REMEDIAL INVESTIGATION/
FEASIBILITY STUDY WORK PLAN
INITIAL PHASE
Former National Rubber Adhesives Site

38-25 9th Street
Long Island City, New York 11101
State ID #2-41-028

&

New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233-7016

Prepared for:

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June 26, 2013

TABLE OF CONTENTS

TABLE OF CONTENTS
(continued)

FIGURES

APPENDICES

1.0 INTRODUCTION

Hamil Stratten Properties, LLC retained CORE Environmental Consultants, Inc. (CORE) to prepare this Remedial Investigation/Feasibility Study (RI/FS) Work Plan for the former National Rubber Adhesives Site (Site 2-41-028). This RI/FS Work Plan has been prepared according to the requirements set forth in the Order on Consent (Index No. W2-1156-11-04) effective February 19, 2013.

This RI/FS Work Plan identifies the processes for further delineation of the environmental impacts from a potential release at the Site. It also strives to identify the additional data needed to assist in the completion of a Remedial Investigation and Feasibility Study.

This RI/FS consists of the following information:

- Section 1 provides a Site description and location, a summary of the known Site history, a review of previous Site investigations, and identification of the remedial investigation (RI) objectives and data needs;
- Section 2 contains the RI scope of work;
- Section 3 describes the content of the RI Report and Feasibility Study; and
- Section 4 contains an approximate RI/FS schedule; and
- Section 5 provides References.

A Quality Assurance Project Plan (QAPP), Health and Safety Plan (HASP), and Community Air Monitoring Plan (CAMP) are provided under this RI/FS Work Plan, and are located in Appendices B though D, respectively.

1.1 SITE LOCATION AND DESCRIPTION

The former National Rubber Adhesives (NRA) Site is located at 38-25 9th Street in Long Island City, in the Borough of Queens, New York (Figure 1-1). The Site is presently owned by Hamil Stratten Properties, LLC, and is bounded by various commercial and residential properties to the north, east, and south, and 9th Street to the west (Figure 1-2); The property is relatively flat, with an approximate elevation of 13 feet above mean sea level (MSL). The East River is located approximately one-quarter mile west of the Site. The Site is comprised of a large mid-block parcel on the east side of 9th Street, between 38th and 40th Avenues. The parcel is approximately 300 feet by 100 feet and is identified by the New York City Department of Buildings as Block 475, Lot 19. It is currently zoned M1-3 - Manufacturing. The Site is currently occupied by one 28,950 square feet, one-story, slab on grade masonry building that covers the entirety of the parcel. The building was constructed in 1924 and is currently separated into three subdivisions containing an automotive body repair shop at the northernmost end, a marble

and granite workshop in the central portion, and a movie production studio at the southern end as shown on Figure 1-3.

1.2 SITE HISTORY

During the development of the Records Search Report (RSR) submitted to the New York State Department of Environmental Conservation (NYSDEC) on March 19, 2013, a history of the Site was compiled based on available analytical data, maps, and historical site investigation reports. Additional information has been derived from Sanborn Fire Insurance Maps obtained from an Environmental Data Report (EDR) and discussed in the RSR.

The facility was occupied by National Rubber Adhesives, Inc. for approximately 62 years. During this time, the space was utilized for adhesive manufacturing, equipment and materials storage, and office space. The adhesives manufactured at the Site included both water-based (latex) and solvent-based products. A number of petroleum products were utilized in various processes performed on site, and were stored in above-ground and underground storage tanks (ASTs, USTs). These tanks included:

- One 2,000-gallon capacity latex AST in courtyard (removed)
- One 3,000- gallon capacity fuel oil AST located in southern portion of building
- One 1,500-gallon capacity heptane UST located in courtyard (abandoned in place)
- One 1,500-gallon capacity methyl ethyl ketone (MEK) UST located in courtyard (abandoned in place)
- One 1,500-gallon capacity toluene UST located in courtyard (abandoned in place, May 1995)
- Two 550-gallon capacity gasoline USTs located in courtyard (abandoned in place before September 1994)
- Two 1,500- gallon capacity out-of-service heptane USTs located under the Latex Production Storage Area on the north end building

A Historical Site Plan is presented as Figure 1-4.

1.3 SUMMARY OF PREVIOUS SITE INVESTIGATIONS

A number of investigations have been performed at the former NRA Site, including the following:

- Phase I, Limited Phase II, U.S. Hydrogeologic Inc. (May, 1996)
- Sub-Surface Investigation Report, Enviro-Comp Consultants, Inc. (June, 2001)

- Site Groundwater Sampling of MW-1 and MW-2, VERTEX Engineering Services (March, 2003)
- Limited Off-Site Soil Gas and Groundwater Sampling and Analysis, AES Inc. (June, 2003)
- Remedial Investigation Report, AES (March, 2006)
- Soil Vapor Extraction Pilot Study Report, AES (April, 2007)
- Remedial Investigation Report, Moishe's Storage and Stellar Printing Buildings, Vernon Boulevard, Long Island City, NY, Keystone E-Sciences Group, Inc. (November, 2008)
- Data Summary Report, Jung Sun Laundry Plume, AECOM Technical Services Northeast, Inc. (March 2010)
- Groundwater Sampling and Analysis Letter Report, CORE Environmental Consultants, Inc., (June, 2011)
- Remedial Investigation Letter Report, National Rubber Adhesives, Inc., MACTEC Engineering and Consulting, P.C. (October, 2012)

Historical on-Site sampling points are presented in Figure 1-5. Historical analytical data is presented in Appendix A.

Phase I, Limited Phase II, U.S. Hydrogeologic, Inc. (May, 1996)

In 1996, a limited subsurface investigation of the site was completed by U.S. Hydrogeologic, Inc. (USH). USH installed eight soil borings, two of which were converted into one-inch PVC monitoring wells (MW-1 and MW-2). Samples were reported for six of the soil borings and both monitoring wells. Analysis performed by USH was limited to volatile organic compounds (VOCs) by EPA Method 8240. Elevated concentrations of toluene, ethylbenzene, and xylene were identified in groundwater beneath the southern portion of the Site. The notable result during this investigation was the detection of toluene in monitoring well MW-2 at a concentration of 280,000,000 micrograms per liter (µg/L). Elevated levels of toluene were identified in soil samples from three borings at concentrations above the respective guidance criteria. Groundwater samples from MW-1 and MW-2 each had four VOCs above their respective guidance values. The USH report attributed all impacts discovered to on-Site USTs and other site-related sources, and did not consider the possibility of off-site contribution. The USH Report did recommend that further subsurface investigation was necessary to define the extent of impacts and to accurately delineate their source. As a result of the USH Report, Spill Number 96-02231 was assigned by the NYSDEC Spills Group. In 1998, the Site was listed in the State Registry of Inactive Hazardous Waste Disposal Sites as a Class 2 Site.

Sub-Surface Investigation Report, Enviro-Comp Consultants, Inc. (June, 2001)

A Sub-Surface Investigation Report was completed by Enviro-Comp Consultants, Inc. (ECC) in June 2001. ECC found that the site is underlain with bedrock that slopes from southeast to the northwest and west under the on-Site structure. The bedrock appears to be consolidated bedrock composed of dense sandstone and carbonaceous rock. Layers of a dense, light gray rock with flecks of black mica were noted during the investigation. The overburden encountered was primarily composed of very fine, well sorted sands and clays considered to be native to the area. Fill material was observed in only one boring (SB -12), located in the extreme Northeast corner of the building. Evidence suggested that the building slab appears to have been constructed directly on top of the bedrock.

Twelve soil samples were collected from the borings. Groundwater samples were collected from two borings that did not meet refusal and recharged sufficiently to provide adequate sample volume for analysis. Groundwater samples were also collected from the previously installed USH monitoring wells, MW-1 and MW-2. Based on the depth of these wells, the bedrock elevation encountered during their investigation, and the inability for the wells to recharge, ECC concluded that the water sampled was not a true representation of groundwater and suggested that it was likely these wells were yielding perched water that infiltrated the overburden from a distant source and became trapped on top of bedrock.

The analytical results obtained by ECC showed a significant decrease in toluene levels in the monitoring wells when compared to previous results from USH. Non-aqueous phase liquid (NAPL) was not found in either well.

The presence of benzene in the groundwater sample collected from MW-2 led ECC to conclude that there is still an active source of gasoline impacts in the area. The soil analysis of SB-2 and SB-3, considered up-gradient from MW-2, contained high levels polycyclic aromatic hydrocarbons (PAHs) and lead. Lead was not used at the NRA facility nor was it a component of other chemicals or processes used at Site.

No analytes were detected in SB-7A, located between the former tank storage area and MW-2. ECC concluded that if the former tank storage area were the source of the subsurface impacts beneath the Site, as suggested by USH and CDM, compounds associated with the tank area would have been found in SB-7A.

Furthermore, neither of the two signature chemicals for the Site, heptane and hexane, were detected in any samples collected. The elevated levels of trichloroethylene (TCE) and tetrachloroethylene (PCE) reported by USH were not confirmed by this effort. Nearly all impacts found during ECC's investigation were located along the East Wall (up-gradient side) of the building. ECC concluded that based on the information and data collected during this

investigation that the impacts were likely due to an off-site source. Results of samples collected indicated that gasoline was the primary compound impacting the subsurface, not industrial use chemicals associated with the Site. Finally, the ECC concluded that the Site should be de-listed as a Class 2 Site pending a re-evaluation.

Site Groundwater Sampling of MW-1 and MW-2, VERTEX Engineering Services (March, 2003)

On-Site groundwater sampling and laboratory analysis were completed by VERTEX Engineering Services (VERTEX) on March 4, 2003. Analysis results for VOCs were tabulated for MW-1 and MW-2. MW-1 contained three VOCs above the respective guidance values, while MW-2 contained elevated concentrations of four VOCs. Toluene was detected in MW-2 at a concentration similar to that of the previous sampling.

Limited Off-Site Soil Gas and Groundwater Sampling and Analysis, AES Inc. [June, 2003]

Off-site soil gas and groundwater sampling was completed by AES in June 2003. A total of 10 borings (BH-1 to BH-10) were attempted, however, BH-5 met refusal at a shallow depth and was abandoned. BH-1 and BH-2 were located adjacent to the west side of the Site along 9th Street. The remaining borings were located across 9th Street or south of 40th Avenue (Figure 1-6).

Soil gas samples collected at BH-2 and BH-10 contained high levels of toluene. The highest concentration of toluene was detected in BH-10, located closer to the property across 9th Street than the Site. BH-10 also contained elevated concentrations of benzene.

Seven groundwater samples were also collected from off-site soil boring locations. Analytical results indicated that the highest concentration of toluene was detected in groundwater collected from BH-10 (302,000 µg/L). This result is approximately to times higher than the level of toluene detected in BH-2 (38,176 µg/L) and 100 times greater than the toluene concentration detected in BH-3 (3328 µg/L), both located adjacent to the Site property.

Remedial Investigation Report, AES (March, 2006)

The investigation included the installation of four 4-inch diameter shallow groundwater monitoring wells. GW-1 and GW-7 were newly installed, while USH wells MW-1 and MW-2 had to be re-drilled as a result of damage from on-Site operations. MW-1, GW-1, and GW-7 were installed to a completed depth of 17 feet below ground surface (bgs). GW-3 was installed to a depth of 15 feet. GW-1 is located along the eastern side of the building interior up-gradient of the UST location. GW-3 is located immediately west of the UST location (down-gradient), and GW-7 is located near the southwest corner of the building. The RIR included the collection of soil, groundwater, and soil gas samples, and was completed in October and November 2005. The results of the RIR included:

- Groundwater sampled from MW-1, located in the Latex Production Area, contained benzene (32 µg/L), ethylbenzene (55 µg/L), toluene (1500 µg/L) and xylene (55 µg/L) above their respective guidance criteria.

- The groundwater sample collected from GW-7, located in the southwest corner of the building, contained higher concentrations of benzene (370 µg/L), ethylbenzene (350 µg/L), toluene (15,000 µg/L), and xylene (900 µg/L).

- A soil sample collected from 10-15 feet bgs from the boring that was converted to GW-7 contained toluene at 5.1 milligrams per kilogram (mg/kg).

- A groundwater sample from GW-3, located in the western portion of the site near the former AST and UST locations, contained benzene (260 µg/L), ethyl benzene (96 µg/L), toluene (20,000 µg/L), and xylene (200 µg/L), above their respective guidance values.

- The soil sample collected from 13 feet bgs from the boring that was converted to GW-3 contained toluene above guidance criteria at 19.0 mg/kg.

- Groundwater collected from monitoring well GW-1, in the northeastern portion of the site, contained benzene (11 µg/L), ethyl benzene (7.7 µg/L), toluene (3,600 µg/L), xylenes (19 µg/L), and PCE (150 µg/L).

- Soil collected from the boring that was converted to GW-1 contained toluene above guidance criteria at 12 mg/kg.

- Soil gas samples SG-2, SG-3, SG-4 and SG-5 were collected along the western interior of the on-Site building, while soil gas samples SG-1 and SG-6 were collected in the southern and northeastern portions of the site. VOCs identified in these samples included benzene, chloromethane, ethylbenzene, xylenes, PCE, 1,2,4-trimethylbenzene, and/or toluene.

AES concluded that the soil and groundwater at the subject site is impacted by VOCs primarily associated with releases from the UST's. They also noted that due to the dramatic decrease in toluene levels between borings BH-2 and BH-3 that this is an indication of a relatively localized toluene groundwater plume. Finally, the RIR indicated that the most significant off-site migration pathway is groundwater, which flows to the southwest towards the East River.

Soil Vapor Extraction Pilot Study Report, AES (April, 2007)

AES conducted a soil vapor extraction (SVE) pilot study from February through March 2007. Prior to SVE activities on-Site, soil vapor samples were collected. Four vapor sampling points (SG-1A, SG-2A, SG-3A, and SG-4A) were installed in the Site building (refer to Figure 1-5). Total VOC measurements were collected using a PID during the purging. After purging, soil gas samples were collected in a Summa canister. One soil vapor sample was collected from each location and analyzed for VOCs by EPA Method TO·15, hexane, heptane, MEK, and methyl-tert butyl ether (MTBE). SG-1A was collected from an area inside the Marble Works facility east of the courtyard, and contained a number of VOC levels above guidance criteria, including

chloroform (1600 µg/m^3), PCE (1900 µg/m^3), and TCE (180 µg/m^3). SG-2A, SG-3A and SG-4A were all collected in the northern portion of the building in the JNP Service Center. In SG-3A, 1,2,4-trimethylbenzene (82 µg/m^3), benzene (67 µg/m^3), n-heptane (1000 µg/m^3), toluene (11,000 µg/m^3) and TCE (8.7 µg/m^3) were above their respective guidance values. In SG-4A, 1,2,4-trimethylbenzene (120 µg/m^3), benzene (49 µg/m^3), n-heptane (590 µg/m^3), and toluene (5300 µg/m^3) exceeded criteria. SG-2A contained elevated n-heptane (300 µg/m^3) although no criteria exceedences were detected.

The pilot study was completed in four phases at MW-2, GW-3, MW-1 and GW-2 to evaluate the effectiveness of an SVE system as an Interim Remedial Measure (IRM) to address the vadose zone VOC impacts at the Site. The SVE unit was allowed to run continuously and exhaust was screened with a PID every thirty minutes. After SVE activities, water samples were collected from monitoring wells being screened. The groundwater sample collected from MW-2, located in the production studio at the southern end of the building, contained 1 semi-volatile organic compound (SVOC) and 13 VOCs at concentrations above guidance criteria.

Based on the findings of the Pilot Study and analysis of field screening and laboratory data, the SVE system was deemed an effective Interim Remedial Measure (IRM) to mitigate the effects of subsurface impacts on-Site. Results also showed that groundwater sample results had significantly improved since initial site investigation activities. AES suggested that to reduce VOC impacts, a bio-remedial product should be added to on-Site monitoring wells in conjunction with SVE activities.

Remedial Investigation Report, Adjacent Building, Keystone (November, 2008)

Moishe's Storage and Stellar Printing is located west of the Site across 9th Street. The stated purpose of the Remedial Investigation Report (RIR) was to assist the NYSDEC on its understanding of the off-site migration pathways and effects of impacts to soil and groundwater from VOCs potentially originating from the Site, and to document baseline conditions at the Moishe property at the time of the proposed property transaction. The RIR included a Phase I Environmental Site Assessment (ESA) of the Moishe's Storage and Stellar Printing site. The Phase I ESA revealed evidence of Recognized Environmental Conditions (REC's) at the property, including the following:

- Two 6,000-gallon heating fuel oil tanks present in the basement of the Stellar Printing building were identified as REC's.
- PCBs were detected in 1 of 13 wipe samples collected in the vicinity of transformers.
- Other than the former NRA Site, there were no other properties of concern to the subject property. The Site is referred to as the National Backing Corp and National Rubber & Backing Corp on some of the databases, and is shown to be on the

RCRA SQG list, the LUST list, and the State Hazardous Waste Sites List. Because of the known nature of the chemicals and releases at the Site and the adjacent, down-gradient location of the subject property, potential conditions in the basement and subbasement areas were identified as a REC.

The environmental sampling of Moishe's Storage and Stellar Printing site was performed between 2005 and 2008 and included the collection and analyses of 12 soil samples from beneath the concrete floor and asphalt parking areas. Trace concentrations of two VOCs were detected in the shallow subgrade soil: methylene chloride was detected at five of nine shallow boring locations, and PCE at one locations. The nine samples were all collected from a depth of less than 2 feet below grade. Concentrations of detected methylene chloride from the two deeper samples along 9th Street were about twice the estimated concentrations in the shallower samples. The deeper samples are from stratigraphic layers that are expected to be periodically saturated as the local water table fluctuates. Methylene chloride is a chemical of concern at the former NRA Site, and its presence in the deeper soil horizon may be the result of migration off-site migration. In addition, hexane, also a chemical of concern at Site was found in the deeper samples, but was not detected in any of the shallower soil samples. Four SVOCs were detected in the soil samples at concentrations that exceed their respective guidance criteria. The SVOCs were benzo(a)anthracene, chrysene, benzo(a)pyrene, and dibenzo(a,h)anthracene, which were attributed to the historical fill present.

The water samples that seeped into the Moishe's building subbasement contained several elevated metals which are likely the result of accumulated dust and other debris being suspended in the infiltrated water. The trench drain sample location closest to the former NRA Site showed only trace amounts of VOCs, including MTBE (1.3 µg/L). The drip observed from a PVC discharge pipe in the subbasement sampled in 2008 did not reveal elevated compounds. Collectively, these results and observations suggest that the trench drain is not continually collecting and transporting impacted groundwater from the Site.

The collection and analyses of four groundwater and four soil gas samples from the sidewalk immediately up-gradient from the subject property and immediately down-gradient of the former National Rubber Site revealed elevated concentrations of two gasoline constituents that were also found in temporary wells (GW-1 and GW-2) inside the building in 2006. Toluene was detected in one location at 144,000 µg/L, and benzene at 144 and 974 µg/L.

The collection and analyses of four background and indoor air quality (IAQ) samples indicated that, in general, the same suite of chemicals that were found in sidewalk subsurface soil gas and sub-slab soil gas samples were also detected in the ambient air inside the basement, although at substantially lower concentrations. A comparison of the IAQ results to the EPA and NYS screening information shows that PCE, 1,3,5-trimehtylbenzene, and 1,2,4-trimethylbenzene exceed the indoor range of at least one of these referenced standards.

Two permanent monitoring wells were installed in the basement of Moishe's Storage and Stellar Printing building (MW-1 and MW-2). Groundwater samples collected from MW-1 contained elevated concentrations of benzene, ethylbenzene, and other solvents known to have been used historically at the former NRA Site. Lower concentrations of these VOCs were also detected in MW-2. The B-4 water sample, collected from rising water in boring B-4 in the subbasement, contained MTBE was present at and PCE at concentrations above their respective guidance criteria.

Three soil gas samples collected from beneath the foundation slab of the Moishe's Storage and Stellar Printing property indicated that chemicals found in the sub-slab soil gas and sidewalk boring soil gas is similar to that found at lower concentrations in the ambient air within the basement and subbasement areas. The suite of chemicals includes the solvents and gasoline constituents that are known to have been used historically at the former NRA Site.

Groundwater within the general area of the former NRA Site and the Moishe's Storage and Stellar Printing property flows in a westerly direction toward the East River, approximately one-quarter mile from the NRA property. Depth-to-groundwater reportedly ranges from 5 to 10 feet bgs and groundwater velocities (horizontal) within the Upper Glacial aquifer have been calculated to be between 1 and 4 feet per day. Previous investigations performed by AES show that groundwater is approximately 7 to 11 feet below ground surface at the former NRA Site. These groundwater conditions strongly suggest that impacted groundwater from the NRA property flows beneath the Moishe's building at a depth close to the foundation slabs.

The RIR offered a number of opinions including:

- Groundwater and soil gas impacted by VOCs are potentially migrating from the former NRA Site and are present along the backside (9th Street side) of the building complex, immediately down-gradient of the NRA property;
- Soil gas and IAQ samples inside the basement of the Moishe's Storage and Stellar Printing site contained VOC impacts; however, the levels of these contaminants do not currently represent a need for mitigation, nor do they appear to result in a present unacceptable risk to occasional occupants of the premises; and
- The VOC groundwater and soil gas impacts identified on the subject property are compounds that have been used historically at the former NRA Site.

Data Summary Report for Jung Sun Laundry Plume, AECOM (March 2010)

AECOM completed a Data Summary Report in March 2010 to identify the source VOC impacts to groundwater at the Scalamandre Silks property adjacent to, and southwest of, the Jung Sun Laundry located at 37-10 24th Street, Long Island City, Queens, New York. The work was performed for the NYSDEC under a work assignment issued under the State Superfund Standby Program. Both the sites are up-gradient from the former NRA Site.

AECOM performed a Phase I groundwater investigation consisting of the installation of three new permanent monitoring wells and collection of groundwater samples for VOC analysis from new wells and five existing wells. They also conducted a membrane interphase probe investigation and collected soil samples from borings. Upon completion of this investigation, AECOM was able to conclude that PCE and TCE present in the groundwater under the Scalamandre and Jung Sun properties. PCE concentrations were greatest in the groundwater observed immediately west of the Jung Sun facility. The Jung Sun facility is the probable source of the observed impacts. Off-site migration of the groundwater impacts is possible as elevated PCE concentrations were observed in down-gradient monitoring wells on two occasions.

AECOM completed a Phase II groundwater investigation to address data gaps in the Phase I investigation. This investigation consisted of groundwater sampling, groundwater elevation measurements, test pit excavation, soil sampling, and installation of soil gas sampling points on the two properties.

AECOM concluded that based on their investigation, groundwater, soil, and soil gas analytical results confirm the presence of chlorinated VOCs (TCE, PCE, vinyl chloride and cis-1,2-dichloroethene) in all matrices at and in the vicinity of the Jung Sun site. A noted decrease in the toluene concentrations in groundwater was observed between up-gradient and down-gradient monitoring wells, indicating that the plume is migrating in a south-southeast direction. PCE impacts in soil samples were detected at 12.0 feet bgs, and are believed to be migrating from impacted groundwater during seasonal water table fluctuation.

Groundwater Sampling and Analysis Letter Report, CORE Environmental Consultants, Inc. (June, 2011)

CORE prepared a letter report to provide the results of the sampling of on-Site groundwater monitoring wells MW-1 and MW-2, which was completed on May 17, 2011. In the sample analyzed from MW-1 a total of 10 VOCs were detected with only benzene (19 µg/L) and toluene (20 µg/L) above respective guidance values of 5 µg/L. The previous groundwater sampling results completed by AES in 2007 indicated that benzene levels were 7 µg/L and toluene was non-detect. A total of 10 VOC's were detected in the groundwater sample from MW-2. Benzene (17 µg/L) and toluene (22 µg/L) each exceeded their guidance criteria, however these results were significantly lower when compared with the previous groundwater sampling event completed by AES in 2007 (benzene at 190 µg/L and toluene at 84,000 µg/L).

Remedial Investigation Letter Report, National Rubber Adhesives, Inc., MACTEC Engineering and Consulting, P.C. (October, 2012)

A Remedial Investigation (RI) letter report was prepared for the former NRA Site by MACTEC Engineering and Consulting, P.C. (MACTEC) as a work assignment for the NYSDEC. The RI

field activities were conducted from June 2012 through July 2012 and consisted of the installation of off-site monitoring wells and collection of soil and groundwater samples.

Seven soil samples were collected from five soil borings and analyzed for VOCs. The majority of the samples were collected at the groundwater table as elevated PID readings were not detected in the soil samples. VOCs were detected through laboratory analysis in some soil samples, however the samples, located in presumed hydraulically down-gradient locations, did not reveal any VOCs above guidance criteria.

Depth-to-groundwater reportedly ranged from 6 to 10 feet below grade. Groundwater grab samples were collected in July 2012 and were submitted for VOCs and monitored natural attenuation (MNA) parameters. Groundwater samples were also collected from the off-site monitoring well network. Access was not provided to on-Site monitoring wells. Toluene was reported above guidance criteria in 2 of 21 groundwater samples. The highest toluene concentrations were identified west of the Site, across 9th Street, where concentrations of toluene were 70,000 µg/L in HRP-MW-4 and 42,000 µg/L in HBR-MW-1. PCE, including its degradation products (such as 1,2-dichloroethene and vinyl chloride), were reported above respective guidance criteria in 5 of 21 groundwater samples.

Four wells were analyzed for MNA parameters to assess the potential for natural attenuation in the off-site groundwater system. The parameters were used to evaluate the likelihood that anaerobic biological degradation of fuel-related compounds or chlorinated VOCs is/was occurring within groundwater up and down-gradient of the Site. The Natural Attenuation Screening Protocol (NASP) score is from the USEPA BIOCHLOR, which is an analytical computer code that is intended for use as a screening-level model to determine if remediation by natural attenuation is feasible. The scoring ranges are as follows:

Inadequate evidence for anaerobic biodegradation of chlorinated organics	≥ 0 - 5
Limited evidence for anaerobic biodegradation of chlorinated organics	≥ 6 - 14
Adequate evidence for anaerobic biodegradation of chlorinated organics	≥ 15 - 20
Strong evidence for anaerobic biodegradation of chlorinated organics	≥ 20

The NASP score of MW-101 and MW-103 was 16 while the score for MW-102 was 11, indicating that adequate evidence exists for anaerobic biodegradation of chlorinated organics at MW-101 and MW-103 and limited evidence exists at MW-102.

The off-site RI findings confirmed the presence of toluene at concentrations exceeding guidance criteria. Elevated toluene concentrations (70,000 µg/L) were identified 50 feet down-gradient of the Site, while the toluene concentration at a sampling point 120 feet down gradient of the Site

was non-detect. Groundwater results indicated similar or lower analyte concentrations in groundwater samples collected in the spring of 2011, suggesting that the plume is stable. A low concentration of toluene (0.00077 mg/kg) was detected in one soil sample directly down-gradient of the Site, indicative of potential groundwater migration of impacts , and not a source extending from the Site.

Due Diligence Review, CORE (March, 2013)

The government records search developed by EDR includes federal and state government databases of known or suspected inactive hazardous waste sites, petroleum and chemical bulk storage tank sites, reported spills (SPILLS), landfills, school and hospitals, and hazardous waste generators, treatment and storage, and disposal facilities. A summary of instances in which the Site appeared in the database, and that may identify an REC, a historical recognized environmental condition (HREC), or a potential environmental concern (PEC) are provided in the table below.

Facility	Database Source	Location	Environmental Concern
National Rubber & Backing Corp.	RCRA NonGen / NLR EPA Id: NYD990690190 SHWS Class Code: Significant threat to the public health or environment - action required. LTANKS Spill No: 9602231 TANKS Facility Id: 2-145203 HIST UST PBS Number: 2-145203 HIST AST PBS Number: 2-145203 NY Hist Spills Spill Number: 9602231 CBS Facility Status: Unregulated CBS Number: 2-000015	TARGET PROPERTY	REC's - Elevated levels of VOCs, SVOC, and metals have been identified in soils and groundwater on-Site.
Marble & Granite Organization Corp.	FINDS US AIRS	TARGET PROPERTY	PEC – due to chemical use and storage
JNP Service Center	FINDS MANIFEST RCRA SQG	TARGET PROPERTY	PEC – due to chemical use and storage

A summary of instances in which nearby sites/facilities appeared on the database, and that may identify an REC, an HREC, or a PEC are provided in the table below.

Facility	Database Source	Location	Environmental Concern
Jung Sun Laundry Plume	SHWS	37-10 24th Street	REC- Up-gradient site that is a significant threat to the public health or environment – action required.
Lic Used Auto Parts	SWF/LF Spills	37-25 21st Street	REC - Junk yard located up-gradient with documented spills of auto fluids.
HAS-UWC East Sun Press Building	RCRA SQG FINDS AST HIST AST	38-38 9th Street, 55 feet NW, adjoins the site to the west	REC - Property adjoins the target property. Two active 6,000 gallon fuel oil ASTs in contact with soil.
Stellar Printing ,Inc.	RCRA SQG FINDS MANIFEST	38-38 9th Street, 55 feet NW, adjoins the site to the west	PEC - Violation listed involving ignitable wastes. Property adjoins the target property.
Best Cleaners	RCRA SQG	36-68 13th Street	REC – Up-gradient, haz materials included waste solvents
D D K Pro Cleaners	RCRA SQG	38-68 13th Street	REC – Up-gradient, haz materials included waste solvents
KTR Laundry & Dry Cleaners	RCRA SQG	38-38 13th Street	REC – Up-gradient, haz materials included waste solvents
Old AMOCO Property	MOSF	35-02 Vernon Boulevard	REC - Inactive oil storage facility with reported #2 fuel oil spill
P & S Queensbridge Cleaners	DRYCLEANER	10-12 41st Avenue	PEC – Down-gradient, haz materials included waste solvents
Tavern on the Green	NY SPILLS NY HIST SPILLS	38-40 10TH Street, 20 feet south of the Target Property, adjoins the property to the south	PEC - Active spill resulting from abandoned USTs. USTs were reportedly used for No. 2 fuel oil. Site adjoins the target property.
Con Edison	NY SPILLS NY HIST SPILLS	38th Avenue and 10TH Street; approximately 294 feet east of the target property	PEC - Active spill resulting dating back to 1992. 7000 gallons of dielectric fluid was released to the soil. Site is in close proximity to the target property.

Facility	Database Source	Location	Environmental Concern
Con Edison Feeder 63	NY SPILLS	38th Avenue and 11th Street, approximately 520 feet ESE of the target property	PEC - Approximately 300 gallons of dielectric fluid spilled on 9/23/04 as a result of equipment failure. Spill status remains active. Site is in close proximity to the target property.
Con Edison	NY SPILLS	38th Avenue and 11th Street approximately 524 feet ESE of the target property	PEC - Approximately 6000 gallons of dielectric fluid was spilled on 05/10/90. Spill status remains active. Site is in close proximity to the target property.

1.4 SITE GEOLOGY AND HYDROGEOLOGY

1.4.1 Site Geology

Little is known about the Site geology based on current available data. Driller logs from the 2001 ECC Sub-surface Investigation and 2006 AES Remedial Investigation Report (RIR) indicate that the site is underlain with fine reddish and brown sands and gravel interbedded with finer-grained sediments in the overburden. Depth to bedrock varies between 2 feet below ground surface (bgs) at the southern portion of the property to 12 feet bgs beneath the northern portion. Bedrock is believed to be highly weathered. A Depth to Bedrock Plan and Depth to Bedrock Cross Sections are included as Figures 1-7 through 1-10.

1.4.2 Site Hydrogeology

Depth to groundwater at the Site varies between 5 feet and 11 feet bgs based on the results of previous investigations. The 2012 MACTEC Remedial Investigation Letter indicated that groundwater flows in a generally westward direction, toward the nearby East River.

1.5 REMEDIAL INVESTIGATION APPROACH

1.5.1 Known Site Conditions

Soil investigation activities have indicated that bedrock was encountered on Site between 2 feet and 12 feet bgs. Previous site investigations suggest that product has been released from on-Site tanks and activities. On-Site soil samples in the UST area have contained elevated concentrations of VOCs. VOC related impacts found at on-Site sampling locations include toluene, methylene chloride, tetrachloroethene (PCE), carbon disulfide, and xylenes. SVOC impacts were identified primarily in the southwest area of the property and include benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3)pyrene, dibenzo(a,h)anthracene, 3+4-methylphenol, and 2-methylphenol. Elevated levels of metals, associated with fill material, were found on the northern portion of the property.

Groundwater is believed to be localized and flowing in a westerly direction. Previous environmental investigations have encountered groundwater between 6 feet and 11 feet bgs. Groundwater located immediately beneath the Site property is believed to have been impacted by various sources. Elevated concentrations of VOC impacts were found on the west side of the property and nearby property on the western side of 9th Street. Impacts found during previous groundwater sampling included benzene, toluene, ethylbenzene, and xylenes (BTEX), as well as MEK, PCE, methyl-tert butyl ether (MTBE), trichloroethene (TCE) and other VOCs. Slightly elevated levels of SVOCs were found on the north and west portions of the property. Metals found in Site groundwater were within applicable guidance criteria.

Previous site investigations confirm that Site-derived impacts have affected subsurface media. A potential source of the release to the environment may have been leaking underground storage tanks, piping, drains, and/or spills to the floor. Former chemicals identified as having been stored on Site and used in on-Site processes are the same as those identified in soil and groundwater samples. In groundwater, the primary impacts are VOC related, with toluene being the most prominent. Site-related impacts appear to have moved through the overburden and into groundwater. Subsequently, on-Site soil and groundwater has been impacted. The probable migration of impacts to off-site locations has been documented in previous off-site investigations.

1.5.2 Remedial Investigation Objectives

The remedial investigation activities described in Section 2.0 are designed to add to previous site investigations and will result in the generation of a more complete data set adequate to characterize:

- Geology and hydrogeology of the Site to facilitate the evaluation of interim and final remedial alternatives;
- Extent of on-Site current and former Site activity-related materials; and
- Nature and extent of chemical constituents in on-Site media, including soil, groundwater, and soil gas vapor.

1.5.3 Investigation Data Needs

The previous investigations at the Site have preliminarily delineated the nature and potential on-Site extent of soil and groundwater impacts associated with known AST and UST areas. These data sets, however, are incomplete and require additional data to refine and verify the nature of potential Site-related impacts. Additionally, little information is available regarding investigations in other areas of the Site. To accurately assess on-Site conditions and complete the RI/FS, additional field activities will be needed to characterize the soil, groundwater, and soil gas vapor impacts on-Site that have not been fully delineated to date.

Currently, the water table appears to be at or near the bedrock surface. As a result, the bedrock conditions beneath the Site may require further characterization to fully vertically delineate subsurface impacts. Should it be deemed necessary, a bedrock investigation will involve the installation of groundwater monitoring wells to approximately 5 feet below the bedrock surface as determined during drilling activities. Due to the shallow water table and elevated levels of toluene previously detected in groundwater samples, soil gas vapor sampling will also be conducted to evaluate the potential for vapor intrusion of VOCs into the overlying, occupied structure.

The remedial investigation activities are described in the following sections.

2.0 REMEDIAL INVESTIGATION SCOPE OF WORK

This section of the RI/FS Work Plan describes field activities necessary to collect a complete and accurate data set. The planned field activities include (but are not limited to):

- Completion of a Site walk-through intended to verify the location of existing groundwater and soil gas vapor monitoring points;
- Ground penetrating radar (GPR) survey to determine the presence and location of on-Site subsurface conduits;
- Completion of a Site-wide Membrane Interphase Probe (MIP) Preliminary Site Assessment to semi-quantitatively verify on-Site locations requiring further delineation;
- Completion of subsurface soil sampling to investigate the nature and extent of on-Site impacts;
- Installation of overburden and groundwater monitoring wells and collection of samples from new and existing wells;
- Installation of soil gas vapor monitoring points and collection of samples from new and existing monitoring points; and
- Collection of groundwater samples from NYSDEC off-site monitoring wells to allow for an accurate on-Site and off-site groundwater characterization using temporally consistent data.

This Remedial Investigation /Feasibility Study Work Plan is the Initial submittal as part of a phased approach to Site investigation activities at the former NRA Site. The Remedial Investigation is being approached in phases in order to allow CORE to analyze data after each portion of the investigation so as to more efficiently and accurately collect subsequent data necessary to fully characterize the Site and delineate potential subsurface impacts.

The MIP Preliminary Site Assessment proposed under this Initial Phase RIFS Work Plan will create a Site-wide screening-level data profile that CORE will use to assist in the determination of boring, monitoring well, and soil vapor point placement during subsequent phases of the RI. Those subsequent phases will be discussed in a Work Plan Addendum to be submitted following analysis of the MIP results.

2.1 MOBILIZATION

Prior to conducting intrusive field activities, CORE will contact Dig Safely New York. In addition, the current Site owner and tenants will be consulted as to the location of sub-structure utilities.

2.2 HEALTH AND SAFETY

A HASP has been prepared and is included as Appendix C. The HASP addresses worker safety and includes air monitoring in the breathing-zone using a photoionization detector (PID).

2.3 SITE WALK-THOUGH

CORE will perform a site-wide walk-through to verify the presence of pertinent Site features prior to the initiation of the RI field program. Pertinent features may include interior floor drains, exterior storm sewers, and previously installed groundwater monitoring wells and soil gas vapor sampling points. Should CORE become aware of new Site features, or should previously installed sampling locations that CORE understands to be present be inaccessible, damaged, or non-existent, the proposed field activities below may be altered to address the need for additional sampling locations to fully and properly delineate subsurface impacts at the property.

2.4 GROUND PENETRATING RADAR SURVEY

CORE will research building construction plans and As-Built plans as available through local Government Agencies. In addition to this research, Ground penetrating radar (GPR) will be used to determine the presence of on-Site subsurface conduits, such as those relating to floor drainage. GPR is commonly utilized as a non-invasive tool for subsurface structure location on concrete slab construction.

2.5 MEMBRANE INTERFACE PROBE PRELIMINARY SITE ASSESSMENT

Prior to the installation of soil borings, groundwater monitoring wells, and soil vapor points, CORE will retain a NYS Licensed drilling contractor to perform approximately 25 MIP subsurface profiles on Site. The down-hole MIP probe is advanced to refusal via standard direct-push techniques. A heated, permeable membrane allows diffusion of VOCs across the concentration gradient into the equipment, where it travels by carrier gas to an attached PID and flame ionization detector (FID). The MIP also uses direct sensing to measure electrical conductivity of the soils for use in conjunction with the PID and FID depth profiles. This semi-quantitative screening method will provide a baseline data set and allow CORE to choose soil boring, groundwater monitoring well, and soil gas vapor point locations that best reflect the subsurface conditions at the Site. This method is applicable to both vadose and saturated zones and is thus the most efficient way to screen subsurface conditions at the Site.

The locations of proposed MIP points are presented in Figure 2-1. The general locations of proposed MIP points may vary slightly in the field. In the event an elevated MIP response is encountered, secondary MIP borings will be installed adjacent to the primary boring locations in order to delineate the lateral extent of impacts and identify potential source areas.

2.6 SOIL INVESTIGATION

Following completion of the MIP Site Assessment, CORE will assess Site conditions and determine the location of soil borings to delineate subsurface impacts. The soil investigation will include the characterization of soils and the collection of soil samples for laboratory analysis. Soil samples collected for analysis will be analyzed for Target Compound List (TCL) VOCs, TCL semi-volatile organic compounds (SVOCs), heptane and hexane, and Target Analyte List (TAL) Metals.

CORE will retain a NYS Licensed drilling contractor to advance direct-push soil borings via pneumatic driven macrocore samplers in areas requiring additional soil characterization. Borings will be continuously sampled for characterization and PID screening purposes. The collection of soil samples from each boring will be determined in-field based on visual and olfactory indications of impacts to the subsurface as well as potential elevated PID readings. If there are no indications of impacts in the boring, the soil immediately above the saturated zone will be collected for analysis. Direct-push borings will be advanced to refusal. Borings will be abandoned by tremie-grouting the borehole. Soil sampling procedures are described in detail in the QAPP located in Appendix B. CORE will submit a Work Plan Addendum indicating the locations of proposed borings. No soil samples will be collected during the Initial Phase RI field activities.

2.7 GROUNDWATER INVESTIGATION

Each monitoring well installed on Site during previous Site investigations will be located and evaluated for usability during the previously discussed Site walk-through. CORE anticipates that all existing wells (GW-1, GW-3, MW-1, and MW-2/GW-7) will be accessible and useable for groundwater sample collection during the RI. Any existing wells that are found to be faulty or damaged upon inspection will be abandoned by grouting in place in accordance with the 2009 NYSDEC Groundwater Monitoring Well Decommissioning Policy (CP-43).

New monitoring wells will be installed in areas requiring additional characterization based on knowledge of former Site conditions and results of the MIP and soil boring program. Soil borings drilled for the purposes of groundwater monitoring well installation will be advanced using four and one-quarter or six and one-quarter-inch hollow stem augers and split-spoon sampler. The borings will be sampled and logged continuously to the water table, then every five feet thereafter. Soil samples will be collected from each boring using the same indicators discussed previously.

Bedrock is expected to be encountered between 2 feet bgs at the southernmost property boundary and 12 feet bgs on the northern portion of the property, established during previous Site investigations (refer to Figure 1-7 through 1-10). Based on actual depth to bedrock encountered during field activities and evidence of impacts, the borings may be advanced up to

5 feet into bedrock to characterize potential impacts that may exist below the overburden. The necessity to complete monitoring wells in bedrock will be determined on a boring-by-boring basis and will rely on in-field observations of impacts to the subsurface.

CORE anticipates installing a minimum of three groundwater monitoring wells, but no more than six. CORE will submit a Work Plan Addendum prior to the installation of groundwater monitoring wells that indicates the proposed locations and depths of groundwater monitoring wells.

2.7.1 Overburden Monitoring Wells

Overburden monitoring wells will be constructed with 2-inch schedule-40 polyvinyl chloride (PVC) pipe. A minimum 10-foot well screen (0.010 slot) will intersect the water table. No. 2 size sand pack will be placed in the annular space to a minimum of 2 feet above the screen, but up to 5 feet contingent on well depth. A 1-foot bentonite seal will be placed on top of the sand pack, and the well will be grouted to the surface. Each well will be completed with flush-mount well boxes at the surface. A Monitoring Well Construction Plan is included as Figure 2-2.

2.7.2 Bedrock monitoring wells

In the event it is determined that a monitoring well should be advanced into bedrock, the boring will be reamed with a larger diameter roller bit and a steel casing will be grouted in place to minimize downward migration of potential impacts during advancement of the boring into bedrock. The grout will be allowed to cure overnight, after which the boring will be advanced 5 feet into bedrock. The bedrock is anticipated to be heavily weathered and no rock core samples will be collected.

2.7.3 Monitoring Well Development and Sampling

The monitoring wells will be developed no sooner than 24 hours following installation. A submersible pump will be used to purge each well until temperature, conductivity, pH, and turbidity of the purge water have stabilized as measured on a Horiba U-10. All readings will be recorded on a Well Development Log, presented in the QAPP located in Appendix B. Development water will be placed in United Nations (UN)-approved 55-gallon drums and stored at the on-Site staging area.

Two rounds of groundwater samples will be collected from all newly-installed and existing on-Site groundwater monitoring wells. The initial collection of groundwater samples will be collected to establish a data baseline, and will occur within two weeks of monitoring well development. The second round of samples will be collected approximately three months after the baseline samples. Depth to water measurements will be measured prior to the commencement of groundwater sampling and will be used to create groundwater elevation contour maps to evaluate groundwater movement at the Site. Water quality parameters will be

measured using a Horiba U-10 and recorded on a Monitoring Well Sampling Log (included in the attached QAPP) until stabilized to within ten percent over a period of three consecutive readings. In addition to on-Site wells, NYSDEC off-site monitoring wells located in the vicinity will be sampled to provide a full set of contemporaneous data which can be used to more accurately evaluate toluene plume location and migration. Groundwater samples will be analyzed for TCL VOCs, TCL SVOCs, heptane and hexane, and TAL metals. Monitoring well sampling procedures are described in detail in the QAPP located in Appendix B.

2.8 SOIL GAS VAPOR INVESTIGATION

Soil gas vapor sampling points will be installed to evaluate the potential for indoor air intrusion. Up to 21 soil vapor points may be installed contingent on the horizontal extent of impacts found during the MIP Site Assessment. Sample points will be installed by advancing a direct-push soil boring to 5 feet bgs, or just above the water table if it is encountered shallower than 5 feet. One round of soil vapor samples will be collected for analysis from all newly installed and existing points to evaluate the nature and extent of possible soil gas vapor intrusion. Soil vapor samples will be analyzed for VOCs by USEPA Method TO-15. A Soil Vapor Monitoring Point Construction Plan is included as Figure 2-3.

2.9 INVESTIGATION DERIVED WASTE

Soil cuttings derived from subsurface investigation activities will be stored on-Site in DOT-approved 55-gallon steel drums. Purge water derived from monitoring well development and sampling will be stored in UN-approved 55-gallon drums. Containers will be labeled with the contents and date and stored at an on-Site staging area for characterization and disposal.

2.10 SAMPLE LOCATIONS AND SURVEY

Upon completion of all field activities, a NYS Licensed Surveyor will survey all sample locations. Monitoring well elevations will be collected at both ground surface and top-of-casing for use in groundwater elevation determination. Survey data will be used to create a Site topographic map and Site base map.

2.11 ENVIRONMENTAL SAMPLE ANALYSIS

All samples collected during the RI will be submitted to a New York State Department of Health (NYSDOH) certified laboratory for analysis under proper Chain-of-Custody procedures.

Duplicate and matrix spike/matrix spike duplicate (MS/MSD) samples will be collected at a rate of 1 per 20 original samples. One equipment blank will be collected from down-hole drilling equipment per day of sampling. A laboratory-provided trip blank will accompany all samples for VOC analysis. Complete sample handling and analysis procedures are discussed further in the QAPP presented in Appendix B.

Laboratory analytical data will be reported using NYSDEC Analytical Services Protocol (ASP) Category B data deliverables. All data will be validated by CORE or a qualified third-party validator.

3.0 DATA EVALUATION AND RI/FS REPORT

3.1 REMEDIAL INVESTIGATION REPORT

Site characterization data from the RI field activities and prior investigations will be compiled and analyzed to establish the nature and extent of impacts at the Site and delineate those impacts that potentially exceed regulatory criteria. Exposure pathways will be addressed and, if necessary, ecological receptors will be evaluated.

An RIR will be prepared following completion of the data analysis and will include the following documentation:

- A Site description;
- A summary of field activities used to delineate potential impacts at the Site during the RI with a discussion regarding any changes from the scope set forth in this Work Plan;
- Laboratory analytical data on CD in an Appendix;
- Maps documenting sample locations and other infographic material designating potential distribution of impacts in the subsurface including groundwater elevation maps and cross sections;
- Tabulated data summaries with comparison to the appropriate guidance criteria;
- Soil boring logs, monitoring well installation logs, and soil gas vapor point logs;
- Conclusions regarding the nature and extent of environmental impacts at the Site; and
- Recommendations.

3.2 FEASIBILITY STUDY

A FS Report identifying and evaluating possible remedial alternatives for the Site will be prepared and submitted to the NYSDEC under separate cover. The FS will contain different alternatives for Site remediation, and include discussions of each of the evaluation criteria for the remedial alternatives (or technologies) being considered. A preferred remedy that is protective of public health and the environment, complies to the maximum extent practicable with appropriate cleanup objectives, reflects a preference for treatment over simple disposal, and is cost effective will be recommended. A conceptual plan for implementing the preferred remedial alternative and verifying its feasibility will be prepared. The report will include limited Site background and Site characterization but will contain a conceptual design of the preferred remedy to include a detailed engineer's cost estimate.

4.0 SCHEDULE

Following Agency approval of the RI/FS Work Plan, the activities described in this document will be implemented. NYSDEC will be provided with a minimum of two weeks' notice before initiating the first on-Site activities. A target project duration schedule is provided below.

RI Activity	Target Duration
Work Plan Approval	Written Notice from Agency
Initial Phase Approximately 6 weeks	
Site Walk-through/Pre-field activities (i.e., scheduling; identification of subsurface utilities)	1 week
MIP Preliminary Site Assessment	1 week
Analysis of MIP data	1 week
Work Plan Addendum (Phase two)	2 weeks
Phase Two Approximately 16 weeks	
Soil boring/monitoring well installation	2 weeks
Soil vapor sampling	1 week
Groundwater sampling (baseline)	1 week
Groundwater sampling (round 2)	1 week (3 months after baseline)
Post-Field/Reporting Activities Approximately 15 weeks	
Laboratory Sample Analysis	3 weeks
Field/Lab Data Compilation and Interpretation	4 weeks
Preparation of Draft RI Report	6 weeks

5.0 REFERENCES

American Environmental Solutions, Inc. (AES), 2003. *Limited Off-site Soil Gas and Groundwater Sampling and Analysis*.

AES, 2006. *Remedial Investigation Report. Voluntary Cleanup Agreement, National Rubber Adhesives, Inc. NYSDEC Index No. W2-0967-03-07.*

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CORE Environmental Consultants, Inc. (CORE), 2011. *Groundwater Sampling and Analysis Letter Report*.

CORE, 2013. *Records Search Report, Former National Rubber Adhesives, 38-25 9th Street, Long Island City, New York 11101. Site ID: 2-41-028*.

Enviro-Comp Consultants, Inc. (ECC), 2001. *National Rubber Adhesives, Inc., 38-31 9th Street, Long Island City, New York. NYSDEC Site #2-41-028. Sub-surface Investigation Report*. *June 18-21, 2001.*

Keystone E-Sciences Group, Inc. (KEYSTONE), 2008. *Remedial Investigation Report, Moishe's Storage and Stellar Printing Buildings, Vernon Boulevard, Long Island City, NY*.

MACTEC Engineering and Consulting, P.C. (MACTEC), 2012. *Remedial Investigation Letter Report, National Rubber Adhesives, Inc. – Site Number 2-41-028*.

New York State Department of Environmental Conservation (NYSDEC), 1998. *Technical and Operational Guidance Series (1.1.1). Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*.

NYSDEC, 2006. *6 NYCRR Part 375, Environmental Remediation Programs. Subpart 375-6 – Remedial Program Soil Cleanup Objectives for Restricted Use.*

NYSDEC, 2010. *DEC Policy CP-51/Soil Cleanup Guidance*.

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NYSDEC, 2013. *Order on Consent and Administrative Settlement. Index #W2-1156-11-04. Site #2-41-028*.

U.S. Hydrogeologic, Inc. (USH), 1996. *Phase I, Limited Phase II.*

VERTEX Engineering Services (VERTEX), 2003. *Site Groundwater Sampling of MW-1 and MW-2*.

COMMUNITY AIR MONITORING PLAN
RI/FS, NATIONAL RUBBER ADHESIVES SITE,
LONG ISLAND CITY, NEW YORK

To provide a measure of protection for any potential downwind receptors, and to confirm that work activities do not generate airborne contaminants, CORE will conduct continuous monitoring for volatile organic compounds (VOCs) and particulate matter (dust) during all ground intrusive activities at the site. Monitoring will be conducted at the downwind perimeter of each work area.

VOC MONITORING, RESPONSE LEVELS, AND ACTIONS

VOCs will be monitored on a continuous basis during all ground-intrusive activities. Upwind concentrations will be measured at the start of each workday and periodically thereafter in order to establish background conditions. VOC monitoring will be conducted using a MiniRae 2000 photoionization detector (PID) or PPB Rae PID. The PID will be calibrated, at a minimum, at the start of each day using the span calibration gas recommended by the manufacturer. The PID will calculate 15-minute running average concentrations which will be compared to the action levels specified below.

Action Levels

- 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 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 be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, 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, all work activities will be stopped.

All 15-minute average readings will be recorded and copies of forms included in the Remedial Investigation Report (RIR). Instantaneous readings, if any, used for decision purposes will also be recorded.

PARTICULATE MONITORING, RESPONSE LEVELS, AND ACTIONS

Particulate concentrations will be monitored continuously at the upwind and downwind perimeter of the each work area during all ground-intrusive activities. 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) will be used for the particulate monitoring. The equipment will be equipped with an audible alarm to indicate exceedence of the action levels summarized below. Any fugitive dust migration will also be visually assessed during all work activities.

Action Levels

- If the downwind PM-10 particulate level is 0.1 milligrams per cubic meter (mg/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 0.15 mg/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 0.15 mg/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 0.15 mg/m3 of the upwind level and in preventing visible dust migration.

All particulate monitoring measurements will be recorded on a Daily Air Monitoring Record included as part of this CAMP. Copies will be kept on file for NYSDEC and NYDOH review.

FIGURES

QUADRANGLE LOCATION

0' 1000' 2000' 4000'

SCALE: 1" = 2000'

SOURCE:

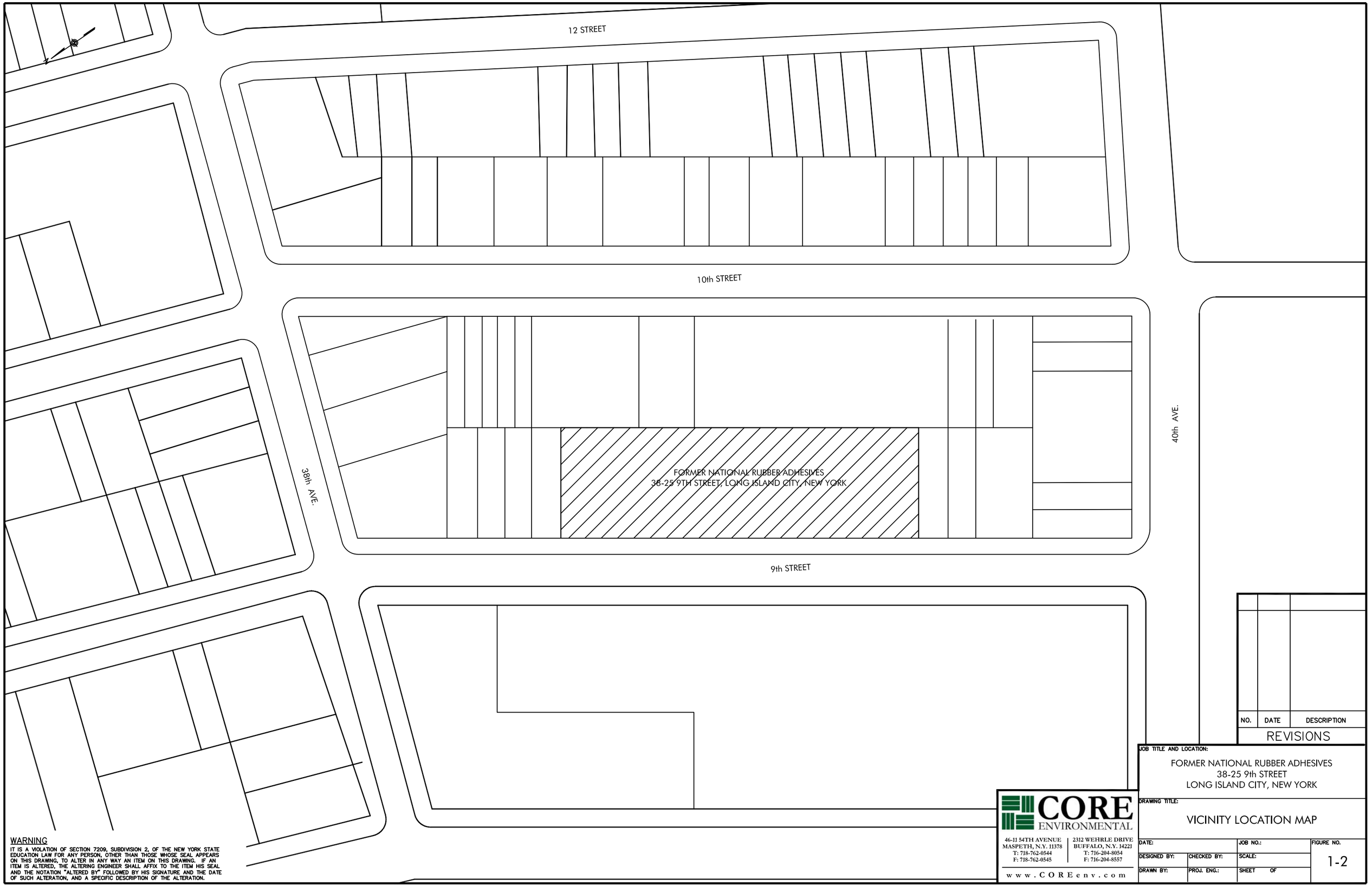
USGS TOPOGRAPHIC MAP
FLUSHING QUADRANGLE 1995

38-25 9th Street
Long Island City, NY

PROJECT SITE LOCATION MAP

CORE ENVIRONMENTAL
46-11 54th Avenue, Maspeth,NY 11378
Phone: 718-762-0544 Fax: 718-762-0545

DATE
04/19/2013
PROJECT No.
1515-132
FIGURE No.
1-1



WARNING

IT IS A VIOLATION OF SECTION 7209, SUBDIVISION 2, OF THE NEW YORK STATE EDUCATION LAW FOR ANY PERSON, OTHER THAN THOSE WHOSE SEAL APPEARS ON THIS DRAWING, TO ALTER IN ANY WAY AN ITEM ON THIS DRAWING. IF AN ITEM IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM HIS SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

NO.	DATE	DESCRIPTION

REVISIONS

JOB TITLE AND LOCATION:

FORMER NATIONAL RUBBER ADHESIVES
38-25 9th STREET
LONG ISLAND CITY, NEW YORK

DRAWING TITLE:

VICINITY LOCATION MAP

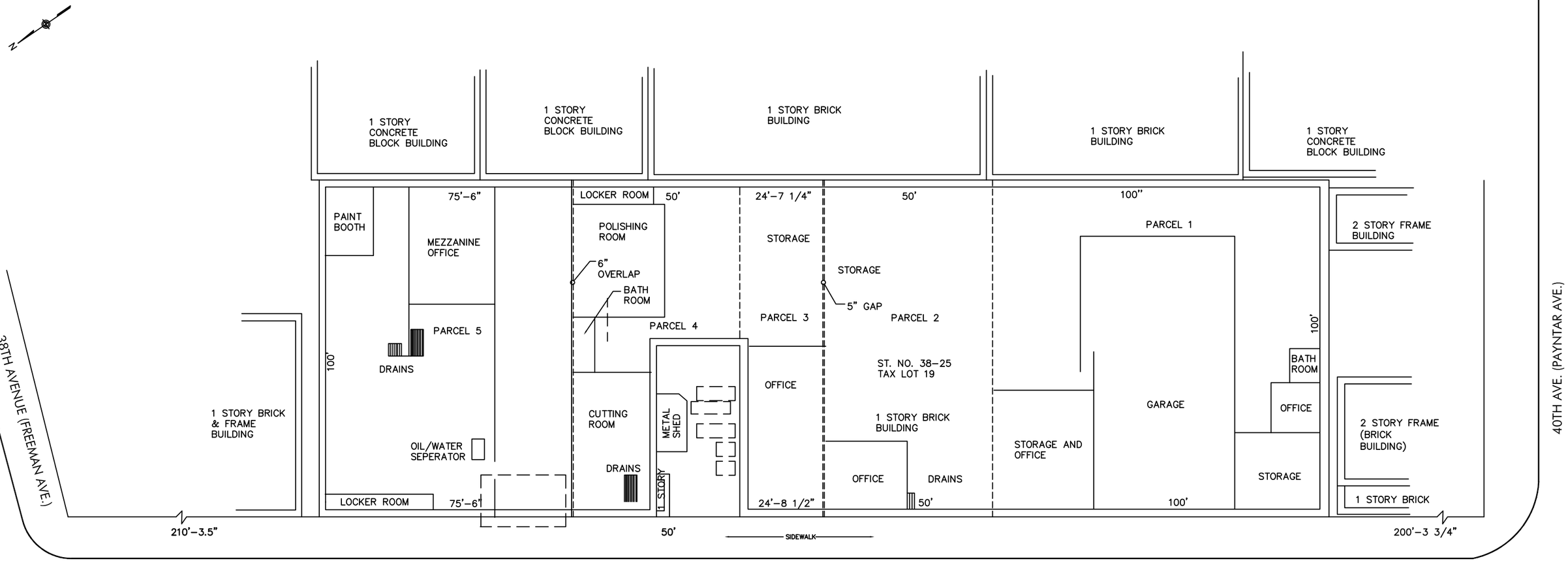
CORE ENVIRONMENTAL

46-11 54TH AVENUE
MASPETH, N.Y. 11378
T: 718-762-0544
F: 718-762-0545

2312 WEHRLE DRIVE
BUFFALO, N.Y. 14221
T: 716-204-8054
F: 716-204-8557

www.COREenv.com

DATE:		JOB NO.:	FIGURE NO.
DESIGNED BY:	CHECKED BY:	SCALE:	1-2
DRAWN BY:	PROJ. ENG.:	SHEET OF	



COUNTY: QUEENS

TAX BLOCK: 475

TAX LOT: 19

LAND BLOCK NO.

STANDARD L.I.C.

SOURCES:
1. U.S. HYDROGEOLOGIC INC. (PRELIMINARY SUB–SURFACE INVESTIGATION 1996)
2. ENVIRO–CORP CONSULTANTS INC. (ECC), SUB–SURFACE INVESTIGATION REPORT 2001
3. AMERICAN ENVIRONMENTAL SOLUTIONS (AES), REMEDIAL INVESTIGATION REPORT 2006
4. AMERICAN ENVIRONMENTAL SOLUTIONS (AES), SOIL VAPOR–EXTRACTION PILOT STUDY 2007
5. AMERICAN ENVIRONMENTAL SOLUTIONS (AES), LIMITED OFF–SITE INVESTIGATION 2008
6. INFORMATION TAKEN FROM MONTROSE SURVEY CO. LLP, TITLE SURVEY 7–15–03.

15 0 15
SCALE IN FEET

NO.	DATE	DESCRIPTION

REVISIONS

JOB TITLE AND LOCATION:
FORMER NATIONAL RUBBER ADHESIVES
38-25 9th STREET
LONG ISLAND CITY, NEW YORK

DRAWING TITLE:
SITE PLAN SURVEY

CORE ENVIRONMENTAL
46-11 54TH AVENUE
MASPETH, N.Y. 11378
T: 718-762-0544
F: 718-762-0545
2312 WEHRLE DRIVE
BUFFALO, N.Y. 14221
T: 716-204-8054
F: 716-204-8557
www.COREenv.com

DATE:		JOB NO.:	FIGURE NO.
DESIGNED BY:	CHECKED BY:	SCALE:	1-3
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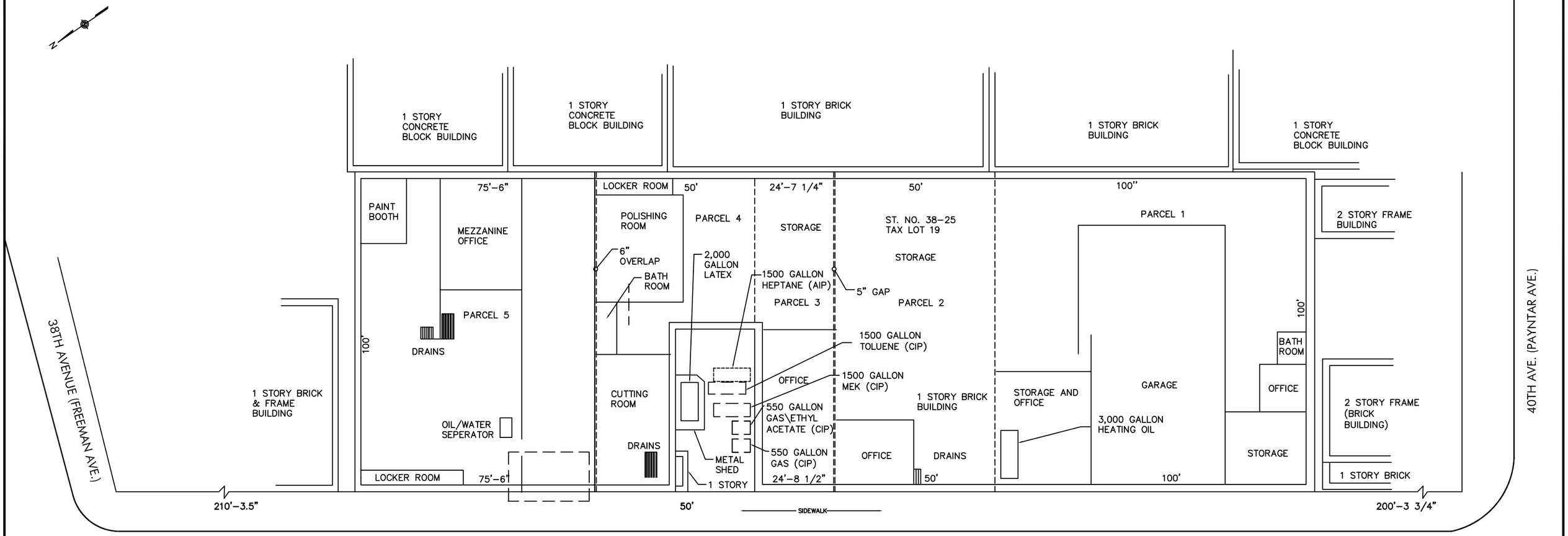

9TH STREET (HAMILTON STREET)

COUNTY: QUEENS

TAX BLOCK: 475

TAX LOT: 19

LAND BLOCK NO.

STANDARD L.I.C.

LEGEND:

- UNDERGROUND STORAGE TANK – ABANDON IN PLACE (AIP)
- UNDERGROUND STORAGE TANK – CLOSED IN PLACE (CIP)
- ABOVEGROUND STORAGE TANK

15 0 15

SCALE IN FEET

SOURCES:

1. U.S. HYDROGEOLOGIC INC. (PRELIMINARY SUB-SURFACE INVESTIGATION 1996)
2. ENVIRO-CORP CONSULTANTS INC. (ECC), SUB-SURFACE INVESTIGATION REPORT 2001
3. AMERICAN ENVIRONMENTAL SOLUTIONS (AES), REMEDIAL INVESTIGATION REPORT 2006
4. AMERICAN ENVIRONMENTAL SOLUTIONS (AES), SOIL VAPOR-EXTRACTION PILOT STUDY 2007
5. AMERICAN ENVIRONMENTAL SOLUTIONS (AES), LIMITED OFF-SITE INVESTIGATION 2008
6. INFORMATION TAKEN FROM MONTROSE SURVEY CO. LLP, TITLE SURVEY 7-15-03.

NO.	DATE	DESCRIPTION

REVISIONS

JOB TITLE AND LOCATION:

FORMER NATIONAL RUBBER ADHESIVES
38-25 9th STREET
LONG ISLAND CITY, NEW YORK

DRAWING TITLE:

HISTORICAL SITE PLAN

CORE ENVIRONMENTAL

46-11 54TH AVENUE
MASPETH, N.Y. 11378
T: 718-762-0544
F: 718-762-0545

2312 WEHRLE DRIVE
BUFFALO, N.Y. 14221
T: 716-204-8054
F: 716-204-8557

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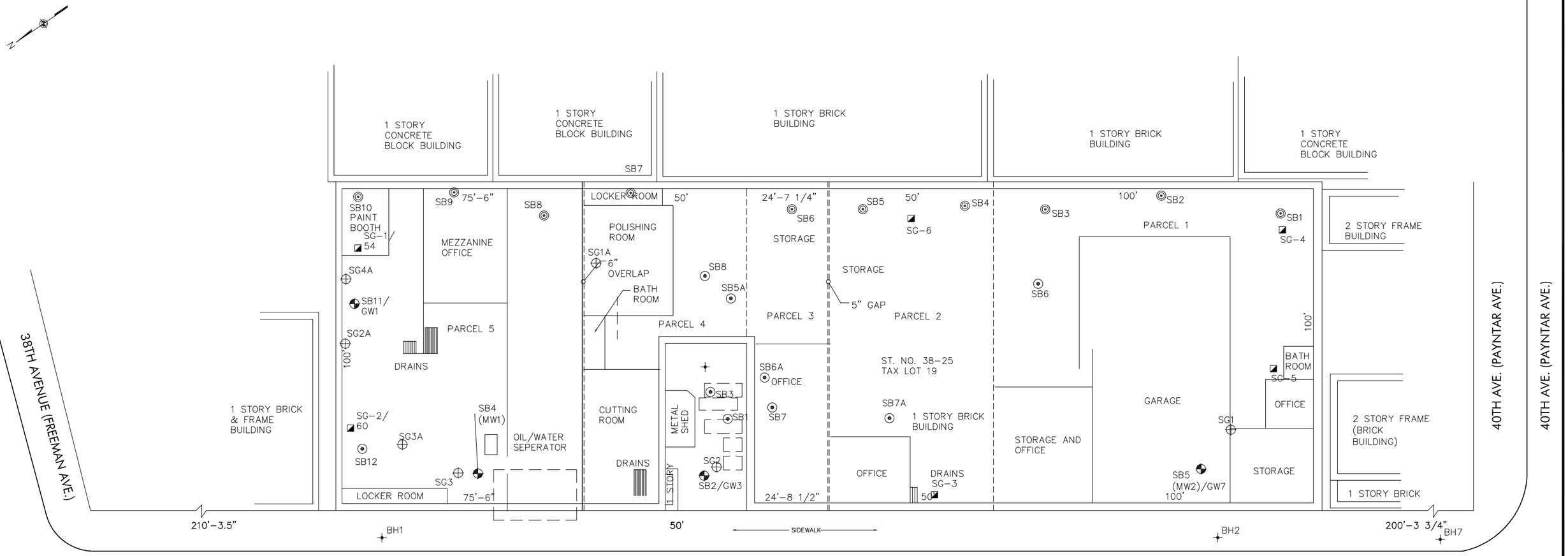
DATE:		JOB NO.:	FIGURE NO.
DESIGNED BY:	CHECKED BY:	SCALE:	1-4
DRAWN BY:	PROJ. ENG.:	SHEET OF	



COUNTY: QUEENS

TAX BLOCK: 475

TAX LOT: 19

LAND BLOCK NO.

STANDARD L.I.C.

SOURCES:
1. U.S. HYDROGEOLOGIC INC. (PRELIMINARY SUB-SURFACE INVESTIGATION 1996)
2. ENVIRO-CORP CONSULTANTS INC. (ECC), SUB-SURFACE INVESTIGATION REPORT 2001
3. AMERICAN ENVIRONMENTAL SOLUTIONS (AES), REMEDIAL INVESTIGATION REPORT 2006
4. AMERICAN ENVIRONMENTAL SOLUTIONS (AES), SOIL VAPOR-EXTRACTION PILOT STUDY 2007
5. AMERICAN ENVIRONMENTAL SOLUTIONS (AES), LIMITED OFF-SITE INVESTIGATION 2008
6. INFORMATION TAKEN FROM MONTROSE SURVEY CO. LLP, TITLE SURVEY 7-15-03.

LEGEND:

- MONITORING WELL
- SOIL BORING (U.S. HYDROGEOLOGIC)
- SOIL BORING (E.C.C.)
- BORING HOLE (A.E.S.)
- SOIL GAS SAMPLING LOC (A.E.S.) 2007
- SOIL GAS SAMPLING LOC (A.E.S.) 2005
- UNDERGROUND STORAGE TANK

15 0 15
SCALE IN FEET

NO.	DATE	DESCRIPTION

REVISIONS

JOB TITLE AND LOCATION:

FORMER NATIONAL RUBBER ADHESIVES
38-25 9th STREET
LONG ISLAND CITY, NEW YORK

DRAWING TITLE:

HISTORICAL ON-SITE SAMPLE POINTS

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F: 718-762-0545
2312 WEHRLE DRIVE
BUFFALO, N.Y. 14221
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F: 716-204-8557
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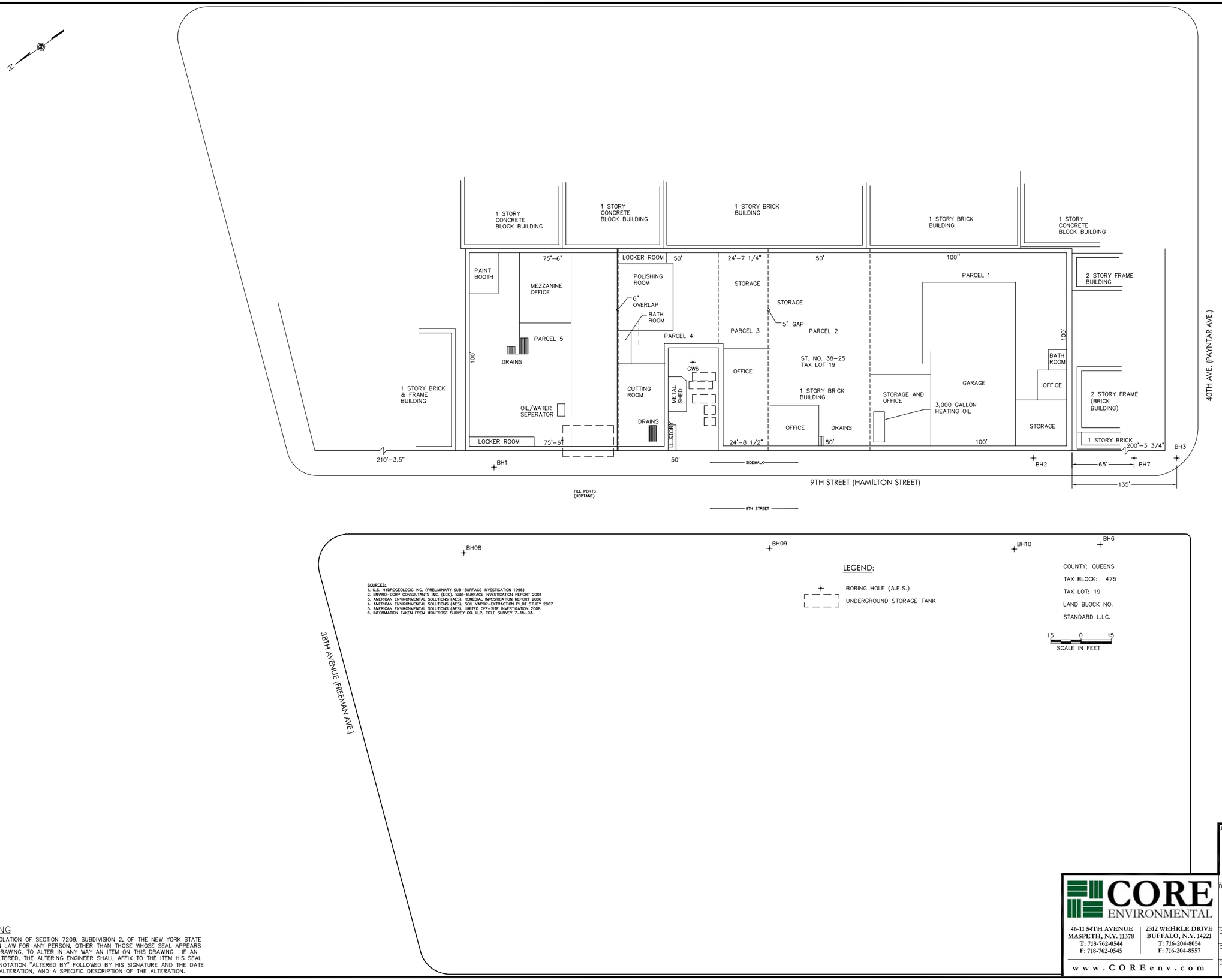
DESIGNED BY:	CHECKED BY:	SCALE:	1-5
DRAWN BY:	PROJ. ENG.:	SHEET OF	



SOURCES:
1. U.S. HYDROGEOLOGIC INC. (PRELIMINARY SUB-SURFACE INVESTIGATION 1996)
2. ENVIRO-CORP CONSULTANTS INC. (ECC), SUB-SURFACE INVESTIGATION REPORT 2001
3. AMERICAN ENVIRONMENTAL SOLUTIONS (AES), REMEDIAL INVESTIGATION REPORT 2006
4. AMERICAN ENVIRONMENTAL SOLUTIONS (AES), SOIL VAPOR-EXTRACTION PILOT STUDY 2007
5. AMERICAN ENVIRONMENTAL SOLUTIONS (AES), LIMITED OFF-SITE INVESTIGATION 2008
6. INFORMATION TAKEN FROM MONTROSE SURVEY CO. LLP, TITLE SURVEY 7-15-03.

LEGEND:

BORING HOLE (A.E.S.)

UNDERGROUND STORAGE TANK

COUNTY: QUEENS
TAX BLOCK: 475
TAX LOT: 19
LAND BLOCK NO.
STANDARD L.I.C.

15 0 15
SCALE IN FEET

NO.	DATE	DESCRIPTION

REVISIONS

JOB TITLE AND LOCATION:

FORMER NATIONAL RUBBER ADHESIVES
38-25 9th STREET
LONG ISLAND CITY, NEW YORK

DRAWING TITLE:

HISTORICAL OFF-SITE SAMPLE POINTS

CORE ENVIRONMENTAL
46-11 54TH AVENUE
MASPETH, N.Y. 11378
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F: 718-762-0545
2312 WEHRLE DRIVE
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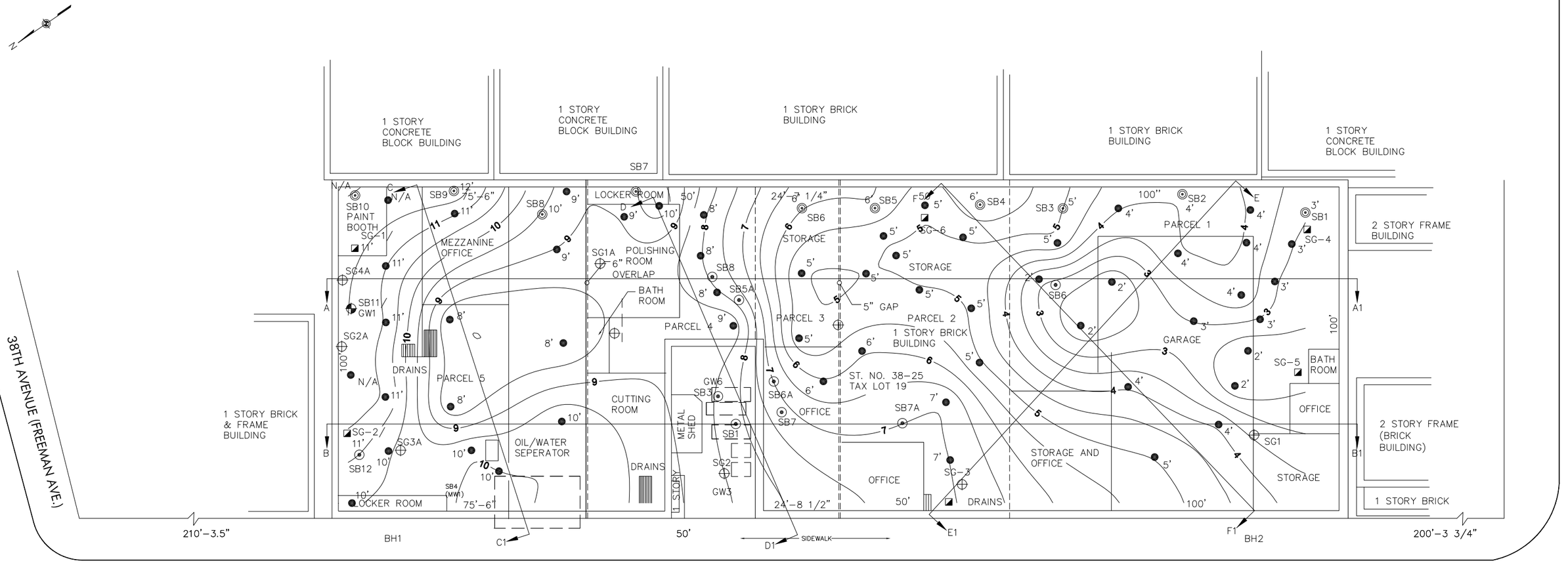
DATE:		JOB NO.:	FIGURE NO.
DESIGNED BY:	CHECKED BY:	SCALE:	1-6
DRAWN BY:	PROJ. ENG.:	SHEET OF	



9TH STREET (HAMILTON STREET)

COUNTY: QUEENS

TAX BLOCK: 475

TAX LOT: 19

LAND BLOCK NO.

STANDARD L.I.C.

SOURCES:
1. U.S. HYDROGEOLOGIC INC. (PRELIMINARY SUB-SURFACE INVESTIGATION 1996)
2. ENVIRO-CORP CONSULTANTS INC. (ECC), SUB-SURFACE INVESTIGATION REPORT 2001
3. AMERICAN ENVIRONMENTAL SOLUTIONS (AES), REMEDIAL INVESTIGATION REPORT 2006
4. AMERICAN ENVIRONMENTAL SOLUTIONS (AES), SOIL VAPOR-EXTRACTION PILOT STUDY 2007
5. AMERICAN ENVIRONMENTAL SOLUTIONS (AES), LIMITED OFF-SITE INVESTIGATION 2008
6. INFORMATION TAKEN FROM MONTROSE SURVEY CO. LLP, TITLE SURVEY 7-15-03.

LEGEND:

- MONITORING WELL
- SOIL BORING (U.S. HYDROGEOLOGIC)
- 3' BORING POINT AND DEPTH BEDROCK ENCOUNTERED (E.C.C.)
- SOIL BORING (E.C.C.)
- BORING HOLE (A.E.S.)
- SOIL GAS SAMPLING LOC (A.E.S.) 2005
- UNDERGROUND STORAGE TANK
- A A1 CROSS SECTION ALIGNMENT
- 9 BEDROCK SURFACE CONTOUR

15 0 15
SCALE IN FEET

NO.	DATE	DESCRIPTION

REVISIONS

WARNING

IT IS A VIOLATION OF SECTION 7209, SUBDIVISION 2, OF THE NEW YORK STATE EDUCATION LAW FOR ANY PERSON, OTHER THAN THOSE WHOSE SEAL APPEARS ON THIS DRAWING, TO ALTER IN ANY WAY AN ITEM ON THIS DRAWING. IF AN ITEM IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM HIS SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

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BUFFALO, N.Y. 14221
T: 716-204-8054
F: 716-204-8557
www.COREenv.com

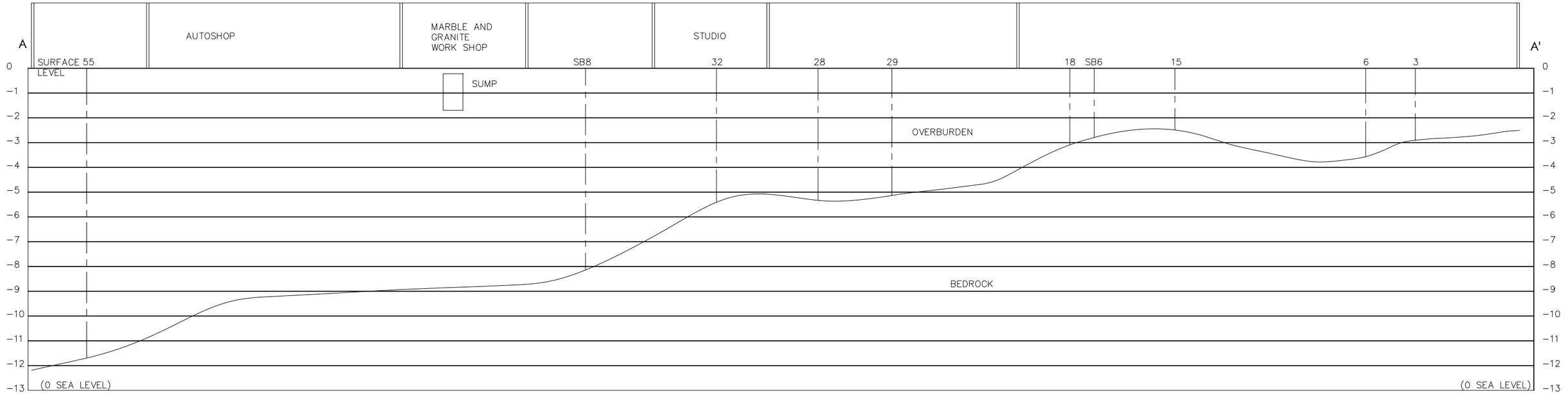
JOB TITLE AND LOCATION:

FORMER NATIONAL RUBBER ADHESIVES
38-25 9th STREET
LONG ISLAND CITY, NEW YORK

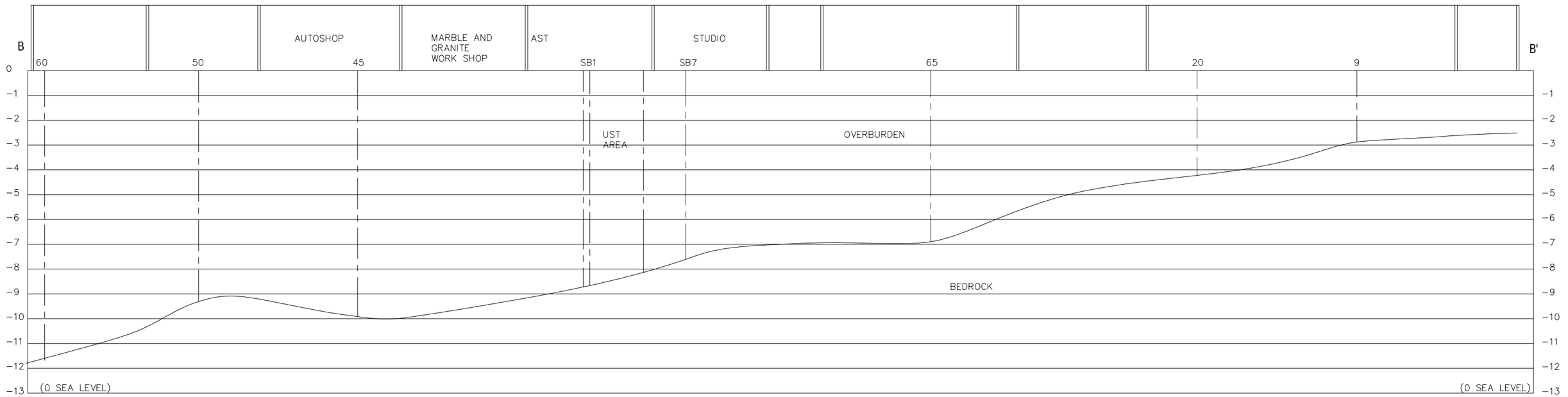
DRAWING TITLE:

DEPTH TO BEDROCK

DATE:		JOB NO.:	FIGURE NO.
DESIGNED BY:	CHECKED BY:	SCALE:	1-7
DRAWN BY:	PROJ. ENG.:	SHEET OF	



SECTION A-A'



SECTION B-B'

5 0 5
HORIZONTAL SCALE
10 0 10
HORIZONTAL SCALE

WARNING

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F: 718-762-0545
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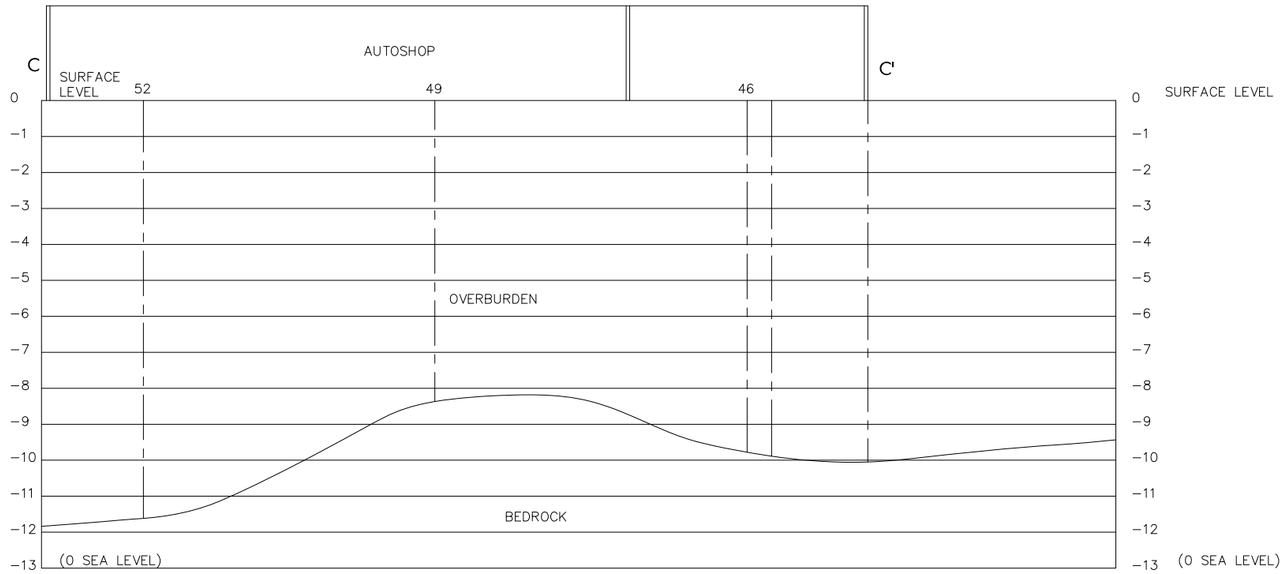
T: 716-204-8054
F: 716-204-8557
www.COREenv.com

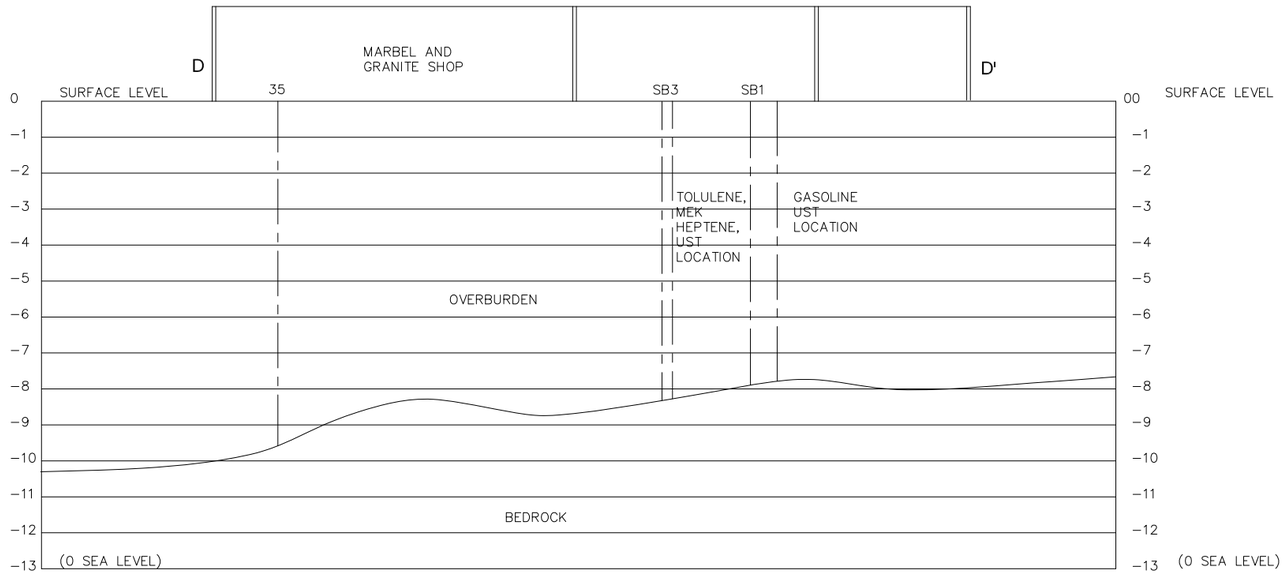
JOB TITLE AND LOCATION:
FORMER NATIONAL RUBBER ADHESIVES
38-25 9th STREET
LONG ISLAND CITY, NEW YORK

DRAWING TITLE:
DEPTH TO BEDROCK
SECTION A-A' AND SECTION B-B'

DATE:		JOB NO.:	FIGURE NO.
DESIGNED BY:	CHECKED BY:	SCALE:	1-8
DRAWN BY:	PROJ. ENG.:	SHEET OF	



SECTION C-C'



SECTION D-D'

5 0 5
HORIZONTAL SCALE
10 0 10
HORIZONTAL SCALE

JOB TITLE AND LOCATION:

FORMER NATIONAL RUBBER ADHESIVES
38-25 9th STREET
LONG ISLAND CITY, NEW YORK

DRAWING TITLE:

DEPTH TO BEDROCK
SECTION C-C' AND SECTION D-D'

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46-11 54TH AVENUE
MASPETH, N.Y. 11378
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F: 718-762-0545
2312 WEHRLE DRIVE
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F: 716-204-8557
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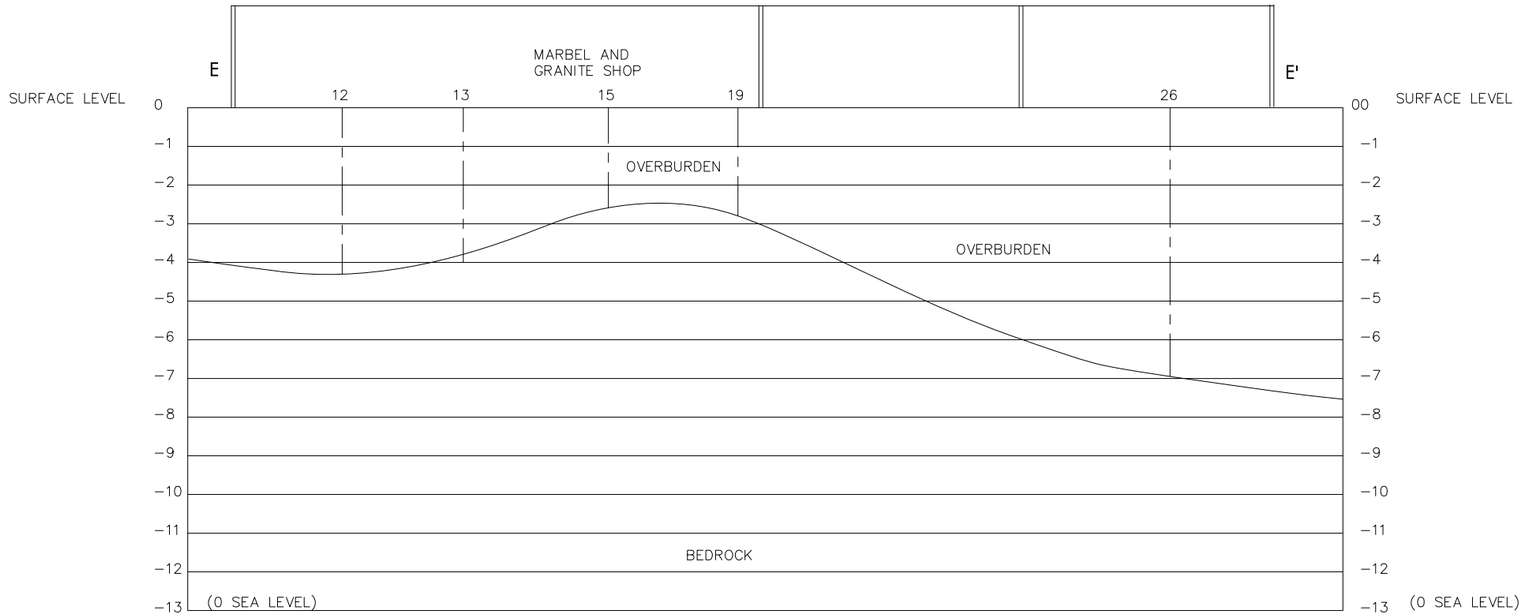
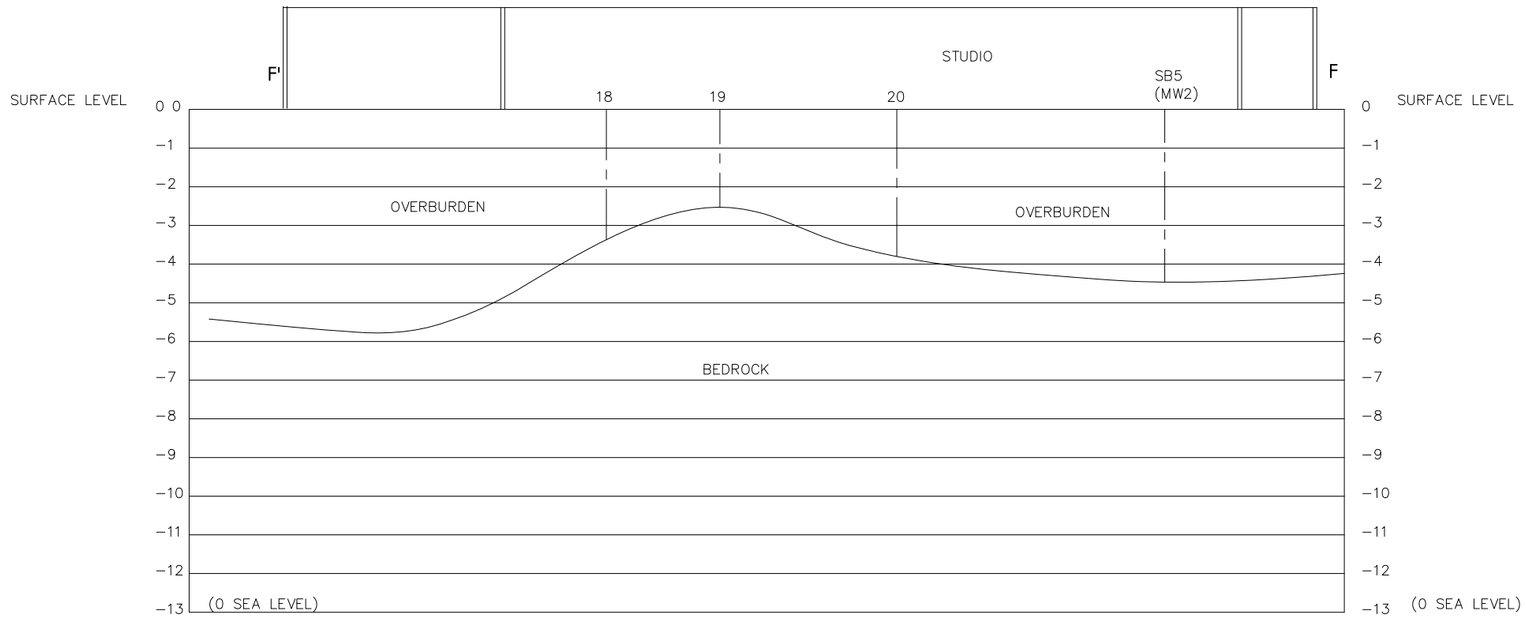
DATE:		JOB NO.:	FIGURE NO.
DESIGNED BY:	CHECKED BY:	SCALE:	1-9
DRAWN BY:	PROJ. ENG.:	SHEET OF	



SECTION E-E'



SECTION F-F'

5 0 5
HORIZONTAL SCALE
10 0 10
HORIZONTAL SCALE

WARNING

IT IS A VIOLATION OF SECTION 7209, SUBDIVISION 2, OF THE NEW YORK STATE EDUCATION LAW FOR ANY PERSON, OTHER THAN THOSE WHOSE SEAL APPEARS ON THIS DRAWING, TO ALTER IN ANY WAY AN ITEM ON THIS DRAWING. IF AN ITEM IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM HIS SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

CORE ENVIRONMENTAL
46-11 54TH AVENUE
MASPETH, N.Y. 11378
T: 718-762-0544
F: 718-762-0545
2312 WEHRLE DRIVE
BUFFALO, N.Y. 14221
T: 716-204-8054
F: 716-204-8557
www.COREenv.com

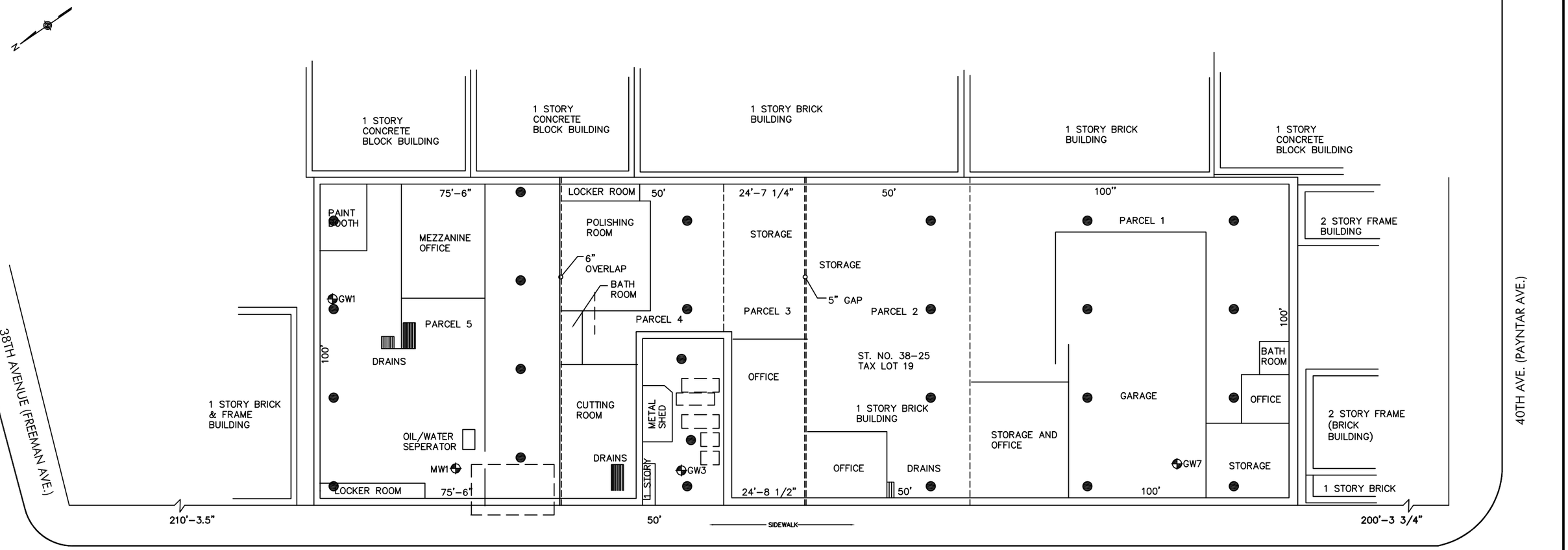
JOB TITLE AND LOCATION:

FORMER NATIONAL RUBBER ADHESIVES
38-25 9th STREET
LONG ISLAND CITY, NEW YORK

DRAWING TITLE:

DEPTH TO BEDROCK
SECTION E-E' AND SECTION F-F'

DATE:		JOB NO.:	FIGURE NO.
DESIGNED BY:	CHECKED BY:	SCALE:	1-10
DRAWN BY:	PROJ. ENG.:	SHEET OF	



COUNTY: QUEENS

TAX BLOCK: 475

TAX LOT: 19

LAND BLOCK NO.

STANDARD L.I.C.

LEGEND:

- EXISTING GROUNDWATER MONITORING WELL (AES)
- PROPOSED M.I.P. DRAWING
- UNDERGROUND STORAGE TANK

15 0 15

SCALE IN FEET

SOURCES:

1. U.S. HYDROGEOLOGIC INC. (PRELIMINARY SUB-SURFACE INVESTIGATION 1996)
2. ENVIRO-CORP CONSULTANTS INC. (ECC), SUB-SURFACE INVESTIGATION REPORT 2001
3. AMERICAN ENVIRONMENTAL SOLUTIONS (AES), REMEDIAL INVESTIGATION REPORT 2006
4. AMERICAN ENVIRONMENTAL SOLUTIONS (AES), SOIL VAPOR-EXTRACTION PILOT STUDY 2007
5. AMERICAN ENVIRONMENTAL SOLUTIONS (AES), LIMITED OFF-SITE INVESTIGATION 2008
6. INFORMATION TAKEN FROM MONTROSE SURVEY CO. LLP, TITLE SURVEY 7-15-03.

WARNING

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NO.	DATE	DESCRIPTION

REVISIONS

JOB TITLE AND LOCATION:

FORMER NATIONAL RUBBER ADHESIVES
38-25 9th STREET
LONG ISLAND CITY, NEW YORK

DRAWING TITLE:

PROPOSED MEMBRANE INTERFACE PROBE BORING LOCATIONS

CORE ENVIRONMENTAL

46-11 54TH AVENUE
MASPETH, N.Y. 11378
T: 718-762-0544
F: 718-762-0545

2312 WEHRLE DRIVE
BUFFALO, N.Y. 14221
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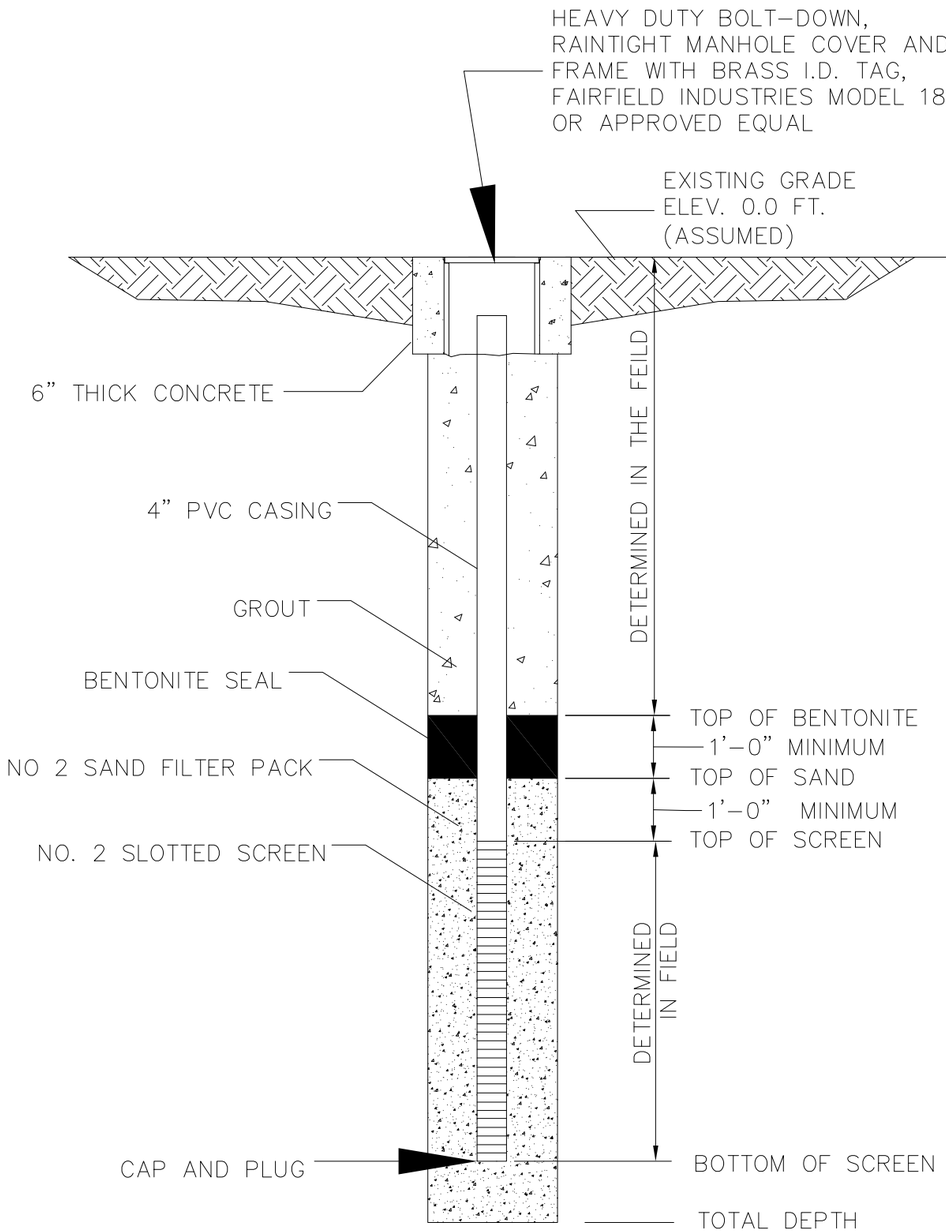
DATE:		JOB NO.:	FIGURE NO.
DESIGNED BY:	CHECKED BY:	SCALE:	2-1
DRAWN BY:	PROJ. ENG.:	SHEET OF	



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NO.	DATE	DESCRIPTION

REVISIONS

JOB TITLE AND LOCATION:

FORMER NATIONAL RUBBER ADHESIVES
38-25 9th STREET
LONG ISLAND CITY, NEW YORK

DRAWING TITLE:

MONITORING WELL
CONSTRUCTION PLAN

CORE ENVIRONMENTAL

46-11 54TH AVENUE
MASPETH, N.Y. 11378
T: 718-762-0544
F: 718-762-0545

2312 WEHRLE DRIVE
BUFFALO, N.Y. 14221
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DATE:		JOB NO.:	FIGURE NO.
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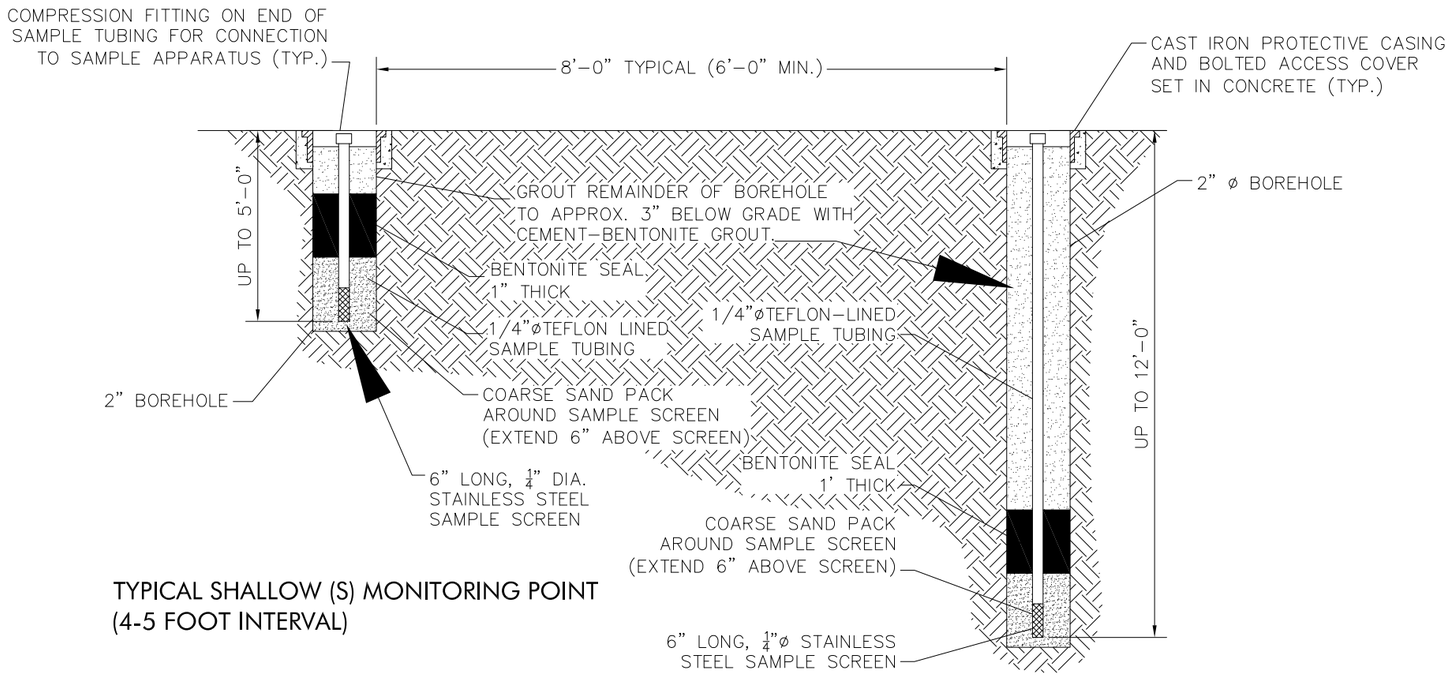
DRAWN BY:	PROJ. ENG.:	SHEET OF	



NO.	DATE	DESCRIPTION

REVISIONS

JOB TITLE AND LOCATION:

FORMER NATIONAL RUBBER ADHESIVES
38-25 9th STREET
LONG ISLAND CITY, NEW YORK

DRAWING TITLE:

VAPOR MONITORING POINT CONSTRUCTION PLAN

CORE ENVIRONMENTAL
46-11 54TH AVENUE
MASPETH, N.Y. 11378
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F: 718-762-0545
2312 WEHRLE DRIVE
BUFFALO, N.Y. 14221
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DESIGNED BY:	CHECKED BY:	SCALE:	2-3
DRAWN BY:	PROJ. ENG.:	SHEET OF	

APPENDICES

APPENDIX A
Historical Data Analytical Tables

Table A-1
Historical Soil Analytical Results
Former National Rubber Adhesives, Inc. Site
Long Island City, New York

Consultant	TAGM	Part 375		U.S. Hydrogeologic*								Enviro-Comp Consultants						
Sample ID	Guidance	Soil Cleanup Objectives[2]		SB-1	SB-3	SB-4		SB-5		SB-7	SB-8	SB-1	SB-2	SB-3	SB-4	SB-5	SB-5A	SB-6
Sample Depth				0-2'	0-2'	0-4'	4-8'	4'	4-8'	0-1'	6'	NA	NA	NA	NA	NA	NA	NA
Sample Date	Criteria[1]	Commercial	Industrial	Mar-96	Mar-96	Mar-96	Mar-96	Mar-96	Mar-96	Mar-96	Mar-96	Jun-01	Jun-01	Jun-01	Jun-01	Jun-01	Jun-01	Jun-01
Volatile Organic Compounds (mg/kg)																		
2-Butanone (MEK)	0.3	500	1000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	NA	500	1000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	2.7	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	0.3	350	700	ND	ND	ND	ND	ND	ND	**0.018**	**0.002**	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	5.5	390	780	ND	**2.9**	ND	**0.600**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	0.1	500	1000	**0.220**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1.4	150	300	**0.710**	**0.630**	ND	ND	**0.006**	**0.014**	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	1.5	500	1000	**16**	**82**	**0.009**	**9.1**	**0.054**	**0.078**	**0.005**	**0.005**	ND	ND	ND	ND	ND	ND	ND
m,p-Xylene	1.2	NA	NA	ND	ND	ND	**2.6**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	1.2	NA	NA	ND	ND	ND	**0.530**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes	1.2	500	1000	ND	**0.830**	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Semi-volatile Organic Compounds (mg/kg)																		
2-Methylphenol	0.1	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
3,4-Methylphenol	200	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	50	500	1000	NS	NS	NS	NS	NS	NS	NS	NS	ND	**1.443**	**0.764**	ND	ND	ND	ND
Anthracene	50	500	1000	NS	NS	NS	NS	NS	NS	NS	NS	ND	**4.571**	**2.449**	ND	ND	ND	ND
Benzo(a)anthracene	0.224 or MDL	5.6	11	NS	NS	NS	NS	NS	NS	NS	NS	ND	**7.540**	**4.113**	ND	ND	ND	ND
Benzo(a)pyrene	0.061 or MDL	1	1.1	NS	NS	NS	NS	NS	NS	NS	NS	ND	**7.622**	**4.095**	ND	ND	ND	ND
Benzo(b)fluoroanthene	1.1	5.6	11	NS	NS	NS	NS	NS	NS	NS	NS	ND	**5.905**	**3.099**	ND	ND	ND	ND
Benzo(g,h,i)perylene	50	500	1000	NS	NS	NS	NS	NS	NS	NS	NS	ND	**3.738**	**2.033**	ND	ND	ND	ND
Benzo(k)fluoroanthene	1.1	56	110	NS	NS	NS	NS	NS	NS	NS	NS	ND	**6.231**	**3.303**	ND	ND	ND	ND
Bis(2-ethylexyl)phthalate	50	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
Butyl benzyl phthalate	50	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
n-butyl Phthalate	8.1	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
Chrysene	0.4	56	110	NS	NS	NS	NS	NS	NS	NS	NS	ND	**7.706**	**4.171**	ND	ND	ND	ND
Dibenzo(a,h)anthracene	0.014	0.56	1.1	NS	NS	NS	NS	NS	NS	NS	NS	ND	**0.902**	**0.575**	ND	ND	ND	ND
Dibenzofuran	6.2	350	1000	NS	NS	NS	NS	NS	NS	NS	NS	ND	**0.983**	**0.529**	ND	ND	ND	ND
Diethylpthalate	7.1	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	50	500	1000	NS	NS	NS	NS	NS	NS	NS	NS	ND	**18.693**	**10.487**	ND	ND	ND	ND
Fluorene	50	500	1000	NS	NS	NS	NS	NS	NS	NS	NS	ND	**1.440**	**0.659**	ND	ND	ND	ND
Indeno(1,2,3-c,d)pyrene	3.2	5.6	11	NS	NS	NS	NS	NS	NS	NS	NS	ND	**4.753**	**2.570**	ND	ND	ND	ND
Naphthalene	13	500	1000	NS	NS	NS	NS	NS	NS	NS	NS	ND	**0.821**	**0.376**	ND	ND	ND	ND
Phenanthrene	50	500	1000	NS	NS	NS	NS	NS	NS	NS	NS	ND	**16.644**	**9.328**	ND	ND	ND	ND
Pyrene	50	500	1000	NS	NS	NS	NS	NS	NS	NS	NS	ND	**15.728**	**8.679**	ND	ND	ND	ND
Tentatively Identified Compounds (mg/kg)																		
Hepatane	NA	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Hexane	NA	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes:
[1]Guidance values from New York State Department of Environmental Conservation, Division of Technical and Administrative Guidance Memorandum (TAGM #4046) Determination of Soil Cleanup Objectives and Cleanup Levels, January 1994
[2]Guidance values from New York State Department of Environmental Conservation, Division of Environmental Remediation 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives, December 2006
mg/kg = milligrams per kilogram; equivalent to ppm or parts per million
BOLD = detection
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SB = site background

= exceeds TAGM Guidance Criteria
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Table A-1
Historical Soil Analytical Results
Former National Rubber Adhesives, Inc. Site
Long Island City, New York

Consultant				U.S. Hydrogeologic*								Enviro-Comp Consultants						
Sample ID	TAGM	Part 375		SB-1	SB-3	SB-4		SB-5		SB-7	SB-8	SB-1	SB-2	SB-3	SB-4	SB-5	SB-5A	SB-6
Sample Depth	Guidance	Soil Cleanup Objectives[2]		0-2'	0-2'	0-4'	4-8'	4'	4-8'	0-1'	6'	NA	NA	NA	NA	NA	NA	NA
Sample Date	Criteria[1]	Commercial	Industrial	Mar-96	Mar-96	Mar-96	Mar-96	Mar-96	Mar-96	Mar-96	Mar-96	Jun-01	Jun-01	Jun-01	Jun-01	Jun-01	Jun-01	Jun-01
Pesticides (mg/kg)																		
4,4 DDT	2.1	47	94	NS	NS	NS	NS	NS	NS	NS	NS	--	--	--	--	--	--	--
4,4 DDE	2.1	62	120	NS	NS	NS	NS	NS	NS	NS	NS	--	--	--	--	--	--	--
Metals (mg/kg)																		
Aluminum	SB	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
Antimony	SB	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
Arsenic	7.5 or SB	16	16	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
Barium	300 or SB	400	10,000	NS	NS	NS	NS	NS	NS	NS	NS	**5.68**	**94.4**	**40.9**	**21.7**	**14.9**		**21.6**
Beryllium	0.16 or SB	590	2700	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
Cadmium	1 or SB	9.3	60	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
Calcium	SB	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
Chromium	10 or SB	1500	6800	NS	NS	NS	NS	NS	NS	NS	NS	ND	**6.96**	**10.6**	**6.47**	**6.33**		**10.8**
Colbalt	30 or SB	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
Copper	25 or SB	270	10,000	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
Iron	2,000 or SB	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
Lead	SB	1000	3900	NS	NS	NS	NS	NS	NS	NS	NS	ND	**193**	**84.9**	**3.06**	**1.99**		**3.58**
Magnesium	SB	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
Manganese	SB	10,000	10,000	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
Mercury	0.1	2.8	5.7	NS	NS	NS	NS	NS	NS	NS	NS	ND	**0.09**	**0.03**	ND	ND	**0.02**	**0.03**
Nickel	13 or SB	310	10,000	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
Potassium	SB	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
Selenium	2 or SB	1500	6800	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
Silver	SB	1500	6800	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
Sodium	SB	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
Thallium	SB	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
Vanadium	150 or SB	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND
Zinc	20 or SB	10,000	10,000	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND

Notes:
[1]Guidance values from New York State Department of Environmental Conservation, Division of Technical and Administrative Guidance Memorandum (TAGM #4046) Determination of Soil Cleanup Objectives and Cleanup Levels, January 1994
[2]Guidance values from New York State Department of Environmental Conservation, Division of Environmental Remediation 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives, December 2006
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Table A-1
Historical Soil Analytical Results
Former National Rubber Adhesives, Inc. Site
Long Island City, New York

Consultant	TAGM	Part 375		Enviro-Comp Consultants							American Environmental Solutions					
Sample ID	Guidance	Soil Cleanup Objectives[2]		SB-6A	SB-7A	SB-8	SB-9	SB-10	SB-11	SB-12	MW-1	GW-1	GW-3	GW-3	GW-6	GW-7
Sample Depth				NA	NA	NA	NA	NA	NA	NA	10-15'	10-15'	5-10'	13'	5-10'	10-15'
Sample Date	Criteria[1]	Commercial	Industrial	Jun-01	Jun-01	Jun-01	Jun-01	Jun-01	Jun-01	Jun-01	Oct-05	Oct-05	Oct-05	Oct-05	Oct-05	Oct-05
Volatile Organic Compounds (mg/kg)																
2-Butanone (MEK)	0.3	500	1000	**0.036**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	NA	500	1000	**0.162**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	2.7	NA	NA	ND	ND	ND	ND	ND	ND	ND	**6.2**	ND	**0.0042**	ND	ND	**0.0037**
Chloroform	0.3	350	700	ND	ND	ND	ND	ND	ND	**10**	ND	ND	ND	ND	ND	ND
Ethylbenzene	5.5	390	780	ND	ND	ND	ND	ND	ND	ND	**0.058**	**0.0018**	ND	**0.580**	**0.176**	**0.660**
Methylene chloride	0.1	500	1000	ND	ND	ND	ND	ND	ND	ND	ND	**0.013**	**0.019**	ND	**0.007**	ND
Tetrachloroethene	1.4	150	300	ND	ND	ND	ND	ND	ND	ND	ND	**0.003**	ND	**0.0035**	**0.012**	**0.0029**
Toluene	1.5	500	1000	ND	ND	ND	ND	ND	ND	ND	**0.037**	**1.100**	**0.380**	**19.0**	**12.000**	**5.100**
m,p-Xylene	1.2	NA	NA	ND	ND	ND	ND	ND	ND	ND	**0.0043**	**0.0048**	ND	**1.000**	**0.280**	**1.40**
o-Xylene	1.2	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	**0.0016**	ND	**0.210**	**0.044**	**0.330**
Xylenes	1.2	500	1000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Semi-volatile Organic Compounds (mg/kg)																
2-Methylphenol	0.1	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.300**	ND
3,4-Methylphenol	200	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.400**	**2.100**	**1.100**
Acenaphthene	50	500	1000	ND	ND	**0.189**	ND	ND	ND		ND	ND	ND	ND	ND	ND
Anthracene	50	500	1000	ND	ND	**0.488**	ND	ND	ND	**1.201**	ND	ND	ND	ND	**0.350**	ND
Benzo(a)anthracene	0.224 or MDL	5.6	11	ND	ND	**0.485**	ND	ND	ND	**10.625**	**0.240**	ND	ND	ND	**1.100**	ND
Benzo(a)pyrene	0.061 or MDL	1	1.1	ND	ND	**0.445**	ND	ND	ND	**12.731**	ND	ND	ND	ND	**1.000**	ND
Benzo(b)fluoroanthene	1.1	5.6	11	ND	ND	**0.406**	ND	ND	ND	**9.437**	ND	ND	ND	ND	**1.200**	ND
Benzo(g,h,i)perylene	50	500	1000	ND	ND	**0.209**	ND	ND	ND	**5.902**	ND	ND	ND	ND	**0.700**	ND
Benzo(k)fluoroanthene	1.1	56	110	ND	ND	**0.334**	ND	ND	ND	**11.677**	ND	ND	ND	ND	**0.170**	ND
Bis(2-ethylexyl)phthalate	50	NA	NA	ND	ND	**0.040**	ND	ND	ND	ND	ND	**0.160**	ND	ND	ND	**0.420**
Butyl benzyl phthalate	50	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	**0.270**	ND	ND	ND	ND
n-butyl Phthalate	8.1	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.680**
Chrysene	0.4	56	110	ND	ND	**0.596**	ND	ND	ND	**11.788**	ND	ND	ND	ND	**1.200**	ND
Dibenzo(a,h)anthracene	0.014	0.56	1.1	ND	ND	**0.057**	ND	ND	ND	**1.294**	ND	ND	ND	ND	**0.020**	ND
Dibenzofuran	6.2	350	1000	ND	ND	**0.118**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diethylpthalate	7.1	NA	NA	ND	ND	ND	ND	ND	ND	**1.676**	**0.250**	ND	ND	ND	ND	ND
Fluoranthene	50	500	1000	ND	ND	**1.402**	ND	ND	ND	**16.421**	**0.560**	ND	ND	ND	**2.200**	ND
Fluorene	50	500	1000	ND	ND	**0.179**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-c,d)pyrene	3.2	5.6	11	ND	ND	**0.245**	ND	ND	ND	**7.669**	ND	ND	ND	ND	**0.660**	ND
Naphthalene	13	500	1000	ND	ND	**0.081**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	50	500	1000	ND	ND	**1.646**	ND	ND	ND	**2.207**	**0.510**	ND	ND	ND	**5.600**	ND
Pyrene	50	500	1000	ND	ND	**1.167**	ND	ND	ND	**16.157**	**0.700**	ND	ND	ND	**2.500**	ND
Tentatively Identified Compounds (mg/kg)																
Hepatane	NA	NA	NA	NS	NS	NS	NS	NS	NS	NS	**1.300**	**0.020**	ND	**0.059**	ND	**0.550**
Hexane	NA	NA	NA	NS	NS	NS	NS	NS	NS	NS	**1.900**	**0.019**	ND	**0.058**	**0.031**	**0.670**

Notes:
[1]Guidance values from New York State Department of Environmental Conservation, Division of Technical and Administrative Guidance Memorandum (TAGM #4046) Determination of Soil Cleanup Objectives and Cleanup Levels, January 1994
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Table A-1
Historical Soil Analytical Results
Former National Rubber Adhesives, Inc. Site
Long Island City, New York

Consultant	TAGM	Part 375		Enviro-Comp Consultants							American Environmental Solutions					
Sample ID	Guidance	Soil Cleanup Objectives[2]		SB-6A	SB-7A	SB-8	SB-9	SB-10	SB-11	SB-12	MW-1	GW-1	GW-3	GW-3	GW-6	GW-7
Sample Depth				NA	NA	NA	NA	NA	NA	NA	10-15'	10-15'	5-10'	13'	5-10'	10-15'
Sample Date	Criteria[1]	Commercial	Industrial	Jun-01	Jun-01	Jun-01	Jun-01	Jun-01	Jun-01	Jun-01	Oct-05	Oct-05	Oct-05	Oct-05	Oct-05	Oct-05
Pesticides (mg/kg)																
4,4 DDT	2.1	47	94	--	--	--	--	--	--	**0.015**	ND	ND	ND	ND	ND	ND
4,4 DDE	2.1	62	120	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	**0.0042**
Metals (mg/kg)																
Aluminum	SB	NA	NA	ND	ND	ND	ND	ND	ND	ND	**7950**	**7610**	**7530**	**7530**	**7800**	**7340**
Antimony	SB	NA	NA	ND	ND	ND	ND	ND	ND	ND	**0.463**	ND	ND	ND	ND	**0.422**
Arsenic	7.5 or SB	16	16	ND	ND	ND	ND	ND	ND	ND	**3.53**	**2.41**	**2.87**	**2.87**	**1.61**	**302**
Barium	300 or SB	400	10,000	**16.6**	**44.8**	**18.7**	**16.5**	**12.4**	**25.8**	**50.5**	**31.3**	**410**	**37.3**	**37.3**	**39**	**50.5**
Beryllium	0.16 or SB	590	2700	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	1 or SB	9.3	60	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	SB	NA	NA	ND	ND	ND	ND	ND	ND	ND	**1950**	**6850**	**1470**	**1470**	**3330**	**1620**
Chromium	10 or SB	1500	6800	**7.34**	**6.48**	**8.70**	**8.50**	**7.74**	**7.70**	**7.48**	**15.1**	**13.3**	**13.2**	**13.2**	**15.0**	**17.9**
Colbalt	30 or SB	NA	NA	ND	ND	ND	ND	ND	ND	ND	**10.8**	**19.2**	**11.4**	**11.4**	**14.5**	**13.9**
Copper	25 or SB	270	10,000	ND	ND	ND	ND	ND	ND	ND	**19.3**	**17.1**	**16.7**	**16.7**	**25.3**	**25.3**
Iron	2,000 or SB	NA	NA	ND	ND	ND	ND	ND	ND	ND	**12,500**	**14,000**	**15,700**	**15,700**	**20,700**	**18,100**
Lead	SB	1000	3900	**11.7**	**39.2**	**2.26**	**5.22**	**2.65**	**4.91**	**288**	**20.9**	**41.6**	**12.2**	**12.2**	**41.3**	**7.79**
Magnesium	SB	NA	NA	ND	ND	ND	ND	ND	ND	ND	**1830**	**2210**	**1430**	**1430**	**1580**	**3210**
Manganese	SB	10,000	10,000	ND	ND	ND	ND	ND	ND	ND	**124**	**235**	**238**	**238**	**263**	**370**
Mercury	0.1	2.8	5.7	**0.02**	ND	ND	**0.03**		**0.03**	**0.13**	**0.0730**	**0.0906**	**0.0174**	**0.0174**	**0.0302**	**0.0324**
Nickel	13 or SB	310	10,000	ND	ND	ND	ND	ND	ND	ND	**12.7**	**12.2**	**9.89**	**9.89**	**10.9**	**12.6**
Potassium	SB	NA	NA	ND	ND	ND	ND	ND	ND	ND	**1170**	**1150**	ND	1120	**1420**	**1970**
Selenium	2 or SB	1500	6800	ND	**4.35**	ND	ND	ND	ND	ND	ND	ND	**1120**	ND	ND	ND
Silver	SB	1500	6800	ND	ND	ND	ND	ND	**3.71**	ND	ND	ND	ND	ND	ND	ND
Sodium	SB	NA	NA	ND	ND	ND	ND	ND	ND	ND	**210**	**160**	**176**	**176**	**209**	**256**
Thallium	SB	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.418**
Vanadium	150 or SB	NA	NA	ND	ND	ND	ND	ND	ND	ND	**18.1**	**15.4**	**16.8**	**16.8**	**19.4**	**22.4**
Zinc	20 or SB	10,000	10,000	ND	ND	ND	ND	ND	ND	ND	**40.7**	**47.7**	**38.8**	**38.8**	**20.2**	**52.1**

Notes:
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Table A-2
Historical Groundwater Analytical Results
Former National Rubber Adhesives, Inc. Site
Long Island City, New York

Sample ID		MW-1						MW-2					GW-1	GW-1	GW-3	GW-3	GW-7	SB-8	SB-9	SB-10	SB-11	BH-1	BH-2	BH-3	BH-6	BH-7	BH-9	BH-10
Sample Date	**TOGS 1.1.1***	Mar-96	Jun-01	Mar-03	Oct-05*	Mar-07	Jun-11	Mar-96	Jun-01	Mar-03	Feb-07	Jun-11	Oct-05*	Mar-07	Oct-05*	Mar-07	Oct-05*	Jun-01	Jun-01	Jun-01	Jun-01	May-03	May-03	May-03	May-03	May-03	May-03	May-03
Volatile Organic Compounds (µg/L)																												
1,2,4,6-Tetramethylbenzene	NA	--	ND	--	ND	**3.5**	ND	--	ND	--	**30**	ND	ND	ND	ND	**48**	ND	ND	ND	ND	ND	--	**--**	**--**		**--**		
1,2,4-Trimethylbenzene	5	--	ND	**4.64**	ND	ND	**0.62**	--	ND	--	**130**	**0.65**	ND	ND	ND	**140**	ND	ND	ND	ND	ND	--	**56**	--		--		
1,3,5-Trimethylbenzene	5	--	ND	--	ND	ND	ND	--	ND	--	**40**	ND	ND	ND	ND	**19**	ND	ND	ND	ND	ND	--	--	--		--		
2-Butanone (MEK)	NA	--	ND	--	ND	ND	ND	--	ND	--	ND	ND	ND	ND	ND	**1700**	ND	**10**	ND	ND	ND	**32**	--	--		--		**1180**
4-Isopropyltoluene	5	--	ND	--	ND	**2.8**	ND	--	ND	--	ND	ND	ND	ND	ND	**2.4**	ND	ND	ND	ND	ND	--	--	--		--		
Acetone	NA	--	ND	**101**	ND	**180**	ND	--	ND	**134**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--		--		
Benzene	1	**280**	**120**	--	**32**	**7**	**19**	--	**207**	**132**	**190**	**17**	**11**	ND	**260**	**88**	**370**	**1.8**	ND	ND	ND	**77**	**616**	**2.2**	**0.7**	--	**5.3**	**1742**
n -Butylbenzene	5	**--**	ND	--	ND	ND	ND	--	ND	--	**9.8**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--		--		
cis-1,2-Dichloroethene	5	**--**	ND	--	ND	**3.6**	**2.7**	--	ND	--	**66**	**2.2**	**20**	**14**	ND	ND	ND	ND	**140**	**23**	ND	--	--	--		--		
p -Diethylbenzene	NA	**--**	ND	--	ND	ND	ND	--	ND	--	**84**	ND	ND	ND	ND	**20**	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
Ethylbenzene	5	**--**	**502**	--	**55**	ND	**1.2**	**890,000**	**107**	--	**310**	**1.2**	**7.7**	ND	**96**	**63**	**350**	ND	ND	ND	ND	**13**	**73**	--	--	--	--	--
p -Ethyltoluene	NA	**--**	ND	--	ND	ND	ND	**--**	ND	--	ND	ND	ND	ND	ND	**39**	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
Isopropylbenzene	5	**--**	ND	--	ND	ND	**1.2**	**--**	ND	--	**10**	**1**	ND	ND	ND	**4.7**	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
Methylene chloride	5	**--**	ND	--	ND	ND	ND	**--**	ND	--	ND	ND	ND	**8.9**	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
Naphthalene	10	**--**	ND	--	ND	ND	**0.52**	**--**	ND	--	**12**	**0.5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
n -Propylbenzene	NA	**--**	ND	--	ND	ND	**1.1**	**--**	ND	--	**22**	**0.8**	ND	ND	ND	**11**	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
Tetrachloroethene	5	**--**	ND	--	ND	ND	ND	**--**	ND	--	**14**	ND	ND	**14**	ND	ND	ND	**20**	**153**	**62**	ND	--	--	--	--	--	--	--
Toluene	5	**52,000**	ND	--	**1500**	ND	**20**	**280,000,000**	**39,410**	**49,300**	**84,000**	**22**	**3600**	**5.3**	**20,000**	**88,000**	**15,000**	**91**	ND	ND	ND	**3328**	**38,176**	**914**	--	**5**	**14**	**302,000**
Trichloroethene	5	**--**	ND	--	ND	ND	ND	**--**	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	**7**	**10**	ND	--	--	--	--	--	--	--
Trimethylbenzene	NA	**--**	ND	**4.64**	ND	ND	ND	**--**	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
Total xylenes	5	**1310**	ND	**5.25**	**55**	ND	**2.62**	**3,170,000**	**647**		**780**	**2.51**	**19**	ND	**200**	**123**	**900**	ND	ND	ND	ND	**17**	**132**	**--**	--	--	--	--
Semi-volatile Organic Compounds (µg/L)																												
2-Methylnaphthalene	4.7	NS	ND	--	ND	ND	NS	NS	ND	--	**9.9**	NS	ND	ND	ND	**3.2**	**5.5**	ND	ND	ND	ND	--	--	--	--	--	--	--
2-Methylphenol	NA	NS	ND	--	ND	ND	NS	NS	ND	--	**250**	NS	**12**	ND	**370**	**200**	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
3,4-Methylphenol	NA	NS	ND	--	ND	ND	NS	NS	ND	--	**280**	NS	ND	ND	ND	**140**	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	NA	NS	ND	--	ND	**1.8**	NS	NS	ND	--	ND	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
Benzoic acid	NA	NS	ND	--	ND	**2.8**	NS	NS	ND	--	**36**	NS	ND	ND	ND	**62**	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
Benzyl alcohol	NA	NS	ND	--	ND	ND	NS	NS	ND	--	**21**	NS	ND	ND	ND	**8.2**	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
Bis (2-ethylhexyl) phthalate	NA	NS	ND	--	ND	**2**	NS	NS	ND	--	ND	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
Butylbenzylphthalate	NA	NS	ND	--	ND	**1**	NS	NS	ND	--	ND	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
Diethylphthalate	NA	NS	ND	--	ND	**1.4**	NS	NS	ND	--	ND	NS	ND	ND	**6.1**	ND	ND	ND	**5**	ND	ND	--	--	--	--	--	--	--
Naphthalene	10	NS	ND	**59.7**	ND	**1.1**	NS	NS	ND	**73.7**	**28**	NS	ND	ND	ND	**9.3**	ND	ND	ND	ND	**821**	--	--	--	--	--	--	--
Pentachlorophenol	NA	NS	ND	--	ND	ND	NS	NS	ND	--	ND	NS	ND	ND	ND	ND	ND	ND	**14**	ND	ND	--	--	--	--	--	--	--
Tentatively Identified Compounds (µg/L)																												
Heptane	NA	NS	NS	NS	ND	NS	NS	NS	NS	NS	NS	NS	ND	NS	ND	NS	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Hexane	NA	NS	NS	NS	**270**	NS	NS	NS	NS	NS	NS	NS	ND	NS	**44**	NS	**41**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Metals (mg/L)																												
Aluminum	NA	NS	ND	--	**1.53**	NS	NS	NS	ND	--	NS	NS	**9.26**	NS	**11.7**	NS	**1.13**	ND	ND	ND	ND	--	--	--	--	--	--	--
Antimony	0.003	NS	ND	--	ND	NS	NS	NS	ND	--	NS	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
Arsenic	0.025	NS	ND	--	ND	NS	NS	NS	ND	--	NS	NS	ND	NS	ND	NS	ND	**0.13**	**0.06**	**0.07**	**0.32**	--	--	--	--	--	--	--
Barium	1	NS	ND	--	**0.949**	NS	NS	NS	ND	--	NS	NS	**0.408**	NS	**0.0949**	NS	**37.7**	ND	ND	ND	**5.30**	--	--	--	--	--	--	--
Beryllium	NA	NS	ND	--	ND	NS	NS	NS	ND	--	NS	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
Cadmium	0.005	NS	ND	--	ND	NS	NS	NS	ND	--	NS	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
Calcium	NA	NS	ND	--	**369**	NS	NS	NS	ND	--	NS	NS	**21.7**	NS	**9.3**	NS	**157**	ND	ND	ND	ND	--	--	--	--	--	--	--
Chromium	0.05	NS	ND	--	ND	NS	NS	NS	ND	--	NS	NS	**0.00908**	NS	**0.0197**	NS	ND	**0.59**	**0.12**	**0.22**	**1.10**	--	--	--	--	--	--	--
Colbalt	NA	NS	ND	--	**0.0255**	NS	NS	NS	ND	--	NS	NS	**0.0258**	NS	**0.025**	NS	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
Copper	0.2	NS	ND	--	ND	NS	NS	NS	ND	--	NS	NS	**0.0703**	NS	**0.0758**	NS	**0.0253**	ND	ND	ND	ND	--	--	--	--	--	--	--
Iron	0.3	NS	ND	--	**25.3**	NS	NS	NS	ND	--	NS	NS	**9.82**	NS	**32.3**	NS	**5.04**	ND	ND	ND	ND	--	--	--	--	--	--	--
Lead	0.025	NS	ND	--	ND	NS	NS	NS	ND	--	NS	NS	**0.0269**	NS	**0.0142**	NS	ND	**0.12**	**0.50**	**0.45**	**18.1**	--	--	--	--	--	--	--
Magnesium	NA	NS	ND	--	**64.9**	NS	NS	NS	ND	--	NS	NS	**14.8**	NS	**9.40**	NS	**51.8**	ND	ND	ND	ND	--	--	--	--	--	--	--
Manganese	0.3	NS	ND	--	**15.3**	NS	NS	NS	ND	--	NS	NS	**4**	NS	**0.943**	NS	**6.78**	ND	ND	ND	ND	--	--	--	--	--	--	--
Mercury	0.0007	NS	ND	--	ND	NS	NS	NS	ND	--	NS	NS	ND	NS	**0.004**	NS	**0.0019**	**0.02**	ND	ND	ND	--	--	--	--	--	--	--
Nickel	0.1	NS	ND	--	**0.0424**	NS	NS	NS	ND	--	NS	NS	**0.0225**	NS	**0.0176**	NS	**0.0464**	ND	ND	ND	ND	--	--	--	--	--	--	--
Potassium	NA	NS	ND	--	**30.8**	NS	NS	NS	ND	--	NS	NS	**41.9**	NS	**24.3**	NS	**9.94**	ND	ND	ND	ND	--	--	--	--	--	--	--
Selenium	0.01	NS	ND	--	**12**	NS	NS	NS	ND	--	NS	NS	ND	NS	**48.6**	NS	**28.5**	ND	ND	ND	ND	--	--	--	--	--	--	--
Silver	0.05	NS	ND	--	ND	NS	NS	NS	ND	--	NS	NS	ND	NS	ND	NS	ND	**0.07**	ND	ND	ND	--	--	--	--	--	--	--
Sodium	20	NS	ND	--	ND	NS	NS	NS	ND	--	NS	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
Thallium	NA	NS	ND	--	ND	NS	NS	NS	ND	--	NS	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
Vanadium	NA	NS	ND	--	ND	NS	NS	NS	ND	--	NS	NS	**0.0124**	NS	**0.0277**	NS	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
Zinc	NA	NS	ND	--	**0.246**	NS	NS	NS	ND	--	NS	NS	**0.123**	NS	**0.111**	NS	**0.0538**	ND	ND	ND	ND	--	--	--	--	--	--	--

Notes:
BOLD = detection
µg/L = micrograms per liter; equivalent to ppb or parts per billion
NA = guidance value has not been established
NS = not sampled
ND = not detected
-- = information not available
* Guidance values from 6NYCRR Part 703: Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations, for Class GA Waters presented in TOGS 1.1.1 June 1998.

= exceeds TOGS Guidance Criteria

Table A-3
Historical Soil Gas Density Analytical Results
Former National Rubber Adhesives, Inc. Site
Long Island City, New York

Sample ID* / Sample Date	NIOSH TWA REL[(1)]	OSHA TWA PEL[(2)]	EPA Soil Gas[(3)]	BH-1 Jun-03	BH-2 Jun-03	BH-3 Jun-03	BH-4 Jun-03	BH-8 Jun-03	BH-9 Jun-03	BH-10 Jun-03
Volatile Organic Compounds (µg/mg³)										
Benzene	3,190	31,900	310	**91**	**93**	**12**	**13**	**13**	**27**	**3336**
Acetone	590,000	2,400,000	3,500	ND	**846**	ND	ND	ND	ND	ND
Carbon Disulfide	3,110	62,200	7,000	**51**	ND	ND	ND	ND	ND	ND
Toluene	377,000	754,000	4,000	**1243**	**80,900**	**3423**	**1469**	ND	**65**	**357,000**
Trichlorofluomethane	5,620,000	5,620,000	7,000	ND	ND	ND	**127**	ND	ND	ND

Notes:
*All samples collected by American Environmental Solutions
BOLD = detection
ND = not detected
[(1)]Guidance Values from National Institute for Occupational Safety and Health (NIOSH) Time-Weighted Average (TWA) Recommended Exposure Limit (REL)
[(2)]Guidance Values from Occupational Safety and Health Agency (OSHA) Time-Weighted Average (TWA) Permissible Exposure Limit (PEL)
[(3)]Guidance Values from Environmental Protection Agency's OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance), November 2002

= exceeds NIOSH TWA REL Guidance Values
= exceeds OSHA TWA PEL Guidance Values
= exceeds EPA Soil Gas Guidance Values

Table A-4
Historical Soil Gas Volume Analytical Results
Former National Rubber Adhesives, Inc. Site
Long Island City, New York

Sample ID* / Sample Date	Target Shallow Gas Concentration[(1)]	SG-1 Nov-05	SG-2 Nov-05	SG-3 Nov-05	SG-4 Nov-05	SG-5 Nov-05	SG-6 Nov-05
Volatile Organic Compounds (ppb)							
Benzene	310	**0.8**	**2.8**	ND	**0.7**	**9.3**	**20**
Chlorobenzene	600	ND	ND	ND	ND	**3.4**	**3.2**
Chloromethane	NA	ND	**0.7**	ND	**0.5**	ND	ND
Ethylbenzene	2200	**1**	**0.9**	ND	**1.3**	**16**	**28**
p&m- Xylenes	7000	**2.6**	**3.3**	ND	**4**	**46**	**83**
o-Xylenes	7000	**0.9**	**1.1**	ND	**1**	**13**	**24**
Tetrachloroethylene	810	**0.5**	**0.5**	ND	**9.8**	**25**	**34**
1,2,4- Trimethylbenzene	60	**1**	**0.5**	ND	**0.6**	**6.6**	**14**
1,3,5- Trimethylbenzene	60	ND	ND	ND	ND	ND	**4.6**
Trichloroethylene	220	**0.5**	ND	ND	ND	ND	ND
Styrene	10,000	ND	ND	ND	ND	**6.6**	**130**
Toluene	4,000	**30**	**13**	**4600**	**19**	**490**	**1100**

Notes:
*All samples collected by American Environmental Solutions
= exceeds EPA Soil Gas Guidance Values
BOLD = detection
ND = not detected
NA = guidance value has not been established
[(1)]Guidance Values from Environmental Protection Agency's OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance), November 2002

APPENDIX B
Quality Assurance Project Plan

QUALITY ASSURANCE PROJECT PLAN
Former National Rubber Adhesives Site

38-25 9th Street
Long Island City, New York 11101
State ID #2-41-028

&

New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233-7016

Prepared for:

Hamil Stratten Properties, LLC
203 Meserole Avenue
Brooklyn, New York 11222

Prepared by:

CORE ENVIRONMENTAL CONSULTANTS
46-11 54th Ave
Maspeth, New York 11378

June 24, 2013

TABLE OF CONTENTS

TABLE OF CONTENTS
(continued)

TABLE OF CONTENTS
(continued)

TABLES

FORMS

ATTACHMENT

GLOSSARY

The following quality assurance terms and definitions presented in this Quality Assurance Glossary Section have been used in preparing this document related to quality assurance or control.

1. **Alteration -** Altering a sample collected for analysis in any way other than by adding a preservative, e.g. the addition of nitric acid to lower the pH of a sample. Examples of alteration include, but are not limited to, filtering, settling and decanting, centrifuging and decanting, and acid extracting.

2. **Analytical Services Protocol (ASP)** – DEC's compilation of approved EPA laboratory methods for sample preparation, analysis, and data handling procedures.

3. **Correlation Sample** – When an in-field testing and analytical technology is being utilized, a sample that is taken for analysis by an ELAP-certified laboratory to determine the correlation between laboratory and field analytical results.

4. **Effective Solubility** - The theoretical aqueous solubility of an organic constituent in groundwater that is in chemical equilibrium with a separate-phase (NAPL) 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.

5. **Environmental Laboratory Accreditation Program (ELAP)** - A program conducted by the NYSDOH which certifies environmental laboratories through on-site inspections, evaluation of principles and credentials, and proficiency testing.

6. **Filtration** - The filtering of a groundwater or surface water sample collected for dissolved metals analysis at the time of collection and prior to preservation. Filtering includes, but is not limited to, the use of any membrane, fabric, paper or other filter medium, irrespective of pore size, to remove particulates from suspension.

7. **Final Delineation Sample** - A sample taken to either assist in the decision making process regarding the extent of impacts at a site during the investigation and design of a remedy, or confirmation/documentation sampling during remedial construction. Analysis performed by an ELAP-certified laboratory.

8. **Intermediate Sample** - A sample taken in the course of an investigation or remediation process that is to be followed by a subsequent sample event(s) to confirm whether remediation was successful, or that the extent of impacts has been defined to below a level of concern.

9. **Method Detection Limit (MDL)** - 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.

10. **Minimum Reporting Limit** - The lowest concentration at which an analyte can be detected and reported with a reasonable degree of accuracy. It is a lab-specific value, and is generally about 5 times the MDL. The MRL is also referred to as the practical quantitation limit (PQL).

11. **Nephelometric Turbidity Unit (NTU)** - The unit by which turbidity of a water sample is measured.

12. **Preservation** - Preventing the degradation of a sample due to precipitation, biological action, or other physical/chemical processes between the time of sample collection and analysis, e.g. storing samples at 4 degrees Celsius or lowering sample pH by the addition of an acid.

13. **Target Analyte List (TAL)** - The list of inorganic compounds/elements designated for analysis as contained in the EPA Contract Laboratory Program Statement of Work for Inorganics Analysis, Multi-Media, Multi-Concentration. For the purposes of this chapter, a Target Analyte List scan refers to the analysis of a sample for Target Analyte List compounds/elements.

14. **Targeted Compound** - A compound for which a specific analytical method is designed to detect that compound both qualitatively and quantitatively.

15. **Target Compound List Plus 30 (TCL+30)** - The list of organic compounds designated for analysis (TCL) as contained in the EPA Contract Laboratory Program Statement of Work for Organics Analysis, Multi-Media, Multi-Concentration and up to 30 non-targeted organic compounds (plus 30) as detected by gas chromatography/mass spectroscopy (GC/MS) analysis.

16. **Tentatively Identified Compound (TIC)** - A chemical compound that is not on the target compound list but is detected in a sample analyzed by a GC/MS analytical method. TICs are only possible with methods using MS as the detection technique. The compound is tentatively identified using a mass spectral instrumental electronic library search and the concentration of the compound is estimated.

17. **Well Development** - The application of energy to a newly installed monitoring well to establish a hydraulic connection between the well and the surrounding formation. During development, fine-grained formation material that may have infiltrated the sand pack and/or well during installation is removed. This allows water from the formation to enter the well without becoming turbid and therefore a more accurate representation of formation water is obtained.

1.0 INTRODUCTION

Hamil Stratten Properties, LLC retained CORE Environmental Consultants, Inc. (CORE) to provide environmental consulting services related to the facility located at 38-25 9th Street, Long Island City, New York. Hamil Stratten tasked CORE to perform a Remedial Investigation/Feasibility Study (RI/FS) at the former National Rubber Adhesives Site (No. 2-41-028).

CORE has prepared this Quality Assurance Project Plan (QAPP) to accompany the Remedial Investigation / Feasibility Study (RI/FS) Work Plan. These documents are being prepared, and the associated field work completed, as per the New York State Department of Environmental Conservation (NYSDEC) Order on Consent and Administrative Settlement issued to Corastor Holding Company, Inc. and Hamil Stratten Properties, LLC for the former National Rubber Adhesives property (Site).

This QAPP presents the policies, organization, objectives, functional activities, and specific quality assurance and quality control activities to ensure the validity of data generated during the remedial investigation. The purpose of this QAPP is to ensure that all technical data generated are accurate and representative.

Quality assurance (QA) is a management system for ensuring that all information, data, and decisions resulting from investigation and environmental monitoring programs are technically sound and properly documented. Quality control (QC) is the functional mechanism through which quality assurance is achieved. Quality control programs, for example, define the frequency and methods of checks, audits, and reviews necessary to identify problems and dictate corrective actions to resolve these problems, ensuring high quality data. As such, a quality assurance and quality control (QA/QC) program pertains to all data collection, evaluation, and review activities that are part of the investigation.

All QA/QC procedures will be in accordance with applicable professional technical standards, government regulations and guidelines, and specific project goals and requirements. This QAPP has been prepared in accordance with NYSDEC and United States Environmental Protection Agency (USEPA) Region II guidance documents.

The QAPP incorporates the following activities:

- Sample collection, control, chain-of-custody, and analysis;
- Document control;
- Laboratory instrumentation, analysis, and control; and
- Review of project reports.

Laboratory analysis of all project samples will be performed by an independent laboratory with the experience and certifications appropriate for the analyses performed. All analyses will be performed by laboratories accredited pursuant to the New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP) for the category of parameters to be analyzed. The specific environmental laboratory or laboratories to be used will be determined at the time investigation and monitoring activities are scheduled.

Duplicates, replicates, and matrix spike/matrix spike duplicate (MS/MSD) samples will be used to identify the quality of the analytical data. Field audits may be conducted to verify that proper sampling

techniques and Chain-of Custody procedures are followed. Field data compilation, tabulation, and analysis will be checked for accuracy. Calculations and other post-field tasks will be reviewed by senior project personnel. Equipment used to take field measurements will be maintained and calibrated in accordance with established procedures. Records of calibration and maintenance will be kept by assigned personnel. Field testing and data acquisition will be performed following strict guidelines as described herein.

Document control procedures will be used to coordinate the distribution, coding, storage, retrieval, and review of all data collected during each sampling task.

A Data Usability Summary Report (DUSR) will be prepared for analytical results from each investigation activity. The DUSR will be prepared by an independent consultant in accordance with NYSDEC's "Guidance for the Development of Data Usability Summary Reports," revised 1997 and NYSDEC's DER-10 "Technical Guidance for Site Investigation and Remediation," May 2010 (DER-10).

2.0 PROJECT DESCRIPTION

This QAPP pertains to the completion of field activities and subsequent laboratory and data analysis associated with the former National Rubber Adhesives Site located at 38-25 9th Street, Long Island City, New York. Currently, there are no proposed remedial actions for the Site; however, if deemed necessary during completion of the remedial investigation (RI), remedial actions will be described in detail in an Interim Remedial Measure (IRM) Work Plan.

Corastor Holding Company, Inc. and Hamil Stratten Properties, LLC have entered into an Order on Consent and Administrative Settlement with the NYSDEC (Index No. W2-1156-11-04). The proposed RI will be performed under this Order.

The objective of the proposed investigation is to determine if interim remedial measures are needed to address impacts identified during the RI and prior Phase II Environmental Site Assessments (ESA). The potential implementation of any remedial measures will be done so as to attain conditions at the Site which are protective of commercial or industrial use, public health, the environment, and off-site areas potentially affected by the migration of impacts.

2.1 SITE DESCRIPTION

The National Rubber Adhesives Site is located at 38-25 9th Street in Long Island City, in the Borough of Queens, New York. The Site is presently owned by Hamil Stratten Properties, LLC, and is bounded by various commercial and residential properties to the north, east, and south, and 9th Street to the west. The property is relatively flat, with an approximate elevation of 13 feet above mean sea level (MSL). The East River is located approximately one-quarter (1/4) mile west of the Site. The Site is comprised of a large mid-block parcel on the east side of 9th Street, between 38th and 40th Avenues. The parcel is approximately 300 feet by 100 feet and is identified by the New York City Department of Buildings as Block 475, Lot 19. It is currently zoned M1-3 - Manufacturing. The Site is currently occupied by one 28,950 square feet, one-story, slab on grade masonry building that covers the entirety of the parcel. The building was constructed in 1924 and is currently separated into three subdivisions containing an automotive body repair shop at the northernmost end, a marble and granite workshop in the central portion, and a movie production studio at the southern end.

2.2 SCOPE

The scope of the project includes an RI/FS Work Plan, QAPP, Health and Safety Plan (HASP), a remedial investigation, a Remedial Investigation Report (RIR), and a Feasibility Study (FS). This QAPP will provide guidance on field collection of samples, analysis procedures, and QA/QC tasks to be performed as part of the project.

2.3 GOALS

The goals of the QA plan are to document the framework needed to ensure that:

- the measurements performed will adequately support the project objectives regarding data collection and hypothesis testing,
- data collected are of the highest quality that can be reasonably expected,
- the quality of the data is known,
- the data and its quality are adequately documented, and
- the data are adequately preserved and rendered in available form.

2.4 PREVIOUS INVESTIGATIONS

Previous investigations of the former National Rubber Adhesives site are not presented herein, but are discussed in the RI Work Plan to which this QAPP is an Appendix.

3.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

This QAPP provides for designated qualified personnel to review products and provide guidance on QA matters. The document also outlines the approach that will be followed in order to ensure that data of sufficient quality are obtained. The Organizational Chart on the following page illustrates the QA program organization. This structure will provide for direct and constant operational responsibility, clear lines of authority, and the integration of QA activities. The various QA functions of the project positions are explained in the following subsections.

Senior Project Manager

The Senior Project Manager will have responsibility for ensuring that the project meets the objectives and quality standards as presented in the RI/FS Work Plan and this QAPP. He/she will be responsible for implementing the project, and will have the authority to commit the resources necessary to meet project objectives and requirements. The project manager's primary function is to ensure that technical, financial, and scheduling objectives are achieved successfully. He/she will act as the major point of contact and control for matters related to the project. In addition, he/she will be responsible for technical quality control and project oversight.

Team Leaders

The Senior Project Manager will be supported by team leaders who will be responsible for leading and coordinating the day-to-day activities of the various resources under their supervision. The team leaders will be highly experienced environmental professionals who will report directly to the Senior Project Manager.

Technical Staff

The technical staff (field support members) for this project will be drawn from CORE's workforce. The technical team staff will be used to gather and analyze data, and to prepare various task reports and support materials. All of the designated technical team members will be experienced professionals who possess the degree of specialization and technical competence required to effectively and efficiently perform the required work.

QA Officer

The Project QA Officer will be responsible for maintaining QA for the project.

Laboratory Director

The Laboratory Director will be responsible for all analytical work and works in conjunction with the QA unit. He/she maintains liaison with the QA Officer regarding QA and custody requirements.

Laboratory Manager

The Laboratory Manager will maintain liaison with the Laboratory Director regarding QA elements of specific sample analysis tasks. He/she will report to the Laboratory Director and work in conjunction with the laboratory QA unit.

Laboratory QA Officer

The Laboratory QA Officer will be responsible for overseeing the QA program within the laboratory and for maintaining all QC documentation. He/she reports directly to the Laboratory Director.

Laboratory Staff

Each member of the laboratory staff will perform an assigned QA or analytical function that is pertinent to and within the scope of his or her knowledge, experience, training, and aptitude. An individual will be assigned the responsibility for checking, reviewing, or otherwise verifying that a sample analysis activity has been performed correctly.

4.0 FIELD ACTIVITIES

All measurements will be made to ensure that analytical results are representative of the media and conditions measured. Unless otherwise specified, all data will be calculated and reported in units consistent with other organizations who report similar data to maintain comparability.

The key considerations for the QA assessment of data generated are accuracy, precision, completeness, representativeness, and comparability. These characteristics are defined below:

Accuracy: Accuracy is the degree of agreement of a measurement (or average of measurements) with an accepted reference or "true" value and is a measure of bias in the system.

Precision: Precision is the degree of mutual agreement among individual measurements of a given parameter.

Completeness: Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount expected to be obtained under correct normal conditions.

Representativeness: Representativeness expresses the degree to which data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition.

Comparability: Comparability expresses the confidence with which one data set can be compared to another.

4.1 GOALS

The QA/QC goal will focus on controlling measurement error within the limits established and will ultimately provide a database for estimating the actual uncertainty in the data collected.

Target values for detection limit, percent spike recovery and percent "true" value of known check standards, and relative percent difference (RPD) of duplicates/replicates are provided in the referenced analytical procedures. It should be noted that target values are not always attainable. Instances may arise where high sample concentrations, non-homogeneity of samples, or matrix interferences preclude achievement of target detection limits or other quality control criteria. In such instances, the laboratory will report reasons for deviations from these detection limits or noncompliance with quality control criteria.

5.0 SAMPLING PROCEDURES

The sampling of various environmental media will be completed as part of the RI activities. Sample type and data use are presented in Table 1.

5.1 SAMPLING PROTOCOL

Contained within this section are various guidelines related to the sample collection activities which may be performed at the site. These guidelines will be used by the field personnel to ensure the samples are collected and field activities are performed in a consistent manner. Each guideline will allow the field teams to customize the Work Plan to meet the specific sampling requirements of each site. Guidelines contained in this section are:

- Soil Sampling
- Boring Using a Geoprobe®
- Boring With a Standard Drilling Rig
- Groundwater Sampling

The sample containers that will be used are identified in Table 2. The sample containers will be labeled in accordance with Section 6.1.1. Sample handling, packaging, and shipping procedures are presented in Section 6.3.

5.1.1 Soil Sampling

This section provides the guidelines and requirements for soil sampling. The objective of the guideline is to ensure a representative soil sample is collected at each designated sampling location to accurately define the concentration and determine whether the site soils have been impacted by site activities.

Soil samples may be collected using a hand auger. Listed below is the process for collecting soil samples:

1. A new pair of clean disposable nitrile gloves will be donned at each sampling location.
2. Prepare the sampling location by removing all concrete, stone sub-base, asphalt, vegetation, roots, etc., from the sampling point.
3. Advance a decontaminated hand auger to the desired sampling depth below ground surface.
4. Remove the hand auger from the boring and use a decontaminated stainless steel spoon to remove the sample from the auger bucket.
5. Carefully place the soil samples for volatile organic analysis directly in to the sample bottles ensuring that no head space exists.
6. Place the remaining sample into a decontaminated bowl (stainless steel or Pyrex). The borehole may need to be further advanced to obtain enough samples to fill all the sample containers.
7. Once enough samples are collected, homogenize the sample using the quartering method (see below). When the sample has been completely mixed, fill the remaining sample containers.
8. After the sample bottle is filled, the cap will be placed on the bottle and the bottle will be packaged for shipment as specified in Section 6.3.
9. QA/QC samples will be collected as specified in Section 5.2.
10. Backfill the boring with the soil removed from the hole and return the site to its natural state.

The following should be considered when collecting a soil sample using a hand auger:

- When a vertical sampling interval has been established, one auger-bucket is used to advance the auger hole to the first desired sampling depth.
- If discrete grab samples are to be collected to characterize each depth, a new bucket must be placed on the end of the auger extension immediately prior to collecting the next sample.
- The top few inches of soil should be removed from the bucket to minimize the chances of cross-contamination of the sample from fall-in of material from the upper portions of the hole.

The cut and quartering technique is as follows:

- The sample will be thoroughly mixed in a bowl, and divided into quarters.
- A portion of the soil will be gathered from two of the quartered sections. This process will be repeated until the amount of soil needed to completely fill the sample containers has been obtained.
- It is pertinent that soil samples be mixed as thoroughly as possible to ensure the sample is representative of the interval sampled.

Soil sampling records will be kept in the field log book. The information recorded will include the general requirements presented in Section. 6.2. The following records will also be reported:

1. Name and location (including sample interval) of the soil sample and boring.
2. Depth to top of sample and soil description when applicable.
3. Type of equipment used during the soil sampling/boring.
4. Sample location.

Field quality control samples will be collected to verify reproducibility of the sampling and analytical methods. Field duplicates will be obtained at a rate of 1 per 20 original field samples, as outlined in Table 3.

5.1.2 Geoprobe® Borings

This section provides the guidelines and requirements for advancing soil borings using a Geoprobe® for the purpose of collecting soil samples and extracting groundwater samples.

The following procedure will be used to advance borings with a Geobprobe® rig and macrocore sampler to collect subsurface soil samples.

1. Determine and clear (for utilities) the boring locations through site personnel and the local underground facilities locating service. Surface materials such as concrete, asphalt, or vegetation may be removed from boring locations.
2. Geoprobe® rods will be advanced in 4-foot intervals. Each new 4-foot interval will be sampled using a single-use acetate macrocore sleeve liner.
3. Once the desired sampling depth has been reached, rods will be retraced and the macrocore sample liner will be retrieved from the sampling rod sleeve.
4. The acetate liner will be cut open by the drill rig operator or his/her assistant.
5. Small portions of soil will be collected along the length of the acetate liner and placed in VOC sample bottles. Sample bottles will be filled in such a manner as to minimize head space and ensure that a representative sample from the designated sampling depth is collected.

6. After the VOC sample is collected, the remaining sample will be placed in a decontaminated stainless steel bowl, homogenized using the quartering method (see Soil Sampling Section 5.1.1), and used to fill remaining sample containers.
7. Once the samples have been collected they will be packaged as specified in Section 6.3.
8. QA/QC samples will be collected as specified in Section 5.2.
9. Backfill the boring with the soil removed from the hole and return the site to its natural state. If the hole is not completely backfilled to ground surface with the soil removed from the hole, bentonite chips will be used to backfill the remaining space.

The following guidelines are to be used when advancing Geoprobe® borings and extracting groundwater samples in areas immediately surrounding the locations where site activities may have impacted groundwater resources:

1. Sampling locations are determined prior to site activities; however minor adjustments in the field may be needed. Prior to advancing the Geoprobe®, underground utilities in the area will be identified.
2. The Geoprobe® borings will be advanced to just below the water table, a predetermined maximum depth, or to refusal.
3. The outer sleeve will be retracted exposing the inner stainless steel screen.
4. Sample will be obtained using a peristaltic pump, tubing and check ball system or a mini bailer.
5. In areas with low groundwater yield, a temporary piezometer constructed out of pre-cleaned schedule 40 PVC (1" diameter) will be placed in the Geoprobe® borehole after down-hole tools have been removed.
6. If the boring yields sufficient water to allow for sample collection completion within one hour, a peristaltic pump, tubing and check ball system, or a mini bailer will be used for sample collection per section 5.1.6.
7. Groundwater will be removed under very low-flow conditions to minimize turbidity when filling precleaned, pre-preserved, pre-labeled sample bottles, starting with the collection of the samples for volatile organic compound (VOC) analyses.
8. There should be no bubbles in VOC samples.
9. Continue to fill remaining bottles.
10. If samples for metals analysis contain excessive silt, the samples may be allowed to settle. The less turbid sample will be decanted and sent to the laboratory for analysis.
11. After the sample bottle is filled, the cap will be placed on the bottle and the bottle will be packaged for shipment as specified in Section 6.3.
12. QA/QC samples will be collected as specified in Section 5.2.
13. Conductivity, pH, and temperature will be measured after sample collection. The measurements will be recorded in the field log book.
14. Once the sample collection process has been completed, the temporary casing will be removed and the borehole will be backfilled with soil removed from the hole. If the hole is not completely backfilled to ground surface with the soil removed from the hole, bentonite chips will be used to backfill the remaining space.

Geoprobe® records will be recorded in the field log book. The information recorded will include the general requirements presented in Section. 6.2. The following records will also be reported:

1. Name and location of the Geoprobe® sample and boring.
2. Date and time that the Geoprobe® boring/sampling was advanced.
3. Depth range across with sample was collected.
4. Name of the persons overseeing and company conducting the Geoprobe® borings.

5. Type of equipment used during the Geoprobe® boring and during construction of the temporary piezometers. Soil descriptions should be included when applicable.
6. Type of equipment used during sampling, number and type of containers used for sampling purposes, and analyses to be conducted.
7. Sample location (see Section 5.1.8).

Field quality control samples will be collected to verify reproducibility of the sampling and analytical methods. Field duplicates will be obtained at a rate of one per 20 original field samples, as outlined in Table 3.

5.1.3 Hollow Stem Auger Rig Borings

This section provides the guidelines and requirements for advancing soil borings with a standard hollow-stem auger (HSA) drilling rig for the purpose of extracting soil samples and installing groundwater monitoring wells.

The following procedure will be used to advance borings with an HSA rig and split spoon sampler to collect subsurface soil samples. Listed below is the procedure for collecting subsurface soil samples:

10. Determine and clear (for utilities) the boring locations through site personnel and the local underground facilities locating service. Surface materials such as concrete, asphalt, or vegetation may be removed from boring locations.
11. A minimum 2 ½ -inch diameter hollow stem auger will be used to advance the borehole to the desired subsurface depth.
12. Once the desired sampling depth has been reached, a decontaminated split spoon sampler will be used to retrieve the subsurface soil sample.
13. The split spoon sampler will be brought to the surface and opened for sample collection and lithological description.
14. Small portions of soil will be collected along the length of the split spoon and placed in VOC sample bottles. Sample bottles will be filled in such a manner as to minimize head space and ensure that a representative sample from the designated sampling depth is collected.
15. After the VOC sample is collected, the remaining sample will be placed in a decontaminated stainless steel bowl, homogenized using the quartering method (see Soil Sampling Section 5.1.1), and used to fill remaining sample containers.
16. Once the samples have been collected they will be packaged as specified in Section 6.3.
17. QA/QC samples will be collected as specified in Section 5.2.
18. Backfill the boring with the soil removed from the hole and return the site to its natural state. If the hole is not completely backfilled to ground surface with the soil removed from the hole, bentonite chips will be used to backfill the remaining space.

Standard drilling rig records and soil sampling records will be kept in the field log book. The information recorded will include the general requirements presented in Section. 6.2. The following records will also be reported:

1. Name and location of the boring.
2. Date and time that the boring was advanced and sampling occurred.
3. Depth range across which sample was collected.
4. Names of on-site personnel and company conducting the borings.
5. Lithological description of subsurface soils for each boring location.
6. Length of split spoon sampler and amount of recovered sample.
7. Sample location (see Section 5.1.8).

Field quality control samples will be collected to verify reproducibility of the sampling and analytical methods. Field duplicates will be obtained at a rate of 1 per 20 original field samples, as outlined in Table 3.

5.1.4 Groundwater Sampling

This section provides the guidelines and requirements for collecting groundwater samples from monitoring wells. The purpose of the guideline is to ensure that the groundwater samples are collected in such a manner to ensure that a representative sample is collected at each designated sampling location.

Prior to collection of groundwater samples, monitoring wells and water supply wells will be purged to remove stagnant water that is not considered indicative of aquifer conditions. Purge water disposal will be addressed on a site-specific basis. A new pair of clean disposable gloves will be donned at each sample location.

Procedures for monitoring well purging:

1. Place plastic around well head.
2. Unlock protective casing and remove well cap.
3. Immediately (after well cap removal) take an organic vapor reading down the well casing using a photoionization detector (PID) and record reading in the field logbook.
4. Measure water level distance from top of casing and sound the total depth as detailed below. Record in logbook. Check tip of water level indicator for silt or product residue. If either is observed, note in logbook.

    a) Lower decontaminated water level indicator into monitoring well until indicator sounds and light is illuminated.
    b) Confirm that the water surface has been contacted by repeatedly raising and lowering the indicator at least three times to ensure a consistent sounding level has been reached.
    c) Measure and record depth (nearest 0.01 feet) to the water surface from the top of casing in field logbook.
    d) Lower the indicator to the well bottom and record the total depth.
    e) Retrieve and decontaminate water level indicator.

5. Calculate volume to remove for purging.
6. Lower decontaminated purging device into well.
7. Begin to purge water from the well near the bottom.
8. Observe and record: odor, color, clarity, siltiness, and general water condition in logbook. Also record changes in the physical condition of the monitoring wells that could affect well integrity.
9. Temperature, pH, and specific conductivity of groundwater will be measured and recorded periodically during well purging. The sample may be collected after the water has cleared sufficiently and temperature, pH, and conductivity have stabilized. Stabilization is defined as follows:

    Temperature ±1°C, pH ±0.1 S.U., and conductivity ±10 µmhos/cm^2.

10. A total of at least 3-5 volumes of well water should be removed for purging to be considered complete. Wells with little or no recharge will be purged to near dryness. If a pump is used for

well purging, it will be brought to the water surface prior to completion of purging activities to ensure complete removal of stagnant water.

Water supply wells which need to be sampled for constituents of concern and are equipped with an operable pump will also be purged of stagnant water. To do so, the total depth and diameter of the well should be known or accurately estimated, and it must be determined whether or not a storage tank exits. If a storage tank is present and is located before the sample port location, it must also be purged of stagnant water.

Listed below are the guidelines used for water supply well purging:

1. Locate a sample port or discharge location.
2. Determine volume to be removed based on total depth and diameter of the well and the storage capacity of the storage tank if it exists.
3. Activate the submersible pump in the well.
4. Begin to remove water from the well, and continue until it has been determined that the stagnant water has been removed based on discharge rate and well construction.
5. Observe and record: odor, color, clarity, siltiness and general water condition in logbook. Also record observed construction of the water supply well.
6. Temperature, pH, and, specific conductivity of the groundwater will be measured and recorded periodically during water supply well purging. The sample may be collected after the water has cleared sufficiently and the temperature, pH, and conductivity have stabilized. Stabilization is defined as follows:

   Temperature ±1°C, pH ±0.1 S.U., and conductivity ±10 µmhos/cm^2.

7. If well construction information is not available, then the recommended purge time is 15 minutes for a high volume pump.

Monitoring wells which contain excess silt and have a low yield will be purged using low flow methodology. This method of purging and well sampling will be used to minimize the volume of purge water removed from the well and to reduce turbidity in the groundwater samples collected. The pumping device selected should operate at variable speeds to reduce aquifer stress and agitation.

Listed below are the guidelines used for purging a well using the low flow method:

1. Place plastic around well head.
2. Unlock protective casing and remove well cap.
3. Immediately (after well cap removal) take an organic vapor reading down the well casing using a photoionization detector and record reading in the field logbook.
4. Measure water level distance from top of casing and sound the total depth as detailed below. Record in logbook. Check tip of water level indicator for silt or product residue (if either are observed note in logbook).

   a) Lower decontaminated water level indicator into monitoring well until indicator sounds and light is illuminated.
   b) Confirm that the water surface has been contacted by repeatedly raising and lowering the indicator at least three times to ensure a consistent sounding level has been reached.
   c) Measure and record depth (nearest 0.01 feet) to the water surface from the top of casing in field logbook.

d) Lower the indicator to the well bottom and record the total depth.
e) Retrieve and decontaminate water level indicator.

5. Calculate volume to remove for purging.
6. Lower decontaminated low flow purging device into well within the screened area of the well producing the highest flow rate.
7. Begin pumping and measure the groundwater elevation to ensure that the aquifer is not being stressed. If significant drawdown occurs, reduce the pumping rate. Flow rates should range between 100 mL/ min and 1,000 mL/min.
8. Observe and record: odor, color, clarity, siltiness, and general water condition in logbook. Also record changes in the physical condition of the monitoring wells that could affect well integrity.
9. Temperature, pH, turbidity, dissolved oxygen, redox potential, and specific conductivity of the groundwater will be measured and recorded periodically during well purging. The sample may be collected after the water has cleared sufficiently, water quality indicators have stabilized after 3 successive measurements, and at least one well volume has been removed. Stabilization is defined as follows:

   Temperature ±1°C, pH ±0.1 S.U., redox potential ±3% for 10 mv and turbidity/dissolved oxygen ±10 %.

10. After the monitoring well is purged, do not turn off the pump or remove it from the well.

Groundwater sample collection from a monitoring well:

1. Purge the monitoring well as described earlier in section.
2. Establish that the well has properly recharged (80% of static water level has recovered). No more than 16 hours should lapse between purge completion and sample collection.
3. Carefully lower a decontaminated bailer (with a fresh nylon line attached for each well) down the monitoring well. Disposable bailers may also be used.
4. Continue to lower the sample collection device to the desired sampling depth.
5. Raise the bailer and carefully fill precleaned, pre-preserved, pre-labeled sample bottles, VOC analysis first.
6. Make sure there are no bubbles in VOC samples.
7. Continue to fill remaining bottles.
8. After the sample bottle is filled, the cap will be placed on the bottle and the bottle will be packaged for shipment as specified in Section 6.3.
9. QA/QC samples will be collected as specified in Section 5.2.
10. Conductivity, pH, and temperature, will be measured after sample collection. The measurements will be recorded in the field log book.

Groundwater sample collection using the low flow method:

1. Purge the monitoring well as described earlier in section.
2. Use the pumping device already in place to collect the samples where turbidity can influence the analytical results (such as metals).
3. If a peristaltic pump/ vacuum jug assembly or stainless steel and Teflon bladder pump were used for purging, continue to collect the remaining samples using these devices.
4. If neither of the devices listed above were used, carefully remove the pump from the well and use a Teflon bailer to collect the remaining groundwater samples.

5. After the sample bottle is filled, the cap will be placed on the bottle and the bottle will be packaged for shipment as specified in Section 6.3.
6. QA/QC samples will be collected as specified in Section 6.2.
7. Conductivity, pH, and temperature will be measured after sample collection. The measurements will be recorded in the field log book.

Records

Sample collection records will be kept on the appropriate forms, including the purge logs and sampling log forms. The information recorded is described on the forms. In addition, the following information will also be reported in the log book:

1. Observations of groundwater condition;
2. Field measurements;
3. Sample identification, date, and time; and
4. Sample analytical parameters

5.2 FIELD QUALITY CONTROL SAMPLES

Field quality control samples will consist of trip blanks, field blanks, field duplicates, matrix spikes, and matrix spike duplicates, as shown in Table 3.

5.2.1 Field Duplicates

Field quality control samples will be collected to verify reproducibility of the sampling and analytical methods. Field duplicates will be obtained at a rate of 1 per 20 original field samples, as outlined in Table 3.

5.2.2 Trip Blanks

Trip blanks will be used to assess whether groundwater has been exposed to volatile constituents during sample storage and transport. Trip blanks will consist of a volatile organics analysis (VOA) vial pre-filled by the laboratory with analyte-free water. The trip blanks will remain unopened throughout the sampling event and will only be analyzed for VOCs. Trip blanks will be collected as outlined in Table 3.

5.2.3 Matrix Spike/Matrix Spike Duplicates

MS/MSD samples will be obtained to determine if the matrix is interfering with the sample analysis. MS/MSDs will be collected at a rate of 1 per 20 original field samples, as outlined in Table 3.

5.2.4 Rinseate Blanks

Rinseate blanks will be used to assess decontamination procedures for non-dedicated equipment. Rinse blanks will be collected as outlined in Table 3.

5.2.5 Laboratory Quality Control Checks

Internal laboratory quality control checks will be used to monitor data integrity. These checks include method (equipment) blanks, spike blanks, internal standards, surrogate samples, calibration standards, and reference standards.

5.3 SAMPLE CONTAINERS

The volumes and containers required for the sampling activities are included in Table 2. Pre-washed sample containers will be provided by the laboratory. All bottles are to be prepared in accordance with EPA bottle washing procedures.

5.4 DECONTAMINATION

Dedicated and/or disposable sampling equipment will be used to the extent possible to minimize decontamination requirements and the possibility of cross-contamination.

When the use of new/dedicated equipment at each sampling location is not feasible, such as the use of augers and a split spoon sampler, equipment will be decontaminated between sampling locations. The water level indicator will be decontaminated between locations by using the following decontamination procedures:

- Initial cleaning of any foreign matter with paper towels, if needed;
- Low phosphate detergent wash;
- De-ionized water rinse; and
- Air dry.

If a Geoprobe® is used to install monitoring wells, the Geoprobe®, Geoprobe® rods, and Macrocore® samplers utilized to install borings will be decontaminated with a bucket wash consisting of a low phosphate detergent wash followed by water rinse. The backhoe bucket, drill rig, augers, rods, split spoon samplers, and/or other related downhole equipment will be decontaminated using high pressure steam prior to initiating the excavation and well installation programs prior to the initiation of subsurface intrusive activities and between each boring location. Steam cleaning will be performed in a pre-designated on-site decontamination area. Throughout and after the cleaning processes, direct contact between the equipment and the ground surface will not be permitted. Decontamination waste water will be collected in 55-gallon drums. The drill rig and associated equipment will also be cleaned upon completion of the investigation and prior to departure from the Site using the following methods:

- Initial cleaning of all foreign matter; and
- Wash down with high pressure, high temperature sprays to remove and/or volatilize organic contamination.

5.5 LEVELS OF PROTECTION/SITE SAFETY

All sampling will be conducted under a documented Health and Safety Plan. On the basis of air monitoring, the level of protection may be downgraded or upgraded at the discretion of the Site Safety Officer. Crew members will stand upwind of open boreholes or wellheads during the collection of samples, when possible. All work will initially be conducted in Level D (refer to Site Specific Health and Safety Plan). Air purifying respirators (APRs) will be available if monitoring indicates an upgrade to Level C is appropriate.

6.0 SAMPLE CUSTODY

This section describes standard operating procedures for sample identification and chain-of custody to be used for all field activities. These procedures are in place to ensure that the quality of the samples is maintained during collection, transportation, storage, and analysis. All Chain-of-Custody requirements comply with standard operating procedures indicated in USEPA and NYSDEC sample-handling protocol.

Sample identification documents must be carefully prepared so that sample identification and Chain-of-Custody can be maintained and sample disposition controlled. Sample identification documents include:

- Field records;
- Sample labels;
- Custody seals; and
- Chain-of-Custody records.

6.1 CHAIN-OF-CUSTODY

The primary objective of the Chain-of-Custody procedures is to provide an accurate written or computerized record that can be used to trace the possession and handling of a sample from collection to completion of all required analyses.

6.1.1 Sample Labels

Sample labels attached to, or affixed around, the sample container must be used to properly identify all samples collected in the field. To the extent possible, the sample labels are to be placed on the bottles so as not to obscure QA/QC lot numbers on bottles. Sample information must be printed in a legible manner using waterproof ink. Field identification must be sufficient to enable cross reference with the field sampling records or sample logbook. For Chain-of-Custody purposes, all QC samples are subject to the same custodial procedures and documentation as original samples.

6.1.2 Custody Seals

Custody seals are pre-printed adhesive-backed seals, often with security slots, designed to break if the seals are disturbed. Sample shipping containers (coolers, cardboard boxes, etc.) are sealed to ensure security. Seals must be signed and dated before use. Upon receipt at the laboratory, the custodian must check (and certify by completing logbook entries) that seals on shipping containers are intact. Strapping tape should be placed over the seals to ensure the Chain-of-Custody remains intact and seals are not inadvertently destroyed during sample shipment.

6.1.3 Chain-Of-Custody Record

The Chain-of-Custody record must be fully completed, on duplicate, at a minimum, by the field technician who has been designated responsible for sample shipment. In addition, if samples are known to require rapid analysis turnaround time because of project time constraints or analytical concerns (e.g., extraction time or sample retention period limitations), the person completing the Chain-of-Custody record should note these constraints in the "Remarks" section of the Custody record.

6.1.4 Field Custody Procedures

- As few persons as possible should handle samples.
- Sample bottles will be obtained pre-cleaned by the laboratory and shipped to sampling personnel in charge of the field activities.
- Coolers or boxes containing cleaned bottles will be sealed with a custody tape seal during transport to the field or while in storage prior to use.
- The sample collector is personally responsible for the care and custody of samples collected until they are transferred to another person or dispatched properly under Chain-of-Custody procedures.
- The sample collector will record sample data in a controlled field notebook and/or on appropriate field sampling records.
- The Site team leader will determine whether proper custody procedures were followed during fieldwork, and decide if additional samples are required.

6.2 DOCUMENTATION

6.2.1 Sample Identification

All containers of samples collected from the project will be identified using the following format on a label or tag fixed to the sample container:

Sample Type Abbreviations which may be used include:

- SS Soil Sample
- GW Groundwater Sample
- A Air
- SB Source Blank
- TB Trip Blank
- ER Equipment Rinse
- FB Field Blank

For example, a sample number: NR-SS-1-2’ would indicate a surface soil sample collected at the former National Rubber Site, at location 1 and a depth of 2 feet. Each sample will be labeled, chemically preserved (where required), and sealed immediately following collection. To minimize handling of sample containers, labels will be filled out prior to sample collection to the extent possible. The sample label will be filled out using waterproof ink and will be firmly affixed to the appropriate sample container. The following information will be contained on the sample label:

- Name or initials of sampler;
- Date (and time, if possible) of collection;
- Sample number;
- Intended analysis; and
- Preservation method (if any).

6.2.2 Daily Logs

Daily logs and data forms are necessary to provide sufficient data and observations to enable participants to reconstruct events that occurred during the project. All daily logs will be kept in a notebook and consecutively numbered. All entries will be made in waterproof ink, dated, and signed. Sampling data will be recorded in sampling records. Errors in daily reporting logs will be corrected

with a single strike-through line through incorrect information, and the initials of the personnel responsible for the correction.

6.3 Sample Handling, Packaging, and Shipping

The transportation and handling of samples must be accomplished in a manner that not only protects the integrity of the sample, but also prevents any detrimental effects due to the potential hazardous nature of the samples. Regulations for packaging, marking, labeling, and shipping hazardous materials are promulgated by the United States Department of Transportation (DOT) in the Code of Federal Regulations, 49 CFR 171 through 177.

All Chain-of-Custody requirements must comply with standard operating procedures in the NYSDEC and USEPA sample handling protocols. Field personnel will make arrangements for samples to be transported to the laboratory. When custody is relinquished to a shipper, field personnel will ensure that the laboratory custodian or Project Manager is aware of the expected arrival time of the sample shipment and of any time constraints on sample analysis. All samples will be delivered to the laboratory in a timely manner to help ensure sample analysis holding times are met.

7.0 CALIBRATION PROCEDURES AND FREQUENCY

All instruments and equipment used during sampling and analysis will be operated, calibrated, and maintained according to the manufacturer's guidelines and recommendations as well as criteria set forth in the applicable analytical methodology references.

7.1 FIELD INSTRUMENTS

A calibration program will be implemented to ensure that routine calibration is performed on all field instruments. Field team members familiar with field calibration and operation of the equipment will maintain proficiency and perform the prescribed calibration procedures outlined in the Operation and Field Manuals accompanying the respective instruments. Calibration records for each field instrument used on the project will be maintained on-site during field activities and a copy will be kept in the project files.

7.1.1 Portable Total Organic Vapor Monitor

Any vapor monitor used will undergo routine maintenance and calibration prior to shipment to the project site. Daily calibration and instrument checks will be performed by a trained team member at the start of each day. Daily calibrations will be performed according to the manufacturer's specifications and are to include the following:

- Battery check: If the equipment fails the battery check, recharge the battery.
- Gas standard: The gauge should display an accurate reading when a standard gas is used.
- Cleaning: If proper calibration cannot be achieved, the instrument ports must be cleaned.

7.1.2 pH and Specific Conductance

The following steps should be observed by personnel engaged in groundwater sampling for pH and specific conductance:

- The operation of instrumentation should be checked prior to each day's sampling and calibrated if necessary. Fresh standard buffer solution (pH 4, pH 7 and pH 10) will be used if it is determined that calibration is required.
- The specific conductance meter should be calibrated prior to each sampling event using a standard solution of known specific conductance.

More frequent calibrations may be performed as necessary to maintain analytical integrity. Calibration records for each field instrument used on the project should be maintained and a copy kept in project files.

7.2 LABORATORY INSTRUMENTS

Laboratory calibration procedures are addressed in detail in the laboratory Quality Assurance Manual (QAM), which can be provided upon selection of a laboratory. All calibration procedures will be consistent with the method used for analysis.

8.0 ANALYTICAL PROCEDURES

8.1 FIELD

On-site procedures for analysis of total organic vapor and other field parameters are addressed in the Remedial Investigation Work Plan.

8.2 LABORATORY

Specific analytical methods for constituents of interest in soil and groundwater are listed in Table 2. The laboratory will maintain, and have available for the appropriate operators, standard operating procedures relating to sample preparation and analysis according to the methods stipulated in Table 2.

9.0 DATA REDUCTION AND REPORTING

QA/QC requirements will be strictly adhered to during sampling and analytical work. All data generated will be reviewed by comparing and interpreting results from chromatograms (responses, stability of retention times), accuracy (mean percent recovery of spiked samples), and precision (reproducibility of results). Refer to Section 10 for a discussion of QA/QC protocol.

Data storage and documentation will be maintained using logbooks and data sheets that will be kept on file. Analytical QC will be documented and included in the analytical testing report. A central file will be maintained for the sampling and analytical effort after the final laboratory report is issued.

All calculations and data manipulations are included in the appropriate methodology references. Control charts and calibration curves will be used to review the data and identify outlying results. Prior to the submission of the report to the client, all data will be evaluated for precision, accuracy, and completeness. Sections 8.0 and 13.0 of this document include some of the QC criteria that will be used in the data evaluation process.

Laboratory reports will be reviewed by the laboratory supervisor, the QA Officer, Laboratory Manager and/or Director, and the project manager. Analytical reports will contain a data tabulation including results and supporting QC information will be provided. Raw data will be available for later inspection, if required, and maintained in the control project file.

All data will be reported to NYSDEC in electronic format in accordance with DER-10 and the NYSDEC's Environmental Data Submission requirements.

10.0 INTERNAL QUALITY CONTROL CHECKS

QC data are necessary to determine precision and accuracy and to demonstrate the absence of interferences and/or contamination of glassware and reagents. The procedures for internal quality control checks will be consistent with NYSDEC ASP protocols.

11.0 PERFORMANCE AND SYSTEM AUDITS

11.1 FIELD AUDITS

The Project QA Director may conduct episodic audits of the operations at the Site to ensure that work is being performed in accordance with the Work Plan and associated Standard Operating Practice (SOP). The audit will cover, but not necessarily be limited to, such areas as:

- Conformance to standard operating procedures;
- Completeness and accuracy of documentation;
- Chain-of-Custody procedures; and
- Construction specifications.

11.2 LABORATORY AUDITS

In addition to any audits required by the NYSDEC, the Project QA Director may choose to audit the laboratory. These additional audits may take the form of performance evaluation samples or on-site laboratory inspections. Performance evaluation samples may be either blind samples or samples of known origin to the laboratory. Reasonable notice will be provided if the audit is to include an on-site inspection.

12.0 PREVENTIVE MAINTENANCE

12.1 FIELD

Field personnel assigned to complete the work will be responsible for preventative maintenance of all field instruments. The field sampling personnel will protect the portable total organic vapor monitors, water quality meter, etc. by placing them in portable boxes and/or protective cases.

All field equipment will be subject to a routine maintenance program, prior to and after each use. The routine maintenance program for each piece of equipment will be in accordance with the manufacturer's operations and maintenance manual. All equipment will be cleaned and checked for integrity after each use. Necessary repairs will be performed immediately after any defects are observed, and before the equipment is used again. Equipment parts with a limited life (such as batteries, membranes, and some electronic components) will be periodically checked and replaced/recharged as necessary according to the manufacturer's specifications.

12.2 LABORATORY

The laboratory's preventative maintenance procedures can be provided as outlined in their Laboratory Quality Assurance Manual.

13.0 DATA ASSESSMENT PROCEDURES

Performance of the following calculations will be completed to evaluate the accuracy, precision and completeness of collected measurement data.

13.1 PRECISION

Precision of a particular analysis is measured by assessing its performance with duplicate or replicate samples. Duplicate samples are pairs of samples taken in the field and transported to the laboratory as distinct samples. Often, the identity of a sample as a duplicate is unknown to the laboratory, so their usefulness for monitoring analytical precision at bench level is limited. For most purposes, precision is determined by the analysis of replicate pairs (i.e., two samples prepared at the laboratory from one original sample). In replicate analysis the sample often chosen for replication does not contain target analytes so that quantification of precision is impossible. Replicate pairs of spiked samples, known as matrix spike/matrix spike duplicate samples, are used for precision studies. This has the advantage that two real positive values for a target analyte can be compared.

Precision is calculated in terms of Relative Percent Difference (RPD), which is expressed as follows:

$$RPD = \frac{(X_1 - X_2)}{(X_1 + X_2)/2} \times 100$$

Where X1 and X2 represent the individual values found for the target analyte in the two replicate analyses or in the matrix spike/matrix spike duplicate analyses. RPDs must be compared to the method RPD for the analysis. The analyst or his/her supervisor must investigate the cause of RPDs outside stated acceptance limits. This may include a visual inspection of the sample for non-homogeneity, analysis of check samples, etc. Follow-up action may include sample re-analysis or flagging of the data as suspect if problems cannot be resolved.

13.2 ACCURACY

Accuracy of a particular analysis is measured by assessing its performance with "known" samples. These "knowns" can take the form of EPA or NBS traceable standards (usually spiked into a pure water matrix), or laboratory prepared solutions of target analytes into a pure water or sample matrix; or (in the case of GC or GC/MS analyses) solutions of surrogate compounds which can be spiked into every sample and are designed to mimic the behavior of target analytes without interfering with their determination. In each case the recovery of the analyte is measured as a percentage, corrected for analytes known to be present in the original sample if necessary, as in the case of a matrix spike analysis. For EPA or NBS supplied known solutions, this recovery is compared to the published data that accompany the solution. For prepared solutions, the recovery is compared to EPA-developed data or historical data as available. In the case of surrogate compounds, recoveries are compared to USEPA Contract Laboratory Program (CLP) acceptable recovery tables. If recoveries do not meet required criteria, then the analytical data for the batch (or, in the case of surrogate compounds, for the individual sample) are considered potentially inaccurate.

For highly contaminated samples, recovery of matrix spike may depend on sample homogeneity. As a rule, analyses are not corrected for recovery of matrix spike or surrogate compounds.

13.3 COMPLETENESS

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the total amount expected to be obtained under normal conditions. Completeness for each parameter is calculated as:

$$\text{Completeness} = \frac{\text{Number of successful analyses}}{\text{Number of requested analyses}} \times 100$$

Target value for completeness for all parameters is 100%. A completeness value of 95% will be considered acceptable. Incomplete results will be reported to the client project officer.

13.4 REPRESENTATIVENESS

The characteristic of representativeness is not quantifiable. Subjective factors taken into account are as follows:

- The degree of homogeneity of a site;
- The degree of homogeneity of a sample taken from one point in a site; and
- The available information on which a sampling plan is based.

To maximize representativeness of results, sampling techniques and sample locations will be carefully chosen so that they provide laboratory samples representative of the Site and the specific area.

14.0 CORRECTIVE ACTIONS

Corrective actions can be initiated as a result of performance and system audits, laboratory and interfiled comparison studies, data validation, and/or a QA program audit. They may also be required as a result of a request from project representatives. All corrective action necessary to resolve analytical problems will be taken. Success or failure of corrective actions will be reported with an estimate of effect on data quality, if any.

Corrective actions may include altering procedures in the field, conducting subsequent audits, or modifying project protocol. Time and type of corrective action, if needed, will depend on the severity of the problem and relative overall project importance. The project manager is responsible for initiating corrective action and the team leader is responsible for its implementation in the correction of field non-conformance corrective actions.

15.0 QUALITY ASSURANCE REPORTS

Upon completion of a project sampling effort, analytical and QC data will be included in a Data Usability Summary Report (DUSR) that summarizes the work and provides a data evaluation. A discussion of the usability of the results in the context of QA/QC procedures will be made, as well as a summation of the QA/QC activity. The DUSR will be performed in accordance with the DEC's "Guidance for the Development of Data Usability Summary Reports," revised 1997 and DER-10.

Serious analytical problems will be reported. Time and type of corrective action, if needed, will depend on the severity of the problem and relative overall project importance. Corrective actions may include altering procedures in the field, conducting an audit, or modifying laboratory protocol. All corrective action will be implemented after notification of the project representatives.

16.0 REFERENCES

NYSDEC, 2010. *DEC Program Policy. DER-10/Technical Guidance for Site Investigation and Remediation.*

NYSDEC, 2013. *Order on Consent and Administrative Settlement. Index #W2-1156-11-04. Site #2-41-028*.

NYSDEC, 2013. *Analytical Services Protocol.*

United States Environmental Protection Agency (USEPA), 2005. *Standard Methods for the Examination of Water and Wastewater.*

USEPA, 2008. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods/SW-846.*

TABLES

TABLE 1 – SAMPLE SUMMARY

Media	Type	Matrix	Data Use
Soil	Pneumatic Soil Boring	Soil	Comparison to CP-51 and/or Part 375
	HSA Split Spoon		
	Pneumatic Soil Vapor Boring		
Vapor	VOCs	Vapor	U.S. EPA and NYSDOH Soil Gas Guidelines
Groundwater	Monitoring Wells	Water	Comparison to TOGS 1.1.1
	Pneumatic Boring Grab Sample		

VOCs Volatile organic compounds
CP-51 Commissioner Policy 51/ Soil Cleanup Guidance
TOGS 1.1.1 NYSDEC Ambient Water Quality Standards and Guidance

CORE ENVIRONMENTAL CONSULTANTS

TABLE 2 - SAMPLE CONTAINERS AND PRESERVATION

Parameter	Method	Matrix	Container	Preservation
VOCs	SW-846 8260B	Liquid	Glass, 2 x 40 mL	HCl to pH<2, 4ºC
SVOCs	SW-846-8270B		Amber Glass 1 L	None, 4ºC
Metals	SW-846-6000, SW-846-7000 EPA 200.1 and Mercury by EPA 245.1		HDPE Plastic 500 mL	HNO_3 to pH<2, 4ºC
Heptane, Hexane	SW 846-8260B		Glass, 2 x 40 mL	HCl to pH<2, 4ºC
VOCs	SW 846-8260B	Soil	Wide mouthed Glass 250 mL	None, 4ºC
SVOCs	SW 846-8270B		Wide mouthed Glass 250 mL	None, 4ºC
Metals	and SW-846–8000 Series		Wide mouthed Glass 250 mL	None, 4ºC
Heptane, Hexane	SW-846-8260B		Wide mouthed Glass 250 mL	None, 4ºC
VOCs	EPA TO-15	Vapor	SUMMA Canister (6 L)	None
Heptane, Hexane				

VOCs Volatile organic compounds
SVOCs Semi-volatile organic compounds
SW-846 EPA “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods”
USEPA “Standard Methods for the Examination of Water and Wastewater”

CORE ENVIRONMENTAL CONSULTANTS

TABLE 3 – SUMMARY OF QUALITY CONTROL CHECKS

Sample Type	Frequency	Justification
Field Duplicate	1 in 20	Data shows precision of analytical scheme from sampling through analysis when compared with results of sample. This represents a blind QC sample to the laboratory. Collect an additional amount of sample.
Laboratory Duplicate	1 in 20	Data shows precision of the analytical scheme within the laboratory. The difference between this precision and that of the field duplicate represents the precision of the analytical method.
Laboratory Spike	1 in 20	Data shows how well the analysis of interest can be performed, and recovered from the sample matrix. Such information is useful when reported value is near an action level, but the sample exhibits poor recovery.
MS/MSD	1 in 20	Data shows precision of analysis when compared with matrix spike duplicate and matrix effects from recovery of spiked analysis. Collect an additional amount for each analysis. Analyzed as a spike.
MS/MSD (inorganic)	1 in 20	Data shows precision of laboratory analysis when compared with results of sample. Collect an additional amount of sample for each analysis. Analyzed as unspiked sample.
Matrix Spike (inorganic)	1 in 20	Data shows matrix effects from recovery of spiked analysis. Collect an additional amount for each analysis. Analyzed as a spike sample.
Field Blank/ Equipment Blank	As required by the DQOs	Data demonstrates that sampling equipment was clean prior to use. Pass a sample of reagent water through collection device. Submit for analysis of analytes of concern.
Trip Blank	As required by the DQOs	Data demonstrates that sample was not contaminated with volatile organics by other samples in shipping container, laboratory or outside influences.
Background or Reference Sample	As required by the DQOs	Data provides baseline information to evaluate environmental impact.
Split Samples/ Inter-laboratory Split Sample	When required to meet DQOs	Compare the quality of laboratory procedures of the permittee with State contracted laboratory procedures. Collect an additional amount of sample for each analysis.

MS/MSD Matrix spike/Matrix spike duplicate
DQO Data quality objectives

Daily Observation Log

Daily Observation Log

CORE ENVIRONMENTAL

Project Name:	**Date:**
Project Address:	**Weather:**
Field Activity:	

PERSONNEL: Name	COMPANY	TIME IN	TIME OUT

TIME	DESCRIPTION OF WORK PERFORMED

CORE ENVIRONMENTAL

Daily Observation Log (continuted)

Project Name: **Date:**

TIME	DESCRIPTION OF WORK PERFORMED

FORMS

Soil Boring Log

CORE ENVIRONMENTAL CONSULTANTS

2312 Wehrle Drive
Williamsville, NY
14221
(716) 204-8054

TEST BORING LOG

BORING NO.

Project:
Client:
Contractor:

Project No.
GS Elev
WS Ref Elev
N-S Coord
E-W Coord
Start Date
Finish Date
Driller
Geologist

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
				Type	HSA	SS	HQ
				Diameter	4.25"	2.0"	3.5"
				Weight		140 #	
				Fall		30"	

Well Construction	Depth (feet)	Sample No.	Blows per 6"	N' Value	Recovery (%)	Graphic Log	Field Description	Remarks PID Reading (ppm) Direct Screen	Remarks PID Reading (ppm) Head Space
	5								
	10								
	15								
	20								
	25								
	30								

FORMS

Well Development/Sampling Log

CORE ENVIRONMENTAL

WELL SAMPLING/DEVELOPMENT RECORD

Well ID: _____ **Initial Depth to Water:** _____

Sample ID: _____ **Duplicate ID:** _____ **Depth to Water After Sampling:** _____

Sample Depth: _____ **Total Depth to Well:** _____

Project Name: _____ **Well Diameter (in.)** _____

Project Address: _____ **1 Casing Volume (Gallons)** _____

Date: _____

Sampled By: _____ **Sample Time:** _____ **4 Casing Volumes (Gallons)** _____

Purge Method: _____

Sample Method: _____ **Total Casing Volumes Removed:** _____

Time	Rate (gal/min)	Cum. Vol. (gal)	Temp (°C)	pH (units)	Specific Electrical Conductivity (mS/cm)	Redox Potential mV	Dissolved Oxygen (mg/L)	Turbidity (NTU)	Depth to Water (ft btoc)	Remarks (color and sediment)

pH CALIBRATION (choose two)			
Buffer Solution	pH 4.0	oH 7.0	pH 10.0
Field Temperature (°C)			
Instrument Reading			

SPECIFIC ELECTRICAL CONDUCTANCE - CALIBRATION			
KCL Solution (mS/cm)	4.49 at 25°C		
Field Temperature (°C)			
Instrument Reading			

REDOX CALIBRATION	DISSOLVED OXYGEN CALIBRATION
Standard Solution	Salinity %
Field Temperature (°C)	Altitude
Instrument Reading	Instrument Readin
Model or Unit No.	Model or Unit No.

Model or Unit No:

Well Diameter	Volume (gal/ft)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

Model or Unit No:

Notes:

CORE ENVIRONMENTAL

WELL SAMPLING/DEVELOPMENT RECORD
(continued)

Well ID: ______________________ **Date:** ______________ **Project Name:** ______________________________ Page _____ of _____

Time	**Rate** (gal/min)	**Cum. Vol.** (gal)	**Temp** (°C)	**pH** (units)	**Specific Electrical Conductivity** (mS/cm)	**Redox Potential** mV	**Dissolved Oxygen** (mg/L)	**Turbidity** (NTU)	**Depth to Water** (ft btoc)	**Remarks** (color and sediment)

SAMPLE CONTROL LOG

CORE ENVIRONMENTAL

Project Name: _____ **Laboratory:** _____

Project Address: _____ **Page** _____ **of** _____

Sampling Date	Sampling Time	Sample ID	C.O.C. Number	Analyses Requested	Remarks (Duplicate, Blank info, etc.)	Date Sent to Lab
				See C.O.C.		

ATTACHMENT

Resumes

Teresa S. Tramposch
President and Principal/ CEO

EDUCATION:

M.S. / Biochemistry and Nutrition/ Texas Woman's University/ 1983
B.S. / Biochemistry and Nutrition/ Cornell University/ 1982

REGISTRATIONS/CERTIFICATIONS:

Certified Environmental Inspector (CEI)
NYSDOL Asbestos Project Designer
EPA, IAQ Mold Remediation in Schools and Commercial Buildings

EXPERIENCE:

Ms. Tramposch has over 20 years of professional management experience. In late 2003, Ms. Tramposch formed a consulting company specializing in environmental services to include site assessment, site inspections and site remediation. Ms. Tramposch's distinguished career includes teaching at college level and numerous managerial positions prior to her current involvement in the environmental industry. Past and present responsibilities have prepared her for her role as President and Chief Executive Officer (CEO) of the growing corporation.

As president and CEO, Ms. Tramposch responsibilities include the operation of the corporation, maintaining the corporation books, and marketing the services of the corporation. Ms. Tramposch is responsible for the successful contracting with Restored Homes Housing Development Fund Corporation, the New York Power Authority, JetBlue Airways Corporation, Ryder Trucking, Mendon Leasing and Franklin Company Contractors.

Ms. Tramposch has played an integral role in the following projects:

Turner Construction Corp., JFK IA Terminal 5 Redevelopment, Queens, NY: Principal in Charge of the project oversight of field monitoring and oversight of the JFK International Airport Terminal 5 Redevelopment Project. The project area, approximately 67 acres, required work area air monitoring throughout the excavation program. As the project air monitoring consultant, Core was responsible for conducting NYSDOL and OSHA compliance monitoring. Core performed continuous air monitoring during excavation of the hydrant fueling lines. A photo-ionization detector (PID) and an explosimeter were used to document site conditions for worker Health and Safety monitoring. Air monitoring equipment was calibrated daily and all data including meteorological data (e.g., temperature range, wind speed, wind direction, etc.) was recorded.

Franklin Company Contractors, NYCT MTA Mother Clara Hale Bus Depot Replacement, New York City, NY: Principal in Charge of the project oversight of Core's scientist to initially direct the contractor in segregating excavated soils according to total organic vapor (TOV) content with a photo-ionization detector. The work was completed in 20' x 20' cells. The soil was stabilized by open pit mixing with a fly ash and grout mix that was previously pilot tested. The stabilization was verified by wet sampling from specific intervals. Responsible for the review of all project deliverables.

NYC Housing Authority, Petroleum Monitoring Reporting Services Contract, New York City, NY: Principal in Charge of the project oversight of the preparation of Quarterly Petroleum Remediation Monitoring Reports at 27 Housing Development Sites that have groundwater contamination resulting from petroleum releases from fuel oil tanks. The purpose of the report is to summarize petroleum remediation activities performed on site, describe the current status, and provide an analysis of current remediation system effectiveness with further recommendation.

NYC School Construction Authority, Asbestos Services, Five Boroughs, NY: Principal in Charge of the project oversight of the air sampling and project monitoring at New York City Schools. The project included surveys, to include the collection of bulk samples as well as project monitoring during asbestos abatement.

Remediation System Operation and Reporting, Five Boroughs of NY: Project Principal responsible for office support to Franklin Company Contractors providing remediation system monitoring and reporting related to fourteen soil and groundwater remediation systems in the City of New York. Responsibilities include daily remote monitoring of remediation systems utilizing SCADA software, weekly report preparation, and preparation of monthly system status reports.

Underground Storage Tank System Closure – Manhattan, NY: Project Principal responsible for coordinating the closure in-place of a 4,000 gallon diesel underground storage tank at a parking lot facility in Manhattan. The tank was located inside a building located in lower Manhattan which was utilized for long term parking. Close coordination with the site owner, parking lot operator and contractor was required in order to remove the concrete pavement from the tank top, empty, purge, clean, and fill the tank with concrete slurry. The project also required Core to restore the disturbed area as soon as possible area so the parking facility could continue operations.

NYC Housing Authority, Lead Based Paint Inspection Services Contract, New York City, NY: Principal in Charge of the project oversight of all lead based paint inspections. Inspections are completed on housing units, common areas, and storage units in accordance with U.S. Housing and Urban Development protocols. Inspections included the use of X-Ray Fluorescence (XRF) analysis in each unit and often paint chip samples were collected and laboratory analyzed. The XRF analysis is conducted on site, using a portable LPA-1 Lead Paint Inspection System manufactured by Radiation Monitoring Devices, Inc. (RMD).

Franklin Company Contractors, NYC Department of Environmental Protection, Facility Reports, Plans and Drawings, New York City, NY: Principal in Charge of the project oversight for the preparation of Petroleum Bulk Storage (PBS) Facility Reports, As-Built Drawings of tanks and Spill Prevention, Control, and Countermeasures Plans (SPCC) at 24 New York City Department of Environmental Protection (DEP) Water Pollution Control Plants and Pumping Stations under Contract 1198-PBS. The purpose of the PBS Facility Report is to identify PBS deficiencies at the site, if any, and provide recommendations for corrective actions. The program is part of DEP's on-going effort to inspect, test, maintain and determine the regulatory health of their PBS tanks, and ancillary equipment through testing, inspection, review, and modifications. As-built drawings were produced from record drawings and field inspections in order to satisfy the requirements of New York State PBS regulations. The drawings and plans were reviewed and approved by the Project Manager and Professional Engineer prior to submission to the client the NYC DEP.

Phase I Environmental Site Assessments (ESA) - Queens, NY: Completed the project Quality Assurance and Quality Control (QA/QC) review for ESAs completed for two (2) self storage facilities. The ESAs were prepared in accordance with ASTM E 1527-05 and EPA All Appropriate Inquiry standards. The confirmation of the recognized environmental conditions (RECs) and overall review of all reports submittals was completed. A scope of work for Phase II ESI activities was provided as part of the ESAs.

Indoor Air Quality (IAQ) Study – Boston, MA: Project responsibilities included the QA/QC review for an Indoor Air Quality (IAQ) evaluation study for a warehouse and adjoining offices (20,000 ft^2). She also completed the research and review of indoor air sampling regulations, protocols, standards and background data for the project.

Garrison Avenue Soil Remediation System, Brooklyn, NY: Project Principal for the remediation system installation and operation of a 350 scfm soil vapor extraction system for the Mendon Truck Leasing Garrison Avenue facility. Coordinated numerous sub-contractors for the installation of 350 feet of buried piping and as well as nine (9) vapor extraction wells. Close monitoring of project costs and contractors invoice were required.

Ryder Truck Leasing, USA: National Environmental Services Contract Project Principal for the overall management of an environmental service on call contract with Ryder Truck Leasing. Responsible for preparing budget estimates, invoices and tracking time and material costs for the project. Core has completed a number of projects for Ryder, including an environmental audit related to regulatory compliance of Aboveground Storage Tanks (AST) at Ryder's Yonkers leasing facility. The second assignment was a geotechnical investigation at their Long Island City truck leasing facility.

Health and Safety Plan, Lewiston, NY: Completed the program Quality Assurance and Quality Control (QA/QC) review for a site specific Health and Safety Plan (HASP) for a site remediation and investigation project at a vacant site impacted with No. 2 fuel oil. The site had formerly contained a building and operated as a construction staging area for the Niagara Power Project. The site is adjoined by a contaminated landfill site that has the potential to impact the site. Project required confirmation of site specific contaminants of concern, exposure levels, personnel protection equipment (PPE), air monitoring, site controls, decontamination and emergency procedures.

Mendon Truck Leasing Lead and Asbestos Services, Five Boroughs, NY: Project Principal responsible for the preparation of the contract documents and assurance that the contract documents adhered to all appropriate standards. Project involves inspection services for lead and asbestos at buildings throughout New York City in support of facility design and future abatement, encapsulation and construction activities.

Restored Homes HDFC Asbestos Consulting Services, Bronx, Brooklyn, Queens and Staten Island, NY: Project Principal for the contract to complete comprehensive asbestos containing material (ACM) surveys and assessments at 280 1-3 family vacant homes being rehabilitated. Responsibilities include the development and supervision of project quality control and assurance measures for efforts to provide comprehensive asbestos inspections and assessments, abatement or removal design.

NYCT Asbestos and Lead Monitoring and Design Services Contract, New York City, NY: Project Principal responsible for the indefinite quantity contract (CM-1320) and for the assurance that the contract documents adhered to all appropriate standards. Project involves inspection services for lead and asbestos throughout New York City in support of facility design and future abatement, encapsulation and construction activities. Services include lead and asbestos investigations and reports, development of abatement work plans, cost estimating, project coordination and interfacing with site representatives, and project management with oversight of the abatement contractors. Project sites included operating substations, subway stations, office buildings, mechanical rooms, rail yards, bus depots, tunnels, bridges, and various other structures throughout many of NYC Transits 3,000 facilities located throughout the five boroughs of New York City.

NYCT Asbestos and Lead Environmental Engineering Services Contract, New York City, NY: Project Principal responsible for the indefinite quantity contract (CM-1328). Responsible for the complete management of the project ensuring all required resources are available to meet project requirements. Additional responsibilities include the supervision of project quality control and assurance measures. Contracted services include lead and asbestos investigations, reports, development of abatement work plans, cost estimating, project coordination and interfacing with project management at NYCT. Project sites include operating substations, subway stations, office buildings, mechanical rooms, rail yards, bus depots, tunnels, bridges, manholes and other structures throughout New York City's Transit System.

Storm Water Pollution Prevention Plans (SWPPP) - 48 Locations, U.S.A and U.S. Territories: Completed the project Quality Assurance and Quality Control (QA/QC) review for site specific SWPPPs for an expanding airline at international airports. Tasks included confirmation of site drainage, outfalls, permits and airport BMPs as well as the overall review of all report submittals, which included reports, inspection forms, drawings, figures, BMPs, flow charts, spill report procedures, and certifications.

Habitat Restoration Work at Calvert Vaux Park (formerly Dreier-Offerman Park), Brooklyn, NY: As the Principal responsible for the contract for providing air monitoring services to monitor upwind and downwind areas of excavation work to ensure that dust concentrations in air do not exceed New York State Department of Environmental Conservation (NYSDEC) regulations [TAGM 4031]. Additionally, she is providing multiple Qualified Inspectors and Professional Engineers to the NYC Parks. Core is providing professional/civil engineering services to perform site inspections required to conform to the requirements in the NYSDEC Pollution Discharge for Construction Activities, General Permit GP-0-08-001. All Qualified Inspectors have received four (4) hours of training endorsed by the NYSDEC from a Soil and Water Conservation District and on-the-job training to follow the appropriate New York State standards, specifications, permits and manuals as part of the job.

Ronald P. Tramposch
Senior Project Manager

EDUCATION:

M.S./ Environmental Science/ University of New Haven/ 1988
B.A./ Geology/ State University of New York at Buffalo/ 1982

REGISTRATIONS/CERTIFICATIONS:

USEPA Environmental Impact Assessment Training
OSHA Confined Space Safety Training
40 Hour OSHA Waste Site Worker Protection Training
8 Hour OSHA Supervisory Training
New York State DOL Asbestos Supervisor

EXPERIENCE:

Mr. Tramposch is a Senior Project Manager with over 25 years of experience in remedial investigations, feasibility studies, underground storage tank management programs, and remedial system design. He specializes in management of large work-order based environmental investigation and remediation projects. He has managed hazardous materials projects involving lead, metals, PCBs, hazardous waste, and asbestos, with many of these assignments occurring simultaneously. He also has experience in environmental assessment, planning, supervision, and interpretation of hydrogeologic and geotechnical investigations, and report preparation for various suites including active and inactive hazardous waste sites.

Mr. Tramposch managed hazardous materials projects involving lead, metals, PCBs, hazardous waste, and asbestos, with many of these assignments occurring simultaneously. He also has experience in environmental assessment, planning, supervision, and interpretation of hydrogeologic and geotechnical investigations, and report preparation for various suites including active and inactive hazardous waste sites. Mr. Tramposch is currently directing an indefinite delivery order contract for asbestos, lead, and comprehensive environmental services for New York City Transit.

Mr. Tramposch has been involved in these projects:

Mother Clara Hale Bus Depot Replacement, New York City, NY Franklin Company Contractors / NYCT MTA: Project Manager responsible for overseeing an experienced scientist to initially direct the contractor in segregating excavated soils according to total organic vapor (TOV) content with a photo-ionization detector. The work was completed in 20' x 20' cells. The soil was stabilized by open pit mixing with a fly ash and grout mix that was previously pilot tested. The stabilization was verified by wet sampling from specific intervals. Responsible for the review of all project deliverables.

Petroleum Monitoring Reporting Services Contract, New York City, NY NYC Housing Authority: Project Manager responsible for project oversight of the Quarterly Petroleum Remediation Monitoring Reports at 27 Housing Development Sites that have groundwater contamination resulting from petroleum releases from fuel oil tanks. The purpose of the report is to summarize petroleum remediation activities performed on site, describe the current status, and provide an analysis of current remediation system effectiveness with further recommendation.

Site Investigation and Remediation, Lewiston, NY - NYPA: Completed the project management for a site remediation and investigation project at a vacant site impacted with No. 2 fuel oil. The site had formerly contained a building and operated as a construction staging area for the Niagara Power Project. Included In house completion of manual product recovery from monitoring wells, a geophysical survey with anomalies located utilizing a Global Positioning System (GPS), a drilling investigation that included rock coring and monitoring well installation and soil and groundwater screening and sampling. All waste streams were characterized for treatment and/or disposal and a comprehensive report was completed.

UST Management Program, NY – NYCT MTA: Project Manager responsible for this program involving site assessments, remedial investigation, feasibility studies, remedial design, and remedial action oversight services for the New York City Transit Underground Storage Tank Management Program. Activities include tank tightness testing, remedial investigations and remediation recommendations, design overview and technical inspection for tank replacement and installation. The underground storage tanks (USTs) are located in all five boroughs of New York City, encompassing 350 tanks at 27 facilities. The USTs range in size from 200 gallons to 35,000 gallons, are generally single walled, and are up to 52 years in age. The tanks contain petroleum products such as gasoline, diesel fuel, lube oil, fuel oil, and waste oil. A comprehensive database and GIS system was developed for UST management.

Remediation System Services, New York City, NY - Franklin Co.: Project Manager for providing remediation system operation and maintenance, monitoring and reporting services at 14 sites in the five boroughs of New York City. Developed and implemented site specific investigations to evaluate the extent and migration of contamination in soil and groundwater. In-depth evaluations of soil and groundwater contamination along with pilot study data and recommendations for remediation were completed. Core personnel prepared the design drawings and specifications for the selected remedial approach. Manager for providing construction monitoring and inspection services during system installation, startup and initial troubleshooting.

Facility Reports, Plans and Drawings, New York City, NY - Franklin Company Contractors, NYC Department of Environmental Protection: Project Manager responsible for overseeing the preparation of Petroleum Bulk Storage (PBS) Facility Reports, As-Built Drawings of tanks and Spill Prevention, Control, and Countermeasures Plans (SPCC) at 24 New York City Department of Environmental Protection (DEP) Water Pollution Control Plants and Pumping Stations under Contract 1198-PBS. The purpose of the PBS Facility Report is to identify PBS deficiencies at the site, if any, and provide recommendations for corrective actions. The program is part of DEP's on-going effort to inspect, test, maintain and determine the regulatory health of their PBS tanks, and ancillary equipment through testing, inspection, review, and modifications. As-built drawings were produced from record drawings and field inspections in order to satisfy the requirements of New York State PBS regulations. The drawings and plans were reviewed and approved by the Project Manager prior to submission to the client the NYC DEP.

JFK IA Terminal 5 Redevelopment, Queens, NY - Turner Construction Corp.: Project Manager for completing the field monitoring and oversight of the JFK International Airport Terminal 5 Redevelopment Project. The project area, approximately 67 acres, required work area air monitoring throughout the excavation program. As the project air monitoring consultant, Core was responsible for conducting NYSDOL and OSHA compliance monitoring. Core performed continuous air monitoring during excavation of the hydrant fueling lines. A photo-ionization detector (PID) and an explosimeter were used to document site conditions for worker Health and Safety monitoring. Air monitoring equipment was calibrated daily and all data including meteorological data (e.g., temperature range, wind speed, wind direction, etc.) was recorded. He supervised the Asbestos Project Air monitoring consultant during abatement and completed the QA/QC of daily reports.

Warehouse Demolition/ Remediation, JFK IA, Queens, NY - JetBlue Airways: Principal in Charge for the site investigation and design for the demolition of four large warehouse and maintenance facilities at JFK International Airport. He provided field support and prepared site investigation reports for the remediation of hazardous materials and asbestos. He supervised the preparation of drawings and specifications for the removal of asbestos, USTs, drummed wastes (PCBs and CFCs).

JetBlue Airways, JFK IA, Queens, NY: Project Manager for completing a Spill Prevention Controls and Countermeasures Plan at John J. Kennedy International Airport Building 74 Ground Service Equipment (GSE) Maintenance Building. For JetBlue, he managed the preparation of a SPCC Plan, in writing, and in accordance with 40 CFR Part 112.7, and any other applicable section of Part 112 – Oil Pollution Prevention (40 CFR Part 112.8). Petroleum Bulk Storage at Building 74 GSE the facility is in one (1) aboveground storage tank (AST) and numerous 55-gallon capacity drums.

Logan International Airport, Boston, MA - JetBlue Airways: Project Manager for completing the SWPPP at the Logan Station after Massachusetts switched to a multi sector general permit. Completed the project

Quality Assurance and Quality Control (QA/QC) review for site specific SWPPPs for an expanding airline at international airports. Tasks included confirmation of site drainage, outfalls, permits and airport BMPs as well as the overall review of all report submittals, which included reports, inspection forms, drawings, figures, BMPs, flow charts, and spill report procedures.

Habitat Restoration Work at Calvert Vaux Park (formerly Dreier-Offerman Park), Brooklyn, NY: As the Program Manager, he is responsible for the contract for providing air monitoring services to monitor upwind and downwind areas of excavation work to ensure that dust concentrations in air do not exceed New York State Department of Environmental Conservation (NYSDEC) regulations [TAGM 4031]. Additionally, he assists the multiple Qualified Inspectors and Professional Engineers. All Qualified Inspectors have received four (4) hours of training endorsed by the NYSDEC from a Soil and Water Conservation District and on-the-job training to follow the appropriate New York State standards, specifications, permits and manuals as part of the job.

Phase II ESAs, Queens, NY, Countrywide Commercial Real Estate: Project Manager responsible for Phase II (ESAs) for the properties to investigate the concerns determined during the Phase I activities. Core completed soil borings and temporary monitoring well installations to evaluate site soils and groundwater samples from the sites. ESA reports were prepared presenting the approach, methods, results, and interpretations of the data as well as recommendations, conclusions and an opinion on further action.

Waste Auditor: Performed the compliance auditing of eight (8) hazardous waste management facilities and Waste Accumulation Areas (WAAs) for compliance with EPA and NYSDEC policies. Waste included: hazardous, radioactive (high and low level), and mixed.

Incinerator/Garage Demolition, NY - NYCDOS: Project Director which included a detailed site investigation for asbestos / hazardous materials. and a structural evaluation in preparation of demolition design documents and specifications. Responsible for coordinating field work and for preparing drawing and specifications for asbestos, lead paint, mercury containing equipment, PCB-bearing equipment, residual ash, USTs, contaminated soil/groundwater and metals contaminated building components.

Varick Avenue Redevelopment, NY - NYCDOS: Principal in Charge for the subsurface environmental investigation for large property being redeveloped for use by NYCDOS. Investigation included over 80 soil borings for delineation of contamination. His investigation work saved the owner from extensive costs and his RI/Site Remediation Plan was cited for excellence by the Chief of NYSDEC's Regional Hazardous Waste Program.

UST Program, NY - DASNY: Project Manager for the Authority's Program to upgrade, replace, add/or close 28 underground storage tanks at various City of New York Campuses in order to comply with Federal, State, and Local regulations regarding storage of petroleum products. The project included heating oil and emergency generator underground storage tanks ranging in size from 280 - 48,000 gallons.

New York Bus Service, NY: Project Manager responsible for the design of a 1,000 cfm multi phase extraction system for the removal and treatment of free product, soil vapor and groundwater contamination. Negotiated a Stipulation Agreement with NYSDEC to allow discharge of treated groundwater to the Hutchinson River.

UST Program, NJ - NJ Department of Treasury: Project Manager responsible for the statewide underground storage tank program consisting of 281 facilities with approximately 1,369 tanks. Project included pre-design investigations, site assessments, tank tightness testing, and soil borings. Responsible for preparation of conceptual design documents and construction staging plans for the upgrade, replacement, and closure at each facility. Project included a motor fuel consolidation study consisting of 229 sites and 458 fuel tanks.

UST Program, NY - NYCDDC: Project Manager for this program, which included the design, construction inspection, and environmental investigation of 225 facilities for the Department of Design and Construction. He was responsible for preparing construction plans and specifications for the installation of 250 tanks.

Stormwater Pollution Prevention Plans, Multiple Cites, U.S. and U.S. Territories - JetBlue Airways: Project Manager for completing SWPPPs at 48 Locations in the U.S. and U.S. Territories: Completed the project Quality Assurance and Quality Control (QA/QC) review for site specific SWPPPs for an expanding airline at international airports. Tasks included confirmation of site drainage, outfalls, permits and airport BMPs as well as the overall review of all report submittals, which included reports, inspection forms, drawings, figures, BMPs, flow charts, and spill report procedures.

Lead Based Paint Inspection Services Contract, New York City, NY - NYC Housing Authority: Project Manager responsible for project oversight of all lead based paint inspections. Inspections were completed on housing units, common areas, and storage units in accordance with U.S. Housing and Urban Development protocols. Inspections included the use of X-Ray Fluorescence (XRF) analysis in each unit and often paint chip samples were collected and laboratory analyzed. The XRF analysis is conducted on site, using a portable LPA-1 Lead Paint Inspection System manufactured by Radiation Monitoring Devices, Inc. (RMD).

Asbestos Services, Five Boroughs, NY - NYC School Construction Authority: Project Manager responsible for oversight of the air sampling and project monitoring. He managed the surveys that included collection of bulk samples throughout the campus that included operating office buildings, mechanical rooms, and various other structures.

Asbestos, Lead, and Comprehensive Environmental Consultant Services Contract, NY – NYCT MTA: Program Manager responsible for three consecutive indefinite quantity contracts. Responsible for the overall management of the project ensuring all required resources were provided to meet project schedules and budgets. Additional responsibilities include the development and implementation of project quality control and assurance measures. Services included asbestos investigations and reports, development of abatement work plans, cost estimating, project coordination and interfacing with site representatives, and project management with oversight of the abatement contractors. Project sites included operating substations, subway stations, office buildings, mechanical rooms, rail yards, bus depots, tunnels, bridges, and various other structures throughout many of NYCT's over 3,000 facilities throughout New York City.

Asbestos and Lead Paint Consulting Services - PA of NY&NJ: Principal for asbestos air and project monitoring services at various PA facilities. Project included surveying, bulk sampling, reporting, tracking of materials/ quantities, compliance monitoring, daily record-keeping of all contractor activities, and reporting.

Mendon Truck Leasing, NY: Project Manager responsible for the investigation of a petroleum spill and the pilot testing of a 600 cfm multi phase extraction system for the removal and treatment of free product, soil vapor and groundwater contamination. The system designed utilizes a medium vacuum liquid ring pump manifolded to 14 recovery wells to recover the free product, groundwater, and soil vapor. Additional duties included system operation, maintenance, and compliance monitoring/reporting.

Stuyvesant Cove Park, NY: Principal-in-Charge for the investigation, remediation, and redevelopment of a 20-acre brownfields site in Manhattan. This former industrial site was contaminated with petroleum products, PCBs, and metals. He provided an accelerated site investigation and remedial design within six months of the work assignment. His leadership provided design-build services and remedial system construction, operation, and maintenance.

Asbestos and Lead Monitoring and Design Services Contract, New York City, NY – NYCT MTA: Senior Project Manager responsible for the indefinite quantity contract (CM-1320). Responsible for the general day to day management of the project ensuring resources are available to meet project demands, schedules and budgets. Responsibilities include the implementation of project quality control and assurance measures including corrective actions. Services provided include lead inspections, lead based paint removal project oversight, waste determination and manifest tracking. Asbestos services include surveys, abatement designs and work plans, cost estimating, project coordination, project and air monitoring, project reporting and oversight of the abatement contractors

Asbestos Consulting Services, Bronx, Brooklyn, Queens and Staten Island, NY - Restored Homes HDFC: Project Manager responsible for assigning personnel, quality assurance and project deliverables.

Core reviewed third-party lead-based paint (LBP) inspection reports, dust wipe analysis and determined the existence and presence of ACMs through surveys specific to areas scheduled for renovation. Also identified ACM, LBP and lead dust to determine what actions are necessary to treat, remediate, abate, enclose, encapsulate, remove or otherwise control such contaminants. Core also provided all design services necessary for the treatment, removal or abatement of ACMs and LBP.

Lead and Asbestos Services, Five Boroughs, NY - Mendon Truck Leasing: Project Manager responsible for the completion of the project to ensure scope of work is executed and the contract documents are adhered to and all appropriate standards are followed. Project included inspection services for lead and asbestos at buildings throughout New York City in support of facility design and future abatement, encapsulation and construction activities. Complete lead and asbestos investigative surveys, inspections, sampling and abatement design. Project reporting with chain of custodies, laboratory analysis and photographs was completed. Core also completed data management with a project information database. Project involves inspection services for lead and asbestos at buildings throughout New York City in support of facility design and future abatement, encapsulation and construction activities of 26 buildings and properties.

Kirkman Boulevard Site, NJ: Task Manager for the investigation of the ACIA hazardous waste site in Atlantic City, New Jersey. The property had a long history of manufactured gas plant (MGP) use and the investigations were conducted in support of redevelopment of the property into a rail terminal and convention center. Responsible for monitoring well construction, soil drilling, data interpretation, and report preparation. The report included plans for managing contaminated soil and groundwater as well plans for long-term monitoring at the site.

Karlsberger Architecture, P.C. - Various Sites: Principal-in-Charge for site investigations and property evaluations for building design and construction specifications at various development sites in New York City. The investigations included reviews of site historical information from Sanborn maps and state/federal database searches as well as subsurface investigations to characterize soil and groundwater quality. Mr. Tramposch identified one of the properties as the former Brooklyn Union Gas Flatbush Works manufactured gas plant (MGP) and MGP contaminants were identified.

GM Plant Decommissioning, Clark, NJ: Task Manager for a site previously used as an automobile assembly plant in Clark, New Jersey. Responsible for delineation of contamination and interpretation of hydrogeologic, geologic, and geotechnical data; and supervision of shallow and deep monitoring well construction. Evaluated 25 underground storage tanks for compliance with NJDEP/USEPA requirements. The project also included determination of soil remediation or reuse options and the development of remedial plans in accordance with NJDEP requirements.

GM Plant Decommissioning Study, Trenton, NJ: Project Manager for a NJDEP ISRA plant closure investigation which included a complete facility assessment with environmental sampling to identify potential environmental concerns. Project scope involved the investigation of PCB transformers, wastewater treatment equipment, RCRA storage areas, waste treatment tanks, USTs, ASTs, process equipment and potential asbestos-containing materials throughout the plant. Soil and groundwater contaminant levels were compared to NJDEP standards to determine cleanup requirements for site soil and groundwater.

Federal Deposit Insurance Corporation (FDIC), MA: Project Engineer responsible for performing environmental assessments of several properties to identify environmental concerns relating to property transfer. Assessments involved site walkover inspections and file reviews for the identification of asbestos containing materials as well as lead based paint.

U.S. Air Force - Loring Air Force Base, ME: Design Task Manager for $1.4 million study for free product recovery at the base fire training area. Design elements include 300 gal/min groundwater treatment facility, blast fractured trench for product recovery, PLC remote monitoring and groundwater and plume modeling.

USAF Plattsburgh AFB, NY: Task Leader responsible for oversight of field work including groundwater, soil, and sediments sampling; developing geologic interpretations; and assisting in report preparation for several assignments of this Indefinite Delivery Type Contract for the U.S. Air Force.

Peter A. Johnston, PE
Vice President/Senior Engineer

EDUCATION:

B.S./Civil and Environmental Engineering/Clarkson University/1983

REGISTRATION/ CERTIFICATIONS/ LICENSES:

New York State Licensed Professional Engineer 065426
Pennsylvania Licensed Professional Engineer PE056647E
Construction Quality Management for Contractors – USACE
General Radiation Worker Training

EXPERIENCE:

Mr. Johnston has over 28 years of professional experience in the civil/environmental engineering industry. He has extensive expertise in all areas of the business, particularly in the design and construction oversight for many different types of projects for government agencies; commercial, retail and residential development companies; and municipalities.

His experience includes projects involving public/private infrastructure design and construction; contractor oversight for USCOE/USEPA environmental remediation; stream rehabilitation design for the NYSDOT; petroleum contamination investigation of public municipal sanitary sewer system; design and construction of industrial utility infrastructure facilities; and Storm Water Pollution Prevention Plan (SWPPP) design and monitoring in accordance with NYSDEC State Pollution Discharge Elimination System (SPDES) requirements.

Additionally, he has directed teams of on-site inspectors, materials testing laboratories, subsurface investigators and analysts for various environmental remediation projects. He has worked with many agency personnel and various stakeholders from project conception and funding to bidding and contracting to project completion and close-out.

Details of some of Mr. Johnston's experience are as follows:

Habitat Restoration Work at Calvert Vaux Park (formerly Dreier-Offerman Park), Brooklyn, NY He is the Professional Engineer on record overseeing the contract for providing multiple Qualified Inspectors and Professional Engineers to the NYC Parks. Core is providing professional/civil engineering services to perform site inspections required to conform to the requirements in the NYSDEC Pollution Discharge for Construction Activities, General Permit GP-0-08-001. His Qualified Inspectors have received four (4) hours of training endorsed by the NYSDEC from a Soil and Water Conservation District and on-the-job training to follow the appropriate New York State standards, specifications, permits and manuals as part of the job. They also received on the job training as well from the PM.

Lead Health and Safety Plan, Bayonne Bridge, New York and New Jersey He completed the Professional Engineering review of a site specific Lead Health and Safety Plan (LHASP) to be utilized by Ahern Painting Contractors, Inc. during the lead paint abatement and repainting of the Bayonne Bridge. The contract (AKB-173) is for lead paint abatement and repainting of the Bayonne Bridge main span arch. The Bayonne Bridge spans the Kill Van Kull to link Bayonne, New Jersey, with the Port Richmond area of Staten Island, New York. The purpose of this Lead Health and Safety Plan (LHASP) is to set forth in an orderly and logical fashion, appropriate health and safety procedures to be followed by employees during lead abatement and cleanup activities.

Hudson River PCB Remediation Project, USCOE/USEPA Contractor Oversight, Field Team Leader: Responsible for planning, managing and scheduling field technical staff to oversee the various contractors completing the dredging of the Hudson River to remove PCB contaminated sediment from the river, transportation of the contaminated sediment to the sediment treatment facility, separation and disposal of the contaminated sediment, and treatment of the river water so that it could be discharged back into the Hudson River. Also responsible for authoring and revising various project documents including the HASP, Work Plan, QAPP, Phase I Dredging Report, Quality of Life Assessment Report, etc.

Linde FUSRAP Project, USCOE Buffalo, New York District, Senior Engineer: Responsibilities included managing and coordinating the design and construction of the relocation of industrial utilities associated with the removal of an existing radiologically contaminated underground concrete utility tunnel. He was also responsible for maintaining water usage and discharge records, reporting water usage and discharge data to interested parties and assuring compliance with the projects sanitary sewer discharge permit. He applied to the Region 9 NYSDEC for approval to discharge various waste streams generated by the demolition and soil remediation work.

NYSDOT Stream Rehabilitation, US Route 219 Extension, Springville, NY: Project Engineer responsible for the design of stream rehabilitation measures including engineered rock riffles, log revetments, and boiling pools. He is also responsible for the preparation of engineering plans and specifications in accordance with NYSDOT standard design guidelines and details.

Commercial, Retail, Residential Site Development Projects, Various Locations, Western, NY: Project Manager and Project Engineer for multiple site development projects including commercial/retail shopping plazas, office/industrial parks, and residential subdivisions. Tasks included the preparation of site plans, utility plans, grading and drainage plans, hydraulic studies, engineering reports, project specifications, etc. He also served as the Owner's representative at public hearings and other board meetings to make project presentations.

Storm Water Pollution Prevention Plans (SWPPP) - Various Locations, NY: Completed the Professional Engineering review and approval for SWPPP plans at commercial, retail and residential development projects throughout western New York State. Responsibilities included evaluation of site drainage, identification and implementation of Best Management Practices (BMPs), report and Notice of Intent (NOI) preparation, and submittal to the NYSDEC for permitting.

Eric Miller
Environmental Inspector / CADD Specialist

EDUCATION:

B.S./ Architectural Engineering/ State University of New York at Alfred/ 2006

REGISTRATIONS/ CERTIFICATIONS:

U.S. EPA Lead Inspector/Risk Assessor
NYS DOL Asbestos Inspector
RMD LPA-1 XRF Analyzer Training

EXPERIENCE:

Mr. Miller has seven (7) years of experience with CADD in an array of different settings and applications. He has a developing background in lead and asbestos abatement designs, above and underground storage tank systems and soil and groundwater contour mapping. He has been involved with environmental site assessments, remediation drawings, sampling plans in support of system evaluation, data analysis and reporting.

Mr. Miller has already worked on a number of diverse projects including:

Facility Reports, Plans and Drawings, New York City, NY - Franklin Company Contractors, NYC Department of Environmental Protection: Report Preparer responsible for the project deliverables as part of Petroleum Bulk Storage (PBS) Facility Reports, He prepared the As-Built Drawings of tanks and Spill Prevention, Control, and Countermeasures Plans (SPCC) at 24 New York City Department of Environmental Protection (DEP) Water Pollution Control Plants and Pumping Stations under Contract 1198-PBS. Drawings required a detailed inventory of all tanks, spill prevention and cleanup materials as well as detailed descriptions of where each tank could potentially discharge to the waters of the U.S.

Lead Wipe Analysis Clearance Testing, Western New York - Various Clients: Environmental Lead Inspector responsible for performing the lead wipe testing of residential units for clearance purposes. Samples are sent to the lab then the analysis is completed, upon receipt of results a written clearance report is completed and sent to the client as well as the County when required.

Petroleum Monitoring Reporting Services Contract, New York City, NY - NYC Housing Authority: CAD Technician for the production of project drawings. A total of four (4) Quarterly Petroleum Remediation Monitoring Reports for 27 Housing Development Sites that have groundwater contamination resulting from petroleum releases from fuel oil tanks were completed. The purpose of the reports are to summarize petroleum remediation activities performed on site, describe the current status, and provide an analysis of current remediation system effectiveness with further recommendation.

Lead and Asbestos Monitoring and Design Services Contract, New York City, NY – NYCT MTA: CADD Operator responsible for the indefinite quantity contract (CM-1320). Services include asbestos investigations comprehensive final reports with detailed drawings that detail the following: company, contractor and laboratory certifications, notifications and variances, permits and licenses, activity logs, inspection results, air monitoring results and manifests. Project sites included operating train and subway stations, terminals, office buildings, mechanical rooms, rail yards, tracks, tunnels, bridges, and various other structures.

UST and AST Design Services, Five Boroughs, NY - Mendon Truck Leasing: CADD Operator responsible for the preparation of the contract documents and assurance that the contract documents adhered to all appropriate standards. Project involves completion of design drawings and specifications to be submitted to the New York City Department of Buildings. The drawings are produced in support of facility construction activities.

Eric Miller
Environmental Inspector / CADD Specialist

Lead Based Paint Inspection Services Contract, New York City, NY - NYC Housing Authority: Report Manager responsible for the deliverables of the lead based paint inspections. Inspections are completed on housing units, common areas, and storage units in accordance with U.S. Housing and Urban Development protocols. Inspections included the use of X-Ray Fluorescence (XRF) analysis in each unit and often paint chip samples were collected and laboratory analyzed. The XRF analysis is conducted on site, using a portable LPA-1 Lead Paint Inspection System manufactured by Radiation Monitoring Devices, Inc. (RMD).

Asbestos Services, Five Boroughs, New York City, NY - NYC School Construction Authority: CADD Operator responsible for the indefinite quantity contract. Services include asbestos investigations comprehensive final reports with detailed drawings that detail the following: company, contractor and laboratory certifications, notifications and variances, permits and licenses, activity logs, inspection results, air monitoring results and manifests. Project sites include City schools.

UST Removal Programs, Various Western NY Sites: Completed five (5) underground storage tank removals projects across. His responsibilities included the preparation of detailed drawings. Many sites required the segregation and staging of contaminated soil in an effort to remove the stained soil and render the excavation free of excessive contaminants. Confirmatory sampling and laboratory analysis was completed and often the spill files were closed based on the removal of stained soil during UST removal activities.

Remediation System Services, New York City, NY - Franklin Company Contractors: CADD Operator responsible for providing remediation system operation and maintenance, monitoring and reporting services at multiple sites in the five boroughs of New York City. He completed site specific contract documents and drawings.

Phase I and Phase II Environmental Site Assessment, Five Boroughs, NY- NYCT MTA: CADD Operator responsible for the all drawings, plans and figures completed for environmental Site Assessments (ESAs). quantity contract. Detailed drawings show the following: location plans, site data, soil borings and monitoring wells, groundwater contours, bedrock elevations and contours, soil boring logs. Project sites include city garages, former service stations, vacant lots, industrial complexes and residential buildings.

Manuel Duran
Environmental Scientist

EDUCATION:

A.A.S/ Accounting/ Nassau Community College/ 2000

REGISTRATIONS/ CERTIFICATIONS:

NYSDOL Asbestos Inspector
SSPC C-3 Supervisor/Competent Person
MTA Track Safety Training
OSHA Certification Confined Space

EXPERIENCE:

Mr. Duran is an Environmental Scientist with 10 years experience managing people and projects. He has a solid background in lead and asbestos investigations, air monitoring and construction management. He is experienced with all types of abatement work areas and has performed the oversight of multiple work areas throughout the New York metropolitan area as well as New Jersey.

Some of the various projects Mr. Duran has been involved with are provided below:

Lead and Asbestos Monitoring and Design Services Contract, NY – NYCT MTA: Asbestos Project Monitor and Lead Task Manger responsible for the management of personnel and the completion of air sampling and monitoring completed during the execution of the indefinite quantity contract. Responsibilities include the development and implementation air monitoring programs at all types of work areas and environments. Services included lead and asbestos investigations and reports, development of abatement work plans, cost estimating, project coordination and interfacing with site representatives, and project management with oversight of the abatement contractors. Additional services includes project monitoring for lead abatement activities including contractor oversight. Project sites include operating substations, subway stations, office buildings, mechanical rooms, rail yards, bus depots, tunnels, bridges, manholes and other structures.

Line Structure Overcoat Painting, White Plains Road Line, Bronx Park East to 241st, Bronx, NY – NYCT MTA: Project involves the removal of lead paint from over 4,000,000 square feet of the elevated subway line. Specific removal methods include manual wet scraping and power tools with Hepa-vacuum attachments, rivet busting and hot work. All work is being performed utilizing a SSPC Class 3P containment system consisting of tarpaulins hanging from the work area both horizontally and vertically. Responsible for on-site field inspection during lead disturbance activities ensuring the contractor maintained proper containment around each work area, proper worker protection procedures under OSHA are carried out by the contractor, preparing weekly field inspection reports, and ensuring lead wastes are properly stored in compliance with NYSDEC and USEPA regulations.

Line Structure Overcoat Painting, Flushing Line, from 103rd Street to the Main Street, Queens, NY – NYCT MTA: Project involves the removal of lead paint from the elevated steel structured of the Flushing Line (A Division, IRT), 103rd Street to the Main Street Portal including the Corona Yard Leads. Work procedures include manual wet scraping, needle scaling, and power tool cleaning. All work areas are contained in SSPC 3P containment. Responsible for ensuring the contractor complies with all NYCT lead removal specifications, OSHA worker protection procedures are carried out by the contractor, storage and tracking of lead waste perform air monitoring, tracking of lead wastes, and maintain ensure contractor follows OHSA requirements for lead removal work.

Phase II Environmental Site Investigation (ESI), Queens, NY - Olympic Flame: Assisted with Phase II ESI activities at the gas station where a truck accident caused a gasoline release from a fuel dispenser. Responsible for the completion of the work plan, soil screening and sampling, well development and sampling. Applied the site health and safety plan and completed the oversight of the field crews.

Foster Avenue, Phase II Environmental Site Investigation (ESI), Bronx, NY - Mendon Realty: Assisted with the Phase II ESI at the commercial property were a spill occurred. Responsibilities included preparing subcontracts and performing oversight for monitoring well drilling, geoprobe activities, and excavation services other field activities and compilation of field data for reporting.

Garrison Avenue, Phase II Environmental Site Investigation (ESI), Brooklyn, NY - Mendon Realty: Assisted with soil borings and temporary monitoring well installations to evaluate site soils and groundwater samples from the sites. A report was prepared presenting the approach, methods, results, and interpretations of the data as well as recommendations, conclusions and an opinion on further action.

775 Tiffany Street, Bronx, Phase II Environmental Site Investigation (ESI), Brooklyn, NY - Kimcomatt Realty Corp.: Assisted with soil borings and temporary monitoring well installations to evaluate site soils and groundwater samples from the sites. Responsibilities included performing oversight for monitoring well drilling, geoprobe activities, and soil and groundwater sampling services as well as other field activities.

APPENDIX C
Health and Safety Plan

HEALTH AND SAFETY PLAN
Former National Rubber Adhesives Site

38-25 9th Street
Long Island City, New York 11101
State ID #2-41-028

&

New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233-7016

Prepared for:

Hamil Stratten Properties, LLC
203 Meserole Avenue
Brooklyn, New York 11222

Prepared by:

CORE ENVIRONMENTAL CONSULTANTS
46-11 54th Ave
Maspeth, New York 11378

June 24, 2013

TABLE OF CONTENTS

TABLE OF CONTENTS
(continued)

TABLES

FORMS

ATTACHMENT

1.0 INTRODUCTION

1.1 OBJECTIVE

Hamil Stratten Properties, LLC retained CORE Environmental Consultants, Inc. (CORE) to provide environmental consulting services related to the facility located at 38-25 9th Street, Long Island City, New York. Hamil Stratten tasked CORE to perform a Remedial Investigation/Feasibility Study (RI/FS) at the former National Rubber Adhesives Site (No. 2-41-028).

1.2 PURPOSE

The purpose of this Health and Safety Plan (HASP) is to set forth appropriate health and safety procedures to be followed by CORE employees during on Site investigative and remedial activities.

The investigative work efforts will include:

Site Walk-Through

- Perform a Site-wide walk-through to evaluate the presence, location, and usability of existing sample points.

Membrane Interface Probe Preliminary Site Assessment

- Retain a NYS Licensed drilling contractor to perform 23 MIP subsurface profiles on Site.
- Evaluate baseline data set and choose soil boring, groundwater monitoring well, and soil gas vapor point locations that best reflect the subsurface conditions at the Site.

Soil Boring Program

- Evaluation of the nature and extent of impacts to soil through the advancement of borings at interior locations.

Groundwater Monitoring Program

- Installation of a minimum of three groundwater monitoring wells.
- Collection of groundwater samples from newly installed and existing monitoring wells.
- Evaluation of the nature and extent of impacts in the groundwater.
- Sampling of off-Site wells to provide a contemporaneous data set.

Water Level Survey

- Measurement of water levels in all on-Site and sampled off-Site monitoring wells.

Soil Vapor Survey

- Installation of up to 21 soil vapor points up to 5 feet below ground surface (bgs).
- Collection of 21 soil vapor samples for analysis.
- Evaluation of the nature and extent of impacts to the soil vapor and the possibility of gas vapor intrusion into the overlying structure.

Sample Analysis

- Analysis of groundwater and soil samples for TCL volatile organic compounds (VOCs), heptane and hexane, TCL semi-volatile organic compounds (SVOCs), and TAL Metals.
- Analysis of soil vapor samples by USEPA Method TO-15. Soil vapor samples will be collected in individually certified clean canisters.

Follow Up Survey

- Survey of newly installed monitoring wells and soil boring locations.

Community Air Monitoring

- Monitoring of air in accordance with NYSDOH guidance.

This document will serve not only to explain the chemical and physical hazards associated with working on the Site, but will also outline approved measures for dealing with such hazards. The project Health and Safety Officer (HSO) will be responsible for the development and implementation of project Health and Safety protocols. In addition, the subcontractor(s) will be required to designate a Site HSO for their personnel and to follow, at a minimum, the requirements of this HASP. All personnel who will be involved with sampling on Site must have completed the appropriate Hazardous Waste Site Worker Training, i.e. 24 hour or 40 hour, as required by OSHA 1910.120(e)(2), 1910.120(e)(3), and 1910.120(e)(8), as applicable, and the required medical surveillance as required by OSHA 1910.120(f).

1.3 SITE DESCRIPTION

The former National Rubber Adhesives (NRA) Site is located at 38-25 9th Street in Long Island City, in the Borough of Queens, New York (Figure 1-1). The Site is presently owned by Hamil Stratten Properties, LLC, and is bounded by various commercial and residential properties to the north, east, and south, and 9th Street to the west (Figure 1-2); The property is relatively flat, with an approximate elevation of 13 feet above mean sea level (MSL). The East River is located approximately one-quarter (1/4) mile west of the Site. The Site is comprised of a large mid-block parcel on the east side of 9th Street, between 38th and 40th Avenues. The parcel is approximately 300 feet by 100 feet and is identified by the New York City Department of Buildings as Block 475, Lot 19. It is currently zoned M1-3 - Manufacturing. The Site is currently occupied by one 28,950 square feet, one-story, slab on grade masonry building that covers the entirety of the parcel.

2.0 KEY PERSONNEL

Personnel responsible for implementation of this Health and Safety Plan are:

Name	Title	Address	Contact Numbers
Ronald Tramposch, PG	Project Manager	46-11 54th Avenue Maspeth, NY 11378	Office: 718-762-0544 Mobile: 917-804-8717
Fred Smith, CIH, CSP	Project HSO	46-11 54th Avenue Maspeth, NY 11378	Office: 718-762-0544 Mobile:

2.1 SITE HEALTH AND SAFETY OFFICER

The responsibilities of the Site HSO are as follows:

- Implement this HASP on Site.
- Enforce day-to-day health and safety protocols in effect on Site.
- Require that all personnel entering the Site understand the provisions of this HASP.
- Conduct periodic training sessions on use/maintenance of personal protective equipment (PPE) and safety practices.
- Conduct daily health and safety meetings each morning.
- Direct and advise CORE's Site personnel, visitors, and subcontractor(s) on the specific hazards associated with the Site and changes, related to health and safety requirements at the Site.
- Conduct necessary health and safety monitoring.
- Administer air monitoring program, to include monitoring logs and accident/incident reports.
- Monitor Site conditions and determine all necessary changes in levels of personal protection and, if warranted, execute work stoppages.
- Report changes in Site conditions and changes in PPE requirements to the Project HSO.

3.0 MEDICAL SURVEILLANCE REQUIREMENTS

All personnel who engage in waste Site activities for 30 days or more per year will participate in a Medical Surveillance Program. All project personnel involved in on Site activities in impacted areas at Site will be required to undergo annual medical examinations. This examination must take place not more than one year prior to and one year after the completion of Site work and must be conducted by a physician who is board-certified in occupational medicine. The physician will have been made familiar with the job-related duties of each worker examined. The physician must certify whether the individual is fit to conduct work on hazardous waste Sites using personal protection, or whether he or she must work within certain restrictions.

Any person exposed to high levels of hazardous substances will be required to undergo a repeat medical exam at or before the conclusion of the project to determine possible health impacts. Any person suffering a lost-time injury or illness must receive medical approval prior to returning to work on Site. When employment is terminated for any reason, the employee must receive an exit medical examination.

All medical records will be held by the employer for the period of employment plus at least 30 years, in accordance with OSHA regulations on confidentiality and any other applicable regulations and will be made available to OSHA upon request. The components of Medical Surveillance include:

- Medical and occupational history
- Physical examination, with particular attention to the cardiopulmonary system, general physical fitness, skin, blood-forming, hepatic, renal, and nervous systems
- Urinalysis, to include:
    - color
    - appearance
    - specific gravity
    - pH
    - ketones
    - protein
    - glucose
    - blood
    - bilirubin
    - leukocyte esterase
    - nitrite
    - WBC
    - RBC
    - casts
    - bacteria
    - epithelial cells
    - crystals
    - yeasts

- heavy metals - arsenic, lead, mercury

- Blood analysis, to include:

  - complete blood count
  - hemoglobin
  - albumin, globulin, total protein
  - bilirubin - direct and total
  - g-glutamyl transpeptidase
  - serum glutamic oxalacetic transaminase
  - lactic dehydrogenase
  - alkaline phosphatase
  - sodium
  - potassium
  - chloride
  - magnesium
  - calcium
  - phosphorus
  - lead
  - uric acid
  - BUN (blood urea nitrogen)
  - creatinine
  - cholesterol
  - triglycerides
  - glucose
  - iron

- Pulmonary function test

- Additional tests as appropriate, including:

  - chest X-ray
  - electrocardiogram
  - stress test
  - audiogram

4.0 SITE HAZARD EVALUATION

Normally, it is the drilling program that poses the greatest potential threat to the safety of Site personnel. Drilling at the Site will be conducted under the OSHA Safety and Health Standards (29 CFR 1926/191) relative to heavy equipment operation. The following sections detail the chemical hazards, physical hazards, radiological and biological hazards, and temperature stresses.

4.1 CHEMICAL HAZARDS

Chemicals that may potentially be encountered at the Site include all VOCs, SVOCs, and metals. The health/safety characteristics and exposure limits of all compounds anticipated at the Site are listed in Table 1. The risk of exposure can be by dermal or respiratory routes, depending on the type of compound and intrusive activity being performed.

Description: During soil boring installation, workers may be exposed to particulates and compounds, such as VOCs, dusts, and metals, in soil and development water through inhalation/ingestion/dermal contact routes.

Control: During installation of wells and trenches, workers may need to apply water or an amended water solution to the area to help control the generation of airborne dusts, particulates, and VOCs. Workers may also use respiratory protection including the use of an air-purifying respirator equipped with approved filter/cartridges (e.g. HEPA (N100, R100, P100) filters for particulates, OV cartridges for vapors, or combination filter/cartridges for dual protection). An analysis of the work tasks and potential for chemical exposure should be performed to determine the correct PPE, and/or respirator cartridge(s), if needed. The analysis should include a chemical waste profile to help ensure that PPE specified will be appropriate for the respective chemical hazard(s).

Control Point: Construction, Operations, Maintenance

4.2 PHYSICAL HAZARDS

Physical hazards include the dangers of tripping and falling on uneven ground, operation of heavy equipment such as drill rigs, vehicular traffic, and utilities either above-ground or buried. The following are physical hazards which may be encountered during investigation activities.

Tripping Hazards - An area of risk associated with on Site investigative activities is presented by uneven or cracked concrete, curb stones, or equipment which may be present at the Site thereby creating a potential tripping hazard. During intrusive work, care should be taken to mark (with orange paint) or remove any obstacles within the Exclusive Zone.

Climbing Hazards - During Site activities, workers may have to work on drilling equipment by climbing the mast. The drilling contractor will conform to any applicable NIOSH and OSHA requirements for climbing activities. These activities will be overseen by the CORE Site HSO.

Cuts and Lacerations - Field activities that involve drilling and sampling activities usually involve contact with various types of machinery. At least one person on Site must be currently certified in

first aid and CPR. Personnel trained and certified in first aid should be prepared to take care of cuts and bruises as well as other minor injuries. CORE will have a first aid kit approved by the American Red Cross available during all field activities.

Lifting Hazards - Improper lifting by workers is one of the leading causes of industrial injuries. Field workers in the remedial and drilling program will often be required to lift heavy objects (pumps, drums, drill castings, rods, etc.). Therefore, all members of the field crew should be trained in the proper methods of lifting heavy objects. All workers should be cautioned against lifting objects too heavy for one person.

Utility Hazards - Before conducting any drilling, CORE will be responsible for locating and verifying all existing utilities at the location of each boring with the assistance of the Owners after completing notification to Dig Safely New York. Site intrusive activities will only be allowed to start after CORE has been notified by every underground utility operator that they have no facilities in the work area.

Traffic Hazards - All traffic, vehicular and pedestrian, shall be maintained and protected at all times consistent with local, state, and federal, and agency regulations regarding such traffic and in accordance with direction of the Owners. Traffic hazards will be limited since the investigation/remediation project is to be completed on private land and not in public right of way areas.

The drilling program poses the greatest potential threat to the safety of Site personnel. The following sections describe specific safety measures to be implemented during specific activities.

1 - Description: Soil boring using push probes or augers may cause a fire or explosion when advanced into soils saturated with flammable and/or combustible materials. Sparks generated when a probe or auger contacts rocks, metal, or other underground objects may ignite a flammable atmosphere inside the bore hole. This is considered an unlikely, but potential hazard.

Control: The potential for a fire or explosion may be controlled as necessary by using mud or water with rotary drilling methods, which add moisture to the cutting area.

Control Point: Construction, Maintenance

2 - Description: Fire, explosion or electrocution hazards may exist when utilizing push probes or augers if the downhole device contacts or ruptures underground utilities such as electrical or gas lines, or comes in contact with overhead electric lines.

Control: To control utility contact hazards, identify the location of all below- and above-ground utilities prior to drilling. Contact local utilities and public works personnel to determine the locations of utilities. When there is any doubt or uncertainty, perform a utility survey, probe with a metal rod, or hand excavate to determine the exact location of utilities prior to drilling. Once utilities are located, careful drilling may be allowed. When raising a drill mast, always have an observer to the side to observe and supervise. Do not move the drill rig with the mast raised.

Control Point: Design, Construction, Maintenance

3 - Description: Steam pressure washing of equipment may expose workers to thermal or burn hazards, eye hazards due to flying projectiles dislodged during pressure washing, slip hazards from wet surfaces, and noise hazards.

Control: Thermal burns may be prevented by using insulated gloves (e.g. silica fabric gloves). Eye injuries and hearing loss may be prevented by wearing safety goggles and hearing protection during pressure washing activities. Slip hazards may be controlled by workers wearing slip-resistant boots and draining water away from the decontamination operation into a tank or pit. Walking surfaces should be drained and free of standing liquids or mud.

Control Point: Construction, Operations, Maintenance

4 - Description: Manual lifting of heavy objects may expose workers to back, arm and shoulder injuries.

Control: Workers should not be required to lift heavy loads manually. Some loads may require two people. Proper lifting techniques include stretching, bending at the knees, and bringing the load close to the body prior to lifting. Mechanical lifting equipment, such as forklifts, should be used to lift or to move loads.

Control Point: Design, Construction, Operations, Maintenance

4.3 RADIOLOGICAL HAZARDS

Description: Radioactive materials may have been buried, or naturally occurring radioactive material (NORM) may be present in soils, sludge and groundwater. Radioactive materials may become entrained with free product and eventually build up as scale in pipes and handling systems. Some radioactive materials may present an external exposure hazard. All radioactive materials may present an internal exposure hazard through inhalation or ingestion. Exposure to radiation using this remediation technology may be rare.

Control: The presence of radioactive materials may be known or the soil, sludge, or groundwater may be tested to determine if radioactive materials are present. If any radioactive material above background levels is found, a qualified health physicist should be consulted to determine exposure potential and any necessary engineered controls or PPE.

Control Point: Design, Construction, Operations, Maintenance

4.4 BIOLOGICAL HAZARDS

Description: Not applicable

Control: Not applicable

4.5 HEAT STRESS

The combination of high ambient temperature, high humidity, physical exertion, and personal protective apparel which limits the dissipation of body heat and moisture can cause heat stress. The Site HSO is responsible for monitoring heat stress in the field team personnel.

The following prevention, recognition, and treatment strategies will be implemented to protect personnel from heat stress. Personnel will be trained to recognize the symptoms of heat stress, and to apply the appropriate treatment.

1. Prevention

    a. Provide plenty of liquids. Available in the Support Zone will be a 50% solution of fruit punch or the like in water, or plain water to be taken with salted foods such as pretzels.

    b. Buddy system. No individual will attempt to undertake any activity alone.

    c. Provide cooling devices. A spray hose and a source of water will be provided to reduce body temperature, cool protective clothing, and/or act as a quick-drench shower in case of an exposure incident.

    d. Adjustment of the work schedule. As is practicable, the most labor intensive tasks should be carried out during the coolest part of the day.

2. Recognition and Treatment

Any person who observes any of the following forms of heat stress, either in himself or in another worker, will report this information to the Site HSO as soon as possible.

    a. Heat Rash (or prickly heat):

        Cause: Continuous exposure to hot and humid air, aggravated by chafing clothing.

        Symptoms: Eruption of red pimples around sweat ducts accompanied by intense itching and tingling.

        Treatment: Remove source of irritation and cool skin with water or wet cloths.

    b. Heat Cramps (or heat prostration):

        Cause: Profuse perspiration accompanied by inadequate replenishment of body water and electrolytes.

        Symptoms: Sudden development of pain and/or muscle spasms in the abdominal region.

        Treatment: Remove the worker to the Contamination Reduction Zone. Provide fluids orally. Remove protective clothing. Decrease body temperatures and allow a period of rest in cool location.

    c. Heat Exhaustion

Cause: Overexertion in a hot environment and profuse perspiration accompanied by inadequate replenishment of body water and electrolytes.

Symptoms: Muscular weakness, staggering gait, nausea, dizziness, shallow breathing, pale and clammy skin, approximately normal body temperature.

Treatment: Perform the following while simultaneously making arrangements for transport to a medical facility: Remove the worker to the Contamination Reduction Zone. Remove protective clothing. Lie the worker down on his or her back, in a cool place, and raise the feet 6 to 12 inches. Keep warm, but loosen all clothing. If conscious, provide sips of a salt water solution, using one teaspoon of salt in 12 ounces of water. Transport the worker to a medical facility.

d. Heat Stroke

Cause: Same as heat exhaustion.

Symptoms: Dry and hot skin, dry mouth, dizziness, nausea, headache, rapid pulse.

Treatment: Cool worker immediately by immersing or spraying with cool water or sponge bare skin after removing protective clothing. Transport to hospital.

4.6 COLD EXPOSURE

Exposure to cold weather, wet conditions and extreme wind-chill factors may result in excessive loss of body heat (hypothermia) and/or frost bite. To guard against cold exposure and to prevent cold injuries, appropriate warm clothing should be worn, warm shelter must be readily available, rest periods should be adjusted as needed, and the physical conditions of on Site field personnel should be closely monitored. Personnel and supervisors working on Site will be made aware of the signs and symptoms of frost bite and hypothermia such as shivering, reduced blood pressure, reduced coordination, drowsiness, impaired judgment, fatigue, pupils dilated but reactive to light, and numbing of the toes and fingers. The potential for wetting of protective clothing should be of concern, since wet clothing (from sweat or splashes) will provide poor insulation against the cold.

5.0 SITE CONTROL

In order to keep unauthorized personnel from entering the work areas during drilling activities without proper protective equipment, and for good control of overall Site safety, two work zones will be established. The two work zones are the Support Zone and the Contamination Reduction Zone/Exclusion Zone. Actual zone width will be determined by optimal size of work area and by obstructions, if any. A brief description of the Site work zones follows.

5.1 SUPPORT ZONE

The Support Zone at the Site will be a mobile unit (automobile) including a cellular telephone for communication. The Support Zone will be located as near as practicable to the active work areas and decontamination areas.

5.2 CONTAMINATION REDUCTION ZONE/EXCLUSION ZONE

Due to the environmental setting for this project, the Contamination Reduction Zone (CRZ) and Exclusion Zone (EZ) will be incorporated into one zone at each boring location. This zone will be mobile and the location will be dependent upon where the active test borings are located. The decontamination of personnel, light equipment, and heavy equipment will be performed at each well installation location.

A temporary storage location will be established at the Site for the storage of any drummed drill cuttings, decontamination water, core water, well purge water, recovered oil and disposable clothing. The facility will be situated away from vehicular and pedestrian traffic.

5.3 SITE VISITATION

It is possible that the Owners or officials from regulating bodies and jurisdiction will visit the Site during operations. It is also possible that an OSHA representative will wish to inspect the Site. All such officials must meet the requirements of occasional Site workers (24 hour OSHA-approved training and Site-specific training) before going into any active Contamination Reduction Zone/Exclusion Zone. Visitors other than the Owners, NYCDEC, or OSHA representatives will be subject to the additional requirements of having to receive written permission from the Owners to conduct a Site visit. Because of the nature of the work, the work zone will be continually supervised. Signs will be used to prevent the entrance of unauthorized visitors.

All visitors must supply their own PPE and will be directed to appropriate disposal areas for soil or used PPE.

6.0 PERSONAL PROTECTION

Since personnel working on Site may be exposed to unexpected levels of hazardous airborne chemicals or compounds released during drilling activities, or may come in contact with VOC's, SVOC's and metals in drill cuttings or soil, various levels of protection will be utilized during field

activities. Components of all levels of personal protection that will be available are listed in Table 2. Planned levels of protection for various activities are given in Table 3.

In the event that unexpected levels of organic vapors are encountered, any personnel working at Level D protection will don their respirators at once (change to Level C). The Site HSO will consult with the Project HSO to decide if and when Level D protection may be resumed, or if a higher level of personal protection is required. Some modification in safety equipment (e.g., switching from polycoated disposable coveralls to standard disposable coveralls) may be implemented in order to balance concerns for full contaminant protection against concerns for the possibility of heat stress resulting from the need to wear more restrictive PPE. Such modifications may be implemented only if approved in advance by the Site HSO, following consultation with the Project HSO. PPE which fully complies with the requirements of all required levels of protection should be immediately available at all times on the Site.

Level C respiratory protection will normally be provided using NIOSH-approved half-face respirators, with appropriate NIOSH approved cartridge for removal of organic vapors. All team members will be fit-tested for respirators using irritant smoke. Due to difficulties in achieving a proper seal between face and mask, persons with facial hair will not be allowed to work in areas requiring respiratory protection. CORE's complete respiratory protection program requirements are documented in their Health and Safety (HAS) guidelines.

For the fullest protection of Site personnel, the supervising field engineer/geologist will conduct organic vapor monitoring at closely spaced intervals during drilling and sampling activities. Monitoring will be accomplished by real-time monitoring equipment.

The primary purpose of this monitoring will be to assess the adequacy of respiratory protection and to make it possible to stop work quickly if explosive or hazardous gases are encountered, or if an oxygen-deficient atmosphere is detected. The air monitoring to be carried out during all intrusive activities is summarized below.

Site personnel timesheets with employee and Project Manager signatures will serve to document the amount of time spent on Site by each team member.

7.0 AIR MONITORING

Air monitoring will be performed throughout the drilling, sampling and purging activities by trained CORE personnel. While these activities are in progress, monitoring frequencies will be as summarized in Table 4. Air monitoring equipment will be calibrated daily and all data will be recorded on the Instrument Reading Logs (Appendix B). Each day, intrusive work will not begin until the instruments are calibrated and background levels are taken and recorded. Air will be monitored for total volatiles with a photoionization detector (PID). All air monitoring results and meteorological data (e.g., temperature range, wind speed, wind direction, etc.) will be recorded on the Instrument Reading Logs.

7.1 TOTAL VOLATILES

During intrusive activities, air monitoring for total volatiles (organic vapors) will be performed using a PID equipped with a 10.2 eV lamp to detect target volatiles typical to the impacts previously identified on Site. When readings from 0.0 to 10 ppm above background in the breathing zone are observed, then the work activity will continue. Continuous monitoring will take place at least every 10 minutes. Levels less than 10 ppm of total volatiles are to be considered permissible. If levels between 10 and 25 ppm are detected then the work area will be cleared and will not begin until a minimum of two (2) minutes have passed and the work area is re-measured and found to be less than 10 ppm. Continuous monitoring will take place at least every 5 minutes. If sustained readings from 10-25 ppm above background in the breathing zone are observed, work will only be allowed to continue after a stoppage and donning of Level C PPE. Monitoring will take place continuously and a down grade to Level D will take place only after levels are found to be consistently below 10 ppm and the HSO informs all affected workers of the situation. If organic vapor readings continue to exceed 50 ppm above background in the breathing zone, activities will be halted and in the event the borehole is the source of the vapors, than an empty steel 55-gallon drum will be placed over the hole in an effort to contain some of the vapors for additional worker protection. All engine and ignition sources will be shut off and all workers will withdraw from the area. The level of protection used by on Site personnel will be reassessed after the HSO, advises the PM and the Owners and a determination is made.

7.2 CALIBRATION OF AIR MONITORING INSTRUMENTS

The PID will be calibrated to a benzene surrogate (an isobutylene standard with a 100 ppm concentration) daily (prior to field activities) and the results will be recorded on the Instrument Reading Log.

7.3 WORK STOPPAGE RESPONSES

The following responses will be initiated whenever one or more of the action levels necessitating a work stoppage is exceeded:

(1) The Site HSO will be consulted immediately.
(2) All personnel (except as necessary for continued monitoring and contaminant mitigation, if applicable) will be cleared from the work area (e.g. from within the Exclusion Zone).
(3) Monitoring will be continued until intrusive work resumes or the soil boring is grouted.
(4) If, during intrusive field activities, downwind monitoring PID readings are greater than 5 ppm above background for more than one half hour, the soil boring will be grouted or covered with an empty 55 gallon drum until grouting can safely be completed.

Any chemical release to air, water, or soil must be reported to the Site HSO at once. Any exposure resulting from protective equipment failure must be immediately reported to the Site HSO and to the Project HSO in writing within 24 hours.

8.0 DECONTAMINATION PROCEDURES

8.1 DECONTAMINATION OF PERSONNEL

Decontamination of personnel will be performed at each Contamination Reduction Zone/Exclusion Zone. This can be accomplished by washing and rinsing the outer gloves and outer boots over the decontamination trough. Disposable clothing can then be removed and discarded into a 30-gallon trash can with a vinyl liner. If personnel are in Level C protection, the above procedures will be followed and the respirator will be removed, sanitized, and placed in a plastic bag.

8.2 DECONTAMINATION OF EQUIPMENT

Heavy Equipment - Decontamination of heavy equipment (such as augers, core bits, rods) will be accomplished by steam cleaning on a decontamination pad constructed on Site of wood and covered with water retaining polyethylene sheeting with a minimum thickness of 6 Mil. Washing of heavy equipment will be completed with attention to minimize any overspray of water, debris and/or soil. All wash water and debris will be collected and contained on Site in a suitable storage tank and/or 55-gallon drums as appropriate. The polyethylene sheeting will be examined frequently for any tears or punctures that may cause a leak. The sheeting will be examined for staining to ensure it can be discarded in a trash dumpster.

Mid-Weight Equipment - Decontamination of mid-weight equipment (such as split spoons, cutting shoes, pumps, non-disposable bailers, etc.) will be accomplished by scrubbing the equipment with a heavy duty bristle brush in a 5 gallon bucket filled half way with water and Alconox® detergent. After washing and scrubbing the equipment will be rinsed by placing it in a separate bucket of water to remove soap and debris. The wash and rinse water will be collected and contained on Site in a suitable storage tank and/or 55-gallon drums as appropriate.

Light Equipment - Decontamination of light equipment (such as tools, containers, monitoring instruments, radios, clipboards, etc.) will be accomplished by wiping equipment off with clean, damp cloths. The cloths can be discarded in the trash can with disposable clothing.

9.0 EMERGENCY PROCEDURES

The most likely incidents for which emergency measures might be required are:

- a sudden release of hazardous gases/vapors during drilling
- an explosion or fire occurring during drilling, or
- a heavy equipment-related accident, or other accident resulting in personal injury

Emergency procedures established to respond to these incidents are covered under the sections that follow.

9.1 COMMUNICATIONS

A portable telephone will be maintained by the Site HSO during the entire project. The phone will be frequently checked to ensure an appropriate signal is available for the phone to work properly.

9.2 FIRE/EXPLOSION

It will be the responsibility of the drill operator to have a fire extinguisher available at the drill rig location. The operator will have further responsibility of taking fire prevention measures such as the continuous removal from the rig of accumulated oil, grease, or other combustible materials.

In the event of a drill rig fire or other fire that cannot be controlled with available equipment, or in the event of an explosion, the local fire department will be summoned immediately by the Site HSO, who shall apprise them of the situation upon their arrival. The Owners will also be notified.

9.3 FIRST AID

First aid for personal injuries will be administered by the Site HSO. All accidents, however insignificant, will be reported to the Site HSO. Personnel designated to administer first aid will have received a minimum of eight hours training in first aid and CPR, and be certified by the American Red Cross. If a Site worker should require further treatment, he will be transported to the hospital. The on-Site vehicle will carry a copy of the HASP which includes written directions to the hospital, as well as a map showing the route.

The following sections are intended as a quick guide to basic first aid only. Effective CPR and first aid require hands-on training that is best accomplished by attending a class in person.

One common formula for performing first aid:

1. Do a primary scene and patient survey, followed by checking Airway, Breathing, and Circulation (ABCs).

   Survey the scene and approach the victim. Determine whether the scene is safe. Look for dangers, such as downed power lines, traffic, unstable vehicles or accidents. Determine what

may have happened, how many victims are involved, and if any bystanders can help. If several persons appear to be injured, perform triage.

Survey the patient and perform an initial assessment. Get consent from a conscious victim (parent/guardian if the victim is a minor) before providing care. If the victim is unconscious, consent is implied. Use infection control precautions and check for signs and symptoms of any life-threatening conditions and care for them. To perform an initial assessment:

- Check the victim for consciousness and obtain consent if the victim is conscious;
- Check the ABCs (airway, breathing and circulation); and
- Check for severe bleeding.

Provide brief care for the conditions. If the patient lacks air or circulation, they may begin to suffer brain damage after approximately four minutes. After ten minutes, they most likely will have some permanent brain damage. (Although unusual, some severely hypothermic drowning victims have been successfully revived with no brain damage after an extremely long period without oxygen.) To care for breathing and circulation means first clearing the airway, and briefly attempting to restart their breathing or circulation with rescue breathing or CPR (and use of a portable defibrillator, where available). This step is crucial, because an unconscious person's airway can be blocked by a normal, comfortable-looking head position (e.g., on their back with a pillowed head). Often, simply tilting the head back will open the airway and restart their breathing. Likewise, many people recovering from a blocked airway vomit, and if they are unconscious, they can drown in the vomit. The standard prevention for both these issues is to turn a breathing, unconscious patient on their side, turning their head and spine in the same movement to avoid spinal injury, pillowing their head on one of their arms. Do not move casualties unless it is necessary to remove them from danger, or to make treatment possible (such as onto a hard surface for CPR).

2. Call for emergency services

Calling for emergency medical services must take priority over extended care such as long term rescue breathing or extended CPR, since these techniques are intended to gain time for emergency services to arrive as part of the chain of survival. However, if bystanders are available, both can be pursued at the same time. If you ask others to call an ambulance for you, make sure they report back to you once released by the emergency operator to confirm that the call has been made.

3. Do a secondary patient survey, and provide appropriate emergency first aid

The secondary survey is to gather information about conditions or injuries that may not be life threatening, but may become so if not cared for. Perform a secondary survey only if you are sure that the victim has no life-threatening conditions. A properly trained and certified person performs three stages in the secondary survey:

1. Interview the victim and include bystanders to supplement info from the patient:

    - Signs and Symptoms - Visible indications of injury and patient reported sensations (e.g. pain)
    - Allergies - especially those relevant to injury (i.e. allergy to latex, penicillin, etc.)
    - Medications - what current or recent medications the patient is taking
    - Past Medical History - any related history, or medical conditions that could complicate treatment (e.g. heart condition)
    - Last meal - last food and/or drink
    - Events - confirm how injury most likely occurred

2. Vitals

    - LOC - Level of Consciousness description (e.g. - alert, aware, disoriented, confused, unresponsive) or AVPU (Alert, Voice, Pain, Unresponsive)
    - Breathing Rate - Number of breaths per minute. Calculate by counting breaths for ten seconds and multiplying by six, or 15 seconds and multiplying by four.
    - Pulse Rate - Number of heart beats per minute. Calculate by counting pulse for ten seconds and multiplying by six, or 15 seconds and multiplying by four. Pulse for an unconscious person is taken on the neck (carotid pulse) and on the wrist (radial pulse) for a conscious person.
    - Skin Condition - Pale vs. normal, cool/cold vs. hot, clammy/sweaty vs. dry

3. Head-to-toe examination

    - Perform a head-to-toe examination
    - Look for medical alert bracelets or medallions.
    - Compare one side of the patient against the other
    - Look for pain, or deformity

9.4 EMERGENCY ASSISTANCE

The following table list telephone numbers of police, fire, hospital, and other agencies whose services might be required, or from whom information might be needed. The following page includes a map and driving directions to New York-Presbyterian/Weill Cornell - Emergency Department, which is the closest hospital with emergency room services.

Name	Contact Numbers
New York-Presbyterian/Weill Cornell - Emergency Department 525 East 68th Street New York, NY 10021	Urgent Care: (212) 746-0795
NYCDEP	311
Fire Department:	911
Police Department	911
Poison Information Center	1-(800) 222-1222
NYSDEC Emergency Hotline	1-(800) 457-7362

10.0 SAFETY CONCERNS AND CONTINGENCY MEASURES

Normally, it is the drilling program that poses the greatest potential threat to the safety of Site personnel. Drilling at the Site will be conducted under the OSHA Safety and Health Standards (29 CFR 1926/191) relative to heavy equipment operation. The following sections describe specific safety measures to be implemented during specific activities.

10.1 BUDDY SYSTEM

The buddy system is an arrangement in which persons are paired, as for mutual safety or assistance. All field work will be completed by at least a two (2) person team.

10.2 SOIL BORINGS

An Active Drilling Exclusion Sub-zone is established by the opening of a borehole. A photoionization detector calibrated to a benzene surrogate will be used in this zone. Monitoring with real-time instrumentation will be performed at the borehole. Action levels will be considered to have been reached when a continuous, steady reading has been observed.

If at any time during the drilling program, USTs, metal, or concrete are penetrated, drilling activities will cease immediately. After obtaining instrument readings, the project geologist/Site HSO will decide whether to continue or discontinue drilling. This decision will be based upon the field conditions such as the resistance to the drill.

10.3 DEVELOPMENT AND DECONTAMINATION WATER

Water generated from purging for groundwater purging and from the decontamination of personnel and equipment in the Contamination Reduction Zone will be screened with a PID. The water will be containerized at the Site for later transport and disposal at a commercial disposal/treatment facility.

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TABLE 1
HAZARD CHARACTERISTICS OF CONTAMINANTS SUSPECTED

Substance	Incompatibles/ Reactive	Exposure Routes/Target Organs	Standards
Benzene	Strong oxidizers, many fluorides and perchlorates, nitric acid	Inhalation, skin absorption, ingestion, skin and/or eye contact Eyes, skin, respiratory system, blood, central nervous system, bone marrow	NIOSH REL: TWA Ca TWA 0.1 ppm ST 1 ppm OSHA PEL: TWA 1 ppm STEL 5 ppm IDLH: 500 ppm
Carbon tetrachloride	NA	Extremely hazardous in case of ingestion, of inhalation and skin contact (irritant, permeator), of eye contact (irritant)., Very hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation	TWA: 10 CEIL: 20 (ppm) TWA: 65 CEIL: 130 (mg/m3 IDLH 200 ppm
Ethyl Benzene	Strong oxidizers	inhalation, skin absorption, ingestion, skin and/or eye contact Eyes, skin, respiratory system, central nervous system, liver, kidneys	TWA: 100 STEL: 125 (ppm) PEL 1255 (ppm) from NIOSH TWA: 100 STEL: 125 (ppm) from ACGIH IDLH: 800 ppm
Heptane	Reactive with oxidizing agents	Absorbed through skin. Dermal contact. Inhalation. Ingestion. May cause damage to the following organs: peripheral nervous system, skin, central nervous system (CNS).	TWA: 500 (ppm) from OSHA (PEL) TWA: 2000 (mg/m3) from OSHA (PEL) TWA: 350 CEIL: 1800 (mg/m3) from NIOSH IDLH 1,100 ppm
Hexane	Reactive with oxidizing agents	Absorbed through skin. Dermal contact. Inhalation. Ingestion. May cause damage to the following organs: peripheral nervous system, skin, central nervous system (CNS).	TWA: 500 (ppm) from OSHA (PEL) TWA: 1800 (mg/m3) from OSHA (PEL) TWA: 176 (mg/m3) from ACGIH (TLV) SKIN TWA: 50 (ppm) from ACGIH (TLV): 500 STEL: 1000 (ppm) from ACGIH IDLH 1,100 ppm
Polyaromatic Hydrocarbons	Strong oxidizers	Inhalation, skin absorption, ingestion, skin and/or eye contact Eyes, skin, respiratory system, central nervous system, liver, kidneys	NIOSH REL: 0.2 mg/m^3* OSHA PEL: 0.2 mg/m^3 IDLH: NA
tert-Butyl alcohol	Reactive with oxidizing agents, acids	Skin irritation, eye irritation, respiratory tract and mucous membrane irritation. May also affect behavior/Central Nervous system (ataxia, somnolence), urinary system. Ingestion: Can cause gastrointestinal irritation. Exposure can cause nausea, headache and vomiting.	TWA: 300 (mg/m3) from ACGIH TWA: 100 (ppm) from ACGIH (TLV) TWA: 100 STEL:150 from NIOSH TWA: 300 STEL: 450 (mg/m3) from NIOSH TWA: 100 STEL: 150 (ppm)

Substance	Incompatibles/ Reactive	Exposure Routes/Target Organs	Standards
Toluene	Strong oxidizers	inhalation, skin absorption, ingestion, skin and/or eye contact Eyes, skin, respiratory system, central nervous system, liver, kidneys	NIOSH REL: TWA 100 ppm (375 mg/m^3) ST 150 ppm (560 mg/m^3) OSHA PEL: TWA 200 ppm Ceiling 300 ppm IDLH: 500 ppm
Trichloroethene (TCE)	Strong oxidizers, many fluorides	Inhalation, skin absorption, ingestion, skin and/or eye contact Eyes, skin, respiratory system, blood, central nervous system	TWA: 350 STEL: 440 CEIL: from ACGIH CEIL: 2380 (mg/m3) from ACGIH OSHA PEL: 100 ppm TWA IDLH: 1,000 ppm
Xylene	Strong oxidizers	inhalation, skin absorption, ingestion, skin and/or eye contact Eyes, skin, respiratory system, central nervous system, liver, kidneys	OSHA PEL 100 NIOSH (REL) 100 ppm STEL 200 ppm TLV 100 ppm IDLH

REL = NIOSH recommended exposure limits, up to 10 hour work day exposure limit, 40 hours/week.
PEL = OSHA permissible exposure limit, 8 hour exposure limit, 40 hours/week, OSHA 29 CFR 1910.1000.
REL, PEL in mg/m^3 = (PEL in ppm x molecular weight) / 24.45.
STEL = Short Term Exposure Limit
TWA = time weighted average
OSHA = Occupational Safety and Health Agency
NIOSH = National Institute for Occupational Safety and Health
N.A. = No applicable value available
ND = no detectable exposure levels for proven carcinogenic substances
Refer to Appendix B for MSDSs of these contaminants that may be encountered on Site.

TABLE 2
COMPONENTS OF PERSONAL PROTECTION LEVELS

Level D Protection	Level C Protection
❒ Safety glasses with side shields (or goggles) ❒ Hard Hat ❒ Face Shield (optional) ❒ Ordinary coveralls ❒ Ordinary work gloves ❒ Steel-toe, steel-shank works shoes or boots (chemical resistant) ❒ Ordinary work gloves	❒ Hard Hat ❒ Ploy-coated disposable (or standard disposable) overalls ❒ Inner gloves of tight-fitting latex or vinyl ❒ Outer gloves of neoprene or nitrile ❒ Steel-toe, steel-shank work shoes or boots (chemical resistant) ❒ Outer boots of neoprene or butyl rubber ❒ Disposable outer “booties” (optional work shoes or boots) ❒ Full-face air-purifying respirator (to be worn)** ❒ Taping of gloves and boots to disposable coveralls

* Respirator to be fitted with NIOSH/MSHA - approved high-efficiency filter (HEPA) combination respirator cartridges approved for organic vapors, particulates, gases, and fumes.
** Half-face respirator, face shield, and safety glasses with side shields (or goggles) may be substituted with approval of the Site HSO.

TABLE 3
PLANNED LEVELS OF PERSONAL PROTECTION FOR EACH ACTIVITY

Field Activity	Level of Protection
Non-Intrusive Activities ❒ Support Zone Activities ❒ GPS Survey ❒ Geophysical Survey	**D**
Intrusive Activities ❒ Soil Borings ❒ Soil Vapor Investigation ❒ Equipment Decontamination ❒ Water Sampling ❒ Transport/Disposal of Generated Waste	**D**

CORE ENVIRONMENTAL CONSULTANTS

TABLE 4
ACTION LEVELS DURING DRILLING ACTIVITIES

Organic Vapors (PID)	Responses
0-10 ppm above Background	Continue drilling, decontamination, characterization, etc. Level D protection Continue monitoring every 10 minutes
10-25 ppm above Background, Sustained Reading	Discontinue drilling, decontamination, characterization, etc. Clear area and re-measure after a minimum of two (2) minutes or Level C protection Continue monitoring every 5 minutes
25-50 ppm above Background Sustained Reading	Discontinue drilling, decontamination, characterization, etc. Clear area, Level C protection and re-measure after a minimum of five (5) minutes Allow hole to vent Continuous monitoring for organic vapors 200 ft. downwind
>50 ppm above Background, Sustained Reading	Discontinue drilling, decontamination, characterization, etc. Withdraw from area; shut off all engine ignition sources Cover hole with drum if the borehole has been vented for a period of greater than one-half hour and levels have not dropped below 10 ppm. Continuous monitoring for organic vapors 200 ft. downwind

Instrument readings collected in breathing zone above borehole unless otherwise noted.

Each action level is independent of all other action levels in determining responses.

Air monitoring for action levels will occur in the breathing zone 30" above the borehole. Readings may be taken in the borehole, but will not be used for action levels.

If an action level for any one of the monitoring parameters is exceeded, then the appropriate responses listed in the right hand column should be taken.

If instrument readings do not return to acceptable levels after the borehole has been vented for a period of greater than one-half hour, the hole will be covered with a 55-gallon drum to reduce emissions. A decision will then be made whether or not to seal the hole with a cement-bentonite plug and abandon it.

FORM

Hazardous Waste Activities Health and Safety Checklist Briefing

HAZARDOUS WASTE ACTIVITIES
HEALTH and SAFETY CHECKLIST and BRIEFING

Project: _____

Project Manager: _____

On Site Health & Safety Officer: _____

The Project Manager or on Site Health and Safety Officer will signify the completion of the following items by initializing and dating each item.

	Initial	Date
❒ Site health and safety plan prepared and approved by health and safety manager		
All employees who will be on Site		
❒ Have received initial (24 or 40 hr.) training		
❒ Have received annual 8 hr refresher training		
❒ Have reviewed the Site health and safety plan and received pre-job briefing		
❒ Have received respiratory protective equipment training including SCBA if required		
❒ Have received negative pressure respirator fit test		
❒ Have had a medical exam within the past 12 months		
❒ A pre-entry briefing has been conducted by myself on ( )		
❒ I deferred the pre-entry briefing responsibility to the HSO		

Each employee conducting field work shall sign this form after the pre-entry briefing is completed and prior to commencing work on Site. A copy of this signed form shall be kept at the Site, and the original sent to the office, for inclusion into the project file.

Site Personnel Sign-off:

❒ I have received a copy of the Site-Specific Health and Safety Plan.

❒ I have read the Plan and will comply with the provisions contained therein.

❒ I have attended a pre-entry briefing outlining the specific health and safety provisions on this Site.

Name: _____ Date: _____
_____ Date: _____
_____ Date: _____
_____ Date: _____
_____ Date: _____
_____ Date: _____
_____ Date: _____
_____ Date: _____

FORM

Report of Accident Injury

REPORT OF ACCIDENT INJURY

Project: _____ Date of Occurrence: _____

Location: (be specific) _____

_____

Type of Occurrence: (check all that apply)

- ❒ Fire
- ❒ Vehicle Accident
- ❒ Equipment Failure
- ❒ Disabling Injury
- ❒ Property Damage
- ❒ Chemical Exposure
- ❒ Explosion
- ❒ Other Injury
- ❒ Other (explain) _____

Injuries:

Name of Injured: _____ Company: _____
Name of Injured: _____ Company: _____
Name of Injured: _____ Company: _____
Name of Injured: _____ Company: _____
Name of Injured: _____ Company: _____

Witnesses to Accident/Injury:

Name of Injured: _____ Company: _____
Name of Injured: _____ Company: _____
Name of Injured: _____ Company: _____
Name of Injured: _____ Company: _____
Name of Injured: _____ Company: _____

What was being done at the time of the accident/injury?

_____

_____

_____

_____

Nature of the Accident/Injury:

_____

_____

_____

FORM

Medical Data Sheet

REPORT OF ACCIDENT INJURY (continued)

What caused the Accident/Injury? _____

_____

_____

_____

_____

What corrective action will be taken to prevent recurrence? _____

_____

_____

_____

_____

Signatures:

Health and Safety Officer _____ Date: _____

Project Manager _____ Date: _____

Reviewer _____ Date: _____

Comments by Reviewer: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

FORM

On-Site Safety Briefing

MEDICAL DATA SHEET

This brief Medical Data Sheet will be completed by all personnel working on-Site and will be kept on Site during operations. This data sheet will accompany any personnel when medical assistance is needed or if transport to the hospital facilities is required:

Site: _____

Name:_____ Home Telephone: _____

Address:_____

_____

Age: _____ Height: _____ Weight: _____

Person to Contact in Case of Emergency:

_____Phone No. _____

Alternate Person to Contact in Case of Emergency:

_____Phone No. _____

Drug or other Allergies:

_____

_____

Particular Sensitivities: _____

Do You Wear Contacts? YES NO

Provide a List of Previous Illnesses:

_____

_____

_____

_____

_____

Provide a List of Previous Exposures to Hazardous Chemicals: _____

_____

_____

_____

_____

What Medications are you presently using? _____

_____

Do you have any Medical Restriction? _____

_____

_____

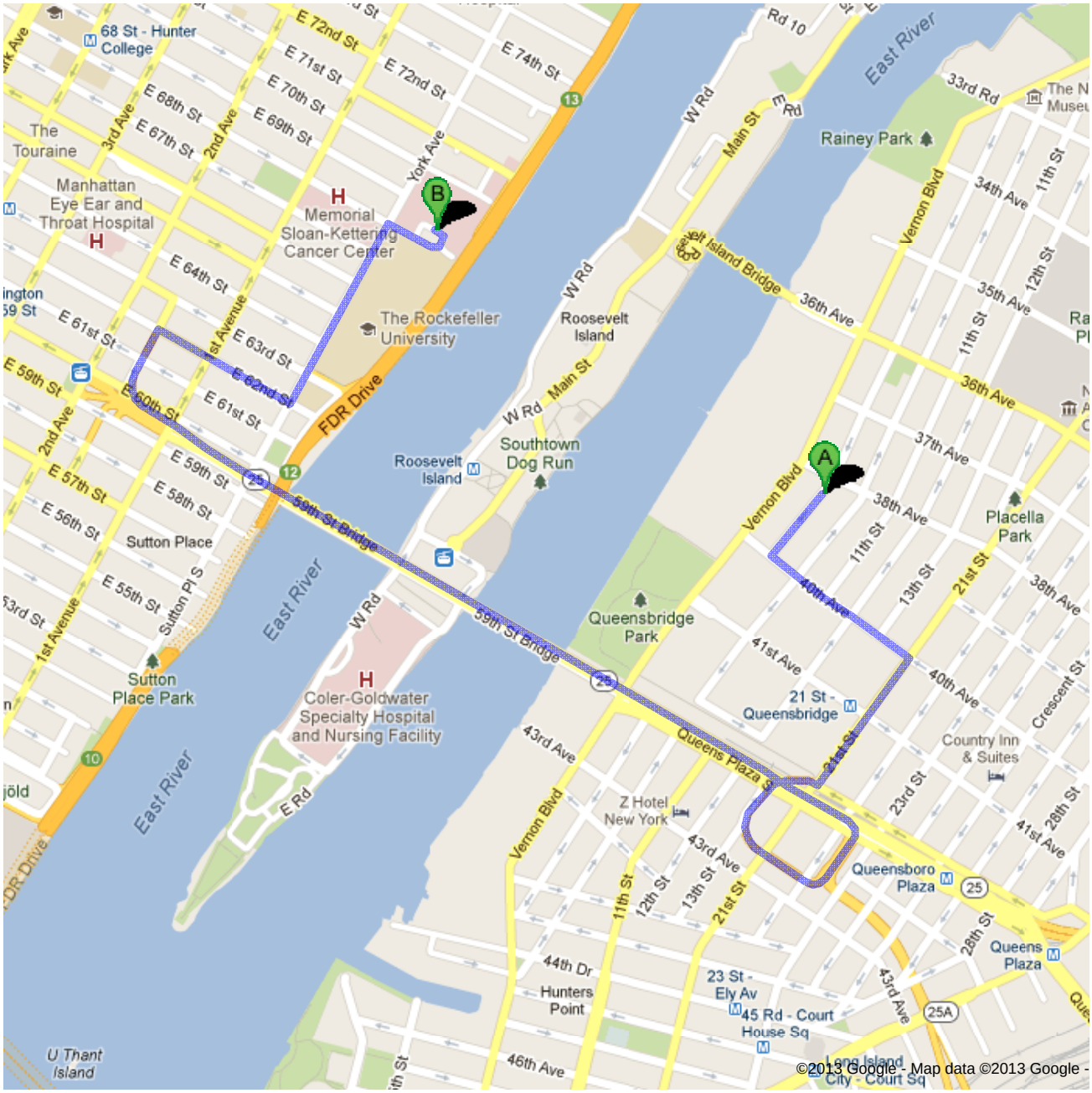
Name, Address, and Phone Number of Personal Physician:

Name: _____ Telephone: _____

Address: _____

ATTACHMENT

Directions to NewYork-Presbyterian Hospital
525 E 68th St, New York, NY 10065
2.9 mi – about **9 mins**
Hospital Route Map



3825 9th St, Long Island City, NY 11101

	1. Head **southwest** on **9th St** toward **40th Ave**	go 0.1 mi total 0.1 mi
	2. Turn left onto **40th Ave** About 1 min	go 0.2 mi total 0.4 mi
	3. Turn right onto **21st St** About 54 secs	go 0.2 mi total 0.6 mi
	4. Turn right onto the ramp to **Queensboro Br Upper Rdwy** About 2 mins	go 0.5 mi total 1.1 mi
	5. Merge onto **Ed Koch Queensboro Bridge** About 2 mins	go 1.0 mi total 2.1 mi
	6. Take the ramp to **2 Ave S/West Side/1 Ave N/FDR Drive**	go 0.2 mi total 2.3 mi
	7. Turn right onto **E 62nd St** About 1 min	go 0.2 mi total 2.5 mi
	8. Take the 2nd left onto **York Ave** About 1 min	go 0.3 mi total 2.8 mi
	9. Turn right onto **E 68th St**	go 433 ft total 2.9 mi
	10. Turn left to stay on **E 68th St** Destination will be on the right	go 180 ft total 2.9 mi

NewYork-Presbyterian Hospital
525 E 68th St, New York, NY 10065

ON SITE SAFETY BRIEFING

Each employee conducting field work shall sign this form after the pre-entry briefing is completed and prior to commencing work on Site. A copy of this signed form shall be kept at the Site, and the original sent to the office, for inclusion into the project file.

Site Personnel Sign-off:

❒ I have received a copy of the Site-Specific Health and Safety Plan.

❒ I have read the Plan and will comply with the provisions contained therein.

❒ I have attended a pre-entry briefing outlining the specific health and safety provisions on this Site.

Name: _____ Date: _____

_____ Date: _____

_____ Date: _____

_____ Date: _____

_____ Date: _____

_____ Date: _____

CORE Environmental, Inc. Project Manager

❒ A pre-entry briefing has been conducted by myself on _____

❒ I deferred the pre-entry briefing responsibility to the Health and Safety Officer.

Name: _____ Date: _____

APPENDIX D
Community Air Monitoring Plan

COMMUNITY AIR MONITORING PLAN
RI/FS, NATIONAL RUBBER ADHESIVES SITE,
LONG ISLAND CITY, NEW YORK

To provide a measure of protection for any potential downwind receptors, and to confirm that work activities do not generate airborne contaminants, CORE will conduct continuous monitoring for volatile organic compounds (VOCs) and particulate matter (dust) during all ground intrusive activities at the site. Monitoring will be conducted at the downwind perimeter of each work area.

VOC MONITORING, RESPONSE LEVELS, AND ACTIONS

VOCs will be monitored on a continuous basis during all ground-intrusive activities. Upwind concentrations will be measured at the start of each workday and periodically thereafter in order to establish background conditions. VOC monitoring will be conducted using a MiniRae 2000 photoionization detector (PID) or PPB Rae PID. The PID will be calibrated, at a minimum, at the start of each day using the span calibration gas recommended by the manufacturer. The PID will calculate 15-minute running average concentrations which will be compared to the action levels specified below.

Action Levels

- 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 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 be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, 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, all work activities will be stopped.

All 15-minute average readings will be recorded and copies of forms included in the Remedial Investigation Report (RIR). Instantaneous readings, if any, used for decision purposes will also be recorded.

PARTICULATE MONITORING, RESPONSE LEVELS, AND ACTIONS

Particulate concentrations will be monitored continuously at the upwind and downwind perimeter of the each work area during all ground-intrusive activities. Real-time monitoring equipment capable of measuring