. As an engineering control, a regenerative air blower may be used to reduce the potential for dangerous concentrations of VOCs in the breathing zone near the excavation, if warranted.

3.2 Work Zones:

Work zones will be defined prior to the commencement of work activities. These work zones will limit equipment, operations and personnel in the areas as defined below:

Exclusion Zone - This shall include all areas where potential environmental monitoring has shown or is suspected that a potential chemical hazard may exist to workers. This will include down-wind locations. If a chemical hazard exists at downwind locations, the exclusion zone will be expanded as necessary. The level of PPE required in these areas shall be determined by the Site HSO after air monitoring and on-Site inspection has been conducted. The area shall be clearly delineated from the decontamination area. As work proceeds, the delineation boundary shall be relocated as necessary to prevent the accidental contamination of nearby people and equipment.

Contamination Reduction Zone - This zone will occur at the interface between the Exclusion Zone ("Hot Zone") and Support Zone ("Clean Zone") and shall provide a transfer of personnel and equipment to and from the Support Zone to the Exclusion Zone. This zone is for the decontamination of personnel and equipment prior to entering the Support Zone, and for the physical segregation of the Support Zone and Exclusion Zone. The contamination reduction zone will be placed along the Westside of the building near the northern most access doors. Access to the Contamination Reduction Zone by the public and employees of commercial business will be restricted during the IRMs.

Support Zone - This area is the remainder of the work Site and project Site. The support zone will be staged near company vehicles at the gated entrance to the site along the north side of West Centennial Avenue. The function of the Support Zone includes:

A. An entry area for personnel, material and equipment to the Exclusion Zone of site operations through the Contamination Reduction Zone
B. An Exit for decontamination personnel, materials and equipment from the "Decon" area of Site operations
C. The Housing of Site special services
D. A storage area for clean safety and work equipment

Small decontamination areas may be set up adjacent to the work area to facilitate decontamination of equipment that is reused throughout the field activity.

3.3 Dust and Odors:

If during excavation, dust or odors emanating from contaminated soils are deemed excessive at adjoining properties and commercial businesses, the excavation will be temporarily covered with poly sheeting. The sheeting will be shifted as necessary to allow for continued excavation. Furthermore, the excavation will be covered with poly sheeting at the end of each work day to reduce odors. As excavation work is slated for the winter months, volatilization of contaminants and resultant odors will be minimized.

3.4 Security:

Periodic security patrols will be conducted to ensure that adequate security is being maintained. Only workers authorized by the field manager may be allowed to enter the Site. Warning signs will be posted to discourage entry by unauthorized personnel. The HSO will brief all visitors of all security and safety plans.

The excavation of impacted material will be performed within the building interior. At the end of each work day, all access to the building interior will be secured by closing and locking all building entrances.

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3.5 Site Communications:

Communications on-Site will be conducted through verbal communications. When out of audible range, verbal communications may be assisted using mobile telephones and two-way radios.

4.0 PERSONAL PROTECTIVE EQUIPMENT

All on-site workers will be familiar with proper protection procedures and this Health and Safety Plan. Level D personal protective clothing will be worn at the outset.

As stated above Level B or C protection will be worn as required. General descriptions of Level C and B protection are presented in Tables 2 and 3 on the following page, respectively. If it is necessary to wear Level B or C protection, the work area shall be separated into three Zones: an Exclusion Zone, a Contamination Reduction Zone, and a Support Zone. No one but protected personnel shall be in the Exclusion and Contamination Reduction Zones. An entrance and exit point shall be designated and monitored to ensure that no unauthorized personnel enter the area. Everyone that enters the area shall log in the field note book with the length of time spent in the area and the task performed noted.

All workers shall wear gloves when handling soil/sludge and apparatus. Gloves shall also be worn while cleaning the sampling equipment.

If any personnel must be lowered into a confined spaces additional procedures must be followed. ***LEA*** will provide the confined space procedures. ***LEA*** will monitor the confined space prior to entry and complete the confined space permit. If needed, dilution or exhaust ventilation will be provided to lower contaminant levels.

All persons working in the confined space must have confined space awareness training and a confined space supervisor must be present. ***LEA*** will perform continuous air monitoring for oxygen, flammability and toxins. At a minimum, carbon monoxide and hydrogen sulfide will be monitored in addition to other site-specific chemicals determined to be a hazard. All personnel working in or monitoring the confined space activities must be properly OSHA confined space entry trained. An approved safety harness and tripod will be employed. Personnel at grade will be constantly monitoring the worker in the pool for signs of fatigue, heat stress or behavior change.

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Table 2
LEVEL C PROTECTION

1. Full-face or half-mask, air purifying, canister equipped respirators (NIOSH approved) for those contaminants present.
2. Hooded chemical resistant clothing: (overalls; two-piece chemical-splash-suit; disposable chemical-resistant overalls).
3. Coveralls*
4. Gloves, outer, chemical-resistant
5. Gloves, inner, chemical-resistant
6. Boots (outer), chemical-resistant, steel toe and shank
7. Boot-covers, outer, chemical-resistant, (disposable)*
8. Hard hat
9. Escape mask*
10. Two-way radios (worn under outside protective clothing)
11. Face shield*

*Optional, as applicable.

Table 3
LEVEL B PROTECTION

1. Pressure-demand, full-faceplate self-contained breathing apparatus (SCBA), or pressure demand supplied air respirator with escape SCBA (NIOSH approved)
2. Hooded chemical-resistant clothing (overalls and long-sleeved shirts) jacket; coveralls; one or two-piece chemical-splash suit; disposable chemical-resistant overalls).
3. Coveralls*
4. Gloves, outer chemical-resistant
5. Gloves, inner, chemical-resistant.
6. Boots, outer, chemical resistant steel toe and shank
7. Boot-covers, outer, chemical-resistant (disposable)
8. Hard hat
9. Two-way radios (worn inside encapsulating suit)
10. Face shield*

* Optional, as applicable

5.0 PERSONNEL SAFETY/HYGIENE

The safety practices to be followed by all on-site personnel include:

1. If Level B or C protection must be worn, eating, drinking, chewing gum or tobacco, smoking or any practice that increases the probability of hand-to-mouth transfer and ingestion of materials is prohibited in the Exclusion and Contamination Reduction Zones. All workers must be trained, medically qualified and fit tested in the use of respirators.

2. Hands and face must be thoroughly washed before eating, drinking or any other personal hygiene activities.

3. No excessive facial hair, which interferes with a satisfactory fit of the mask to face seal, is allowed for personnel to wear respiratory protective equipment.

6.0 PERSONNEL TRAINING

At the start of the job before engaging in any work, all personnel will be briefed on the following:

1. The person in charge as safety officer
2. Boundaries, entry and exit point locations of the work zones, if established
3. Use of personnel protection equipment
4. Principles of personnel hygiene
5. Location of first-aid equipment
6. Evacuation procedures to be followed in case of emergencies
7. Heat stress symptoms. All personnel will be advised to watch for signs of heat stress.

New personnel will be briefed on the same points prior to starting work at the site.

7.0 DECONTAMINATION PROCEDURES

If Level B or C protection is worn, decontamination procedures shall be performed in the Contamination Reduction Zone. All disposable garments and spent cartridges/canisters from respiratory equipment will be stored, transported, and properly disposed of in DOT approved 55-gallon drums. Potentially contaminated equipment will be cleaned before leaving the site.

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8.0 EMERGENCY CONTINGENCY PLAN

In the event of physical injury, the safety officer or any other qualified person will initiate first aid and, if necessary, call the ambulance. If a chemical exposure is encountered, a physician will be informed, as specifically as possible, of the chemical(s) to which the person had been exposed and the toxicological properties of the chemical(s).

In case of any emergency, the following resources might need to be contacted:

A. Local Resource
   Fire Department: **911**
   Police Department: **911**

B. Hazardous Waste Spills
   New York State Department of Environmental Conservation **1-800-457-7362**
   Nassau County Department of Health, **516-571-6000**
   Laurel Environmental Associates, Ltd.: Nights and Weekend Emergencies **516-971-6332**

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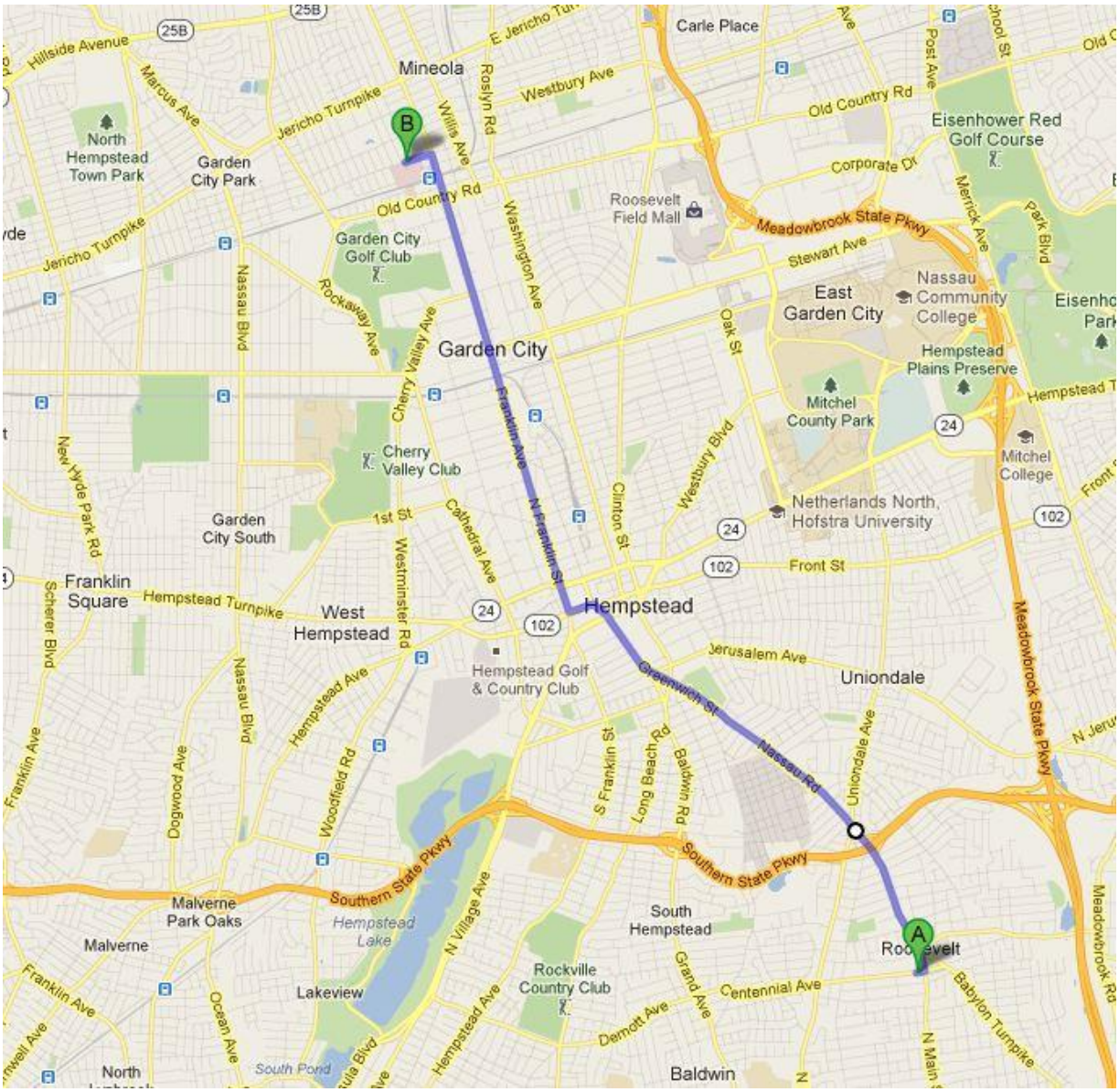
C. Hospital
259 1st Street
Mineola, New York 11501
Telephone: (866) 946-8476
Total Distance: 5.8 Miles
Approximate Driving Time: 17 Mins.
Start: 20

1.	Head **east** on **W Centennial Ave** toward **Nassau Rd**	go 253 ft total 253 ft
2.	Turn left onto **Nassau Rd** About 5 mins	go 1.6 mi total 1.6 mi
3.	Continue onto **Greenwich St** About 3 mins	go 1.2 mi total 2.9 mi
4.	Turn left onto **Front St**	go 0.1 mi total 3.0 mi
5.	Take the 1st right onto **N Franklin St** About 7 mins	go 2.4 mi total 5.4 mi
6.	Continue onto **Mineola Blvd** About 50 secs	go 0.2 mi total 5.7 mi
7.	Turn left onto **1st St** Destination will be on the left About 1 min	go 0.2 mi total 5.8 mi



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9.0 HEAT STRESS CASUALTY PREVENTION PLAN

A. Identification and Treatment

1) **HEAT EXHAUSTION**

Symptoms: Usually begins with muscular weakness, dizziness and a staggering gait. Vomiting is frequent. The bowels may move involuntarily. The victim is very pale, his/her skin is clammy and he/she may perspire profusely. The pulse is weak and fast, breathing is shallow. He/she may faint unless he/she lies down. This may pass, but sometimes it remains and death could occur.

First Aid: Immediately remove the victim to a shady or cool area with good air circulation. Remove all protective outerwear. Call a physician. Treat the victim for shock. (Make him lie down, raise his feet 6-12 inches, and keep him warm but loosen all clothing). If the victim is conscious, it may be helpful to give him sips of a salt water solution (1 teaspoon of salt to 1 glass of water). Transport victim to a medical facility.

2) **HEAT STROKE**

Symptoms: This is the most serious of heat casualties due to the fact that the body excessively overheats. Body temperatures are often are between 107°-110°F. There is often pain in the head, dizziness, nausea, oppression, and a dryness of the skin and mouth. Unconsciousness follows quickly and death is imminent if exposure continues. The attack will usually occur suddenly.

First Aid: Immediately evacuate the victim to a cool and shady area. Remove all protective outer wear and all personal clothing. Lay them on his back with the head and shoulders slightly elevated. It is imperative that the body temperature be lowered immediately. This can be accomplished by applying cold wet towels, ice bags, etc., to the head. Sponge off the bare skin with cool water or rubbing alcohol, if available, or even place them in a tub of cool water. The main objective is to cool the person without chilling them. Give no stimulants. Transport the victim to a medical facility as soon as possible.

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B. **Prevention of Heat Stress**

1) One of the major causes of heat casualties is the depletion of body fluids. On-site there will be plenty of fluids available. Personnel should replace water and salts lost from perspiration. Salts can be replaced by either a 0.1% salt solution, more heavily salted foods, or commercial mixes such as Gatorade®.

2) A work schedule will be established so that the majority of the work day will be during the morning hours of the day before ambient air temperature levels reach their highs if high air temperatures are anticipated.

3) A work/rest guideline will be implemented for personnel required to wear Level B protection, if this situation arises. This guideline is as follows:

Ambient Temperatures	***Maximum Working Time***
Above 90°F	< 1 hour
80° - 90° F	1 hour
70 °- 80° F	2 hours
60 °- 70° F	3 hours
50 °- 60° F	4 hours
40° – 50°F	5 hours
30° - 40° F	6 hours
Below 30° F	8 hours

A sufficient period will be allowed for personnel to "cool down". This may require separate shifts of workers during operations.

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APPENDIX B

Community Air Monitoring Program

INTERIM REMEDIAL MEASURES
COMMUNITY AIR MONITORING PLAN

20 W. CENTENNIAL CORP.
20 WEST CENTENNIAL AVENUE
ROOSEVELET, NEW YORK 11575

August 27, 2012
NYSDEC Site Code # 1-30-154
Order of Consent # W1-1137-09-06
***LEA* PROJECT # 12-260**

COMMUNITY AIR MONITORING PLAN
FOR USE DURING INTERIM REMEDIAL MEASURES

Due to the nature of known contaminates of concern and/or potential contaminants at the site, real-time air monitoring for volatile organic compounds (VOCs) and/or particulate levels at the perimeter of the exclusion zone or work area may be necessary. The scope of work regarding the subject property will involve VOC and particulate monitoring. No other additional monitoring requirements should be necessary per consultation with appropriate NYSDEC/NYSDOH staff. Continuous monitoring will be completed for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. For the purpose of this investigation, ground intrusive activities include, but are not limited to; excavation, application and installation of replacement monitoring wells.

Periodic monitoring for VOCs will be completed during non-intrusive activities such as the collection of endpoint samples and staging of drums. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while conducting ground intrusive activities, and taking a reading prior to leaving a sample/drum staging location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling and drum staging activities. Due to the close proximity of residential properties as well as an active shopping area, continuous air monitoring will be conducted during all phases of investigation at the site.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) will 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 will be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- 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 will be temporarily halted and monitoring

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continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.

- 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 will cease, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After which, work activities will 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.

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

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

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Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring will 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 will be fitted with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m3 above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m3 above the upwind level, work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration.

All readings must be recorded and be available for State (NYSDEC and NYSDOH) personnel to review.

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APPENDIX C

Sampling and Analysis Plan

INTERIM REMEDIAL MEASURES
SAMPLING AND ANALYSIS PLAN

20 W CENTENNIAL CORP.
20 WEST CENTENNIAL AVENUE
ROOSEVELT, NEW YORK 11575

AUGUST 27, 2012
REVISED OCTOBER 5, 2012
NYSDEC SITE CODE # 1-30-154
ORDER OF CONSENT # W1-1137-09-06
***LEA* PROJECT # 12-260**

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1.0 ACRONYMS

ARARs	Applicable or Relevant and Appropriate Requirements
AS	Air Sparge
bgs	below ground surface
CAMP	Community Air Monitoring Program
C&D	Construction and Demolition (debris)
CEC	Cation Exchange Capability
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFM	cubic feet per minute
COC	Contaminate of Concern
COD	Chemical Oxygen Demand
CPC	Chemical of Potential Concern
DNAPL	Dense non-aqueous phase liquid
DO	Dissolved Oxygen
DOT	Department of Transportation
EISB	Enhanced *In-situ* Bioremediation
EPA	Environmental Protection Agency
FWIA	Fish and Wildlife Impact Analysis
HASP	Health and Safety Plan
HP	Horsepower
HRA	Health Risk Assessment
HRC	Hydrogen Release Compound
GAC	Granulated Active Carbon
IHWS	Inactive Hazardous Waste Site
IIWA	Immediate Investigation Work Assignment
IRMs	Interim Remedial Measures
ISCO	In-Situ Chemical Oxidation
LBWD	Long Beach Water District
LEA	Laurel Environmental Associates Ltd
LDR	Land Disposal Restrictions
MNA	Monitored Natural Attenuation
MW	Monitoring Well
NCDH	Nassau County Department of Health
NCP	National Contingency Plan
NPL	National Priority List
NYSDOH	New York State Department of Health
NYSDEC	New York State Department of Environmental Conservation
O&M	Operation and Maintenance
OSHA	Occupational Safety and Health Administration
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PCE	perchloroethylene (same as tetrachloroethene)
PID	Photoionization detector
POTW	Publicly-Owned Treatment Works
ppb	parts per billion (µg/kg)
ppm	parts per million (mg/kg)
PRAP	Proposed Remedial Action Plan
QA/QC	Quality Assurance/Quality Control
RAGS	Risk Assessment Guidance for Superfund
RAP	Remedial Action Plan
RAO	Remedial Action Objective
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
ROI	Radius of Influence
SARA	Superfund Amendments and Reauthorization Act
SCGs	Standards, Criteria, and Guidance Values
SSVMP	Stainless Steel Vapor Monitoring Points
SVE	Soil Vapor Extraction
SVI	Soil Vapor Intrusion
SVOCs	Semi Volatile Organic Compounds
TAGM	Technical and Administrative Guidance Memorandum
TCE	Trichloroethene
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TMV	Toxicity, Mobility, or Volume
TOC	Total Organic Compounds
USEPA	United States Environmental Protection Agency
UTS	Universal Treatment Standards
VOCs	Volatile Organic Compounds

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2.0 INTRODUCTION

Laurel Environmental Associates, Ltd. was retained by 20 W. Centennial Corp., to prepare this Sampling and Analysis Plan (SAP) as part of an Interim Remedial Measures (IRMs) Work Plan for the property located at 20 West Centennial Avenue, Roosevelt, New York. The site is designated on the Nassau County Tax Map as Section 59, Block 229, Lot 21. The physical location of the site is at Latitude 40° 35' 20" North and Longitude 73° 38' 42" West.

The SAP contains a Field Sampling Plan (FSP) to be employed in conducting the IRMs scope of work. The objectives and details of the specific sampling procedures and the relevant sampling and analytical protocols to ensure that the data collected during the IRMs are of sufficient quality to support additional remedial decisions.

3.0 FIELD SAMPLING PLAN

This IRM will involve multiple sampling events that take place at various times during the IRM that will dictate the extent of remediation that occurs at the site and will document the remediation that has taken place.

3.1 SAMPLING OBJECTIVE

There are five sampling objectives for the site, each with a specific function. The first sampling objective is to collect groundwater samples from the on-site and off-site wells to determine current groundwater concentrations. The second sampling objective is to collect soil samples continuously from the base of the three drywells to the top of the groundwater table. This will determine if these structures have contributed to the contamination encountered on-site. Additionally, a single groundwater sample directly down-gradient from the drywell which is located up-gradient from an area of known impact will be collected and analyzed. This will verify whether groundwater directly down-gradient of the drywells is impacted. The third sampling objective is to collect post drywell remediation samples. This will confirm that all of the impacted material has been removed. The fourth sampling objective is the collection of the post excavation soil sampling within the building's interior. This data will determine if contaminant concentrations have been reduced to acceptable levels and in areas where all of the impacted material has not been removed provide a baseline level of the soil in the area where the SVE system will be installed. The fifth sampling objective is the collection of a post remediation soil vapor sample to be collected at the down-gradient property boundary. The post remedial sample will document the success of the remediation. Additionally, sampling of the backfill material will ensure imported backfill material is acceptable based upon comparison of laboratory analysis data to 6NYCRR Subpart 375-6-Remedial Program Soil Cleanup Objectives. Excavated soils will be characterized as required by the transporting company and disposal facility.

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3.1.1 Sampling Location and Frequency

Groundwater Monitoring Wells and Analysis

There are currently four on-site and four off-site groundwater monitoring wells. The depth of each well and depth to water will be gauged utilizing a water level meter and recorded on a field monitoring sheet. Utilizing the well gauging data, the standing water volume in each well will be calculated; Based on this information each well will be purged of approximately three to five well volumes. The purging of the well will be performed utilizing a down-hole pump set within the top five feet into the water table to assure a complete turnover in water entering the well screen and casing. After proper purging, groundwater sampling will be performed in accordance with EPA Region 1 guidance "low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells"- July 30, 1996 Revised January 19, 2010. This sampling will be performed utilizing a bladder pump system. A field blank will be prepared and a duplicate sample will collected at the time of sampling. A trip blank prepared by the laboratory will accompany all field activities and will be submitted back to the laboratory for analysis and will be included on the Chain of Custody. All samples will be placed into approved laboratory supplied containers and stored on ice. All groundwater samples will be submitted for laboratory analysis at York Analytical Laboratories of Stratford, Connecticut to test for analytes described in the Tables found on Page 7 of this report. York Analytical Laboratories is a NYSDOH, ELAP approved laboratory and will be required to maintain this certification throughout the IRM.

Groundwater samples will be designated as MW-20-3, MW-20-4, MW-20-7, MW-20-8, MW-1s, MW-1d, MW-2s, and MW-2d. Matrix spike and Matrix spike duplicate samples will be performed on laboratory prepared samples in order to reduce any error generated from non-homogeneity in groundwater quality at the site.

Drywell Sampling and Analysis

There are currently three drywells located on the site. Each drywell will be sampled utilizing a direct push soil sampling rig. Continues soil cores, in five foot increments, will be collected from the base of the structures to the top of the groundwater table. Each soil core will be field screened utilizing a Photoionization Detector (PID). Based on the PID reading and a visual inspection of the soil cores, one core sample will be retained one foot below the base of the structures, a second sample will be retained based of field observation, indicating the highest level of contamination and a third sample will be collected at the water table. The selected from each structure will be submitted for laboratory analysis. If no PID reading above background levels is detected within a drywell, the samples collected one foot below the base of the structures and directly above the groundwater table will be retained for laboratory analysis. In accordance with NYSDEC protocol, a duplicate sample will be collected from one of the structures for Quality Assurance/Quality Control (QA/QC) analysis. Upon completion of the drywell sampling, a single groundwater sample will be collected directly south, hydraulic down-gradient, of the drywell designated as DW-2. This groundwater sample will be collected through a temporary

groundwater sampling point installed utilizing a direct push sampling rig. This groundwater sampling point will be developed until visually clear and/or a turbidity reading of less than 50 NTU is achieved. Groundwater sampling will be performed in accordance with EPA Region 1 guidance "low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells"- July 30, 1996 Revised January 19, 2010. This sampling will be performed utilizing a bladder pump system. Collected samples will be submitted for laboratory analysis at York Analytical Laboratories of Stratford, Connecticut to test for analytes described in the Table found on Page 7.

Drywell samples will be designated as DW-1 through DW-3 and DW-2GW. Matrix spike and Matrix spike duplicate samples will be performed on laboratory prepared samples in order to reduce any error generated from none-homogeneity in soil condition at the site. Only the shallowest or most contaminated soil sample for each structure, based on field observations will be analyzed for the full NCDH protocol. All other retained samples will be analyzed for VOCs utilizing EPA Method 5035a and EPA Method 8260.

Drywell Endpoint Sampling and Analysis

A post remediation sample will be collected from the termination depth of each drywell. These samples will be collected utilizing a stainless steel hand auger. Collected soil samples will be placed in laboratory supplied glassware and stored in a cooler with ice. In accordance with NYSDEC protocol, one duplicate sample will be collected and submitted under the same chain-of-custody for analysis. The collected endpoint samples will be submitted for laboratory analysis at York Analytical Laboratories of Stratford, Connecticut to test for analytes described in the Table on Page 7.

Drywell endpoint samples will be designated DW-1EP through DW-3EP. Matrix spike and Matrix spike duplicate samples will be performed on laboratory prepared samples in order to reduce any error generated from none-homogeneity in soil conditions at the site.

Interior Endpoint Sampling and Analysis:

Endpoint soil samples will be collected from the base and sidewalls of the excavation once the planned extent of each excavation has been reached. In accordance with NYSDEC protocol, a total of six soil samples will be collected, one from each sidewall and two from the base. Collected soil samples will be placed in laboratory supplied glassware and stored in a cooler with ice. Quality Assurance/Quality Control samples will be analyzed as presented in the Sampling and Analysis plan. Depending on stability of the excavation and access, samples may be collected from the bucket of the machinery performing the excavation or by a direct grab sample. Endpoint samples will be submitted for laboratory analysis at York Analytical Laboratories of Stratford, Connecticut to test for analytes described in Table I on Page 7.

Sample locations will be designated EP-01, EP-02, etc. Matrix spike and Matrix spike duplicate samples will be performed on laboratory prepared samples in order to reduce any error generated from non-homogeneity in soil conditions at the site. The proposed locations of these samples are provided in

Figure 6.2. The purpose of this testing is to determine the extent of residual vadose zone contamination that cannot be reasonably removed by excavation. The NYSDEC may require collection and analysis of additional endpoint soil samples during implementation of the IRM.

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Table I
Matrix Type and Number, Analytical Method, Preservation and Holding Time Summary

Matrix	Analyses	Analytical Method	Number of Anticipated Samples	Number of Anticipated Duplicate Samples	Number of Anticipated Equipment Blank Samples	Number of Anticipated Rinsate Blank Samples	Number of Anticipated Trip Blank Samples	Total Number of Anticipated Samples	Container and Preservation	Analytical Services Protocol Holding time	Analysis Holding Time
Soil from Drywells (initial and endpoint in two rounds)	VOCs SVOCs 8 RCRA Metals	5035a/8260 8270 6010, 7470/7471	12 6 6	2 2 2	2 2 2	2 2 2	2 0 0	20 12 12	40 ml VOAs, Methanol4 oz. glass 4 oz. glass (40 ml VOAs with HCl for aqueous 8260, 8 oz. HDPE with NaOH for aqueous metals, 1 liter amber glass for aqueous SVOCs)	12 Days 5 Days, extraction, 40 Days, analysis 6 Months Mercury 26 Days	14 Days 7/40 Days prep,/analysis 6 Months
Soil from below interior slab (initial and endpoint in two rounds)	Volatiles	EPA Methods 5035a/8260	6	1	1	1	1	10	40 ml VOAs Methanol / HCl	12 Days	14 Days
Groundwater (from temp and permanent wells)	VOCs,	EPA Method 8260	9	1	1	0 (collected on same day as soil from drywells)	0 (collected on same day as soil from drywells)	11	40 ml. VOAs, HCl	12 Days	14 Days
Soil Vapor	VOCs	TO15	2	1	0	0	1	4	6 Liter Summa Cans	30 Days	30 Days

Backfill Material Sampling and Analysis:

Upon completion of the testing, the excavation will be backfilled with imported bank run or similar. Representative soil samples will be collected in accordance with NYSDEC protocol from imported soils and analyzed prior to placement at the Site. Samples will be submitted for laboratory analysis at York Analytical Laboratories, Stratford Connecticut to test for Target Compound List (TCL) VOCs, TCL SVOCs, pesticides, PCBs, TAL metals and cyanide. York Analytical Laboratories is a NYSDOH, ELAP approved laboratory and will be required to maintain this certification throughout the IRM. If imported soils are from independent sources, samples will be collected and analyzed from each source as above. The results of the analysis will be submitted to the NYSDEC for approval prior to use as backfill.

TABLE II

BACKFILL SAMPLING AND ANALYSIS SUMMARY

Location/Matrix	Number of Locations	Analytes	Number of Samples	Total No.*
Composite - Soil	1	TCL Volatiles	1	1
Composite - Soil	1	TCL Semi-Volatiles	1	1
Composite - Soil	1	TCL Pesticides	1	1
Composite - Soil	1	TAL Metals	1	1
Composite - Soil	1	Cyanide	1	1
Composite - Soil	1	TCL Volatiles	1	1
Composite - Soil	1	TAL Metals	1	1
Composite - Soil	1	PCBs	1	1

TCL VOCs - Target Compound List
TAL - Target Analyte List
PCBs - Polychlorinated Biphenyls

Soil Characterization Sampling and Analysis:

A soil characterization and analysis for waste disposal will be required prior to performing any on site excavation activities. A waste characterization sample will be collected by a representative of Stablex Canada Inc. of Blainville, Québec, Canada (USEPA ID #NYF006000053) or a similar permitted facility under proper manifest procedures. The containers will be transported by Rollex Transport Ltd. of Varennes, Québec, Canada (USEPA ID #NYD980756415) or similar permitted transporter. The sample will be analyzed for RCRA hazardous waste characterization parameters. The results will be utilized to obtain approval from the disposal facility.

3.1.2 Sample Identification

Details on the identification of samples can be found in the QA/QC prepared as part of the IRM Work Plan.

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3.1.3 Sample Documentation

Each sample bottle will be labeled with at least the following:

- Complete Sample Identification
- Date and Time of Sample Collection
- Required Analysis
- Sampler's Initials

All sample bottles will be accounted for on a Chain-of-Custody form; see the QA/QC for additional details on completion of the form and procedures. Additional details on samples and locations will be recorded in the bound field logbooks maintained by field personnel as outlined in the QA/QC.

3.2 SAMPLE HANDLING AND ANALYSIS

3.2.1 Chain-of Custody Procedures

Each sample collected for analysis will be recorded on a Chain-of-Custody form. If an error is made while completing the multi-part form, a single line is drawn through the error and initially by field personnel. A copy of the completed form is maintained by field personnel once transfer of custody of the samples is documented by signing of release by field personnel. The Chain-of-Custody form accompanies the samples during shipment to the laboratory and each transfer of custody is documented. Further detail pertaining to acceptable COC procedures is provided in the ASTM guidance document D4840-99. *Standard Guide for Sample Chain-of-Custody Procedures*[16].

3.2.2 Sample Packaging and Shipment

Samples will be packaged and shipped according to requirements provided in the QA/QC.

3.2.3 Sample Containers, Holding Times and Preservation

Requirements pertaining to sample containers. sample holding times and sample preservation are provided in the QA/QC.

3.2.4 Sampling QA/QC Protocols

Field QA/QC samples will be collected and analyzed as part of all field sampling activities. The protocols to be followed for collection of field QA/QC samples are provided in the QA/QC. The sample identifier numbers for QA/QC samples are outline in the QA/QC.

4.0 QUALITY ASSURANCE PROJECT PLAN

The Quality Assurance – Quality Control Plan (QA/QC), provided as part of the IRM Work Plan is being prepared in conjunction with the Sampling and Analysis Plan (SAP) detailing activities to be undertaken as part of the IRM at the 20 West Centennial Avenue Site.

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APPENDIX D

Quality Assurance/Quality Control- DUSR

INTERIM REMEDIAL MEASURES
QUALITY ASSURANCE/QUALITY CONTROL

20 W CENTENNIAL CORP.
20 WEST CENTENNIAL AVENUE
ROOSEVELT, NEW YORK 11575

August 27, 2012
NYSDEC Site Code # 1-30-154
Order of Consent # W1-1137-09-06
***LEA* Project # 12-260**

QUALITY ASSURANCE/QUALITY CONTROL - DUSR
FOR USE DURING INTERIM REMEDIAL MEASURES

Laurel Environmental Associates, Ltd. (LEA) considers the quality and accuracy of all of our reports to be of the utmost importance. To achieve this goal, all reports are peer reviewed and corrected. Final reviews are completed by the project manager and finally by an officer of the company, who co-signs all reports.

Laboratory analysis will be completed by a NYSDOH Certified Laboratory; specifically York Analytical Laboratories Inc., ELAP certified, #10854. All samples will be hand delivered under strict chain of custody procedures. The laboratory's QA/QC manual has been reviewed and kept on file.

Additional quality assurance protocol will be implemented should the need arise, this includes but is not limited to the following:

- Mr. Scott Yanuck, the Project Manager, will ensure that there are suitable and verifiable data results from sampling and analysis. To achieve this objective, the quality assurance procedures detailed in this section will be followed for all sampling and laboratory analysis activities. The person responsible for conducting the investigation and/or remediation will consult with NYSDEC during the development of the work plan to determine whether a site Quality Assurance Officer (QAO) will be required.
- Ms. Carla Sullivan, the QAO, will review sampling procedures and certify that the data was collected and analyzed using the appropriate procedures. The QAO may not have any responsibilities specific to the collection and analysis of samples from the site for which they are the QAO. The qualifications of a QAO are included in Appendix G of the Work Plan. The QAO will perform the Data Validation and Data Acceptance associated with this project in accordance with the DER-10 DUSR Technical Guidance for Site Investigation and Remediation, May 3, 2010 – Appendix 2B, Guidance for Data Deliverables and the Development of Data Usability Summary Reports. The QAO will perform the Data Quality Assessment in accordance with Section 5 of this document. The Data Validation and Data Usability will encompass Completeness, Compliance and Report Submittal.
- A third party data validator will review and write the DUSR.

I. Certification and data acceptance:

(a) Laboratories performing analyses will conform to the following:

i. For the analysis of any aqueous samples for a parameter or category of parameters for which laboratory certification exists pursuant to NYSDOH ELAP Certification, the laboratory will be certified for that specific parameter or category of parameters pursuant to NYSDOH ELAP Certification;

ii. For the analysis of non-aqueous samples using specific analytical methods contained in the EPA Publication SW-846, "Test Methods for Evaluating Solid Waste", third edition, update IIF, January 1995, as amended and supplemented, for a parameter or category of parameters for which certification exists pursuant to NYSDOH ELAP Certification, the laboratory will be certified for that specific parameter or category of parameters pursuant

to NYSDOH ELAP Certification or, at a minimum, have obtained temporary approval to analyze regulatory samples pursuant to NYSDOH ELAP Certification.

iii. NYSDOH ELAP does not certify analysis of biological tissue. Laboratories will provide documentation of ability to perform analysis of tissue samples for approval by the DER prior to conducting any tissue analysis.

iv. For analysis of samples where Category B deliverables are required by (e) i. below, NYSDOH ELAP certification is required for the category of parameters to be analyzed for.

(b) Analytical methods:

1. All analytical methods used will be the most current NYSDEC Analytical Services Protocol dated July 2005. Where possible, the method selected will achieve a detection limit that is below the lowest standard or guidance value that applies to the media being sampled/analyzed for the contaminants that can reasonably be expected to be found.

2. If an analytical method as described in (b)1 above does not exist for a specific contaminant or parameter within a specific matrix, or if an analytical method as described in (b)1 above for a given contaminant or parameter is demonstrated to be inappropriate for the matrix analyzed, or the method cannot achieve a detection limit below the applicable standard or guidance value, then the person responsible for conducting the investigation and/or remediation will:

   i. Select an appropriate method from another source;

   ii. Document the rationale for selecting the method; and

   iii. Develop a standard operating procedure for the method, including a quality control section.

   iv. Exception: it is recognized that the analytical methods for semi-volatile compounds in soil frequently cannot achieve detection limits below SCG levels. In these cases, Method 8270 is acceptable irrespective of the detection limit.

3. Methods acceptable to the NYSDEC will be utilized for the determination of the presence of free product in soil or water. Such methods include, without limitation, visual identification of sheens or other visible product, measurable thickness of product on the water table, the use of field instruments, ultraviolet fluorescence, soil-water agitation, centrifuging, and hydrophobic dye testing.

   i. For contaminants that in their pure phase and at standard state conditions (20 degrees Celsius to 25 degrees Celsius and one atmosphere pressure) have densities greater than water, free product will be considered to be present if the contaminant is detected in groundwater at concentrations equal to or greater than one percent of the water solubility of the contaminant if groundwater contains only that organic contaminant. If a mixture of such contaminants is present, then the effective water solubility of the contaminant should be estimated for this determination.

4. Except for tissue samples (see 2.1(c) below), gas chromatography methods with a mass spectrometer detector system should be used for analysis of semi-volatile contaminants (exclusive of herbicides, pesticides, and PCBs). Other chromatography methods (liquid

chromatography, HPLC) with appropriate detector systems should be used for the analysis of organic analytes amenable only to non-gas chromatographic methods. A mass spectrometer detector system is not required if the site has already been characterized to the extent that all contaminants are known.

(c) Specific requirements:

1. Laboratories will follow all quality assurance/quality control procedures specified in the analytical methods.
2. Sampling methods, sample preservation requirements, sample handling times, decontamination procedure for field equipment, and frequency for field blanks, field duplicates and trip blanks will conform to the NYSDEC Analytical Services Protocol, July 2005 (ASP), unless an alternate method/procedure has been approved in the work plan.
3. Results from analysis of soils and sediments will be reported on a dry weight basis, except for those results required by the method to be otherwise reported. Analysis of vegetation tissue shall be on a dry weight basis. All other tissue analysis shall be reported on a wet weight basis.

(d) Sample matrix cleanup:

1. Acceptable sample matrix cleanup methods include, without limitation, those methods contained in the EPA Publication SW846 or the EPA "Contract Laboratory Statement of Work for Organics Analysis, Multi-Media, Multi-Concentration" in effect as of the date of sample analysis.
2. Sample matrix cleanup methods will be performed if:

   i. Petroleum contaminated soils, sediments, or other solids are analyzed for semi-volatile organics, and the method detection limits are elevated above the applicable remediation standard because of matrix interference;

   ii. Gas chromatographic peaks are not adequately separated due to matrix interference. A peak will be considered inadequately separated when a rise in baseline or extraneous peaks interfere with:

      (1) the instrumental ability to correctly identify compounds present (including internal standards and surrogates), and/or;

      (2) the integration of peak area and subsequent quantitation;

   iii. So specified by the analytical method; or

   iv. Matrix interferences prevent accurate quantification and/or identification of target compounds.

(e) Unless otherwise approved in advance by the NYSDEC, laboratory data deliverables will be as follows:

1. Category B laboratory data deliverables as defined in the analytical services protocol (ASP July 2005) should be submitted for confirmatory (post remediation) samples and final delineation samples for all sites except those listed in Section 5.5. In addition, a Data Usability Summary Report should be prepared by a party independent from the laboratory performing the analysis.
2. Category A (as defined in the ASP) or Category Spills laboratory data deliverables should

be submitted for all other analyses; and

3. Analytical results without all quality control documentation and raw data may be provided for all intermediate sampling events and for all long-term groundwater monitoring samples where the site has NYSDEC oversight, provided the following information is submitted:
    i. A cover page, including facility name and address, laboratory name and address, laboratory certification number, if applicable, date of analytical report preparation and signature of laboratory director;
    ii. A listing of all field sample identification numbers and corresponding laboratory sample identification numbers;
    iii. A listing of all analytical methods used, including matrix cleanup method;
    iv. The method detection limit and practical quantitation level for each analyte for each sample analysis;
    v. All sample results including date of analysis;
    vi. All method blank results; and
    vii. All chain of custody documentation.
4. Upon written request, the NYSDEC may require that deliverables package be upgraded to a "Category B" data deliverables package for any sample analysis. If the backup documentation is not available to generate “Category B” deliverables or that the lab is not qualified to generate “Category B” deliverables, reanalysis or re-sampling and analysis is an option.
5. Identify any analytical cleanup methods, where applicable.

(f) Field screening methods, (such as immunoassay, x-ray fluorescence, and mobile laboratories) are limited as follows:

1. Field screening methods for all sampling matrices (soil, water, air, interior surfaces) will only be used under the following conditions:
    i. For contaminant delineation if contaminant identity is known or if there is reasonable certainty that a specific contaminant may be present (for example, benzene, toluene, ethylbenzene, xylene in the case of sampling for a gasoline release); or
    ii. To bias sample location to the location of greatest suspected contamination.

2. Field screening methods will not be used to verify contaminant identity or clean zones unless there has been a correlation study approved in advance by the NYSDEC for the specific site where screening methods are proposed for verification.

3. Where field screening is used:
    i. A standard operating procedure must exist or be developed which includes:
        (1) A detailed step by step procedure for the analysis method.
        (2) Duplicate analysis of 10% of the samples.
        (3) Quality assurance procedures (calibration standards, blanks, etc.) As specified by the method.
        (4) Laboratory confirmation on 10% of the samples by a standard ASP method is required. There should be no bias in the selection of duplicate or laboratory confirmation samples, such as selecting positive detections for duplication or confirmation. The duplicate or confirmation analysis should be done on every 10th

sample, selected in the order they are presented for analysis. Laboratory confirmation occurs if the correlation between field screening and laboratory results are within +/- 30%.

ii. Analysis must be done by a Field Analyst with the following minimum qualifications:

(1) Completion of a certification course or training by an experienced analyst who has demonstrated proficiency in the method; or,

(2) Demonstration of the analyst's proficiency by correlation of the analyst's results with laboratory confirmation analysis.

3. Other field screening methods may be utilized, subject to the NYSDEC review of documentation.

(g) The following requirements apply for selection of analytical parameters:

1. Samples from each area of concern will be analyzed for contaminants which may be present.

2. Analysis of Target Compound List plus 30/Target Analyte List (TCL+30/TAL), petroleum hydrocarbons, and pH will be conducted when contaminants in an area are unknown or not well documented, although a limited contaminant list may be used subject to the NYSDEC approval.

i. For all petroleum storage and discharge areas, sample analysis will be conducted pursuant to the requirements of STARS #1" Petroleum Contaminated Soil Guidance Policy." Samples taken in non-petroleum storage and discharge areas should be analyzed for the stored material. Analysis should be conducted using any gas chromatography method by a laboratory that is certified pursuant to NYSDOH ELAP for the category of parameters being analyzed for. Laboratory deliverables should be as specified in the method listed above.

(h) If tentatively identified compounds or unknown compounds are detected at concentrations in excess of the applicable SCG, they will be addressed in either of two ways listed below.

(i) If a contaminant specific SCG does not exist for tentatively identified compounds and for unknown compounds, the generic SCG (class of contaminant, e.g. semi volatile compounds) will be used.

1. If the area will be remediated and it is likely that concentration of the tentatively identified compounds/unknown compounds will be reduced by the remediation, the tentatively identified compounds/unknown compounds will be analyzed in post remediation samples to document that they no longer exceed the applicable SCG.

2. An attempt should be made to positively identify and accurately quantify the tentatively identified compounds/unknown compounds using an analytical method consistent with this section so that a remediation standard can be developed.

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Quality Assurance Project Plan

(a) All work plans will address quality assurance procedures. A generic QAPP may be submitted in advance for sampling using a dynamic work plan. These procedures may be incorporated into the work plan or be supplied as a separate stand alone document. If a separate QAPP, is required, the sampling requirements must also be shown in the work plan. The person responsible for conducting the investigation and/or remediation will submit necessary information in a format that corresponds directly to the outline of this section. For ease of reading, QAPP means the section or document that addresses how data will be quality assured. For large, complicated sites, the NYSDEC may require a separate QAPP. The following should be included in the Quality Assurance Project Plan:

1. The project's scope and project goals as well as how the project relates to the overall site investigation or remediation strategy;
2. Project organization, including the designation of a Project Manager, Quality Assurance Officer and Field Analyst, (if field analysis is planned). Resumes of these individuals may be requested by the NYSDEC;
3. Sampling procedures and equipment decontamination procedures;
4. Site map showing sample locations;
5. An "Analytical Methods/Quality Assurance Summary Table" which should include the following information for all environmental, performance evaluation, and quality control samples:
    i. Matrix type;
    ii. Number or frequency of samples to be collected per matrix;
    iii. Number of field and trip blanks per matrix;
    iv. Analytical parameters to be measured per matrix;
    v. Analytical methods to be used per matrix
    vi. The number and type of matrix spike and matrix spike duplicate samples to be collected;
    vii. The number and type of duplicate samples to be collected;
    vii. Summary Table
    viii. The number and type of split samples to be collected;
    ix. The number and type of performance evaluation samples to be analyzed;
    x. Sample preservation to be used per analytical method and sample matrix;
    xi. Sample container volume and type to be used per analytical method and sample matrix; and
    xii. Sample holding time to be used per analytical method and sample matrix;

6. A detailed description of site specific sampling methods to be used, sample storage in the field and sampling handling time requirements;
7. If required by the NYSDEC, a description of the laboratories ability to provide the analytical data in electronic format.

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Quality Assurance Glossary

"Analytical Services Protocol" or "ASP" means the NYSDEC's compendium of approved EPA and NYSDEC laboratory methods for sample preparation and analysis and data handling procedures, June 2000.

- "Confirmatory Sample" means a sample taken after remedial action is expected to be complete to verify that the cleanup requirements have been met. This term has the same meaning as "post remediation sample".
- "Data Usability Summary Report, (DUSR)" is a document that provides a thorough evaluation of the analytical data to determine whether or not the data, as presented, meets the site/project specific criteria for data quality and use. Renee G. Cohen, of Premier Environmental Services, Merrick, New York, will perform organic and inorganic data validation according to the various protocols from the USEPA EPA CLP, NYS ASP and USEPA test methods for the evaluation of solid waste, methods for the chemical analysis of water and waste and the federal register.
- "Effective solubility" means the theoretical aqueous solubility of an organic constituent in groundwater that is in chemical equilibrium with a separate phase mixed product (product containing several organic chemicals). The effective solubility of a particular organic chemical can be estimated by multiplying its mole fraction in the product mixture by its pure phase solubility.
- "Environmental Laboratory Accreditation Program" or "ELAP" means a program conducted by the NYSDOH which certifies environmental laboratories through on-site inspections and evaluation of principles of credentials and proficiency testing.
- "Intermediate Sample" means a sample taken during the investigation process that will be followed by another sampling event to confirm that remediation was successful or to confirm that the extent of contamination has been defined to below a level of concern.
- "Method detection limit" or "MDL" means the minimum concentration of a substance that can be measured and reported with a 99 percent confidence that the analyte concentration is greater than zero and is determined from the analysis of a sample in a given matrix containing the analyte.
- "Non-targeted compound" means a compound detected in a sample using a specific analytical method that is not a targeted compound, a surrogate compound, a system monitoring compound or an internal standard compound.
- "Practical quantitation level" or "PQL" means the lowest quantitation level of a given analyte that can be reliably achieved among laboratories within the specified limits of precision and accuracy of a given analytical method during routine laboratory operating conditions.
- "PAH" means polycyclic aromatic hydrocarbon as defined by USEPA Method 8270.
- "Quality assurance" means the total integrated program for assuring the reliability of monitoring and measurement data which includes a system for integrating the quality planning, quality assessment and quality improvement efforts to meet data end-use requirements.
- "Quality assurance project plan" or "QAPP" means a document which presents in specific terms the policies, organization, objectives, functional activities and specific quality assurance/quality control activities designed to achieve the data quality goals or objectives of a specific project or operation.
- "Quality control" means the routine application of procedures for attaining prescribed standards of performance in the monitoring and measurement process.
- "Semi-volatile organic compound" means compounds amenable to analysis by extraction of the

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sample with an organic solvent. For the purposes of this section, semi-volatiles are those target compound list compounds identified in the statement of work in the current version of the EPA Contract Laboratory Program.

- "Target analyte list" or "TAL" means the list of inorganic compounds/elements designated for analysis as contained in the version of the EPA Contract Laboratory Program Statement of Work for Inorganics Analysis, Multi-Media, Multi-Concentration in effect as of the date on which the laboratory is performing the analysis. For the purpose of this chapter, a Target Analyte List scan means the analysis of a sample for Target Analyte List compounds/elements.
- "Targeted compound" means a hazardous substance, hazardous waste, or pollutant for which a specific

  analytical method is designed to detect that potential contaminant both qualitatively and quantitatively.
- "Target compound list plus 30" or "TCL+30" means the list of organic compounds designated for analysis (TCL) as contained in the version of the EPA "Contract Laboratory Program Statement of Work for Organics Analysis, Multi-Media, Multi-Concentration" in effect as of the date on which the laboratory is performing the analysis, and up to 30 non-targeted organic compounds (plus 30) as detected by gas chromatography/mass spectroscopy (GC/MS) analysis. For the purposes of this chapter, a Target Compound List+30 scan means the analysis of a sample for Target Compound List compounds and up to 10 non-targeted volatile organic compounds and up to 20 non-targeted semi volatile organic compounds using GC/MS analytical methods. Non-targeted compound criteria should be pursuant to the version of the EPA "Contract Laboratory Program Statement of Work for Organics Analysis, Multi-Media, Multi-Concentration" in effect as of the date on which the laboratory is performing the analysis.
- "Tentatively identified compound" or "TIC" means a non-targeted compound detected in a sample using a GC/MS analytical method which has been tentatively identified using a mass spectral library search. An estimated concentration of the TIC is also determined.
- "Unknown compound" means a non-targeted compound which cannot be tentatively identified. Based on the analytical method used, the estimated concentration of the unknown compound may or may not be determined.
- "Volatile organics" means organic compounds amenable to analysis by the purge and trap technique. For the purposes of this chapter, analysis of volatile organics means the analysis of a sample for either those priority pollutants listed as amenable for analysis using EPA method 624 or those target compounds identified as volatiles in the version of the EPA "Contract Laboratory Program Statement of Work for Organics Analysis, Multi-Media, Multi-Concentration" in effect as of the date on which the laboratory is performing the analysis.
- “Waste oil” means used and/or reprocessed engine lubricating oil and/or any other used oil, including but not limited to: fuel oil, engine oil, gear oil, cutting oil, transmission fluid, oil storage tank residue.

SPECIFIC QA/QC MEASURES FOR 20 WEST CENTENNIAL AVENUE

Laurel Environmental Associates, Ltd. considers the quality and accuracy of all of our reports to be of the utmost importance. To achieve this goal, all reports are peer reviewed and corrected. Final reviews are completed by the project manager and finally by an officer of the company, who co-signs all reports.

Laboratory analysis will be completed by a NYSDOH Certified Laboratory; specifically York Analytical Laboratories, ID # 10854. All samples will be hand delivered under strict chain of custody procedures. The laboratory's QA/QC manual has been reviewed and kept on file.

To ensure that cross contamination of samples or wells does not occur, the decontamination of field equipment including hollow stem auger, split spoons, *Teflon* bailers, hand augers, soil vapor probes, etc. follows protocols outlined in each job's specifications sheet. Field blanks and/or equipment blanks are collected and submitted when sampling groundwater. Upon receipt of the analytical results by ***LEA***, a thorough review is completed to check for inconsistencies or lab contaminants.

Field Activities, QA/QC

Each sample collected for analysis will be recorded on a Chain-of-Custody form. If an error is made while completing the multi-part form, a single line is drawn through the error and initially by field personnel. A copy of the completed form is maintained by field personnel once transfer of custody of the samples is documented by signing of release by field personnel. The Chain-of-Custody form accompanies the samples during transit to the laboratory and each transfer of custody is documented. Further detail pertaining to acceptable COC procedures is provided in the ASTM guidance document D4840-99. *Standard Guide for Sample Chain-of-Custody Procedures16*.

All field instrumentation will be operated and calibrated in accordance with the manufacturer's recommended methods. Measurements collected using the field instrumentation will be recorded on appropriate data forms.

A quality assurance field audit check list will be completed by the QC Field Officer during the field investigation. A checklist is based on USEPA 330/9-81-003R, 1984, used in conjunction with maintaining a field log, will document all critical field activities and events. In addition, it will insure that procedures such as calibration of field instruments is completed. A copy of the completed quality assurance field audit check list along with completed data forms will be incorporated into the report.

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The following discussions are for the completion of various field tasks:

Field Log Book

The field log will be maintained by ***LEA*** personnel during all field activities to document all pertinent daily occurrences such as, but not limited to, the following:

- Site conditions and weather
- Personnel present
- Sample locations/methodologies
- Sampling times
- Drilling/sampling progress
- Well construction diagrams
- PID data
- Unforeseen events/delays

Labeling and Storing Samples

Samples selected for laboratory analysis will be placed in appropriate laboratory supplied containers. All sample containers will be properly labeled, labels will contain the following information:

- Time of collection
- Date of collection
- Sample location designation
- Preservative, if any
- Sampler's name
- Intended analysis
- Container serial number

Samples will be carefully placed in an appropriate cooler containing ice or "ice packs" immediately upon collection.

Chain-of-Custody

In order to track all persons handling samples, ***LEA*** and laboratory personnel will maintain chain-of-custody forms for each sample collected. After a sample has been collected, a chain-of-custody form will be completed and signed by the person collecting the sample. The original of the form will remain with the sample and will be signed each time the sample is relinquished to another party, until it reaches the laboratory or analysis is completed. The field sampler will keep one copy and a copy will be retained for the project file. Chain of Custody will contain, at a minimum, with the following information:

- Sampler's name/company
- Sample number and location
- Analysis to be performed
- Date/time

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Table I
Matrix Type and Number, Analytical Method, Preservation and Holding Time Summary

Matrix	Analyses	Analytical Method	Number of Anticipated Samples	Number of Anticipated Duplicate Samples	Number of Anticipated Equipment Blank Samples	Number of Anticipated Rinsate Blank Samples	Number of Anticipated Trip Blank Samples	Total Number of Anticipated Samples	Container and Preservation	Analytical Services Protocol Holding time	Analysis Holding Time
Soil from Drywells (initial and endpoint in two rounds)	VOCs SVOCs 8 RCRA Metals	5035a/8260 8270 6010, 7470/7471	12 6 6	2 2 2	2 2 2	2 2 2	2 0 0	20 12 12	40 ml VOAs, Methanol4 oz. glass 4 oz. glass (40 ml VOAs with HCl for aqueous 8260, 8 oz. HDPE with NaOH for aqueous metals, 1 liter amber glass for aqueous SVOCs)	12 Days 5 Days, extraction, 40 Days, analysis 6 Months Mercury 26 Days	14 Days 7/40 Days prep,/analysis 6 Months
Soil from below interior slab (initial and endpoint in two rounds)	Volatiles	EPA Methods 5035a/8260	6	1	1	1	1	10	40 ml VOAsMethanol HCl	12 Days	14 Days
Groundwater (from temp and permanent wells)	VOCs,	EPA Method 8260	9	1	1	0 (collected on same day as soil from drywells)	0 (collected on same day as soil from drywells)	11	40 ml. VOAs, HCl	12 Days	14 Days
Soil Vapor	VOCs	TO15	2	1	0	0	1	4	6 Liter Summa Cans	30 Days	30 Days

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QUALITY CONTROL (QC) CHECK SUMMARY

Quality Control *(QC) Checks*	*Minimum Frequency*
Field Blank (FB)[1]	1 per matrix per parameter per day of sample collection (minimum 5% frequency)
Rinsate Blank (RB)	1 per matrix per fraction per piece (or related pieces) of sampling equipment, per day of sample collection (minimum 5% frequency)
Trip Blank (TB)	1 per cooler (volatiles only)
Blind Field Duplicate (DUP)	1 per matrix per parameter per 20 samples
Matrix Spike (MS)	1 per matrix per 20 samples or SDG
Matrix Spike Duplicate (MSD)	1 per matrix per 20 samples or SDG (organics only)
Matrix Duplicate (MD)	1 per matrix per 20 samples or SDG (inorganics only)
Laboratory Control Sample (LCS) or Blank Spike Sample (BS)	1 per analytical batch not to exceed 20 samples
Surrogate Compound Spike	Every analytical run (organics only)
Method (Preparation) Blank (MB)	1 per 20 samples or prep/analysis batch per SDG

Notes:
- Field blanks are obtained in place of rinsate blanks in cases where disposable sampling equipment is used.
- SDG = Sample Delivery Group

Laboratory QA/QC

The selected laboratory, York Analytical Laboratories, Inc., will be completing the chemical analysis of samples in strict accordance with protocols set forth in NYSDEC Analytical Services Protocols, (ASP), July, 2005, or other state or federal agency protocols, where necessary. Specific analytical methods are provided in are provided in each report. Where necessary, reporting and deliverables (data package) will be completed in accordance with ASP Category B requirements, the reporting and deliverables document will be submitted as an appendix to the report. See following tables for an analyte list with laboratory QA/QC Objectives:

Data Validation

Data validation will be performed by Renee G. Cohen, of Premier Environmental, a third party data validator. See IRM Workplan Appendix G for Ms. Cohen's resume. The data validation process will be completed by Ms. Cohen, a qualified independent consultant, and will consist of data editing, screening, auditing, certification, review, and interpretation. The selected laboratory, York Analytical Laboratories, Inc., will submit results and ASP Category B reporting and deliverables to the data validator to enable the validator to conclusively determine the quality of the data.

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Data Quality Control Objectives

To insure that generated data is of good quality and meet the stated job specific quality objectives, data quality controls must be provided. Quality control elements include sensitivity, precision, accuracy, representativeness and completeness. The data quality control objectives for the remaining contaminants to be tested for, will be in accordance with ASP or other protocols. The following are descriptions of the above listed quality control objectives:

Sensitivity:

The required sensitivity of data will be the stated job specific quantitation limits. The TCL quantitation limits will sufficiently meet stated data quality objectives.

Precision:

Primarily determined from the relative percent difference (RPD) of Matrix Spike (MS) and Matrix Spike Duplicate (MSD) recoveries.

Accuracy:

The accuracy objectives for this project require that all matrix spike and surrogate spike recoveries fall within the ASP required recovery limits.

Completeness:

The completeness objectives of this project will require that at a minimum 90% of the QA/QC data meet given quality assurance objectives previously stated. Where data does not meet the requirements, an explanation or justification for the failure will be given and, if necessary, corrective action such as repeat sampling and analysis may be conducted as necessary.

Laboratory:

York Analytical Laboratories, Inc. Laboratory Certification: 10854

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APPENDIX E

Previous Investigations

Supplemental Remedial Investigation Work Plan

20 West Centennial Avenue, Roosevelt, New York

NYSDEC Site No. 1-30-154

Revised
July 2010

Dermody Consulting
Geologists and Environmental Scientists
32 Chichester Avenue, Center Moriches, NY 11934
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Table of Contents

SECTION 1.0
INTRODUCTION

This Supplemental Remediation Investigation Work Plan has been prepared by Dermody Consulting for the property located at 20 West Centennial Avenue in Roosevelt, New York. The property consists of a northern portion that contains a warehouse currently leased to J. Ramos Woodworking, Inc. (the "woodworking building"), and a southern portion that contains a 9,000 square foot former commercial laundry building (the "south building"). For the purpose of this investigation, the area of concern (the "Site") is defined as the southern portion of the property (that is, the portion of the property to the south of the woodworking building). The Site location is shown in Figure 1 and the Site layout is shown in Figure 2.

Based on a Phase II Environmental Site Assessment (ESA) performed by Sear-Brown during October, 2002 and a partial Remedial Investigation performed by Malcolm Pirnie during April and May, 2008, the soil at the Site and the groundwater at and downgradient of the Site have been impacted primarily by tetrachloroethylene and its degradation products. The Site is listed as New York State Department of Environmental Conservation (NYSDEC) Inactive Hazardous Waste Disposal Site No. 1-30-154.

The purpose of this proposed Supplemental Remedial Investigation is to further delineate the nature and extent of contamination in the subsurface soil and groundwater beneath and downgradient of the Site. To achieve this, Dermody Consulting proposes to obtain environmental samples to augment existing sampling data for the Site. Dermody Consulting also proposes to perform a ground-penetrating radar survey to evaluate the potential for additional areas of concern at the Site.

Data obtained during this proposed investigation will be analyzed to determine areas that require additional investigation, and areas that require remediation.

SECTION 2.0
SITE GEOLOGY AND HYDROGEOLOGY

The Site area is underlain by unconsolidated deposits of sand, clay, and gravel of late Cretaceous and Pleistocene ages. In the area of the Site, the upper sand and gravel deposits comprise the Upper Glacial Formation. The soils in the Site area are classified by the US Department of Agriculture as consisting mostly of urban land soils, which consist of a mix of sand, gravel, silt, clay, and fill material. Borings performed during previous investigations have indicated that the upper soil beneath portions of the Site contain cinders and other materials that indicate that artificial fill material exists in some areas in the upper soils of the Site.

The aquifer of concern beneath the Site is the Upper Glacial Aquifer which lies between the water table (which occurs at approximately 20 feet below grade) and the surface of the Magothy Aquifer (which is estimated to occur at 56 feet below grade). The Gardiners Clay and the 20-foot Clay, which are present in many areas in southern Nassau County, do not appear to be present beneath the Site [US Geological Survey publication, "Geology of the 20-Foot Clay and the Gardiners Clay in Southern Nassau County and Southwestern Suffolk County" (US Geological Survey Water Resources Report 82-4056, Doriski and Wilde-Katz, 1983)].

The topography of the Site is generally flat. Based on US Geological Survey Topographic Maps (2003), the elevation of the Site is approximately 36 feet above mean sea level. Based on the Nassau County Water Table Elevation Map dated March, 2000, the regional groundwater flow direction across the area of the Site is generally to the south. However, there may be an easterly or westerly component to the groundwater

flow direction due to the presence of streams located similar distances to the east and west of the Site. Previous investigations at the Site indicated that the depth to the water table in the Site area is 20 to 23 feet below grade.

SECTION 3.0
SITE HISTORY

The Site is located on the north side of West Centennial Avenue, approximately 170 feet west of Nassau Road. The Nassau County tax map number for the Site is Section 55, Block 415, Lot 273.

3.1 Previous Investigations

Phase I Environmental Site Assessment, Sear-Brown, October, 2002

Historical records reviewed from the Town of Hempstead Building Department files, Sanborn Fire Insurance Maps, and aerial photographs indicated that in 1955, a small building on the southern portion of the property was removed and a large industrial building (the former commercial laundry building) was constructed and first occupied by Precision Instruments Manufacturing. It is not known when Precision Instruments vacated the Site. The available history of commercial laundries operating at the Site is as follows:

- Prior to March 1, 1977, the Site was owned by Benjamin Alpert and Alexander Hyde, 333 Stegg St., Brooklyn, NY and was operated as S&H Laundries. On or about March 1, 1977, 20 West Centennial Corporation acquired the Site.
- On December 1, 1977, the Site was leased to Servisco, a New Jersey corporation with offices at 470 Mundet Place, Hillside, NJ. Servisco operated at the Site as a commercial laundry and linen rental service and storage. Servisco was later acquired by Aramark Corp., a public corporation located at 1101 Market St., Philadelphia, PA.

- On or about August 1, 1985, Amlino Realty Corporation, d/b/a Amato Linen Corporation, Angela Coat, Apron & Towel, Inc. leased the Site to operate a commercial laundry. Amlino Realty Corp. purchased the property on October 20, 1988. The owner of Amlino Realty Corp. was William Amato, Jr., who resided in Deer Park, New York and, upon information, still operates a commercial laundry in Suffolk County.
- 1989-1993 - Amlino Realty Corp. is the owner/operator during installation and removal of a 275-gallon above-ground storage tank (AST) and a NY Spill (petroleum release).
- In 1998, Amlino Realty Corp. defaulted on its mortgage, vacated the property and a judgment of foreclosure was entered on September 10, 1998, wherein 20 West Centennial Corp. took ownership of the Site. There have been no other occupants, and the Site has remained vacant to date.

An environmental database search report indicated that the Site was listed as a Resource Conservation and Recovery Act (RCRA) Large-Quantity Generator of hazardous waste for the prior occupant, Island Uniform Rental; as a NYSDEC Chemical Bulk Storage (CBS) site for the prior occupant Angela Coat, Apron & Towel, Inc.; and, as a NY Spill site under the prior occupant Amato Linen Corporation for the release of diesel fuel to the soil during a tank removal. The CBS listing indicated that a 275-gallon AST for the storage of sodium hypochlorite (bleach) had been installed at the Site during October, 1989, however, the AST was reported to be removed in January, 1993. The NY

Spill listed for the Site was opened on October 19, 1990 and closed to the satisfaction of the NYSDEC on October 24, 1990.

Town of Hempstead Building Department records show that a 2,000-gallon gasoline underground storage tank (UST) was installed along the southern portion of the Site in or about November, 1968. Two USTs were reported to exist to the north of the south building; a potential gasoline UST to the northwest of the south building, and a potential fuel oil UST to the northeast of the south building (see Figure 2 for the locations of the potential USTs).

Three stormwater drywells exist at the Site: two to the north of the south building and one in the driveway near the southwest corner of the south building (see Figure 2 for drywell locations).

Several concrete sealed trench drains were noted within the floor of the south building. The trench drains were reported to have been utilized by the past laundry businesses.

Phase II Environmental Site Assessment Report, Sear-Brown, December 26, 2002

A Phase II ESA was performed in November, 2002. A UST was verified to be located to the south of the south building at the Site during a ferro-magnetic geophysical survey. However, the presence of additional USTs located to the north of the south building could not be verified due to metallic interferences.

Eight Geoprobe soil borings were performed (GP-20-1 through GP-20-8) and continuous soil cores were collected for each boring. The depth of the borings ranged from 8 to 28 feet below grade. At four of the boring locations, permanent groundwater monitoring wells were installed (MW-20-3, MW-20-4, MW-20-7, and MW-20-8).

Soil and groundwater samples were collected from below the slab within the south building in the vicinity of the former trench drains (GP-20-1, GP-20-2, and GP-20-3), to the north of the south building (GP-20-7 and GP-20-8), to the south of the south building in the vicinity of the apparent UST (GP-20-4, GP-20-5, and GP-20-6) and, one surface soil sample was collected adjacent and north of the south building. All soil samples were analyzed for volatile organic compounds (VOCs), and selected samples were also analyzed for semi-volatile organic compounds (SVOCs) and RCRA metals, and the surface soil sample collected in the vicinity of spilled hydraulic fluid was analyzed only for polychlorinated biphenyls (PCBs).

Table 1 summarizes the soil chemical analytical results for the samples collected by Sear-Brown during November, 2002. Tetrachloroethylene was detected at concentrations above the NYSDEC Subpart 375.6 Unrestricted Remedial Program Soil Cleanup Objectives (SCOs) and at the highest concentrations in the three soil samples collected from beneath the slab of the south building (GP-20-1, GP-20-2, and GP-20-3). The highest concentration of tetrachloroethylene, 154,000 micrograms per kilogram (ug/kg), was detected at GP-20-3 at 0-2 feet below grade. However, a deeper sample obtained at 22-24 feet below grade at this location showed a decrease in the tetrachloroethylene concentration to 28.4 ug/kg. No SVOCs or PCBs were detected in any of the soil samples collected. Arsenic was detected at a concentration above the SCOs from beneath the slab (GP-20-1). Chromium was also detected at concentrations above the SCOs in samples GP-20-2 and GP-20-3.

Table 2 summarizes the groundwater chemical analytical results collected by Sear-Brown during November, 2002. Four of the borings performed during the soil

investigation were converted to permanent groundwater monitoring wells with 10-foot screens set 5 feet below the water table. Groundwater sample results showed that tetrachloroethylene was detected above the NYSDEC Class GA Ambient Water Quality Standards (the Standards) in all four of the groundwater monitoring wells (MW-20-3, MW-20-4, MW-20-7, and MW-20-8). The highest concentration of tetrachloroethylene was detected at MW-20-3 [7,690 micrograms per liter (ug/l)], which corresponds to the area of highest soil contamination, and MW-20-4 (7,530 ug/l). Relatively minor concentrations of trichloroethylene, a degradation product of tetrachloroethylene, and petroleum constituents were also detected at the Site. Tetrachloroethylene was also detected, at lower concentrations, in the groundwater in the area adjacent to the exterior north wall of the south building. Cadmium and chromium were also detected at concentrations slightly above the Standards in MW-20-3 and MW-20-4, and lead was also detected at a slightly elevated concentration above its Standard in MW-20-3. However, Sear-Brown noted that the groundwater samples obtained for the metals analyses were turbid. Therefore, the metals samples do not appear to be representative of groundwater conditions.

Subsurface Remedial Investigation, Malcolm Pirnie, April, 2008

A Subsurface Remedial Investigation was performed at the Site by Malcolm Pirnie to further delineate the soil and groundwater contamination. The Final Project Management Work Plan (February, 2008) was provided to Dermody Consulting. However, for the investigation, only summary results tables were provided for the samples collected by Malcolm Pirnie in April and May, 2008.

The investigation included the sampling of the liquid and sediment within the three on-Site stormwater drywells (DW-1, DW-2, and DW-3), 33 soil samples were collected at multiple depths from 19 borings (SB-1 through SB-19), two surface soil samples (SS-1 and SS-2) were collected along the southern portion of the Site, and 30 groundwater samples were collected from multiple depths from on-Site borings (GW-2, GW-3, GW-5, and GW-19) and from downgradient, off-Site borings (GW-22 through GW-27). The soil and sediment samples were analyzed for VOCs, SVOCs, and metals. The stormwater drywell liquid samples were analyzed for VOCs. The groundwater samples were analyzed for VOCs and SVOCs.

Table 3 summarizes the chemical analytical results for the sediment sampling for the three Site stormwater drywells. The sediment samples were obtained from a depth of 0-1 foot below the sediment surface. The results show that several SVOCs were detected at concentrations above the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 SCOs [the results are compared to the TAGM-4046 SCOs in accordance with the US Environmental Protection Agency (EPA) Underground Injection Control Program]. Therefore, the three drywells require remediation.

Table 4 summarizes stormwater liquid chemical analytical results for the drywells. The results show minor detections of VOCs.

Table 5 summarizes the soil chemical analytical results. Tetrachloroethylene was detected at concentrations that exceed its SCO in two soil samples collected in the west driveway (SB-3 and SB-4) at 0-1 foot below grade. Tetrachloroethylene was also detected above its SCO in four soil samples collected from beneath the south building at: SB-7 at 2-3 feet below grade; SB-8 at 1-2 and 17-18 feet below grade; SB-10 at 1-2 feet

below grade; and, SB-12 at 4-5 feet below grade. Toluene was detected above its SCO in shallow soil samples collected from the driveway at SB-3 and SB-4.

Minor and sporadic concentrations of SVOCs were detected in the soil samples. All detected concentrations were below the SCOs and are not significant.

For the soil chemical analytical results for metals, the detections were generally sporadic and minor. However, exceedances of the TAGM-4046 SCO for chromium were noted in two surface soil samples (SS-1 and SS-2) and one boring (SB-13). It should be noted that Dermody Consulting compared all soil results to the NYSDEC Subpart 375.6 Unrestricted SCOs. However, since the Subpart 375.6 SCOs do not contain a guidance value for total chromium, the chromium results were compared to the TAGM-4046 SCO.

Table 6 summarizes the VOC and SVOC groundwater chemical analytical results. Tetrachloroethylene and its degradation products (trichloroethylene and cis-1,2-dichloroethylene) were detected in several on-Site and off-Site groundwater samples at concentrations that exceeded the Standards. However, the concentrations are significantly lower than the 2002 on-Site groundwater concentrations.

An upgradient groundwater sample location (GW-2), showed no detections of VOCs or SVOCs at the three depths sampled. Also, the two northernmost soil samples obtained at the Site (SB-1 and SB-2) showed no detections of VOCs or SVOCs and no detections of metals above the SCOs. Therefore, there are no apparent upgradient contributors to the Site groundwater contamination or evidence that the woodworking building is a contributor to the contamination at the Site. A downgradient, on-Site groundwater sample (GW-19), showed tetrachloroethylene at 74 ug/l at the water table (20 feet below grade) and 280 ug/l at 50 feet below grade.

For the on-Site SVOCs, the detections were also minor and sporadic. The only exceedance of the Standards was for bis(2-ethylhexyl)phthalate (12 ug/l at 40 feet below grade at location GW-19).

For off-Site results, relatively minor concentrations of tetrachloroethylene and cis-1,2-dichloroethylene (a degradation product) were detected in the downgradient area. The highest detection of tetrachloroethylene was at GW-22 (immediately downgradient of the Site along West Centennial Ave.) in the shallow groundwater at 280 ug/l. Other detections of chlorinated VOCs were minor and sporadic, both laterally and vertically.

No SVOCs were detected in the off-Site groundwater.

Summary of Previous Investigations

Based on the previous investigations, it appears that releases of tetrachloroethylene occurred within the south building. Also, relatively minor concentrations of tetrachloroethylene were detected in the soil and groundwater in the driveway adjacent and west of the south building, and in the groundwater adjacent to the exterior north wall. No off-Site upgradient contamination appears to be impacting the on-Site groundwater.

The area containing the highest tetrachloroethylene concentrations is the subfloor within the south building in the area of soil sample location GP-20-3, which was found to contain tetrachloroethylene at 154,000 ug/kg at a depth of 1-2 feet. However, a deeper sample (22-24 feet) at this location showed a significant decrease in concentration to 28.4 ug/kg. Shallow samples obtained in the vicinity of GP-20-3 also showed elevated concentrations of tetrachloroethylene. However, these concentrations were all at least one order of magnitude lower than those at GP-20-3.

Also, in the west driveway, elevated concentrations of tetrachloroethylene appear to be confined to the shallow soil. However, elevated concentrations of petroleum constituents, primarily toluene and methylcyclohexane, were noted in the shallow soil at generally the same locations and depths as the tetrachloroethylene detections. This suggests the possibility that in this area, tetrachloroethylene was co-mingled with other compounds and released to the surface in the area of the driveway at relatively minor concentrations. The process by which these compounds entered the subsurface is not known.

The 2002 sampling indicated that the highest groundwater concentrations consisted primarily of tetrachloroethylene and were found near the center of the south building and near the southern (downgradient) property line. Lesser concentrations of tetrachloroethylene and other contaminants were found to be present to the immediate north of the south building.

For the 2008 groundwater sampling, significantly reduced concentrations of tetrachloroethylene were detected at the downgradient border of the Site and in the area immediately off-Site. Further downgradient, there are sporadic detections of tetrachloroethylene and cis-1,2-dichloroethylene, although there are several locations at which exceedances of the Standards were noted.

SECTION 4.0
PROPOSED INVESTIGATION

The purpose of this proposed Supplemental Remedial Investigation is to augment the existing sampling results to determine the extent of contamination in the soil and groundwater. The tasks to be performed are discussed below.

4.1 Ground-Penetrating Radar Survey

A ground-penetrating radar survey will be performed at the Site to obtain evidence of the presence or absence of two USTs at the north end of the Site. Also, the presence of the UST to the south of the south building will be confirmed. Finally, the ground-penetrating radar survey will be performed in the west driveway and to the north of the south building to determine if there is evidence of the presence of subsurface structures that may have accepted discharges from the former trench drains within the south building.

4.2 Soil Sampling Procedures

Soil borings will be performed at five additional locations at the Site using a Geoprobe direct-push rig. The proposed supplemental soil sampling locations are presented in Figure 4. Three of these borings are proposed for the area of the west driveway. The purpose of these borings is to determine if there are any other areas of contamination in the west driveway. In addition, two additional soil borings will be performed within the south building to provide additional information regarding the lateral and vertical extent of the area showing the highest concentrations of contamination in the vicinity of GP-20-3/MW-20-3. This further delineation will be used to evaluate [illegible] Interim Remedial Measure to remove the highly contaminated soil so that fut[illegible]

vapor extraction (if selected as a part of the Site remedy) may be completed in a shorter timeframe and require lesser amounts of carbon for vapor adsorption.

The borings will be performed with macro-samplers which will obtain soil cores at four-foot intervals. The macro-samplers will be opened and inspected for staining and screened with a photoionization detector (PID). Two soil samples will be retained from zones generally showing the highest PID concentrations. In the event that no PID readings are obtained, the samples retained for laboratory analysis will be derived from the 0 to 2 foot zone. The depth of coring at each location will be 20 feet (which is the approximate depth to the water table). In addition, boring logs will be prepared that describe the geology as well as providing the PID readings for each core.

4.3 Geoprobe Groundwater Sampling Procedures

A Geoprobe rig will be used to obtain groundwater samples from six off-Site locations as shown in Figure 5. The proposed off-Site groundwater sampling locations are selected based on the regional groundwater flow direction (generally south) and the results from the previous groundwater sampling. As discussed previously, due to streams located to the east and west of the Site, there may be an easterly or westerly component of flow. Malcolm Pirnie obtained samples to both the south and southwest in the off-Site area. However, the data indicates that the groundwater flow, and therefore the plume migration, may have a more easterly component. The purpose of the additional sampling is to define the eastern extent of groundwater contamination in the downgradient area.

At each location, a groundwater sample will be obtained from approximately 1 to 2 feet below the water table (approximately 20 to 21 feet below grade) using a check valve and dedicated tubing to agitate the groundwater sample to the surface. In a

a second sample will be obtained from approximately 20 feet below the shallow samples (40 to 41 feet below grade). Finally, a third sample will be obtained at 60 to 61 feet below grade. The purpose of the sampling is to delineate the vertical and horizontal extent of contamination in the southeast off-Site area.

4.4 Groundwater Monitoring Well Installation and Sampling Procedures

It is anticipated that off-Site permanent groundwater monitoring wells will be installed at two locations. At each well location, screens are anticipated to be installed at two depth intervals; one shallow and one deep. The locations and depths of the screened intervals of these wells will be determined based on the results of the Geoprobe groundwater sampling investigation and in consultation with, and approval of, the NYSDEC.

The groundwater monitoring wells will be installed with a hollow-stem auger drill rig. It is expected that the shallow and deep screened intervals at each location will be installed within the same borehole. The deep screen will consist of a five-foot length of one-inch-diameter PVC with a slot size of 0.010 inches and an appropriate length of riser pipe. Upon placement of the deep screen, No.1 Morie gravel will be placed in the borehole to a depth of approximately two feet above the top of the screen. Then, approximately two feet of bentonite chips will be placed above the gravel to create a seal between the shallow and deep screens.

The shallow screen will be installed in the same manner, however, the shallow screen will be ten feet in length and will be installed with five feet above, and five feet below, the water table. The interval in the borehole above the bentonite seal (the bentonite above the water table will be hydrated) for the shallow screen will be grouted to

grade. Locking well caps will be placed on the wells and flush-to-grade manholes will be installed at the surface. Following installation, each of the wells will be developed to clarity.

Each of the wells will be sampled following a period of at least one week after the completion of the development of the wells. The wells will be sampled using low-flow sampling methods and purged of at least three casing volumes utilizing dedicated polyethylene tubing with a submersible pump and a low-flow controller. Prior to collecting the groundwater samples, three casing volumes of groundwater will be purged at a rate of 0.1 liters per minute. Stability parameters, including pH, specific conductivity, and temperature, will be recorded following the removal of each casing volume. Sampling will commence if the parameters following the removal of the second and third volumes show agreement within 10 percent. Otherwise, an additional volume will be purged and the stability parameters compared to the previous readings. No more than five casing volumes will be removed prior to sampling.

Samples will be contained in 40 milliliter vials with Teflon septa with zero headspace. The samples will be placed into an ice-filled cooler for delivery to a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory for analysis of VOCs via USEPA Method 8260 with Category B deliverables (the sample analysis will include a matrix spike, a matrix spike duplicate, and an equipment and trip blank). A chain of custody form will be completed to document the sequence of sample possession.

4.5 Soil Vapor Intrusion Sampling Procedures

Following the completion of the analysis of the results from the Geoprobe groundwater investigation, which will provide additional information regarding the location and concentrations of contaminants in the off-Site groundwater, soil vapor intrusion sampling locations will be selected and sampled. The sample locations will be selected in consultation with, and with the approval of, the NYSDEC. The samples will be collected in accordance with the NYSDOH "Guidance for Evaluating Soil Vapor Intrusion in New York State" (October, 2006).

The sampling locations will include an on-Site sample from the north woodworking building. The south building at the Site, which is known to be the source area of the soil and groundwater contamination, will not be included in the soil vapor investigation since the building is vacant and unoccupied and it is presumed that elevated concentrations of vapors exist within this building. The off-Site, adjacent buildings to be sampled will consist of the two church buildings located adjacent to the south building at 18 W. Centennial Avenue and ~~the building~~ at the corner of Nassau Road and W. Centennial Avenue. Off-Site downgradient samples may consist of two residences located on the south side of W. Centennial Ave. However, the decision regarding the residences to be sampled will be subject to the results of the investigation. All soil vapor intrusion samples will be obtained during the upcoming heating season. The soil vapor intrusion investigation sampling at each location will include one sub-slab soil vapor sample obtained from beneath the first floor, or the lowest floor or basement of the structure. In addition, an indoor air sample will be obtained from a height of approximately four feet in the area of the sub-slab soil vapor sample.

The indoor air samples will be obtained with 6-liter Summa Canisters with flow restrictors set to obtain samples over a 24-hour period at a flow rate of less than 0.2 liters per minute. The sample intakes will be set at a height of approximately four feet above the floor level. The samples will be delivered to a NYSDOH-ELAP-certified laboratory and analyzed for VOCs by U.S. Environmental Protection Agency (EPA) Method TO-15 with SIM (Selective Ion Monitoring) with Category B deliverables.

For the sub-slab soil vapor samples, a one-half-inch drill hole will be created through the concrete to a depth of approximately two inches into the underlying soil. A length of quarter-inch-diameter, food-grade polyethylene tubing will be placed to the base of the borehole. Approximately two inches of Morie No. 0 sand will be placed in the borehole around the tubing. Melted beeswax will then be poured into the borehole above the sand to seal the drillhole from the atmosphere. The beeswax will be allowed to set for approximately ten minutes. A Summa Canister will be used to obtain the sample. The tubing will be connected to the canister and a t-valve will be attached to the tubing with a ball valve for flow control. A plastic syringe will be used to withdraw two tubing volumes from the withdrawal port and the ball valve on the port will then be closed. A Summa Canister with a flow restrictor will then be opened and a sample obtained over a 24-hour period at a flow rate of less than 0.2 liters per minute. The samples will be delivered to a NYSDOH ELAP-certified laboratory for analysis of VOCs by USEPA Method TO-15 with SIM and Category B deliverables.

At one sub-slab soil vapor sampling location, a duplicate sample will be obtained for quality assurance/quality control purposes by using a t-valve to simultaneously fill each of two canisters from the same sampling point. In addition, one outdoor air sample

will be obtained upwind (if discernable) of the other sample locations to determine background concentrations.

4.6 Sampling Objectives

The objective of the sampling is to complete the delineation of the on-Site soil contamination for the purpose of considering remedial alternatives. These preliminary alternatives include soil vapor extraction, or removal of soil from the area of the highest concentrations of contamination followed by soil vapor extraction to remove the residual contamination.

For the Geoprobe groundwater investigation, the purpose of the supplemental sampling is to further delineate the off-Site extent of contamination. Based on this information, a soil vapor intrusion investigation of downgradient residential structures will be confirmed. In addition, installation of permanent off-Site groundwater monitoring wells will be proposed to monitor the progress of the anticipated groundwater remediation.

Following the completion of the investigation, a Remedial Investigation Report will be prepared. Following the completion of the Remedial Investigation Report, a Feasibility Study Report will be prepared to evaluate remedial alternatives.

SECTION 5.0
QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

5.1 Decontamination Procedures

All sampling equipment will be either dedicated equipment or decontaminated prior to sampling at each location. Equipment to be decontaminated will include the Geoprobe sampling rods. Decontamination will consist of scrubbing the equipment in a bath of Liquinox and water, and then rinsing with water.

5.2 Sampling Procedures

Soil samples will be obtained by Geoprobe. The soil cores will be collected in dedicated four-foot-long acetate sleeves within the macro-cores which will be halved lengthwise to expose the soil. The length of the core will be screened with a PID and then a sample or samples may be obtained.

The groundwater samples will be obtained by inserting dedicated polyethylene tubing through the sampling rods and below the water table. A check valve will be affixed to the end of the tubing which will be agitated at the surface to produce groundwater. The samples will be collected in 40 ml vials with Teflon septa and zero headspace.

5.3 Preservation and Chain-of-Custody Procedures

The soil and groundwater samples will be placed in an ice-filled cooler for transport to the laboratory. The samples will be transferred to the laboratory within 48 hours of obtaining the samples.

A chain-of-custody form will be completed for each submission of samples to the laboratory to document the sequence of sample possession.

5.4 Laboratory Analytical Procedures

A total of 10 soil samples and 18 groundwater samples will be obtained (and additional soil vapor, indoor and outdoor air, and groundwater samples will be obtained following the analysis of the Geoprobe groundwater sampling results). The soil and groundwater samples will be analyzed for VOCs by USEPA Method 8260 with Category B deliverables. A duplicate sample, a matrix spike sample, a matrix spike duplicate, and an equipment blank sample will be obtained for the soil and groundwater samples (a separate set will be obtained for each media for each day or for every 20 primary samples obtained). A trip blank sample will also be submitted for laboratory analysis. Therefore, 28 environmental samples will be obtained along with nine quality assurance/quality control samples. A Data Usability Summary Report will be prepared for the laboratory analyses and will be included in the Supplemental Remedial Investigation Report.

5.5 Field Notes

All field notes will be recorded in a bound, weatherproof notebook with black ink. The information recorded will include the date, weather conditions, personnel present, description of sampling methods and samples, geology of samples, and other pertinent field observations.

5.6 Data Reporting

A report of all sampling procedures and observations will be prepared which will include laboratory reports and summary results tables, figures showing the sampling locations, and a comparison of the sample results to applicable standards and guidance values for each parameter. The soil sample chemical analytical results will be compared to the NYSDEC Unrestricted Use SCOs (Subpart 375-6). The groundwater chemical

analytical results will be compared to the NYSDEC Class GA groundwater standards (6 NYCRR 703.5).

5.7 Schedule

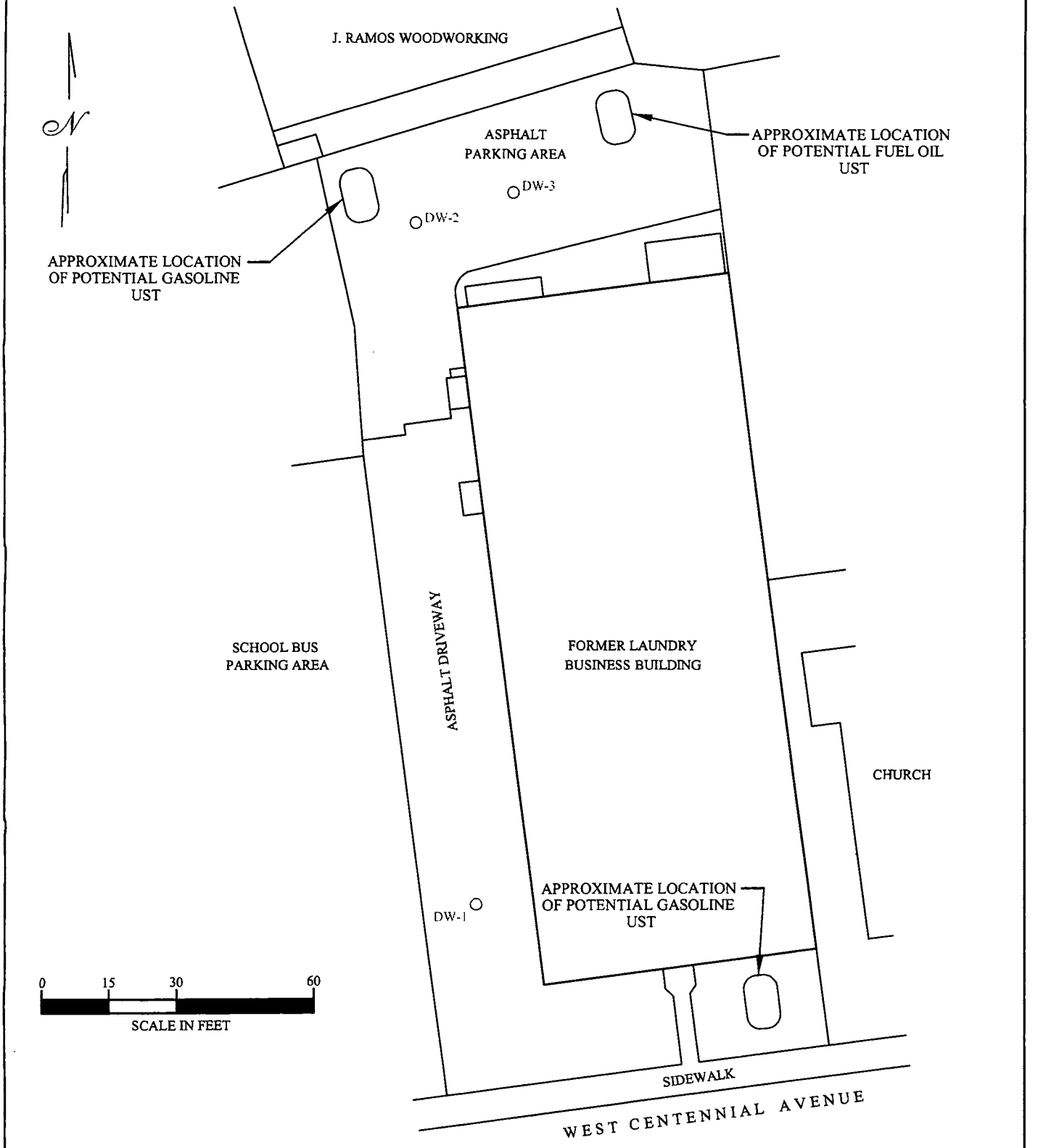
The NYSDEC will be notified 10 days in advance of any field work so that they may be present during the activities. The estimated schedule to complete the tasks in this work plan are as follows:

Days Following NYSDEC Approval	Task
21	Commence field activities, perform ground-penetrating radar survey.
28	Obtain road opening permits for off-Site borings, perform utility markouts.
35	Complete on-Site soil sampling and off-Site groundwater sampling. Complete soil vapor intrusion investigation of north woodworking building.
65	Receive laboratory analytical results including Category B deliverables data packages.
80	Analyze Geoprobe groundwater data and propose locations for permanent groundwater monitoring wells.
110	Complete installation, development, and sampling of off-Site permanent groundwater monitoring wells.
140 4-5 Months	Receive laboratory analytical results including Category B deliverables data packages.
170	Submit Remedial Investigation Report that will contain all information and results with the exception of those related to the soil vapor intrusion investigation which will be completed during November-December 2010 and the results will be submitted as an addendum report to the Remedial Investigation Report 60 days following the commencement of soil vapor intrusion field activities.

Days Following NYSDEC Approval *(continued)*	Task
260	Submit Feasibility Study Report

Figure 1
Site Location Map
20 West Centennial Avenue, Roosevelt, NY
NCTM No. 55-415-273

Dermody Consulting



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CENTER MORICHES, NEW YORK

FIGURE 2
GENERAL SITE LAYOUT AND APPROXIMATE LOCATIONS OF POTENTIAL USTs AND DRYWELLS
20 WEST CENTENNIAL AVENUE
ROOSEVELT, NEW YORK

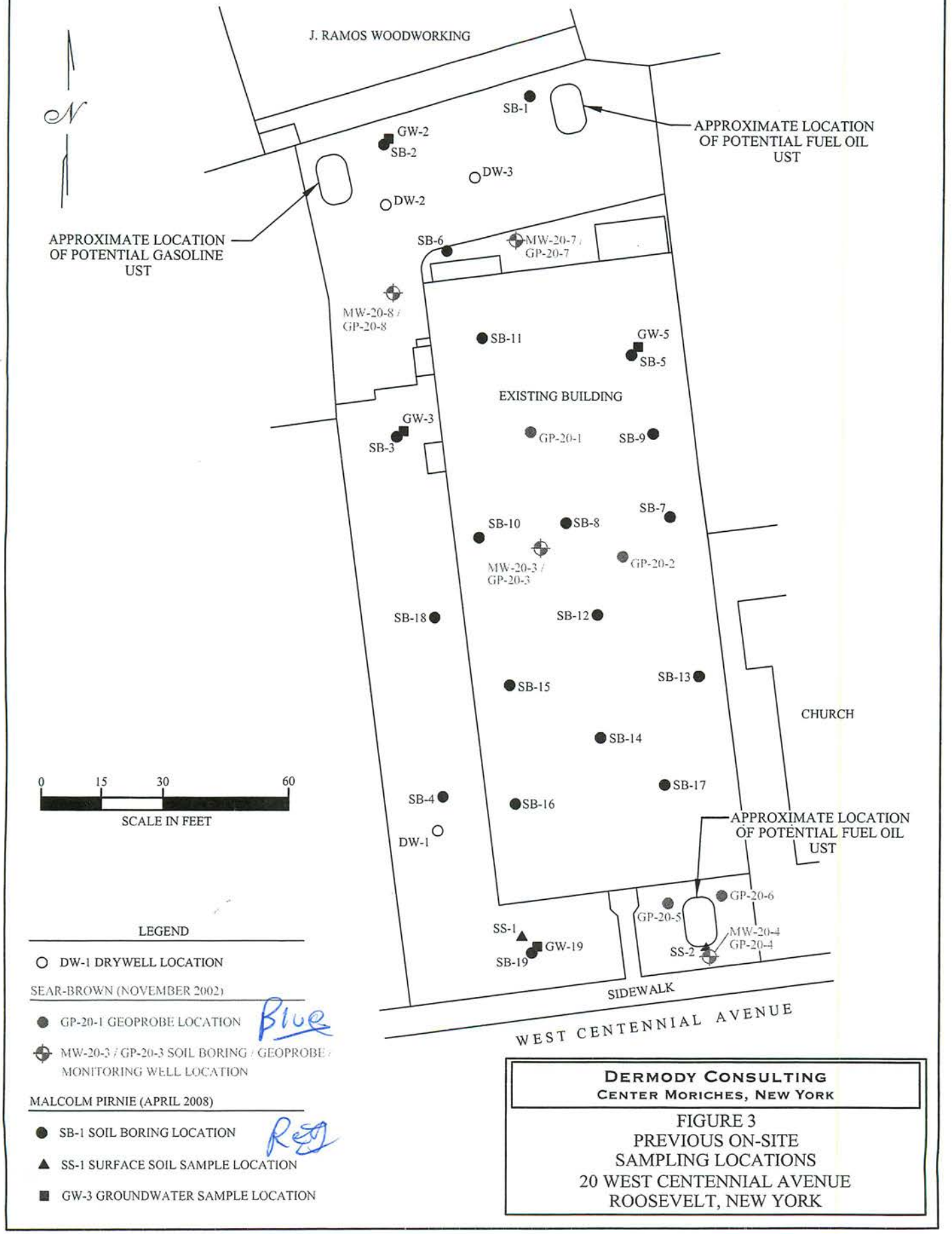

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FIGURE 3
PREVIOUS ON-SITE
SAMPLING LOCATIONS
20 WEST CENTENNIAL AVENUE
ROOSEVELT, NEW YORK

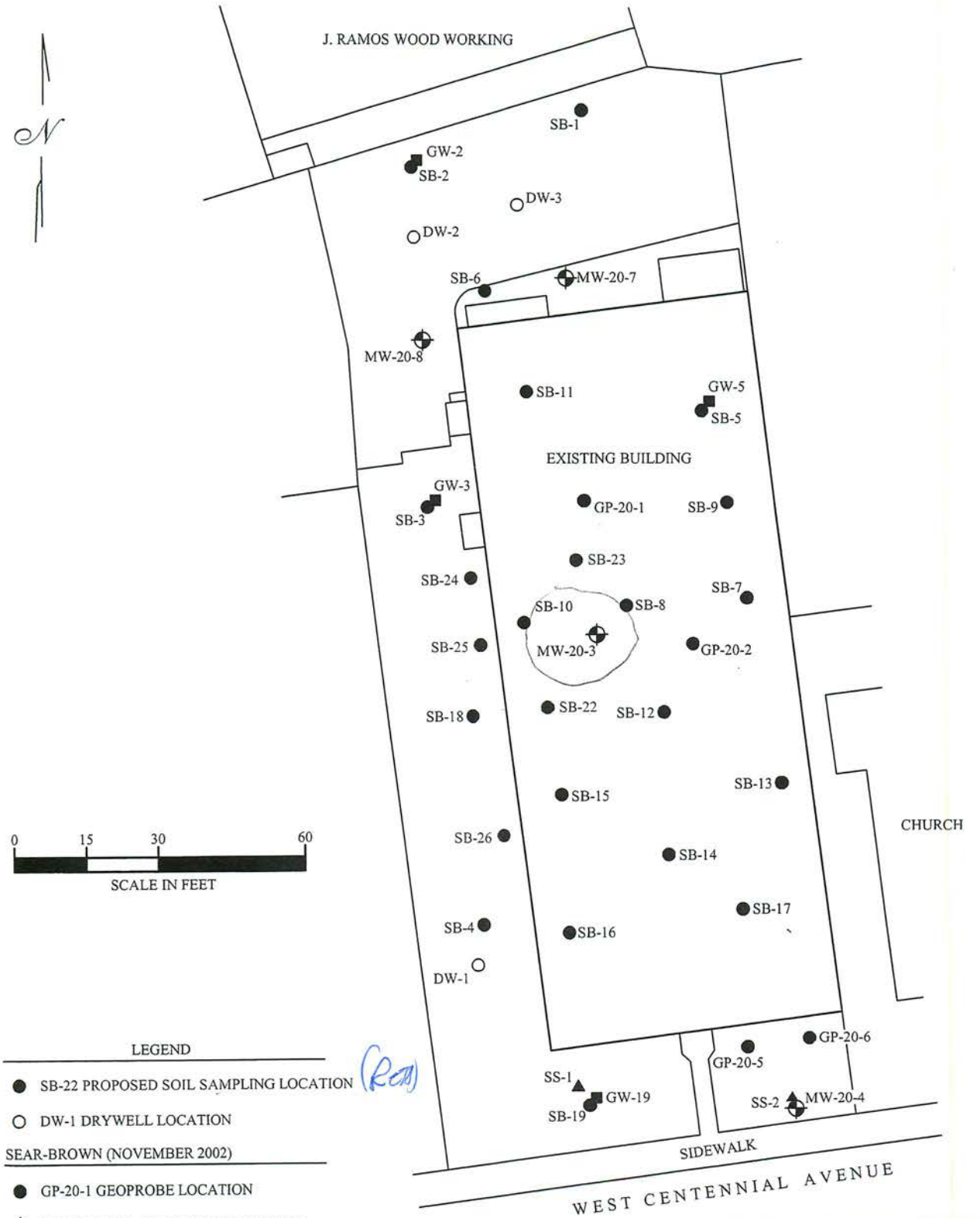

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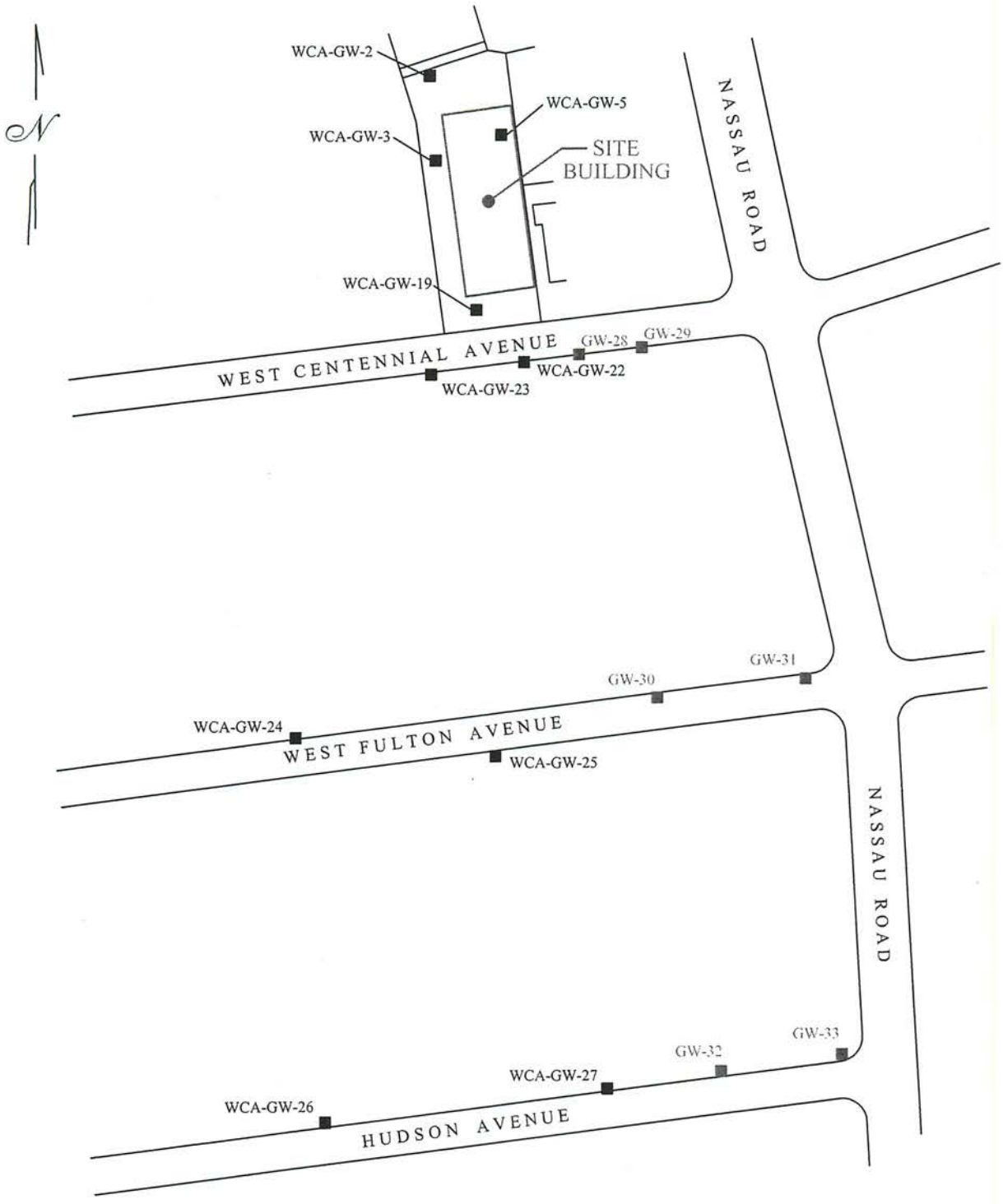
FIGURE 4
PROPOSED SUPPLEMENTAL
ON-SITE SAMPLING LOCATIONS
20 WEST CENTENNIAL AVENUE
ROOSEVELT, NEW YORK



LEGEND

- GW-28 PROPOSED GEOPROBE GROUNDWATER SAMPLING LOCATION
MALCOLM PIRNIE (APRIL 2008)
- WCA-GP-20-1 SOIL BORING LOCATION
- WCA-GW-5 GROUNDWATER SAMPLE LOCATION

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FIGURE 5

PROPOSED AND PREVIOUS SUPPLEMENTAL OFF-SITE SAMPLING LOCATIONS

20 WEST CENTENNIAL AVENUE
ROOSEVELT, NEW YORK

Table 1
Soil Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, New York
November, 2002

Sample ID	GP-20-1	GP-20-2	GP-20-3	GP-20-3	GP-20-4	GP-20-7	GP-20-8	Surface	Soil Cleanup Objectives Subpart 375.6
Sample Depth	**6' – 8'**	**2' – 4'**	**0' – 2'**	**22' – 24'**	**24' – 26'**	**22' – 24'**	**22' – 24'**	**0" – 1"**	
Volatile Organic Compounds ***(in micrograms per kilogram)***									
Tetrachloroethylene	**11,500**	**14,000**	**154,000**	28.4	ND	ND	ND	NS	1,300
m & p-Xylenes	ND	ND	ND	ND	41.1	ND	ND		1,600
o-Xylene	ND	ND	ND	ND	11.9	ND	ND		1,600
Semi-Volatile Organic Compounds ***(in micrograms per kilogram)***									
SVOCs	NS	NS	NS	NS	ND	ND	ND	NS	-
Polychlorinated Biphenyls ***(in milligrams per kilogram)***									
PCBs	NS	NS	NS	NS	NS	NS	NS	ND	3.2
Metals ***(in milligrams per kilogram)***									
Arsenic	**16.6**	5.79	7.75	NS	NS	NS	NS	NS	16
Barium	32.8	55.2	34.4						820
Cadmium	0.92	1.70	1.39						7.5
Chromium	7.08	14.0	**23.2**						19*
Lead	12.7	19.2	13.7						450
Selenium	0.574	ND	ND						4

Notes:
Only detected analytes were reported.
ND = Not Detected
NS = Not Sampled
* = The standard is for hexavalent chromium only.
Bolded values indicate an exceedance of the New York State Department of Environmental Conservation (NYSDEC) Restricted Use Soil Cleanup Objectives for the Protection of Groundwater as per Subpart 375.6.

Table 2
Groundwater Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, New York
November, 2002

Sample ID	MW-20-3	MW-20-4	MW-20-7	MW-20-8	NYSDEC Groundwater Standards
Volatile Organic Compounds ***(in micrograms per liter)***					
cis-1,2-Dichloroethylene	ND	ND	3.30	ND	5*
Tetrachloroethylene	**7,690**	**7,530**	**243**	**1,220**	5*
Trichloroethylene	ND	ND	**7.71**	ND	5*
1,2,4-Trimethylbenzene	ND	ND	3.60	ND	5*
m & p-Xylenes	ND	ND	2.18	ND	5*
Semi-Volatile Organic Compounds ***(in micrograms per liter)***					
SVOCs	NS	ND	ND	ND	-
Metals ***(in milligrams per liter)***					
Arsenic	0.023	0.009	NS	NS	0.025
Barium	0.272	0.116			1
Cadmium	**0.008**	**0.007**			0.005
Chromium	**0.230**	**0.125**			0.05
Lead	**0.037**	0.012			0.025

Notes:
Only detected anlytes are reported.
ND = Not Detected
NS = Not Sampled
* = The Principal Organic Contaminant Standard applies.
Bolded values indicate an exceedance of the New York State Department of Environmental Conservation (NYSDEC) Class GA Ambient Water Quality Standards.

Table 3
Sediment Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, NY
April, 2008

Sample ID	DW1	DW2	DW3	Recommended Soil Cleanup Objectives TAGM 4046
Sample Depth *(in feet below grade)*	**0-1**	**0-1**	**0-1**	
Volatile Organic Compounds *(in micrograms per kilogram)*				
Cyclohexane	ND	690 J	ND	-
Isopropylbenzene	ND	40 J	320 J	-
Methylcyclohexane	ND	1,300 D	39 J	-
Toluene	ND	ND	11 J	1,500
m & p-Xylenes	ND	27 J	ND	1,200
Semi-Volatile Organic Compounds *(in micrograms per kilogram)*				
Bis(2-Ethylhexyl)phthalate	1,300 J	9,100	18,000 J	50,000
Phenanthrene	ND	3,500	11,000 J	50,000
Fluoranthene	ND	1,300 J	ND	50,000
Pyrene	ND	1,600 J	4,900 J	50,000
Butylbenzylphthalate	ND	800 J	3,700 J	50,000
Benzo(a)anthracene	ND	**680 J**	**2,600 J**	224
Chrysene	**1,400 JB**	**830 JB**	**4,300 JB**	400
Benzo(b)fluoranthene	**1,200 J**	820 J	**2,500 J**	1,100
Benzo(k)fluoranthene	**1,300 J**	310 J	ND	1,100
Benzo(a)pyrene	ND	**430 J**	ND	61
Indeno(1,2,3-cd)pyrene	ND	320 J	ND	3,200
Benzo(g,h,i)perylene	ND	600 J	ND	50,000
Naphthalene	ND	420 J	3,100 J	13,000
2-Methylnaphthalene	ND	7,400	25,000	36,400
Fluorene	ND	ND	4,100 J	50,000
Anthracene	ND	810 J	3,000 J	50,000
1,1-Biphenol	ND	560 J	ND	-
Acenaphthene	ND	570 J	ND	50,000
Dibenzofuran	ND	**22,500 J**	ND	6,200
Di-n-butylphthalate	ND	500 J	ND	8,100

Table 3*(continued)*
Sediment Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, NY
April, 2008

Sample ID	DW1	DW2	DW3	Recommended Soil Cleanup Objectives TAGM 4046
Sample Depth ***(in feet below grade)***	**0-1**	**0-1**	**0-1**	
Metals ***(in milligrams per kilogram)***				
Aluminum	1,680	4,820	2,810	SB
Antimony	0.641 J	2.07 J	ND	SB
Arsenic	0.641 J	1.97	0.703 J	7.5 or SB
Barium	13	42	30.9	300 or SB
Cadmium	0.332	**1.83**	**1.74**	1 or SB
Calcium	20,700	8,260	25,900	SB
Chromium	**13.7 J**	**28 J**	**23 J**	10 or SB
Cobalt	1.52	4.01	3.09	30 or SB
Copper	19.2	**486**	**52.8**	25 or SB
Iron	**6,370**	**13,700**	**17,700**	2,000 or SB
Lead	20.2	47.7	30.7	200 – 500
Magnesium	12,200 J	3,850 J	4,900 J	SB
Manganese	85.3	99.8	160	SB
Mercury	0.025	**0.149**	0.034	0.1
Nickel	5.68	**22.4**	**14.1**	13 or SB
Potassium	273	254	238	SB
Sodium	308	346	383	SB
Vanadium	10.7	18.4	8.86	150 or SB
Zinc	**104**	**304**	**221**	20 or SB

Notes:
Only detected analytes are reported.
ND = Not Detected
J = The concentration is estimated
B = The analyte was detected in the laboratory blank as well as the sample. This indicates a possible laboratory contamination of the environmental sample.
SB = Site Background
- = No Recommended Soil Cleanup Objective available.
Bolded values indicate an exceedance of the New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives as per the Technical and Administrative Guidance Memorandum (TAGM) 4046.

Table 4
Stormwater Liquid Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, New York
April, 2008

Sample ID	DW2	DW3
Volatile Organic Compounds ***(in micrograms per liter)***		
Acetone	40	ND
2-Butanone	4.7 J	ND
cis-1,2-Dichloroethylene	ND	ND
Trichloroethylene	ND	ND
Toluene	ND	0.7 J
Tetrachloroethylene	ND	ND
1,2,4-Trimethylbenzene	ND	ND

Notes:
Only detected anlytes are reported.
ND = Not Detected
J = The concentration is estimated

Table 5
Soil Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, NY
April, 2008

Sample ID	SB-1	SB-2	SB-3	SB-3	SB-4	SB-4	Soil Cleanup Objectives Subpart 375.6
Sample Depth *(in feet below grade)*	18-19	17–18	0-1	18-19	0–1	17–18	
Volatile Organic Compounds ***(in micrograms per kilogram)***							
Cyclohexane	ND	ND	270 J	ND	110 J	ND	-
cis-1,2-Dichloroethylene	ND	ND	160 J	ND	ND	ND	250
Methylcyclohexane	ND	ND	4,800 D	ND	1,700 D	ND	-
Trichloroethylene	ND	ND	140 J	ND	ND	ND	470
Toluene	ND	ND	**2,300 D**	ND	**7,400 D**	ND	700
Tetrachloroethylene	ND	ND	**4,600 D**	ND	**2,000 D**	ND	1,300
Ethylbenzene	ND	ND	26 J	ND	ND	ND	1,000
m&p-Xylenes	ND	ND	85 J	ND	27 J	ND	260
o-Xylenes	ND	ND	29 J	ND	13 J	ND	260
Styrene	ND	ND	20 J	ND	ND	ND	-
Semi-Volatile Organic Compounds ***(in micrograms per kilogram)***							
Bis(2-Ethylhexyl)phthalate	ND	ND	ND	44 J	ND	ND	-
Phenanthrene	ND	ND	ND	ND	ND	ND	100,000
Fluoranthene	ND	ND	ND	ND	ND	ND	100,000
Pyrene	ND	ND	ND	ND	ND	ND	100,000
Butylbenzylphthalate	ND	ND	ND	ND	ND	ND	-
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	1,000
Chrysene	ND	ND	ND	ND	ND	ND	1,000
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	1,000
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	800
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	1,000
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	500
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	ND	100,000

Table 5 *(continued)*
Soil Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, NY
April, 2008

Sample ID	SB-1	SB-2	SB-3	SB-3	SB-4	SB-4	Soil Cleanup Objectives Subpart 375.6
Sample Depth *(in feet below grade)*	18-19	17–18	0-1	18-19	0–1	17–18	
Metals *(in milligrams per kilogram)*							
Aluminum	485	411	2,400		2,000		-
Antimony	ND	ND	ND		ND		-
Arsenic	ND	ND	0.806		2.72		13
Barium	1.99 J	3.07 J	13.7		19.1		350
Beryllium	ND	ND	ND		0.027 J		7.2
Cadmium	ND	ND	0.231 J		0.167 J		2.5
Calcium	ND	26.9 J	18,300		5,420		-
Chromium	2.83 J	2.05 J	5.73 J		3.74 J		10 or SB*
Cobalt	0.965 J	0.554 J	2.34		2.03		-
Copper	1.26	1.41	12.9		10.8		50
Iron	1,730	2,490	4,790	NS	4,600	NS	-
Lead	0.765	0.742	8.98		13.4		63
Magnesium	114 J	93 J	5,270 J		2,360 J		-
Manganese	57.4	36.2	70		58.8		1,600
Mercury	ND	ND	0.016		0.04		0.18
Nickel	1.14 J	1.19 J	6.43		6.53		30
Potassium	ND	46.4 J	263		168		-
Silver	ND	ND	ND		ND		2
Sodium	79.8 J	85 J	136 J		159		-
Vanadium	1.35 J	1.45	24.2		22.3		-
Zinc	8.4	10.3	17.1		17.2		109

Table 5 *(continued)*
Soil Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, NY
April, 2008

Sample ID	SB-5	SB-6	SB-7	SB-7	SB-8	SB-8	Soil Cleanup Objectives Subpart 375.6
Sample Depth *(in feet below grade)*	18-19	18-19	2-3	17–18	1-2	17–18	
Volatile Organic Compounds *(in micrograms per kilogram)*							
Cyclohexane	ND	ND	ND	ND	ND	ND	-
cis-1,2-Dichloroethylene	ND	ND	ND	ND	49	ND	250
Methylcyclohexane	ND	ND	ND	ND	ND	ND	-
Trichloroethylene	ND	ND	ND	ND	75	ND	470
Toluene	ND	ND	ND	ND	ND	ND	700
Tetrachloroethylene	ND	ND	**2,400 D**	ND	**33,000 D**	**4,200 D**	1,300
Ethylbenzene	ND	ND	ND	ND	ND	ND	1,000
m&p-Xylenes	ND	ND	ND	ND	ND	ND	260
o-Xylenes	ND	ND	ND	ND	ND	ND	260
Styrene	ND	ND	ND	ND	ND	ND	-
Semi-Volatile Organic Compounds *(in micrograms per kilogram)*							
Bis(2-Ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND	-
Phenanthrene	ND	ND	ND	ND	ND	ND	100,000
Fluoranthene	ND	ND	ND	ND	ND	ND	100,000
Pyrene	ND	ND	ND	ND	ND	ND	100,000
Butylbenzylphthalate	ND	ND	ND	ND	ND	ND	-
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	1,000
Chrysene	ND	ND	ND	ND	ND	ND	1,000
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	1,000
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	800
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	1,000
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	500
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	ND	100,000

Table 5 *(continued)*
Soil Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, NY
April, 2008

Sample ID	SB-5	SB-6	SB-7	SB-7	SB-8	SB-8	Soil Cleanup Objectives Subpart 375.6
Sample Depth *(in feet below grade)*	18-19	18-19	2-3	17–18	1-2	17–18	
Metals *(in milligrams per kilogram)*							
Aluminum	NS	NS	NS	512	NS	434	-
Antimony				ND		ND	-
Arsenic				ND		ND	13
Barium				2.08 J		2 J	350
Beryllium				ND		ND	7.2
Cadmium				ND		ND	2.5
Calcium				44 J		24.6 J	-
Chromium				1.56 J		2.49 J	10 or SB*
Cobalt				0.558 J		0.417 J	-
Copper				1.3		1.24	50
Iron				1,680		1,370	-
Lead				0.803		0.572 J	63
Magnesium				116 J		103 J	-
Manganese				28.7		19.1	1,600
Mercury				ND		ND	0.18
Nickel				1.38		1.09 J	30
Potassium				78 J		72.5 J	-
Silver				ND		0.16 J	2
Sodium				89.6 J		106 J	-
Vanadium				1.3 J		1.26 J	-
Zinc				3.28		2.98	109

Table 5 *(continued)*
Soil Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, NY
April, 2008

Sample ID	SB-9	SB-9	SB-10	SB-10	SB-11	SB-12	Soil Cleanup Objectives Subpart 375.6
Sample Depth ***(in feet below grade)***	**1–2**	**17–18**	**1–2**	**17–18**	**17–18**	**4–5**	
Volatile Organic Compounds ***(in micrograms per kilogram)***							
Cyclohexane	ND	ND	ND	ND	ND	ND	-
cis-1,2-Dichloroethylene	38	ND	49	ND	ND	ND	250
Methylcyclohexane	ND	ND	ND	ND	ND	ND	-
Trichloroethylene	ND	ND	75	ND	ND	ND	470
Toluene	ND	ND	ND	ND	ND	ND	700
Tetrachloroethylene	640 JD	ND	**15,000 D**	ND	ND	**1,900 D**	1,300
Ethylbenzene	ND	ND	ND	ND	ND	ND	1,000
m&p-Xylenes	ND	ND	ND	ND	ND	ND	260
o-Xylenes	ND	ND	ND	ND	ND	ND	260
Styrene	ND	ND	ND	ND	ND	ND	-
Semi-Volatile Organic Compounds ***(in micrograms per kilogram)***							
Bis(2-Ethylhexyl)phthalate	ND	ND	560	ND	ND	ND	-
Phenanthrene	ND	ND	ND	ND	ND	ND	100,000
Fluoranthene	ND	ND	ND	ND	ND	ND	100,000
Pyrene	ND	ND	45 J	ND	ND	ND	100,000
Butylbenzylphthalate	ND	ND	ND	ND	ND	ND	-
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	1,000
Chrysene	ND	ND	ND	ND	ND	ND	1,000
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	1,000
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	800
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	1,000
Indeno(1,2,3-cd)pyrene	ND	ND	41 J	ND	ND	ND	500
Benzo(g,h,i)perylene	ND	ND	72 J	ND	ND	ND	100,000

Table 5 *(continued)*
Soil Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, NY
April, 2008

Sample ID	SB-9	SB-9	SB-10	SB-10	SB-11	SB-12	Soil Cleanup Objectives Subpart 375.6
Sample Depth *(in feet below grade)*	1–2	17–18	1–2	17–18	17–18	4–5	
Metals *(in milligrams per kilogram)*							
Aluminum	NS	549	NS	499	NS	NS	-
Antimony		ND		ND			-
Arsenic		1.29		0.689 J			13
Barium		2.18 J		2.46 J			350
Beryllium		ND		ND			7.2
Cadmium		ND		ND			2.5
Calcium		50.4 J		55.7 J			-
Chromium		2.21 J		1.8 J			10 or SB*
Cobalt		0.648 J		0.56 J			-
Copper		2.47		1.48			50
Iron		2,660		2,570 J			-
Lead		0.703		0.625 J			63
Magnesium		103 J		101 J			-
Manganese		35		28.5 J			1,600
Mercury		ND		ND			0.18
Nickel		1.57		1.21 J			30
Potassium		74.5 J		71.7 J			-
Silver		ND		ND			2
Sodium		112 J		84.9 J			-
Vanadium		4.9		1.69 J			-
Zinc		3.81		4.08 J			109

Table 5 *(continued)*
Soil Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, NY
April, 2008

Sample ID	SB-12	SB-13	SB-13	SB-14	SB-14	SB-15	Soil Cleanup Objectives Subpart 375.6
Sample Depth *(in feet below grade)*	17–18	4–5	15–16	0.5–3.5	17–18	1–2	
Volatile Organic Compounds *(in micrograms per kilogram)*							
Cyclohexane	ND	ND	ND	ND	ND	ND	-
cis-1,2-Dichloroethylene	ND	ND	ND	ND	ND	ND	250
Methylcyclohexane	ND	ND	ND	ND	ND	ND	-
Trichloroethylene	ND	ND	ND	ND	ND	ND	470
Toluene	ND	ND	ND	ND	ND	ND	700
Tetrachloroethylene	ND	420	1,200 D	330	ND	610 JD	1,300
Ethylbenzene	ND	ND	ND	ND	ND	ND	1,000
m&p-Xylenes	ND	ND	ND	ND	ND	ND	260
o-Xylenes	ND	ND	ND	ND	ND	ND	260
Styrene	ND	ND	ND	ND	ND	ND	-
Semi-Volatile Organic Compounds *(in micrograms per kilogram)*							
Bis(2-Ethylhexyl)phthalate	ND	ND	240 J	ND	ND	ND	-
Phenanthrene	ND	ND	ND	ND	ND	ND	100,000
Fluoranthene	ND	ND	ND	ND	ND	ND	100,000
Pyrene	ND	ND	ND	ND	ND	ND	100,000
Butylbenzylphthalate	ND	ND	ND	ND	ND	ND	-
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	1,000
Chrysene	ND	ND	ND	ND	ND	ND	1,000
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	1,000
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	800
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	1,000
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	500
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	ND	100,000

Table 5 *(continued)*
Soil Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, NY
April, 2008

Sample ID	SB-12	SB-13	SB-13	SB-14	SB-14	SB-15	Soil Cleanup Objectives Subpart 375.6
Sample Depth *(in feet below grade)*	**17–18**	**4–5**	**15–16**	**0.5–3.5**	**17–18**	**1–2**	
Metals *(in milligrams per kilogram)*							
Aluminum	607		1,960		945		-
Antimony	ND		ND		ND		-
Arsenic	ND		0.806		0.258 J		13
Barium	5.52		10.4		3.42 J		350
Beryllium	ND		ND		ND		7.2
Cadmium	ND		ND		ND		2.5
Calcium	38 J		3,740		57.3 J		-
Chromium	3.25 J		**12.3 J**		3.9 J		10 or SB*
Cobalt	0.958 J		1.66		0.64 J		-
Copper	1.41		13.9		2.15		50
Iron	1,990	NS	5,460	NS	3,830	NS	-
Lead	2.86		5.99		1.00		63
Magnesium	158 J		511 J		456 J		-
Manganese	76		130		47.8		1,600
Mercury	ND		0.008 J		ND		0.18
Nickel	1.23 J		4.20		4.65		30
Potassium	91.5 J		232		133 J		-
Silver	ND		ND		ND		2
Sodium	176		120 J		116 J		-
Vanadium	1.48 J		4.83		2.63		-
Zinc	6.38		10.5		5.54		109

Table 5 *(continued)*
Soil Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, NY
April, 2008

Sample ID	SB-15	SB-16	SB-16	SB-17	SB-17	SB-18	Soil Cleanup Objectives Subpart 375.6
Sample Depth *(in feet below grade)*	16-18	1–2	16–18	6–7	16-18	5–6	
Volatile Organic Compounds *(in micrograms per kilogram)*							
Cyclohexane	ND	ND	ND	ND	ND	ND	-
cis-1,2-Dichloroethylene	ND	ND	ND	ND	ND	ND	250
Methylcyclohexane	ND	ND	ND	ND	ND	ND	-
Trichloroethylene	ND	ND	ND	ND	ND	ND	470
Toluene	ND	ND	ND	ND	ND	ND	700
Tetrachloroethylene	ND	230	ND	16 J	ND	360	1,300
Ethylbenzene	ND	ND	ND	ND	ND	ND	1,000
m&p-Xylenes	ND	ND	ND	ND	ND	ND	260
o-Xylenes	ND	ND	ND	ND	ND	ND	260
Styrene	ND	ND	ND	ND	ND	ND	-
Semi-Volatile Organic Compounds *(in micrograms per kilogram)*							
Bis(2-Ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND	-
Phenanthrene	ND	ND	ND	ND	ND	ND	100,000
Fluoranthene	ND	40 J	ND	ND	ND	ND	100,000
Pyrene	ND	84 J	ND	ND	ND	ND	100,000
Butylbenzylphthalate	ND	ND	ND	ND	ND	ND	-
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	1,000
Chrysene	ND	ND	ND	ND	ND	ND	1,000
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	1,000
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	800
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	1,000
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	500
Benzo(g,h,i)perylene	ND	61 J	ND	ND	ND	ND	100,000

Table 5 *(continued)*
Soil Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, NY
April, 2008

Sample ID	SB-15	SB-16	SB-16	SB-17	SB-17	SB-18	Soil Cleanup Objectives Subpart 375.6
Sample Depth *(in feet below grade)*	16-18	1–2	16–18	6–7	16-18	5–6	
Metals ***(in milligrams per kilogram)***							
Aluminum	863		686		869		-
Antimony	ND		ND		ND		-
Arsenic	ND		ND		0.893		13
Barium	2.73 J		2.23 J		2.5 J		350
Beryllium	ND		ND		ND		7.2
Cadmium	ND		ND		ND		2.5
Calcium	59.7 J		32 J		51.7 J		-
Chromium	2.02 J		1.83 J		2.69 J		10 or SB*
Cobalt	0.708 J		0.451 J		0.672 J		-
Copper	2.39		1.43		2.26		50
Iron	3,260	NS	1,820	NS	4,830	NS	-
Lead	0.969		0.536		1.13		63
Magnesium	208 J		149 J		189 J		-
Manganese	39.7		46.1		32.1		1,600
Mercury	ND		ND		0.08		0.18
Nickel	1.73		1.70		1.78		30
Potassium	96.8 J		78.3 J		88.6 J		-
Silver	ND		ND		0.337 J		2
Sodium	139		116 J		167		-
Vanadium	2.20		1.36		3.39		-
Zinc	5.16		4.52		3.88		109

Table 5 *(continued)*
Soil Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, NY
April, 2008

Sample ID	SB-18	SB-19	SB-19	SS-1	SS-2	Soil Cleanup Objectives Subpart 375.6
Sample Depth *(in feet below grade)*	16.5–18.5	12-15	16-18	0-1	0-1	
Volatile Organic Compounds *(in micrograms per kilogram)*						
Cyclohexane	ND	ND	ND	ND	ND	-
cis-1,2-Dichloroethylene	ND	ND	ND	ND	ND	250
Methylcyclohexane	ND	ND	ND	ND	ND	-
Trichloroethylene	ND	ND	ND	ND	ND	470
Toluene	ND	ND	ND	ND	ND	700
Tetrachloroethylene	ND	ND	ND	47 J	23 J	1,300
Ethylbenzene	ND	ND	ND	ND	ND	1,000
m&p-Xylenes	ND	ND	ND	ND	ND	260
o-Xylenes	ND	ND	ND	ND	ND	260
Styrene	ND	ND	ND	ND	ND	-
Semi-Volatile Organic Compounds *(in micrograms per kilogram)*						
Bis(2-Ethylhexyl)phthalate	ND	ND	ND	510 J	300 J	-
Phenanthrene	ND	ND	ND	120 J	80 J	100,000
Fluoranthene	ND	ND	ND	370 J	600 J	100,000
Pyrene	ND	ND	ND	320 J	610 J	100,000
Butylbenzylphthalate	ND	ND	ND	150 J	ND	-
Benzo(a)anthracene	ND	ND	ND	150 J	340 J	1,000
Chrysene	ND	ND	ND	220 J	410 J	1,000
Benzo(b)fluoranthene	ND	ND	ND	290 J	580 J	1,000
Benzo(k)fluoranthene	ND	ND	ND	93 J	200 J	800
Benzo(a)pyrene	ND	ND	ND	190 J	410 J	1,000
Indeno(1,2,3-cd)pyrene	ND	ND	ND	170 J	360 J	500
Benzo(g,h,i)perylene	ND	ND	ND	170 J	360 J	100,000

Table 5 *(continued)*
Soil Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, NY
April, 2008

Sample ID	SB-18	SB-19	SB-19	SS-1	SS-2	Soil Cleanup Objectives Subpart 375.6
Sample Depth *(in feet below grade)*	16.5–18.5	12-15	16-18	0-1	0-1	
Metals *(in milligrams per kilogram)*						
Aluminum	1,110	NS	901	6,250	6,130	-
Antimony	ND		ND	ND	ND	-
Arsenic	0.48 J		ND	10.8	5.73	13
Barium	5.33		2.99 J	41.4	25.9	350
Beryllium	ND		ND	ND	ND	7.2
Cadmium	ND		ND	0.881	0.778 J	2.5
Calcium	61 J		49.7 J	1,860	2,080	-
Chromium	3.27 J		1.52 J	**14.3 J**	**20 J**	10 or SB*
Cobalt	1.41		0.52 J	1.9	1.92	-
Copper	2.53		1.13	25.6	23.2	50
Iron	5,190		1,960	8,940	7,810	-
Lead	1.08		0.678	**145**	**103**	63
Magnesium	234 J		211 J	865 J	824 J	-
Manganese	83.1		41.1	138	111	1,600
Mercury	ND		ND	**0.219**	**0.207**	0.18
Nickel	2.74		1.5	8.42	6.73	30
Potassium	149		111 J	156 J	156 J	-
Silver	ND		ND	ND	ND	2
Sodium	125 J		82 J	144 J	185	-
Vanadium	3.97		1.79	21.6	18.1	-
Zinc	12.1		3.96	**123**	90.2	109

Notes:
Only detected analytes are reported.
ND = Not Detected
NS = Not Sampled
J = The concentration is estimated
D = The concentration was detected at a secondary dilution factor
SB = Site Background
* = The Recommended Soil Cleanup Objective from the New York State Department of Environmental Conservation (NYSDEC) Technical and Administrative Guidance Memorandum (TAGM) 4046 was substituted since there is no Subpart 375.6 Soil Cleanup Objective for total chromium.
- = No Soil Cleanup Objective is available.
Bolded values indicate an exceedance of the NYSDEC Unrestricted Use Soil Cleanup Objectives Subpart 375.6 or Recommended Soil Cleanup Objective as per TAGM 4046.

Table 6
Groundwater Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, NY
April, 2008

Sample ID	GW-2	GW-2	GW-2	GW-3	GW-3	NYSDEC Groundwater Standards
Sample Depth (in feet below grade)	20	40	57	20	37	
Volatile Organic Compounds (in micrograms per liter)						
Acetone	ND	ND	ND	ND	ND	50
2-Butanone	ND	ND	ND	ND	ND	50
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	5*
Trichloroethene	ND	ND	ND	**9.8**	ND	5*
Toluene	ND	ND	ND	ND	ND	5*
Tetrachloroethene	ND	ND	ND	**280 J**	ND	5*
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	5*
Semi-Volatile Organic Compounds (in micrograms per liter)						
SVOCs	NS	NS	NS	NS	NS	-

Sample ID	GW-3	GW-5	GW-5	GW-5	NYSDEC Groundwater Standards
Sample Depth (in feet below grade)	53	20	40	57	
Volatile Organic Compounds (in micrograms per liter)					
Acetone	ND	ND	ND	ND	50
2-Butanone	ND	ND	ND	ND	50
cis-1,2-Dichloroethene	ND	ND	**53**	ND	5*
Trichloroethene	ND	ND	2.8 J	ND	5*
Toluene	ND	ND	ND	ND	5*
Tetrachloroethene	ND	**18**	**15**	ND	5*
1,2,4-Trimethylbenzene	ND	ND	ND	ND	5*
Semi-Volatile Organic Compounds (in micrograms per liter)					
SVOCs	NS	NS	NS	NS	-

Table 6 *(continued)*
Groundwater Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, NY
April, 2008

Sample ID	GW-19	GW-19	DW3-SW	DW2-SW	NYSDEC Groundwater Standards
Sample Depth (in feet below grade)	**20**	**40**	**Surface**	**Surface**	
Volatile Organic Compounds (in micrograms per liter)					
Acetone	ND	ND	ND	40	50
2-Butanone	ND	ND	ND	4.7 J	50
cis-1,2-Dichloroethene	1.2 J	ND	ND	ND	5*
Trichloroethene	ND	ND	ND	ND	5*
Toluene	ND	ND	0.7 J	ND	5*
Tetrachloroethene	**74 J**	ND	ND	ND	5*
1,2,4-Trimethylbenzene	ND	ND	ND	ND	5*
Semi-Volatile Organic Compounds (in micrograms per liter)					
2-Nitroaniline	ND	1.2 J	NS	NS	5*
2,6-Dinitrotoluene	ND	1.2 J	NS	NS	5*
Dibenzofuran	ND	1.2 J	NS	NS	-
2,4-Dinitrotoluene	ND	1.4 J	NS	NS	-
Phenanthrene	ND	1.8 J	NS	NS	50
Carbazole	ND	1.2 J	NS	NS	-
Bis(2-Ethylhexyl)phthalate	3.4 J	**12**	NS	NS	5*

Table 6 *(continued)*
Groundwater Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, NY
April, 2008

Sample ID	GW-19	GW-22	GW-22	GW-22	NYSDEC Groundwater Standards
Sample Depth (in feet below grade)	**50**	**25**	**35**	**50**	
Volatile Organic Compounds (in micrograms per liter)					
Acetone	ND	ND	ND	40	50
2-Butanone	ND	ND	ND	ND	50
cis-1,2-Dichloroethene	ND	**31**	ND	ND	5*
Trichloroethene	ND	**11**	ND	ND	5*
Toluene	ND	ND	ND	ND	5*
Tetrachloroethene	**280 J**	**180 D**	**7.7**	**72**	5*
1,2,4-Trimethylbenzene	ND	ND	ND	ND	5*
Semi-Volatile Organic Compounds (in micrograms per liter)					
2-Nitroaniline	ND	NS	NS	NS	5*
2,6-Dinitrotoluene	ND	NS	NS	NS	5*
Dibenzofuran	1.2 J	NS	NS	NS	-
2,4-Dinitrotoluene	1.5 J	NS	NS	NS	-
Phenanthrene	1.6 J	NS	NS	NS	50
Carbazole	1.3 J	NS	NS	NS	-
Bis(2-Ethylhexyl)phthalate	ND	NS	NS	NS	5*

Table 6 *(continued)*
Groundwater Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, NY
April, 2008

Sample ID	GW-23	GW-23	GW-23	GW-24	NYSDEC Groundwater Standards
Sample Depth (in feet below grade)	**23**	**35**	**50**	**23**	
Volatile Organic Compounds (in micrograms per liter)					
Acetone	ND	ND	ND	ND	50
2-Butanone	ND	ND	ND	ND	50
cis-1,2-Dichloroethene	ND	ND	ND	ND	5*
Trichloroethene	ND	ND	ND	ND	5*
Toluene	ND	ND	ND	ND	5*
Tetrachloroethene	**15**	ND	ND	ND	5*
1,2,4-Trimethylbenzene	ND	ND	ND	**5.3 J**	5*
Semi-Volatile Organic Compounds (in micrograms per liter)					
2-Nitroaniline	ND	ND	ND	ND	5*
2,6-Dinitrotoluene	ND	ND	ND	ND	5*
Dibenzofuran	ND	ND	ND	ND	-
2,4-Dinitrotoluene	ND	ND	ND	ND	-
Phenanthrene	ND	ND	ND	ND	50
Carbazole	ND	ND	ND	ND	-
Bis(2-Ethylhexyl)phthalate	ND	ND	ND	ND	5*

Table 6 *(continued)*
Groundwater Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, NY
April, 2008

Sample ID	GW-24	GW-24	GW-25	GW-25	NYSDEC Groundwater Standards
Sample Depth (in feet below grade)	**35**	**50**	**23**	**35**	
Volatile Organic Compounds (in micrograms per liter)					
Acetone	ND	13 J	ND	ND	50
2-Butanone	ND	ND	ND	ND	50
cis-1,2-Dichloroethene	ND	**6.3**	ND	ND	5*
Trichloroethene	ND	ND	ND	ND	5*
Toluene	ND	ND	ND	ND	5*
Tetrachloroethene	ND	ND	2.6 J	2.6 J	5*
1,2,4-Trimethylbenzene	ND	ND	ND	ND	5*
Semi-Volatile Organic Compounds (in micrograms per liter)					
2-Nitroaniline	ND	ND	ND	ND	5*
2,6-Dinitrotoluene	ND	ND	ND	ND	5*
Dibenzofuran	ND	ND	ND	ND	-
2,4-Dinitrotoluene	ND	ND	ND	ND	-
Phenanthrene	ND	ND	ND	ND	50
Carbazole	ND	ND	ND	ND	-
Bis(2-Ethylhexyl)phthalate	ND	ND	ND	ND	5*

Table 6 *(continued)*
Groundwater Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, NY
April, 2008

Sample ID	GW-25	GW-26	GW-26	GW-26	NYSDEC Groundwater Standards
Sample Depth (in feet below grade)	**50**	**23**	**40**	**52**	
Volatile Organic Compounds (in micrograms per liter)					
Acetone	ND	ND	ND	ND	50
2-Butanone	ND	ND	ND	ND	50
cis-1,2-Dichloroethene	ND	ND	0.76 J	**8.7**	5*
Trichloroethene	ND	ND	ND	ND	5*
Toluene	ND	ND	ND	ND	5*
Tetrachloroethene	ND	ND	ND	ND	5*
1,2,4-Trimethylbenzene	ND	ND	ND	ND	5*
Semi-Volatile Organic Compounds (in micrograms per liter)					
2-Nitroaniline	ND	ND	ND	ND	5*
2,6-Dinitrotoluene	ND	ND	ND	ND	5*
Dibenzofuran	ND	ND	ND	ND	-
2,4-Dinitrotoluene	ND	ND	ND	ND	-
Phenanthrene	ND	ND	ND	ND	50
Carbazole	ND	ND	ND	ND	-
Bis(2-Ethylhexyl)phthalate	ND	ND	ND	ND	5*

Table 6 *(continued)*
Groundwater Chemical Analytical Results
20 West Centennial Avenue
Roosevelt, NY
April, 2008

Sample ID	GW-27	GW-27	GW-27	NYSDEC Groundwater
Sample Depth (in feet below grade)	26	40	52	Standards
Volatile Organic Compounds (in micrograms per liter)				
Acetone	ND	ND	ND	50
2-Butanone	ND	ND	ND	50
cis-1,2-Dichloroethene	2.8 J	ND	ND	5*
Trichloroethene	1.3 J	ND	ND	5*
Toluene	ND	ND	ND	5*
Tetrachloroethene	**14**	1.9 J	3.4 J	5*
1,2,4-Trimethylbenzene	ND	ND	ND	5*
Semi-Volatile Organic Compounds (in micrograms per liter)				
2-Nitroaniline	ND	ND	ND	5*
2,6-Dinitrotoluene	ND	ND	ND	5*
Dibenzofuran	ND	ND	ND	-
2,4-Dinitrotoluene	ND	ND	ND	-
Phenanthrene	ND	ND	ND	50
Carbazole	ND	ND	ND	-
Bis(2-Ethylhexyl)phthalate	ND	ND	ND	5*

Notes:
Only detected analytes are reported.
* = The Principal Organic Contaminant Standard applies.
ND = Not Detected
NS = Not Sampled
J = The concentration is estimated
D = The concentration was detected at a secondary dilution factor
\- = No Groundwater Standard is available.
Bolded values indicate an exceedance of the New York State Department of Environmental Conservation (NYSDEC) Class GA Ambient Water Quality Standards.

APPENDIX F

NYSDEC Part 375 Soil Cleanup Objectives

11.0 Final SCO Tables from Part 375

Tables 11-1 and 11-2 show the final SCOs as presented in 6 NYCRR Part 375-6.8. The Unrestricted use values shown in Table 11-1 were derived from the final human-health based SCOs (Table 5.6-1), the groundwater SCOs (Table 7-1) and the ecological SCOs (Table 8.6-1). The lowest of these values was selected as the final SCO, unless a corresponding rural soil background concentration (Tables 9.1-9 and 9.2-1) was higher, in which case the lowest rural soil background concentration was selected as the final SCO. If the final SCO was lower than the CRQL for a chemical (Section 9.4), the CRQL was substituted as the final SCO.

Table 11-1. Final Unrestricted Use SCOs as Presented in 6 NYCRR Part 375-6.8(a).

Unrestricted Use Soil Cleanup Objectives		
Contaminant	**CAS Number**	**Unrestricted Use**
Metals		
Arsenic	7440-38-2	13[c]
Barium	7440-39-3	350[c]
Beryllium	7440-41-7	7.2
Cadmium	7440-43-9	2.5[c]
Chromium, hexavalent[e]	18540-29-9	1[b]
Chromium, trivalent[e]	16065-83-1	30[c]
Copper	7440-50-8	50
Total Cyanide[e,f]		27
Lead	7439-92-1	63[c]
Manganese	7439-96-5	1600[c]
Total Mercury		0.18[c]
Nickel	7440-02-0	30
Selenium	7782-49-2	3.9[c]
Silver	7440-22-4	2
Zinc	7440-66-6	109[c]
PCBs/Pesticides		
2,4,5-TP Acid (Silvex)[f]	93-72-1	3.8
4,4’-DDE	72-55-9	0.0033[b]
4,4’-DDT	50-29-3	0.0033[b]
4,4'-DDD	72-54-8	0.0033[b]
Aldrin	309-00-2	0.005[c]
alpha-BHC	319-84-6	0.02
beta-BHC	319-85-7	0.036

Unrestricted Use Soil Cleanup Objectives		
Contaminant	**CAS Number**	**Unrestricted Use**
Chlordane (alpha)	5103-71-9	0.094
delta-BHC	319-86-8	0.04
Dibenzofuran[f]	132-64-9	7
Dieldrin	60-57-1	0.005[c]
Endosulfan I[d,f]	959-98-8	2.4
Endosulfan II[d,f]	33213-65-9	2.4
Endosulfan sulfate[d,f]	1031-07-8	2.4
Endrin	72-20-8	0.014
Heptachlor	76-44-8	0.042
Lindane	58-89-9	0.1
Polychlorinated biphenyls	1336-36-3	0.1
Semivolatile organic compounds		
Acenaphthene	83-32-9	20
Acenapthylene[f]	208-96-8	100[a]
Anthracene[f]	120-12-7	100[a]
Benz(a)anthracene[f]	56-55-3	1[c]
Benzo(a)pyrene	50-32-8	1[c]
Benzo(b)fluoranthene[f]	205-99-2	1[c]
Benzo(g,h,i)perylene[f]	191-24-2	100
Benzo(k)fluoranthene[f]	207-08-9	0.8[c]
Chrysene[f]	218-01-9	1[c]
Dibenz(a,h)anthracene[f]	53-70-3	0.33[b]
Fluoranthene[f]	206-44-0	100[a]
Fluorene	86-73-7	30
Indeno(1,2,3-cd)pyrene[f]	193-39-5	0.5[c]
m-Cresol[f]	108-39-4	0.33[b]

Unrestricted Use Soil Cleanup Objectives		
Contaminant	**CAS Number**	**Unrestricted Use**
Naphthalene[f]	91-20-3	12
o-Cresol[f]	95-48-7	0.33[b]
p-Cresol[f]	106-44-5	0.33[b]
Pentachlorophenol	87-86-5	0.8[b]
Phenanthrene[f]	85-01-8	100
Phenol	108-95-2	0.33[b]
Pyrene[f]	129-00-0	100
Volatile organic compounds		
1,1,1-Trichloroethane[f]	71-55-6	0.68
1,1-Dichloroethane[f]	75-34-3	0.27
1,1-Dichloroethene[f]	75-35-4	0.33
1,2-Dichlorobenzene[f]	95-50-1	1.1
1,2-Dichloroethane	107-06-2	0.02[c]
cis-1,2-Dichloroethene[f]	156-59-2	0.25
trans-1,2-Dichloroethene[f]	156-60-5	0.19
1,3-Dichlorobenzene[f]	541-73-1	2.4
1,4-Dichlorobenzene	106-46-7	1.8
1,4-Dioxane	123-91-1	0.1[b]
Acetone	67-64-1	0.05
Benzene	71-43-2	0.06
n-Butylbenzene[f]	104-51-8	12
Carbon tetrachloride[f]	56-23-5	0.76
Chlorobenzene	108-90-7	1.1
Chloroform	67-66-3	0.37
Ethylbenzene[f]	100-41-4	1
Hexachlorobenzene[f]	118-74-1	0.33[b]

Unrestricted Use Soil Cleanup Objectives		
Contaminant	**CAS Number**	**Unrestricted Use**
Methyl ethyl ketone	78-93-3	0.12
Methyl tert-butyl ether[f]	1634-04-4	0.93
Methylene chloride	75-09-2	0.05
n-Propylbenzene[f]	103-65-1	3.9
sec-Butylbenzene[f]	135-98-8	11
tert-Butylbenzene[f]	98-06-6	5.9
Tetrachloroethene	127-18-4	1.3
Toluene	108-88-3	0.7
Trichloroethene	79-01-6	0.47
1,2,4-Trimethylbenzene[f]	95-63-6	3.6
1,3,5-Trimethylbenzene[f]	108-67-8	8.4
Vinyl chloride[f]	75-01-4	0.02
Xylene (mixed)	1330-20-7	0.26

All Soil clean up objectives (SCOs) are in parts per million (ppm).
Footnotes:
[a] The SCOs for unrestricted use were capped at a maximum value of 100 ppm, as discussed in the TSD.
[b] For constituents where the calculated SCO was lower than the Contract Required Quantitation Limit (CRQL), the CRQL is used as the Track 1 SCO value.
[c] For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the DEC/DOH rural soil survey, the rural soil background concentration is used as the Track 1 SCO value for this use of the site.
[d] SCO is the sum of Endosulfan I, Endosulfan II and Endosulfan Sulfate.
[e] The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.
[f] Protection of ecological resources soil cleanup objectives were not developed for contaminants identified in Table 375-6.7(b) with "NS". Where such contaminants appear in Table 375-6.7(a), the applicant may be required by the Department to calculate a protection of ecological resources soil cleanup objective according to the Technical Support Document.

Table 11-2. Final Restricted Use SCOs as Presented in 6 NYCRR Part 375-6.8(b).

Restricted Use Soil Cleanup Objectives							
		Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
Contaminant	CAS Number	Residential	Restricted-Residential	Commercial	Industrial		
Metals							
Arsenic	7440-38-2	16[f]	16[f]	16[f]	16[f]	13[f]	16[f]
Barium	7440-39-3	350[f]	400	400	10,000[d]	433	820
Beryllium	7440-41-7	14	72	590	2,700	10	47
Cadmium	7440-43-9	2.5[f]	4.3	9.3	60	4	7.5
Chromium, hexavalent[h]	18540-29-9	22	110	400	800	1[e]	19
Chromium, trivalent[h]	16065-83-1	36	180	1,500	6,800	41	NS
Copper	7440-50-8	270	270	270	10,000[d]	50	1,720
Total Cyanide[h]		27	27	27	10,000[d]	NS	40
Lead	7439-92-1	400	400	1,000	3,900	63[f]	450
Manganese	7439-96-5	2,000[f]	2,000[f]	10,000[d]	10,000[d]	1600[f]	2,000[f]
Total Mercury		0.81[j]	0.81[j]	2.8[j]	5.7[j]	0.18[f]	0.73
Nickel	7440-02-0	140	310	310	10,000[d]	30	130
Selenium	7782-49-2	36	180	1,500	6,800	3.9[f]	4[f]
Silver	7440-22-4	36	180	1,500	6,800	2	8.3
Zinc	7440-66-6	2200	10,000[d]	10,000[d]	10,000[d]	109[f]	2,480
PCBs/Pesticides							
2,4,5-TP Acid (Silvex)	93-72-1	58	100[a]	500[b]	1,000[c]	NS	3.8
4,4’-DDE	72-55-9	1.8	8.9	62	120	0.0033 [e l]	17
4,4’-DDT	50-29-3	1.7	7.9	47	94	0.0033 [e l]	136
4,4'-DDD	72-54-8	2.6	13	92	180	0.0033 [e l]	14

Restricted Use Soil Cleanup Objectives							
		Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
Contaminant	CAS Number	Residential	Restricted-Residential	Commercial	Industrial		
Aldrin	309-00-2	0.019	0.097	0.68	1.4	0.14	0.19
alpha-BHC	319-84-6	0.097	0.48	3.4	6.8	0.04[k]	0.02
beta-BHC	319-85-7	0.072	0.36	3	14	0.6	0.09
Chlordane (alpha)	5103-71-9	0.91	4.2	24	47	1.3	2.9
delta-BHC	319-86-8	100[a]	100[a]	500[b]	1,000[c]	0.04[k]	0.25
Dibenzofuran	132-64-9	14	59	350	1,000[c]	NS	210
Dieldrin	60-57-1	0.039	0.2	1.4	2.8	0.006	0.1
Endosulfan I	959-98-8	4.8[i]	24[i]	200[i]	920[i]	NS	102
Endosulfan II	33213-65-9	4.8[i]	24[i]	200[i]	920[i]	NS	102
Endosulfan sulfate	1031-07-8	4.8[i]	24[i]	200[i]	920[i]	NS	1,000[c]
Endrin	72-20-8	2.2	11	89	410	0.014	0.06
Heptachlor	76-44-8	0.42	2.1	15	29	0.14	0.38
Lindane	58-89-9	0.28	1.3	9.2	23	6	0.1
Polychlorinated biphenyls	1336-36-3	1	1	1	25	1	3.2
Semivolatiles							
Acenaphthene	83-32-9	100[a]	100[a]	500[b]	1,000[c]	20	98
Acenapthylene	208-96-8	100[a]	100[a]	500[b]	1,000[c]	NS	107
Anthracene	120-12-7	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Benz(a)anthracene	56-55-3	1[f]	1[f]	5.6	11	NS	1[f]
Benzo(a)pyrene	50-32-8	1[f]	1[f]	1[f]	1.1	2.6	22
Benzo(b)fluoranthene	205-99-2	1[f]	1[f]	5.6	11	NS	1.7
Benzo(g,h,i)perylene	191-24-2	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Benzo(k)fluoranthene	207-08-9	1	3.9	56	110	NS	1.7

Restricted Use Soil Cleanup Objectives							
		Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
Contaminant	CAS Number	Residential	Restricted-Residential	Commercial	Industrial		
Chrysene	218-01-9	1[f]	3.9	56	110	NS	1[f]
Dibenz(a,h)anthracene	53-70-3	0.33[e]	0.33[e]	0.56	1.1	NS	1,000[c]
Fluoranthene	206-44-0	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Fluorene	86-73-7	100[a]	100[a]	500[b]	1,000[c]	30	386
Indeno(1,2,3-cd)pyrene	193-39-5	0.5[f]	0.5[f]	5.6	11	NS	8.2
m-Cresol	108-39-4	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
Naphthalene	91-20-3	100[a]	100[a]	500[b]	1,000[c]	NS	12
o-Cresol	95-48-7	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
p-Cresol	106-44-5	34	100[a]	500[b]	1,000[c]	NS	0.33[e]
Pentachlorophenol	87-86-5	2.4	6.7	6.7	55	0.8[e]	0.8[e]
Phenanthrene	85-01-8	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Phenol	108-95-2	100[a]	100[a]	500[b]	1,000[c]	30	0.33[e]
Pyrene	129-00-0	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Volatiles							
1,1,1-Trichloroethane	71-55-6	100[a]	100[a]	500[b]	1,000[c]	NS	0.68
1,1-Dichloroethane	75-34-3	19	26	240	480	NS	0.27
1,1-Dichloroethene	75-35-4	100[a]	100[a]	500[b]	1,000[c]	NS	0.33
1,2-Dichlorobenzene	95-50-1	100[a]	100[a]	500[b]	1,000[c]	NS	1.1
1,2-Dichloroethane	107-06-2	2.3	3.1	30	60	10	0.02[f]
cis-1,2-Dichloroethene	156-59-2	59	100[a]	500[b]	1,000[c]	NS	0.25
trans-1,2-Dichloroethene	156-60-5	100[a]	100[a]	500[b]	1,000[c]	NS	0.19
1,3-Dichlorobenzene	541-73-1	17	49	280	560	NS	2.4

Restricted Use Soil Cleanup Objectives							
		Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
Contaminant	CAS Number	Residential	Restricted-Residential	Commercial	Industrial		
1,4-Dichlorobenzene	106-46-7	9.8	13	130	250	20	1.8
1,4-Dioxane	123-91-1	9.8	13	130	250	0.1[e]	0.1[e]
Acetone	67-64-1	100[a]	100[b]	500[b]	1,000[c]	2.2	0.05
Benzene	71-43-2	2.9	4.8	44	89	70	0.06
n-Butylbenzene	104-51-8	100[a]	100[a]	500[b]	1,000[c]	NS	12
Carbon tetrachloride	56-23-5	1.4	2.4	22	44	NS	0.76
Chlorobenzene	108-90-7	100[a]	100[a]	500[b]	1,000[c]	40	1.1
Chloroform	67-66-3	10	49	350	700	12	0.37
Ethylbenzene	100-41-4	30	41	390	780	NS	1
Hexachlorobenzene	118-74-1	0.33[e]	1.2	6	12	NS	3.2
Methyl ethyl ketone	78-93-3	100[a]	100[a]	500[b]	1,000[c]	100[a]	0.12
Methyl tert-butyl ether	1634-04-4	62	100[a]	500[b]	1,000[c]	NS	0.93
Methylene chloride	75-09-2	51	100[a]	500[b]	1,000[c]	12	0.05
n-Propylbenzene	103-65-1	100[a]	100[a]	500[b]	1,000[c]	NS	3.9
sec-Butylbenzene	135-98-8	100[a]	100[a]	500[b]	1,000[c]	NS	11
tert-Butylbenzene	98-06-6	100[a]	100[a]	500[b]	1,000[c]	NS	5.9
Tetrachloroethene	127-18-4	5.5	19	150	300	2	1.3
Toluene	108-88-3	100[a]	100[a]	500[b]	1,000[c]	36	0.7
Trichloroethene	79-01-6	10	21	200	400	2	0.47
1,2,4-Trimethylbenzene	95-63-6	47	52	190	380	NS	3.6
1,3,5-Trimethylbenzene	108-67-8	47	52	190	380	NS	8.4
Vinyl chloride	75-01-4	0.21	0.9	13	27	NS	0.02
Xylene (mixed)	1330-20-7	100[a]	100[a]	500[b]	1,000[c]	0.26	1.6

All Soil clean up objectives (SCOs) are in parts per million (ppm).
NS=Not specified. See Technical Support Document (TSD).
Footnotes:
[a] The SCOs for residential, restricted-residential and ecological resources use were capped at a maximum value of 100 ppm, see TSD Section 9.3.
[b] The SCOs for commercial use were capped at a maximum value of 500 ppm, see TSD Section 9.3.
[c] The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1000 ppm, see TSD Section 9.3.
[d] The SCOs for metals were capped at a maximum value of 10,000 ppm, see TSD Section 9.3.
[e] For constituents where the calculated SCO was lower than the Contract Required Quantitation Limit (CRQL), the CRQL is used as the SCO value.
[f] For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the DEC/DOH rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.
[g] SCO is the sum of DDD, DDE and DDT.
[h] The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.
[i] This SCO is for the sum of Endosulfan I, Endosulfan II and Endosulfan Sulfate.
[j] This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts), see TSD table 5.6-1.
[k] This SCO is derived from data on mixed isomers of BHC.
[l] This SCO is for the sum of DDD, DDE and DDT.

APPENDIX G

Personnel Qualifications

SCOTT A. YANUCK, C.E.I., C.E.S.

EDUCATION: STATE UNIVERSITY OF NEW YORK AT STONY BROOK
B.A., Earth and Space Sciences, December, 1987, Minor in Technology and Society.
M.Sc., Hydrogeology, May, 1993.Course work included classes in Geophysics, Chemical Hydrogeology, Organic Contaminant Hydrology, and Computer Modeling.

EXPERIENCE:

PRINCIPAL, MANAGING HYDROGEOLOGIST
LAUREL Environmental Associates, Ltd.

- Supervise all technical and financial operations of environmental consulting firm.
- Completed OSHA 40 Hour HAZWOPER Supervisors course, 8 Hour Refresher Courses.
- Geoprobe Systems Training on Direct Push Techniques including well installation and pump tests
- Completed ASTM Environmental Site Assessment training course for professionals.
- Completed NJDEPE UST Certification Program.
- Completed Mold Remediation Manage Course based on NYC DOH Guidelines
- NYSDOL Asbestos Inspector, #AH97-08528
- GSSI Certification in Ground Penetrating Radar

September, 1992-present

PROJECT MANAGER, GROUP SUPERVISOR: ENVIRONMENTAL SERVICES
Richard D. Galli, P.E., P.C.

In charge of Environmental Services Group. Scope of work within group includes the following:

- Phase I Environmental Assessments.
- Phase II Environmental Assessments.
- Groundwater Contamination Studies.
- Underground Storage Tanks (UST'S): testing, removal, closure.
- Underground Injection Well Closure (UIC)
- Hazardous Site Remediation.
- State Superfund RI/FS.
- Indoor Air Quality (IAQ) studies.

In addition to performing any of the above-mentioned work, personally responsible for project management, including project setup, project review and quality control/quality assurance of proposals and reports generated by the environmental group.

PROJECT MANAGER, HYDROGEOLOGY
Richard D. Galli, P.E., P.C.

Performed all aspects of numerous Phase I Environmental Assessments.

Performed and supervised Phase II and Phase III investigations and remediation. Duties included proposal writing, historical investigations, soil and water sampling, supervision of well drilling teams, supervision of remediation work, supervision of underground storage tanks removals, groundwater studies, and report writing.

Knowledgeable in Ground Water Computer Modeling with *canned* programs as well as developing new programs. Worked to set up a GIS based system capable of mapping CERCLA and NPL site, NYSDEC Spills and Inactive Hazardous Waste Sites, etc., to aid in performing Audits.

Certified: OSHA Forty Hour HAZWOPER Course, NIOSH 582.

TECHNICIAN, FIELD AND LABORATORY
Kemron Environmental Services, Inc.

Worked as an industrial hygienist, taking air and bulk samples, and performing Indoor Air Quality (IAQ) studies. As a Polarized Light Microscopist, analyzed bulk samples for asbestos. Analyzed samples from the *Gramercy Park steam pipe explosion* and was detailed to St. Croix for on site sampling and analysis at the Hess oil refinery during the cleanup of *Hurricane Hugo.* Also worked as GC/MS and HPLC technician.
June, 1989-July, 1990 full time, continuing part time to 1993.

CONSTRUCTION SUPERVISOR, DEVELOPER
SHY Building Corporation, Huntington, NY.

Managed land development and housing construction. Scheduling and supervision of all trades necessary. Duties included the following:

- Design of drainage structures
- Design of buildings/renovations
- Surveying in conjunction with road/drainage construction.
- Property acquisition.
- Submitted applications for subdivision, building permits, and sanitary/water permits to Town and County agencies.
- Supervision of UST installations.
- Geotechnical and environmental inspections of properties/building sites.
- Energy efficient building design and implementation.

AFFILIATIONS

Air & Waste Management Association
American Institute of Professional Geologists
American Society for Testing and Materials
    Active Committee Member E-40, Subsurface Investigations
    Active Committee Member E-50, Environmental Assessment
    Active Committee Member E-50.1, Underground Storage Tanks
Environmental Assessment Association, Certified Environmental Inspector and Specialist, #12200.
Hazardous Materials Control Resources Institute
Huntington Chamber of Commerce
Huntington Historical Society
Long Island Association
Long Island Builders Institute
Long Island Geologists
National Fire Protection Association
National Ground Water Society
New York State Council of Professional Geologists
US Green Building Councel

CARLA M. SULLIVAN, C.E.S

EDUCATION

BS GEOLOGY, January 1998. **Cum Laude**

EXPERIENCE:

SENIOR GEOLOGIST, Laurel Environmental Associates, Ltd., Huntington, NY November 1997 – present.

- Project Manager
- Certified Environmental Specialist
- Phase I Environmental Site Assessments
- Phase II Soil and Groundwater Sampling and Analysis Reports.
- Supervises and writes Remediation/Phase III and Analysis
- Geotechnical reports, class V injection well closure plans and RI/FS workplan for regulatory agency approval
- Groundwater Contamination Studies.
- Underground Storage Tanks (UST'S): testing, removal, closure
- Underground Injection Well Closure (UIC)
- Hazardous Site Remediation.

In addition to performing any of the above-mentioned work personally, responsible for project management, including project setup, project review and quality control/quality assurance of proposals and reports

FIELD SKILLS:

- Completed OSHA 40 HOUR HAZWOPER with confined space, 8 Hour Refresher Courses to current.
- State of New Jersey Department of Environmental Protection Subsurface Inspection, License #483291
- Supervises drilling and installation of groundwater monitoring wells, drilling of borings, UST removals, geotechnical drilling, leaching pool "super sucker" remediation, ground penetrating radar survey.
- Performs split spoon soil sampling, groundwater monitoring well installation, purging & sampling, soil-vapor sampling, UST sampling & registration, dye trace & floor drain closure, magnetometer survey
- Experience with PID, hand auger, soil-vapor probe, soil dredge sampler, magnetometer, pH meter.

ACTIVITIES:

- Member of the National Honorary Society in the Earth Sciences — Sigma Gamma Epsilon
- Member of the National Society of Research for Professionals 5 — Sigma Xi
- Member of the National Honor Society C. W. Post Chapter — Phi Beta Kappa
- Member of the Geological Society of America
- Member of New York State Paleontological Society
- Member of the American Natural History Museum
- Member of Sierra Club
- Member of the National Geographic Society

AFFILIATIONS

- American Institute of Professional Geologists
- Environmental Assessment Association, Certified Environmental Inspector and Specialist
- Huntington Historical Society
- Oyster Bay Historical Society
- Long Island Association
- Long Island Professional Geologists Association
- New York State Council of Professional Geologists

BRIAN C MCCABE

EDUCATION: STATE UNIVERSITY OF NEW YORK AT STONY BROOK
B.S, Geology, September, 1991, Minor in Marine Science.
M.Sc., Hydrogeology, Pending. Course work included classes in Geophysics, Chemical Hydrogeology, Organic Contaminant Hydrology, and Bio-Remediation.

EXPERIENCE:

SENIOR GEOLOGIST
LAUREL Environmental Associates, Ltd.

- Phase I Environmental Site Assessments.
- Phase II Environmental Assessments.
- Groundwater Contamination Studies.
- Underground Storage Tanks (UST'S): testing, removal, closure.
- Underground Injection Well Closure (UIC)
- Hazardous Site Remediation.
- Completed OSHA 40 Hour HAZWOPER Supervisors course, 8 Hour Refresher Courses.
- Completed ASTM Environmental Site Assessment training course for professionals.

January, 2012-present

PROJECT MANAGER, DEPARTMENT MANAGER: PROFESSIONAL SERVICES
Fenley & Nicol Environmental Inc.

In charge of Environmental Services Group. Scope of work within group includes the following:

- Phase I Environmental Assessments.
- Phase II Environmental Assessments.
- Groundwater Contamination Studies.
- Underground Storage Tanks (UST'S): testing, removal, closure.
- Underground Injection Well Closure (UIC)
- Hazardous Site Remediation.
- Construction and operation of remediation system.

In addition to performing any of the above-mentioned work, personally responsible for project management, of professional staff project, which, included review of proposals and reports generated by the professional service department.

Certified: OSHA Forty Hour HAZWOPER Course
Preston Groundwater Remediation Course
ASTM 1527-05 Environmental Site Assessment training course
Waterloo, Groundwater modeling I training course
Exxon-Mobil, LPS training
LIRR Track Safety training

September, 1997-July, 2012

FIELD TECHNICIAN, AND LABORATORY SUPERVISER
Kemron Environmental Services, Inc.

FIELD TECHNICIAN – Collected waste water and Indoor Air Quality (IAQ) samples.
LABORATORY SUPERVISER, - Supervised and performed the analysis of asbestos air and bulk samples utilizing Phase Contrast and Polarized Light Microscopist, Performed on-site sampling and analysis of asbestos air and bulk samples at the Hess oil refinery in St. Croix during the cleanup of *Hurricane Hugo.* Also worked as GC/MS and HPLC technician. Perform air, bulk and water analysis for metals utilizing ICP and Flame AA instrumentation.
Part time from February 1990-May 1991
Full time from May 1991-September 1997

AFFILIATIONS

Long Island Geologists
United States Coast Guard Auxiliary

THOMAS H. JOHANSEN

EXPERIENCE

Geologist, Laurel Environmental Associates, Ltd., Huntington, NY
August 2008 – Present

- Phase I Environmental Site Assessments
- Phase II Subsurface Soil, Soil Vapor, and Groundwater Investigations
- Remediation/Phase III projects and reports
- Sub-Slab Soil Vapor and Indoor Air Quality (IAQ) studies
- Groundwater Quality Investigations
- Underground Injection Well Closure (UIC)
- Underground Storage Tank (UST) removals, abandonments, and spill closures
- Hazardous site remediation

FIELD SKILLS:

- Performs various methods of soil, soil vapor and groundwater sampling
- Experienced with truck-mounted, track mounted and portable Geoprobe® machines and tooling
- Supervises ground penetrating radar, magnetic and utility surveys
- Supervises leaching pool remediation
- Performs and supervises direct push and hollow stem auger monitoring well installation
- Experienced with various field screening and monitoring equipment such as Photo Ionization Detector and water quality instruments
- Experienced with magnetic and pipe locating equipment
- Completed OSHA 40-Hour HAZWOPER Training program, 8 Hour Refresher Courses to current.

EDUCATION

BS Geology, May 2008.

- Hofstra University, New York

RELATED COURSES

- Environmental Science I, Geology I & II, Hydrogeology, Petrography, GeoChemistry, Cartography, Sedimentation, Stratigraphy, Chemistry I & II, Physics I & II, Biology, Computer Science I, Calculus I & II.

CHRISTOPHER J. CONNOLLY

EDUCATION

BSc Music Technology and Audio Systems Design, May 2008

- University of Derby, Derbyshire, United Kingdom

RELATED COURSES

- Acoustics, Auditory Perception and Psychoacoustics, Micro-electronics, Sound Reinforcement, Electronic Communications Technology, C/C++ Programming, Quantitative Methods.

EXPERIENCE

Environmental Consultant, Vibrock Limited, Heanor, Derbyshire, United Kingdom
September 2008 – April 2010

- Conducted Occupational Personal Noise and Dust Monitoring
- Conducted Environmental Compliance Noise and Dust Monitoring
- Produced technical reports based on monitoring sessions

Environmental Scientist, Laurel Environmental Associates, Ltd., Huntington, NY
December 2010 – Present

- Assists in visual inspections of Phase I & II Environmental Site Assessments
- Writes Transaction screen and Phase I Environmental Site Assessments
- Assists in Phase II site operations

FIELD SKILLS:

- Assists in various methods of soil and groundwater sampling, groundwater monitoring, well purging & sampling.
- Assists with truck-mounted, track-mounted and portable Geoprobe® machines and tooling.
- Assists with ground penetrating radar, magnetic and utility surveys.
- Supervises leaching pool remediation.
- Completed OSHA 24-Hour HAZWOPER Training program
- Has conducted Nuisance Noise and Excessive Vibration monitoring assessments.
- Assists in air quality and dust sampling in residential and commercial spaces.
- Assists in environmental remediation projects.
- Experience with various forms of noise monitoring equipment such as; Casella and Cirrus Sound Level Meters, and Personal Dosimeter badges, personal and environmental particulate dust monitoring apparatus, such as; personal air flow pumps, cyclone filter heads, filters and weighing balance.
- Working knowledge of the aggregate industry including; Quarrying practices, machinery and equipment and concrete, asphalt and block production methods.
- Knowledge of noise and dust suppression, protection and reduction methods including; Personal Protective Equipment (hearing protection and dust masks), dust extraction, acoustic dampening and general safe work practices.

STEVEN C. BITETTO

EXPERIENCE

Environmental Technician, Laurel Environmental Associates, Ltd., Huntington, NY
October 2006 - Present

- Phase II Subsurface Soil, Soil Vapor and Groundwater Investigations
- Remediation/Phase III projects
- Sub-Slab Soil Vapor and Indoor Air Quality (IAQ) studies
- Groundwater Quality Investigations
- Underground Injection Well Closure (UIC)
- UST removals, abandonments and spill closures
- Hazardous site remediation

FIELD SKILLS:

- Performs various methods of soil, soil vapor and groundwater sampling, groundwater monitoring
- Experienced with truck-mounted, track mounted and portable Geoprobe® machines and tooling
- Supervises ground penetrating radar, magnetic and utility surveys
- Supervises leaching pool remediations
- Performs and supervises direct push and hollow stem auger monitoring well installation
- Experienced with various field screening and monitoring equipment such as Photo Ionization Detector and water quality instruments
- Experienced with magnetic and pipe locating equipment

RELATED QUALIFICATIONS

- Geoprobe Systems Direct Push Training – setting standard and pre-pack monitoring wells.
- Regenesis Advanced Technologies for Contaminated Site Remediation and Gas Vapor Intrusion Management
- Geophysical Survey Systems, Inc. Utility Scan Ground Penetrating Radar Two Day Class
- Completed OSHA 40 HOUR HAZWOPER with confined space, 8 Hour Refresher Course to current
- OSHA HAZWOPER physical to current